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Ideas and Beliefs in Architecture and Industrial design

How attitudes, orientations, and underlying assumptions shape the built environment.

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In memory of my father

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Ivar Holm

Abstract

Architecture and industrial design are two professions where values play a vital role. To uncover and shed light on the nature and role of the values embedded in the two design professions, they have been examined from a number of perspectives, including: the general concept of values, general concept of profession, the general concept of design practice and the individual design practitioner as well as that of the overall design process.

Within this framework, a number of different values have been observed and identified. It can be argued that these values play a fundamental role in defining the two design professions. In addition, it is asserted that various design values also influence the way design is practised and the relationship between designers and their clients. They also contribute to how designers cooperate with other “team” members. Similarly, values are one of the main factors that determine the knowledge base existing within architecture and industrial design, as well as how it is developed. From a general professional perspective, the knowledge foundation within architecture and industrial design has within this thesis been characterised as a rather weak base. Thus, this text also includes an examination of a number of design values that have contributed to the classification of architecture and industrial design as “weak” or “minor” professions.

Individual designers are characterised not only by their various professional values, but also by their “distinctive individual” design values. These “distinctive individual” design values are considered to be one of the fundamental explanatory models as to why architects and industrial designers often conduct design differently, propose distinct design proposals and conduct divergent design evaluations.

Within this work, design values have also been determined to be one of the most important contributing factors to the formulation of design decisions. More specifically it has been argued that design values have a dominant and inherent influence on architects’ and industrial designers’ main and subsequent design decisions, as well as in design evaluation. Thus, it is argued within this work that architecture and industrial design are more closely

linked to politics than to a general concept of profession. Furthermore, this characteristic raises questions as to the two professions' claim of specialised competency. Thus, it is possible to question the two design professions' legitimacy to propose solutions that are objected to by large segments of a democratic society. Even so, neither architecture and industrial design education nor design scholars have historically taken into account design values' influence or given design values a central role in their work.

However, it is asserted within this text that, all in all, it is not problematic that both architecture and industrial design are to large extent value based. But it has been suggested that both architecture and industrial design would benefit from a more explicit awareness and reflective relationship to their value base.

Preface

> *"Writing a book is an adventure. To begin with, it is a toy and an amusement; then it becomes a mistress, and then it becomes a master, and then a tyrant. The last phase is that just as you are about to be reconciled to your servitude, you kill the monster, and fling him out to the public." — Winston Churchill*[1] *(Gilbert, 1991: 887)*[2]

> *"Writing is a way of talking without being interrupted." — Jules Renard*[3]

This thesis came to be written due to my continued curiosity and puzzlement over the driving forces that motivate architects and industrial designers to create buildings and products. Both professions are the primary parties responsible for designing buildings and products. Therefore, I have chosen to focus on these two disciplines within this thesis. In addition to my curiosity over the nature of these driving forces, I was also interested in architecture and industrial design's continuing resistance towards developing similarly to professions like medicine and law, a curiosity which set the stage for this work.

This puzzelement over the driving forces motivating the design professional and the resistance towards development similar to other professions led me on a journey to uncover and understand the attitudes, beliefs, orientations, and underlying assumptions, i.e. values,[4] that have made the architecture and industrial design professions what they are today.

As with any PhD project, this task has turned out to be more difficult than I expected it would be, and it has been much more time consuming than anticipated. To quote Hofstadter's Law: "It always takes longer than you think, even when you take this into account" *(O'Connor and McDermott, 1997: 100)*. It has been a challenging journey, it has been difficult at times to determine and understand the central values inherent in these two professions. The sheer number of texts that can provide insight has created a challenge in selecting the most appropriate ones. There has simply been too much information on each topic to cover it all; some information has been specialized and at times outside my domain of core expertise.

The journey has resulted in a thesis which, like most books, is a compromise between detailed arguments and an overall coherent whole. I, like most other PhD students, would have liked to spend more time researching the topic, but within the time available, I have focused on identifying the essential aspects of the different subject areas and allowed for reflection over the different argumentations and concepts presented.

A jigsaw puzzle is a metaphor which fairly accurately describes the process which I have undertaken to create this thesis. The individual pieces represented in ideas, hypotheses, facts, data, arguments, and interpretations subtracted from the writings conducted by a number of design scholars as well as practising architects and industrial designers, have laid the foundation for this text. Some of these pieces are historically oriented, others are focused on scientific aspects, and some fall into the normative tradition commonly found in architecture and industrial design. I have also included pieces that are hunches, insights, myths, and personal stories. The one commonality uniting these divergent pieces is that they all shed light on the role of values in design. The sheer amount of reading material available has at times felt like someone dumped a million-piece jigsaw puzzle on the desk; with the accompanying task of making sense of all of the material. The process has at times led to insight and realisations that some pieces do not belong at all or have been misplaced. To add to the complexity, new pieces have emerged in the form of new books and articles published during the process of collating and writing. Considerable effort has gone into including these new pieces in order to keep the PhD up to date, but with the broad scope of this PhD there will most certainly be pieces that should have been included, which have been left out for this reason.

A limited PhD project with its single author could not possibly consider every piece that exists, nor discuss every point of view available. Therefore, a number of choices have been made with regards to what to include and what to leave out. The final structure and outline has emerged through a reflective process, based on reading, discourse and consideration. There is no claim within the thesis that the picture created by this selection of information, forms the complete story of values in architecture or the industrial design domain. Rather, the thesis offers a first step into identifying the most pertinent values within the two design professions.

With regard to the style of this work, I have aimed to make this thesis as readable as possible for as wide of an audience as possible. Thus, I have attempted to avoid the use of specialized jargon, largely understood only by experts in particular disciplines. The emphasis has been on using a language that does not create a barrier between the reader and arguments presented in the text. This is an academic tradition which has been advocated by a number of distinguished scholars including Karl R. Popper[5], exemplified when he so fittingly advises his PhD students to focus on communicating with the reader, asserting that:

> "you must be clear, never use big words or anything needlessly complicated. ('Write it for Tirzah,' he would say—referring to Agassi's eight year-old daughter.) […] It is immoral to be pretentious, or to try to impress the reader or listener, with your knowledge. For you are ignorant. Although we may differ in the little things we know, in our infinite ignorance we are all equal." *(Bartley, 1990: 159)*

It will be up to the reader to judge if I have been successful in my quest to follow Popper's advice. But I can assure that I have made my utmost effort not to attempt to impress the reader as well as not to be pretentious. This as I accept Karl Poppers assertion that "in our infinite ignorance we are all equal" *(Bartley, 1990: 159).*

Neither architects nor industrial designers are known for their appetite for complex academic texts. I have therefore made an effort to deliberately reduce the amount of academic terminology and to use everyday phrases instead. I have consciously chosen a path that selects aspects of controversial topics to create this argument. The goal has been to produce a single coherent picture that makes sense as a whole, not to argue over details of every point along the way.

The observations and logical argumentation present in the thesis are substantiated by bibliographical citations as well as notes. A number of citations do not quote the original source; I have done my utmost to use original sources when citing design scholars and design practitioners, but I have made a conscious decision not to follow this through for other supplementary subjects. This might be especially evident when I am referring to philosophy and psychology. The rationale behind this design is one of time constraint as well as an acknowledgement that I am not trained as a philosopher nor in any of the other supplementary subjects. Thus, these aspects have not been prioritised. The notes provided within the text are mainly meant as additional information if a name or concept is unfamiliar to the reader. Following the advice of Popper, explanatory notes have been added even to names and concepts which most of the readers will know (for details on notes see the note).[6]

It is my hope that the readers will be inspired to reflect on the assertions made within this thesis and, furthermore, the role of values in the two design professions.

1 Introduction and methodology

> *"Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has." — Margaret Mead[1] (Richardson, 1982)[2]*

This thesis is concerned with values found in the architecture and industrial design professions and, as the preface points out, values in this context are inherently linked to the ideas, beliefs, attitudes, orientations, and underlying assumptions found in the two design domains. This somewhat broad definition of design values is the cornerstone of this thesis.

When the term value is used it is not uncommon to expect to discuss subject matters like ethics and morality, but neither of these topics will not be covered in this work; the work will instead draw on the way the term value is used in a “political” context, which implies a process by which collective decisions are made within groups i.e. behaviour within governments as well as within corporate, academic, and religious institutions.

In much the same way as a small group of citizens have changed and can change the “political” world, a number of individuals and small groups of architects and industrial designers have influenced and changed the two design professions. This thesis aims to introduce the underlying ideas and thinking i.e. values that are behind contemporary architecture and industrial design.

1.1 OUTLINE OF THE CHAPTER STRUCTURE

> *“The time to begin writing an article is when you have finished it to your satisfaction. By that time you begin to clearly and logically perceive what it is you really want to say.” —Mark Twain i.e. Samuel Langhorne Clemens[3]*

This thesis is built around freestanding chapters, each based on different perspectives on the values found within architecture and industrial design. The first chapter deals with limiting the scope of this thesis and, in essence, sets the stage for the following chapters. Chapter 2 introduces the reader to the nature of values in general and includes an introduction to values within the context of design. Chapter 3 introduces the concept of a profession and then compares the architectural and industrial design professions to this general concept of a profession, all from a value perspective. Deviations from this general concept within architecture and industrial design are highlighted, as well as the relationship between design and the general society.

Chapter 4 describes the values typically found within architectural and industrial design practices and their educational institutions. Values within this perspective are attributed to three main domains, including: (1.) external conditions, (2.) internal self imposed conditions and (3.) a knowledge perspective.

Chapter 5 describes value positions found among individual designers, which tend to have their roots in different design movements. These individual values are grouped into a number of main categories including: aesthetic values, social values, environmental values, traditional values and gender values.

Chapter 6 describes how the values introduced in chapter 3, 4 and 5 are utilised in the design process. The main emphasis within this chapter is on the concept of value sets, as designers have different value set. This is followed by an examination of value sets in relation to design decisions conducted within a design process. The chapter is rounded out by a description of design evaluation and its dependencies on value sets.

The thesis is concluded in Chapter 7 where the previous chapters are wrapped up and reflected upon. In addition, future avenues for research in this field are introduced.

The overall structure attempts to capture values within architecture and industrial design from different perspectives and on different levels which are intimately connected.

1.2 BACKGROUND, OBSERVATION, INTEREST AND DEMARCATION

> *"Nor must we forget that in science there are no final truths. The scientific mind does not so much provide the right answers as ask the right questions." — Claude Levi-Strauss*[4] *(Lévi-Strauss, 1994: 7)*

The initial impetus for writing this thesis occurred while I was studying for a Bachelor's degree in Industrial Design at the Central Saint Martin's College of Art and Design[5] in London. It was further developed as a result of the stark contrast I experienced between the design based Bachelor's degree and the subsequent Master's degree in Computer Science I received from the Imperial College of Science, Technology and Medicine[6], also situated in London. Though both schools command considerable reputations, they treated the two subject areas very differently which was startling and puzzling from a student's point of view. I became increasingly perplexed while working in different departments of the telecommunications company Telenor PLC[7]. All of these experiences developed my interest in understanding the underlying cause of these fundamental differences.

My interest was further increased by two particular observations I made while working at Telenor. The first of these observations was that it was common for members of cross-professional teams, i.e. projects consisting of people representing a number of different professions, to have different goals and values. This was particularly evident during the peak of the Internet bubble which reached its height only a few years after I joined the company. A number of these cross-profession projects were characterised by conflicts and problem areas, but from my point of view the most profound shortcoming was a lack of common understanding and agreement over the definition of the main guiding principles i.e. values of a given project. This came to light in a number of situations as team members tended to have different understandings of the project's visions and core values. As an organization, Telenor did not customarily examine value conflicts in cross-professional teams which made it difficult for team members to establish an explicit value discourse while working on projects. This often led to different singular perspectives being pursued by different team members. In practical terms this often led to some team members focusing on the technical possibilities provided by the Internet technology while others remained concerned with expanding the customer base nationally and internationally. Some team members focused on the user experience, others on the increased value these new services could contribute to the Telenor brand. The value conflicts that occurred in some of these projects had—from a designer's point of view—devastating consequences; the collaboration lacked shared common goals and as a consequence did not produce the desired result. There were indications that these value conflicts affected numbers of areas including: performance, user experience, technical reliability, market share and the revenue stream. What is beyond speculation is that some of these projects were not ultimately successful despite heavy investments by Telenor.

The second of these observations was that value conflicts were not restricted to cross-profession projects alone, but were equally present between industrial designers, including myself, in the Research and Development Department of Telenor. While developing new telecommunication services, it became apparant that the different members of the design team had different design values. Consequently, many of the projects that this small group was working on at the time posed difficult value related realisations, questions and trade-offs.[8] Whilst this group represented industrial design traditions from United Kingdom, Denmark and Norway, none of us had the intellectual training or tools to deal with issues related to value conflicts and trade-offs.

Both of the above observations highlight the importance of values in the workplace; most or all of the participants in the projects in question lacked the training and tools necessary to successfully handle the value conflicts and trade-offs that emerged during the duration of their project. These examples demonstrate that value conflicts are not restricted to disciplinary projects, but can be found within most professions. In other words, design professions are no exception. The education I received at Central Saint Martins College of Art and Design reiterated the fact that designers are not educated in even the most common value positions. As a result they avoid or are unable to articulate their own value positions when they become practicing professionals.

My initial interest supplemented by the above-mentioned observations caused me to theorize that the reluctance among architects and industrial designers to tackle value conflicts and to articulate their own value positions, often results in a “circular” argument where vague references to values are used to legitimise form solutions, while the form solutions are used to legitimise equally vague value positions. This “hunch” also supposes that the implicit way of dealing with values within architecture and industrial design, has the potential of creating conflicts between collaborating designers and/or between designers and their clients. Thus, this thesis project is primarily focused on investigating what values exist within architecture and industrial design and, to some extent, the impact some of these values have on the two design professions.

1.2.1 Field of study and clarification of terms

> *“Heaven might be defined as the place which men avoid.”*
> *— Henry David Thoreau[9] (Thoreau, 2002: 115)*

> *"In the animal kingdom, the rule is, eat or be eaten; in the human kingdom, define or be defined." — Thomas S. Szasz[10] (Szasz, 1974: 20)*

This work is primarily concerned with values and their relationship with and impact on design in general, which implies an investigation into the rationale behind design.[11] However, as within all PhD work, one has to limit the scope as resources are limited, and some would argue scarce. Based on the initial interest and background as well as the framework that a PhD project provides, it is the intent to limit the focus to the study of values found within the architectural and to some degree the industrial design professions. The focus on both professions might be considered inappropriate as it broadens the scope rather than limits it. However, the selection of two design professions offers the scope of indicating if some of, or most of, the design values are of a general design type or if they are profession specific. In addition, the selection of two professions offers a richer and border selection of work to select from, which have been of importance in some of the subsequent sections. Thus, the choice of architecture and industrial design was made on the basis that architecture and industrial design are often considered to be in the middle of the spectrum of all the design professions *(Lawson, 1997: 4).*[12]

Even so, the appropriateness of the selection of the architecture and industrial design profession might be objected to on the grounds that they are quite different professions with distinct traditions and histories. This is a common view that is not supported within this thesis; as it is argued, these two professions are closely related. This as many of the early industrial designers were in fact architects who had divagated from their core discipline. Equally, some contemporary industrial designers are trained fully or partly as architects.[13] The two professions also have commonalities when it comes to the design process, design approaches,[14] and, as this work will illustrate, they share many common design values. Contrary to what many design scholars argue, these two professions have—from a value perspective—a very similar and at times common knowledge and research bases (this point is elaborated in chapter four).[15]

However, there are at times some differences in main emphasis as industrial design tends to be more focused on mass-produced products than what is common in architecture. It should be noted that architects do not only deal with unique objects, but also at times concerns themselves with mass-production.[16] Even so, this difference in focus is of importance when values are concerned, and the difference has been useful when mapping out some of the values presented in subsequent chapters; many architectural scholars tend to hide or ignore the mass-production aspect of architecture, whereas this is not the case in industrial design.

The shared common ground between the two professions contributes to blurred boundaries, and some crossovers.[17] But the status and established precedency tends to vary between these two design professions, where architecture is generally considered to hold the most rank and authority. Architecture has long been considered to be the “queen of the arts”, implying that it has been respectable and powerful enough, as a profession, to influence most of the other design professions *(Sparke, 1998: 10), (Pevsner, 1960: 16).* The focus of this work will therefore be mainly on the architectural profession with the industrial design profession providing supplementary information.

A number of terms and concepts that are essential for understanding these two design professions are not always straightforward. It is therefore appropriate to clarify some of the key concepts and terms which this work is based upon.[18] In addition, as for most PhD work, a number terms and preconditions will have to be accepted, as these are relied upon during the subsequent argumentation. The essential concepts, terms and preconditions which this thesis is built upon include terms such as, design, architecture, architectural profession, industrial design, industrial design profession, values, frame and framing, which will be introduced in the following:

Design is as old as human civilization and it is an activity which has a considerable tradition *(Heufler, 2004: 9)*, as people were designing artifacts and buildings long before design was institutionalised in education and professions *(Cross, 2000: 3).*[19] But the term design or its equivalent did not emerge in most European languages before around the sixteenth century *(Cooley, 1988: 197).* The term itself emerges on the back of a development where the architect and builder functions came to be two separate functions, which created a need for a term that describes the occupation of drawing and or planning before building *(Gedenryd, 1998: 42), (Cooley, 1988: 197).*[20]

The term design[21] has since become a term which is widely used both within the design professions[22] and in every day life *(Woodham, 2004: xiii).*[23] It is extensively used in many different professions[24] and describes a broad range of activity *(Krippendorff, 2000: 58).*[25] Design is without a doubt a key concept within architecture, interior design, industrial design, engineering design, graphic design, urban design, information system design, interaction design (software design) and fashion design *(Nelson and Stolterman, 2003: 1), (Margolin, 1989: 4).*[26] Generally it can be argued that “no single definition of design … adequately covers the diversity of ideas and methods gathered together under the label" *(Buchanan, 1995b: 3)*.[27]

Design has a strongly rooted connection between the meaning of plan and intention, where intention and plan both belong to the domain of design thinking *(Gedenryd, 1998: 43)*. Hence, design within this thesis covers the activities which take place within architecture and industrial design that correspond to transforming ideas and beliefs into a plan for implementation through thought, planning and analysis as well as execution, action and synthesis. The emphasis will be on the design ideas and beliefs, i.e. design values, as they create the basis for a design proposal and for how the design plan is to be executed *(Gedenryd, 1998: 43)*.

Architecture is, similarly to design, a term which is commonly used within everyday language and within a number of different professional contexts.[28] Architecture, within the context of this thesis, is linked to the architectural profession and the built environment, consisting of buildings and urban planning. Even though landscape architecture and interior architecture are at times considered to be a part of architecture, these areas will receive little attention.

The architectural profession is not a concept which is as easily defined as one would think at first glance, because it is of a "weak" character (this point is elaborated in chapter three).[29] The architectural profession has to a large degree been influenced by a number of factors including the work of historians. Difficulties in defining the architectural profession can be illustrated by the historians' contribution to the definition of the profession. Their contribution have been of pointing and selecting key figures and buildings which represent architects and architecture in general, as well as highlights of the architectural profession. Historical opinion has often been based on the notion that the architectural profession is primarily concerned with aesthetics. This is a point of view which to some extent overlooks the fact that, historically speaking, architecture has been made by a number of different people representing different knowledge and skill bases.[30] It is not uncommon for historians to exclude groups like engineers and inventors; even if some individuals of these professionals have contributed to the built environment in very much the same way as architects.

Another example can be found in the difficulties that exist in defining the point when architecture emerged as a profession. Pinpointing the moment that architectural practitioners can be defined as members of a profession is as difficult for architects themselves as it is for historians *(Briggs, 1974: 1-10)*. It all depends on which definition of profession is used, as before the

20th century the majority of practitioners of architecture had no formal education and therefore obtained their training as architects through ap-parenticeships *(Cuff, 1991: 24 - 26), (Wilton-Ely, 1977: 191 - 193).*[31]

Within the context of this thesis the concept of an architectural profession will be linked to practitioners who have received their education from architectural schools, and to other institutions which safeguard the status and privileges granted the profession. But practitioners of architecture outside of this category will not be excluded as they are often the source of the values found within the contemporary architectural profession. Architecture and the architectural profession are often linked to art and culture, and although this aspect will not be denied within the context, it will not be given prominence.

Industrial design has roots in the guilds and apprenticeships tradition where craft traditions were passed on from generation to generation. With the emergence of the industrial revolution the influence of the guilds diminished, but at the same time it led to a need for art and industry to collaborate, in order to produce numerous new consumer and capital goods *(Heufler, 2004: 9 f)*. Thus the foundation for industrial design was born.

As for architecture, it is not a simple task to define what the term industrial design should include, as there is no commonly accepted definition for industrial design.[32] Historians have, much like for architecture, tended to define industrial design as an aesthetic activity.[33] Within the industrial design discourse it has been common to link industrial design not only to aesthetic activities, but also to problem solving activities. The lack of a generally accepted definition reflects a number of different perspectives which can be found within the industrial design profession and among its academic institutions *(Gemser and Leenders, 2001:29)*. These different perspectives have led to a situation where the term industrial design tends to include a number of things,[34] which embody the areas of product design, transport design or interaction design *(Heufler, 2004: 14)*.[35]

Within the context of this thesis the term industrial design refers to what is traditionally seen as “product design” without too much restriction on the product range, as the process for designing in this context tends to cover a wide variety of products ranging from teaspoons to cars *(Dorst, 1997: 15)*. Other areas of industrial design such as transport design or interaction design will not be excluded, but will not receive much attention.

The Industrial design profession is a relatively new profession and it is of an even “weaker” character than the architectural profession (this point is elaborated in chapter three).[36] Even if industries have been producing mass-produced products for more than a century, it was only after 1945 that the trained industrial designer emerged *(Sparke, 1998: 6), (Dorst, 1997: 16).*[37] Before this time almost all products were "designed by mechanical engineers, artists and architects who had strayed from their original disciplines" *(Dorst, 1997: 16).*[38] But industrial design has gradually developed into a specialisation requiring a set of specific skills and a different knowledge base than the other design based professions *(Dorst, 1997: 16)*.

Within the context of this thesis the concept of the industrial design profession will be linked to design schools providing dedicated training in the subject area of industrial design. The industrial design profession is often mainly associated with giving form to products, but within the context of the thesis the concept of industrial design also includes the capability of integrating other aspects like ergonomics and different technologies into a given design project. It will mainly be linked to mass production and thought of as a profession which is closely linked with industry. This is not denying that the industrial design profession is often closely linked with art and culture, but these aspects will be given less attention.

Values is a term which is used in a number of contexts including politics, marketing,[39] economics,[40] computer science,[41] mathematics[42] and law as well as within the personal and cultural[43] domain. The term implies different concepts within each of these different domains, but in general expresses the concept of worth. Values are closely linked to reasons for certain practices, policies, or actions; they are also intrinsically linked to ethics. It is also common to link values to the topics of aesthetics[44], doctrine[45] and human rights.

Within the context of this thesis values have, as indicated earlier, a scope consisting of: attitudes, beliefs, orientations, and underlying assumptions. These concepts are closely linked to ideas, opinions and culture. Values are organised into value systems—the ordering and prioritization of different values, both on an individual, professional and societal level.

The broad definition of design values—the cornerstone of this thesis—is sometimes referred to as design culture within the design discourse. A similarly broad definition of values is described as culture[46] outside the design domain. Current academic literature concerned with general values argues that values "play an unquestioned role in human behavior and progress" *(Porter, 2000b: 14)*. The link that exists between values and human progress[47] has been explored by a large quantity of literature outside the design domain *(Porter, 2000b: 14)*. This literature is used as a source and inspiration within the thesis project to investigate if design values have a similar potential link between design values and design process.

Frame and framing[48] are terms that are used in many domains such as art, construction, and mechanical engineering. The term has many extended, metaphorical meanings in various fields. Among these are the frame referring to a solid border around a picture or painting within an art context. Within mathematics a frame is an abstract concept of manifold, and in law the term frame is linked to “framing someone” which implies an effort to make someone look guilty of crime which they did not commit. In other contexts framing often refers to how one organizes knowledge about the world and how one uses “this knowledge to predict interpretations and relationships regarding new information, events, and experiences” *(Tannen, 1979: 138 f)*

Frames tend not to have a permanent characteristic, as framing involves the concepts of constructing, shaping, focusing, organizing and representing interpretations of the world *(Gray, 2003: 11 f)*. Reframing implies a change of a frame and involves weighing new information against previous interpretations and creating a new frame *(Gray, 2003: 12)*.[49] In the framing process one will tend to be “imparting meaning and significance to elements within the frame and setting them apart from what is outside the frame” *(Buechler, 2000: 41)*.

Within the context of this thesis, framing is closely linked to the concept of values because it involves a representational process in which it represents or expresses a thought process as well as the basis of this thought process *(Gray, 2003: 12)* (this point is elaborated in chapter six).[50] The frame and the process of framing are therefore two key concepts that will be used to describe the setting of the stage for the design process. Additionally, they serve as key aspects of the design process in itself.[51] The term frame will also be used within this thesis as a “road map” that contributes to organized knowledge, and to “sort and predict the meaning of new information, events, and experiences” *(Gray, 2003: 13)*

It can be considerably difficult to define what constitutes these key concepts, as illustrated by the above. These difficulties will not be resolved within the framework of this thesis. Rather, the objective here will be to expose some of the underlying factors that contribute to these difficulties by investigating the values found within the architectural and industrial design professions. This as the history of architecture and industrial design is not merely a history of buildings and products, but a history of the changing views of subject matter held by architects and designers, manifested through artefacts *(Buchanan, 1995b: 18)*.

1.2.2 Design with its values are of consequence

> *"We shape our buildings, and afterwards, they shape us."*
> *— Winston Churchill (Churchill and James, 1974: 6869)* [52]

> *"We all live in, work in or walk around buildings and experience architecture on a daily basis. The design decisions taken by architects in the near or distant past affect us more directly than any other comparable art or craft. We don't have to listen to opera or look at paintings but we do have to confront architecture." (Cruickshank, 2000: 7)*

A research project should always be of some significance, and at first glance it might not be clear that the study of values within architecture and industrial design is of any importance. So, whether design values are of any importance and important enough to require an investigation, is a legitimate question.

Little controversy exists over the assertion that the physical environment surrounding people has an influence on the way people live their lives. Products such as airplanes, cars, television, telephones and mobile phones have changed people's behaviours and the way they interact with each other. Similarly, architecture has a profound impact on people's lives as argued by Winston Churchill when he asserts:

> "There is no doubt whatever about the influence of architecture and structures upon human character and action. We make our buildings and afterwards they make us. They regulate the course of our lives." *(Churchill and James, 1974: 3467)*[53]

This effect is no more evident than in the ability of architecture (be it in a small way) to influence the political system, which was particularly evident in the argument over the restoration of the war-destroyed House of Commons[54]. At the time, Churchill argued that the original design, with its opposing benches, was essential to the preservation of the parliamentary process. Churchill maintained that such a layout demands a choice and public conviction to be declared in relation to a given issues, which is different from the arc layout which has the ability to blur the manifestation of each member's political convictions.[55] This as the point of view held by a Member of the House of Commons, have practical implications for where the MP is seated and with which other MPs he or she is associated. Winston Churchill argued this position with his characteristic wit when he asserted:

> "It is easy for an individual to move through those insensible gradations from Left to Right, but the act of crossing the Floor is one which requires serious consideration. I am well informed

> on this matter, for I have accomplished that difficult process, not only once but twice!" *(Churchill and James, 1974: 6869)*

Winston Churchill's argumentation illustrates that design has potential to influence both the political processes and the every day life of people.[56] This point is echoed by Denise Scott Brown[57] when she asserts that: "Architects, because they can do harm, must learn to be open-minded" *(Cuff, 1991: 101)*. Thus, it can be argued that the creations of the physical environment have a significant impact on the live of people *(Cuff, 1991: 101 f)*.

The impact that architects have on society is nowhere more evident than in urban planning, a discipline that aims to impose physical order on things that by their very nature are chaotic. It can be argued that the cities planned and created by architects "have been formed by the seemingly omniscient hand of urban planning or, less fortunately, by the lack thereof." *(Cormier, 2004b: 1379)*. Both successful and unsuccessful urban design tends to have greater impact on people's lives than individual buildings and products. It could be argued that the design professions might not exist, if architecture and industrial design did not create such profound societal impact.

Another indication of the importance of architecture and industrial design can be found in the long life-span of some urban design and individual buildings (and even some products). Architectural projects on the whole are buildings which are big, expensive, immovable, and public, factors that contribute to considerable difficulties in replacing them if they become tiresome or outdated. A potential dissatisfaction with a building (and some products) is not resolved if a dissatisfied client and/or owner sells the building as a new group of individuals must cope with the potential dissatisfaction *(Cuff, 1991: 102)*.

The influence of products on people's lives is similar to that of architecture, but at the same time slightly different due to being mass-produced. A successful or unsuccessful product is not easily replaced, as mass production tends to require great quantity of any particular design to achieve break-even point on the initial investment. Unsuccessful design can result in loss of market share and layoffs within a given company *(Cross, 2000: 204 f)*.

From the purchaser's or user's point of view it might not be straightforward to exchange an unsuccessful product for a more successful one. Equally, a complicated design might prevent the user from taking full advantage of all of the features of the product *(Norman, 1990: 1 f)*. Design weaknesses can have even more disastrous effects such as design faults in cars, airplanes, or nuclear power plants, which in some cases can lead to accidents *(Norman, 1990: xi f)*.

If one accepts that architecture and product design are of importance, then the values of architects and industrial designers must be of consequence. An indication of the importance of values in architecture and industrial design can be found in the fact that designers do not have one single “correct” answer, and often produce many possible answers in their quest to find the ‘best’. The built environment can take on almost any shape imaginable and thus there is little chance of ever discovering the ‘right’ answer to what world we ought to build *(Nelson and Stolterman, 2003: 30)*. This is the case even with those designers that claim to have found “access to the truth—i.e., that they are able to discern what should, or should not, be regarded as an appropriate addition to our real world” *(Nelson and Stolterman, 2003: 30)*. Design emerges from a series of human judgments which can differ depending on the particular designer involved in the design process. Different designers have a different view on what kind of environment one ought to create, be it in architecture or industrial design *(Fiell, 2001: 15)*. Additionally, many design scholars, practising architects and industrial designers claim that they are contributing to the future through their design projects; this type of assertion indicates that values might have an impact on design. Thus the value sets held by architects and industrial designers are of importance with regards to both design decisions and the input that designer brings to a design project.

1.2.3 Demarcation of the intended scope

> *“In view of the fact that God limited the intelligence of man, it seems unfair that He did not also limit his stupidity.” — Konrad Adenauer*[58]

The very nature of a PhD project requires some sort of demarcation of the scope, and this process tends to be challenging, regardless of the academic discipline it belongs to or the particular subject matter being investigated. This is certainly the case within the domain of architecture and industrial design, as these domains are characterised by a multidisciplinary disposition (this point is elaborated in chapter four).[59]

Architecture and industrial design have traditionally been researched from at least three perspectives which include: the historical, theoretical and design process perspective. For instance, within historical research the emphasis has typically been on elements such as: buildings and products from a timeline perspective, from a style and former expression perspective, social circumstances and technical opportunities etc. *(Sparke, 1998), (Woodham, 1997), (Gibberd, 1997)*. Equally, architecture and industrial design have been researched from a theoretical perspective focusing on the question of what constitutes "proper" design, which has been concentrating on the design discourse among the design scholars and practising designers *(Rowe, 1987), (Margolin, 1989)*. Another perspective can be found in the investigation of what architects and industrial designers actually do during the design process etc. *(Cuff, 1991), (Edwards, 1999), (Darke, 1979)*[60]*,(Janson, 1998)*.

All of these different perspectives and more can be found within contemporary design literature. Adding to the complexity, is the fact that research tends to be confined to specific subject matters such as: the individual designer, the design team, the design office, the freelance designer, design clients, design relationships, the design economy, creative freedom, different design methodologies, the design processes, aesthetic styles, design as problem solving, or design as an aesthetic activity.

This PhD project differs from the above-mentioned overall perspectives in that it is not primarily concerned with one particular perspective, be it theoretical or practical; nor does this thesis focus on specific aspects of design. Instead, the focus within this thesis is on "encircling" the broad spectrum of values inherent within architecture and industrial design through a number of different perspectives, which include: (1.) a general value perspective found in chapter two, (2.) a general profession perspective found in chapter three, (3.) a general design practice perspective in chapter four, (4.) an individual design practitioner perspective found in chapter five and finally (5.) a design process perspective in chapter six.

The aim of this work is to establish a broad overview of the different design values that exist within the architectural and industrial design professions. But as with any PhD project, there is a need to clarify what is considered to be outside of the scope and what will be given the main focus, this as a realistic PhD project has its limitation with regards to manpower and time frame. The demarcation of the scope which has been struck will be described in the following:

The relationship between aesthetics and ethics is outside the scope even if there exists an aesthetic versus ethics discourse among design scholars writing about the two design professions. The aesthetic versus ethics discourse is based on the dual characteristics of design; which on the one hand can be seen as a profession concerned with functionality and construction, and on the other hand as a creative art that uses form of buildings or products to express an aesthetic quality *(Schön, 1987: 43)*. It is a dichotomy within design theory, where there is little consensus. Extending and developing further theories regarding aesthetics versus ethics is outside the scope, as is providing a comprehensive overview of the aesthetic versus ethics discourse, which has its roots stretching back at least a couple of centuries *(Watkin, 1977: 22 f), (Taylor, 2000)*. But as some design values have a link to the aesthetic versus ethics discourse, the subject will be briefly touched upon in the following chapters; as there exists an intricate relationship between form and function where design values play an essential part.

General philosophy is outside the scope of this work, despite the fact that some design scholars, architects and industrial designers reference philosophy as both a pre and post-rational argument for designs of buildings and products.[61] Some design values do contain elements of philosophy; where design values touch upon this topic, a brief reference will be given when appropriate, but it will be treated superficially.

General ethics are outside the scope. Values and ethics are closely related; both are subjects with long traditions in different academic disciplines. The sheer volume of literature on ethics makes it virtually impossible to do the subject matter any justice within the limits of this thesis, while at the same time investigating design values generally.[62] It is therefore outside the scope of this thesis to investigate ethics.

Even so, design values are intrinsically linked to some aspects of ethics. Indications of this can be found in that many designers and design scholars have attempted to propose specific ethical guidelines for designers. These ethical guidelines have often been aimed at changing the way designers do their work as well as what they design *(Wasserman et al., 2000), (Conrads, 1970)*. An example of this can be found in Victor Papanek's[63] work, particularly in his book "Design for the Real World", where he proposes new ways of designing and attempts to introducing new design ethics. The aim of this thesis is not to follow in Victor Papaneks footsteps by defining new design ethics or proposing a particular design value set.[64]

However, the relationship between values and ethics will be examined from a professional perspective, even though there is a limited discourse within design on ethics and its relationship to design.[65] It will, as for philosophy, only be touched upon very briefly in the following chapters.

A comprehensive outline of the design process is outside the scope of this thesis, but there will be limited attention given to the concept phase of a given design process, with a lesser focus on the subsequent design stages. This as it is within the concept phase, that architects and industrial designers attempt to both set the conditions for the final design outcome, and set the frame for the remaining parts of the design process.[66] Thus, the concept phase is the part of the design process where design values are most apparent and where designers tend to have the most impact on the design outcome; this part of the design process will be discussed while the remaining phases of the design process will receive less attention and focus within this thesis.

1.3 RESEARCH METHOD

> *"For so long, design has been dogged with debate over what might be constituted the `right' research methods: whether design is special and therefore should establish its own research methods, or whether it was about practice and therefore the mere act of practice was research. Hopefully we have moved on. From a personal perspective I have always believed there were enough methods available in science, social science, the arts and humanities for us to pick and choose and to create our own toolbox according to the research issue or problem under consideration. All that we need to do is to understand methods and to apply them with rigour and in an appropriate manner." (Cooper, 2003: 1)*

A number of design scholars as well as architects and industrial designers assert that architecture and industrial design are "special" disciplines, and therefore need to be researched using special research methods (see above quote).[67] This argument will not be drawn upon, referenced or supported here. Neither will the idea that architecture and industrial design practice is in itself research be supported. Instead, it will be suggested that architecture and industrial design could benefit from learning from other professions and their approach to research, specifically how research contributes to the knowledge base found within other professions (this point is elaborated in chapter four).[68]

As introduced in the previous section, this PhD project is different from many other design research projects because it contains multiple perspectives, has a relatively broad scope and utilizes an encircling research approach and scholarship of integration rather over an in-depth approach and scholarship of discovery *(Boyer, 1990: 16 - 18).*[69] This is based on an argument asserting that, in addition to the in-depth approach, there is a need for scholarly work which gives meaning to isolated research (facts) and then puts these aspects in perspective *(Boyer, 1990: 18)*.

An encircling and integrative approach implies the formation of connections across disciplines (in this case architecture and industrial design), placing aspects and specialties in a larger context and illuminating data from new perspectives *(Boyer, 1990: 18)*. In short, encircling and integration is characterised by interdisciplinary, interpretive and integrative aspects.

The scholarship of encircling and integration is closely related to "detection" and implies that one is seeking to interpret, draw together, define relationships, and bring new insight to bear on already existing research. Using this approach, the researcher tends to ask "'What do the findings mean? Is it possible to interpret what's been discovered in ways that provide a larger, more comprehensive understanding?'" *(Boyer, 1990: 19)* instead of the usual question of *What is to be known?* and *What is yet to be found?*. In other words, it can be asserted that theory building in a very coarse categorisation serves two main purposes where "one is to predict the occurrence of events or outcomes of experiments, and thus to anticipate new facts" *(Boyer, 19901971: 19)*, and "the other is to explain, or to make intelligible facts which have already been recorded" *(Wright, 1971: 1)*. The scholarship of encircling and integration is connected to the second one, and when carefully pursued, this approach holds the potential to reveal new knowledge or larger intellectual patterns.

However, PhDs which are based on this approach tend to have a broader scope than the more "traditional" in-depth approach and therefore often include a more extensive manuscript than other PhDs; this is the case for the PhD in question. From an in-depth perspective this type of PhD can be criticised for having a tendency to treat every aspect as equally important and for lacking a very specific research question. From an in-depth perspective, this criticism is valid, but as the objectives within the scholarship of integration is to interpret, draw together, define relationships, and bring new insight to bear on already existing research, the very nature of this approach tends to have an all-encompassing evenness and have a broad research question. Thus, it should be accepted that, within the scholarship of integration, an all-encompassing evenness and broad research question is not a problem, but a natural consequence of the method in question.

Nevertheless, even if this PhD is not allied with the more "traditional" in-depth approach, is it consistent with a considerable research tradition that incorporates a number of research approaches within architecture and industrial design, which focus on why it is that, architects and industrial designers design as they do.[70]

In the following sections the aforementioned research method will be introduced. Additionally, the background and the rationale behind its selection will be discussed.

1.3.1 Research challenges and possibilities

> *"The greatest enemy of truth is very often not the lie—deliberate, contrived, and dishonest—but the myth—persistent, pervasive, and unrealistic." — John F. Kennedy*[71]

The analogy of the preparation for a trial serves as an exemplary metaphor to illustrate the development of the research strategy chosen for this PhD project. A lawyer or a prosecutor prepares by collecting and investigating a number of sources of "evidence", which are then submitted in order to build up a convincing case. The case is also substantiated by references made to previous cases and any judicial precedent[72]. The authority of previous court cases is often an essential part of securing the verdict, where rulings from the higher courts supercede rulings from the lower courts. Similarly, argumentation within this thesis will be based on "evidence" which is based on empirical based studies, historical studies, normative work and practising architect's and industrial designer's assertions, bearing in mind that not all can be given equal importance (this point is expanded upon in a subsequent section).[73]

The tactic of arguing a case on the authority of previous cases, which is common within law, is also a tactic that is found, encouraged and extensively used within the whole of the academic world. In the same way that solicitors or prosecutors refer to previous court cases, academic scholars substantiate their preconditions and their general findings by referring to other academic scholars' work.[74] This tactic is extensively used within this thesis, where considerable efforts have gone into referring accurately and correctly referencing works cited.

Similarly to the manner in which higher courts supercede rulings from the lower courts, some scholarly works are found to be more important than others in academia. These typically encompass routines such as peer reviewed magazines that vouch for the quality of articles. In much the same manner, books and publications tend to have quality routines that vouch for their quality. Even the particular magazine or publisher that publishes a work indicates the precedence one should attribute to a particular article and book. These routines are trivial in most established academic fields, but within architecture and especially industrial design this is not a trivial matter, as there are few established peer reviewed magazines, and many books are not published by the prestigious publishing houses. Thus, considerable effort has gone into utilizing books as the main source, supplemented by articles published in well-established architecture and industrial design magazines.

Still referring to the court metaphor, it is the last ruling of a court system that takes precedence when the publishing courts are on the same level. This principle also applies to some extent to most academic fields, as scholars are expected to know of existing research and contribute with new works. Thus, care has been taken here to select only the most recent works of appropriate quality. This is not a trivial matter within architecture and industrial design as the two professions have a different relationship to research than many other academic fields (this point is elaborated in chapter four).[75]

The very nature of architecture and industrial design as well as values makes it challenging to find and submit any hard "evidence"[76], that is, evidence that corresponds to repeatabe research conducted by observation or tested by experiment etc.[77] However, as in the law profession, it is possible to build up a convincing case by submitting a number of details which when put together make up a convincing case. The "evidence" which will be submitted within this thesis will mostly be "circumstantial evidence", but as in a court case, the sheer volume of this "circumstantial evidence" will serve to build up a believable case.

The idea of "circumstantial evidence" can be challenged on the grounds that it is inappropriate to present conclusions from previous research as "facts" ready to be inserted "as found" into the argumentation. Similarly the idea of "circumstantial evidence" could be seen as objectionable on the grounds that a PhD should present original research, and be able to support and defend its claims. A reader might even argue that the selection of "facts" should be substantiated by an in-depth analysis of the "facts" selected throughout the argumentation i.e. the different section of the thesis. These are to some extent valid criticisms of the approach selected. However, the very nature of the scholarship of integration—it seeks to interpret, draw together, define relationships, and bring new insight to bear on already existing research—makes an in-depth analysis of all the research relied upon virtually impossible within a manageable length of manuscript and the time limit imposed on a PhD project. Instead, as for a court case the quality of the work should be judged on the overall logic and the persuasive power that the overall argument holds (this point is elaborated in a subsequent section).[78]

The reliance on "circumstantial evidence" should not be interpreted as a denial of the importance of hard-hitting or strictly scientifically based "evidence". On the contrary, it is acknowledged that this type of "evidence", if available, would have strengthened the case made within the thesis. But as the following sections will indicate, the nature of architecture, industrial design and values research pose a challenge in finding and developing hardhitting "evidence". In any case, the following sections demonstrate that the available resources do not facilitate the generation of this type of "evidence". Thus, this thesis is primarily based on existing research within architecture and industrial design. The exact type of research varies but includes works from a wide variety of disciplines, some outside the fields of architecture and industrial design such as: cognitive psychology[79], engineering, computer science, sociology, anthropology and history *(Craig, 2001: 13).*[80]

It is the combination of several sources and the interpretation of these sources from a value perspective which will contribute to new "evidence" and build the "case".[81] But the strategy of utilising already existing academic work to substantiate claims is not without its problems and challenges, as indicated above. For this strategy to be successful, the research upon which it is based must be of a robust scholarly quality. This is of course not always the case, especially not in academic research within architecture and industrial design. Thus, it is at times difficult to determine what is worthy of being deemed to have a robust scholarly quality.[82] It is therefore essential to develop a strategy for what should be included and what should be excluded. This is particularly challenging within a PhD set in the design domain, as the quality of research conducted within the domain varies considerably.[83] The sheer volume of appropriate research also poses a challenge within a research strategy that is attempting to define a domain, as opposed to investigating further an already well-established academic domain.[84] The very nature of architecture and industrial design also contributes to these difficulties, because there are several design discourses that serve to unravel values and how values are utilised within design.[85] To deal with these challenges, a number of selection criteria have been developed for the selection of research and literature to be included in the thesis.

Firstly, as already indicated considerable effort has gone into utlizing books as the main source, supplemented by articles published in well-established architecture and industrial design magazines. In addition the publishing date of the selection of books and articles has been used as selection criteria, where efforts have gone into finding the most recent work available.

Secondly, research and literature will be chosen on the grounds of what is considered to be influential within the academic discourse within architecture and industrial design. These will include works from a number of different research strategies and perspectives, empirical and historical based research as well as normative based work (predominately written by design scholars). In addition, accounts from prominent practising architects and industrial designers will be included.

Thirdly, the selection of material will be restricted both linguistically and geographically. The main focus will be on Anglo-American (Anglo-Saxon) based research and literature. Equally, the focus will be on Western Europe and the USA.[86] This strategy excludes a number of works and appropriate examples found in other parts of the world, as well as writings that are principally available in other languages. But this strategy is chosen on the presumption that: (1.) many of the most important works are translated into English and will therefore be available and (2.) that major influential works outside Western Europe and the USA often are cited in texts primarily concerned with Europe and the USA.[87]

Fourthly, a strategy of including multiple texts from different research traditions and perspectives will be adopted. This is intended to meet some of the methodological challenges that exist in studying literature describing design and extracting the exploration of values from it, rather than conducting an investigation in the field itself, as there might be a discrepancy between the literature and actual design.[88] The multiple texts strategy will contribute to findings that have the potential to resemble something closer to what has actually taken place within the design domain. The interaction that exists between the literature and practice of architecture and industrial design makes this likely, as design scholars tend to be involved in drawing up curricula, giving lectures and publishing scholarly articles as well as writing books which influence design practice *(Crysler, 2003: 9).*[89]

In addition, this thesis also touches upon issues which have considerable traditions outside the domain of architecture and industrial design, so a number of works outside the core domain will be included. These works have been selected from very much the same perspective as the two design professions.[90]

This section was introduced by creating a judicial analogy. To follow up on that same analogy, a court case often reveals that evidence is collected using a number of research methods, which are all conducted within the scope of limited resources, due to a number of circumstances. It is legitimate to question the methods and resources that have gone into the finding and/or developing of evidence for a trial, and it is also appropriate to question the selection of methods and the use of resourses within a PhD project. This type of investigation may cause us to question exactly which methods and resources would produce the most sustainable case. The rationale for the selection of research method and allocation of resources will be introduced, reflected upon and examined in the following sections.

1.3.1.1 Analytical serendipity

> *"Chance favors only those who know how to court her" — Charles J. H. Nicolle[91] (Beveridge, 1950: 27)*
>
> *"In the field of observation, chance favors only the prepared mind"[92] — Louis Pasteur[93] (Beveridge, 1950: 34)*

A PhD project based on an encircling method will often approach the research and literature search in a broad manner in order to find, and eventually include, all possible "evidence". This approach and process allows for serendipity[94] to play a part in revealing surprising and important sources, findings and issues.

Serendipity can at times lead to new discoveries and the consequent changing of existing theories and explanatory models.[95] This characteristic of serendipity ties in with the now dominant social constructivist model of the development of science, as found in the sociology of science.[96] The social constructivist model is most notably represented by Thomas Kuhn's "Structure of Scientific Revolutions",[97] where Kuhn argues that a scientific breakthrough is an unpredictable enterprise, and that breakthroughs are not generally derived from so-called normal scientific work.[98]

Even so, research strategies generally will not have the proper conditions for serendipity to occur as an integrated and clearly expressed part of the overall research strategy, which views serendipity as accidental[99] or simply good fortune.[100] But it is not uncommon to rely on a certain amount of serendipity, as many research projects start out without a concrete perception of what they are looking for i.e. a clearly defined hypothesis supported by data or how one will discover it i.e. method which will best contribute to revealing new insights. Researchers will therefore often have an untold hope and faith that the selected research process will unravel data and or an understanding that sheds light on the questions at hand, even without knowing exactly how.

Depending on the research strategy selected, "courting" serendipity will become an important part of the research strategy, especially in instances where other methods are not deemed to guarantee to provide substantial new insight or findings.[101] Researchers who deliberately court serendipity will typically take a number of steps to ensure that the research methods selected have the potential of providing maximum opportunity for serendipity to take place.[102] For instance, they will rely on analytical serendipity, as opposed to serendipity as controlled chaos or temporal serendipity, and typically take the following steps to ensure maximum effectiveness of the opportunity *(Fine and Deegan, 1996: 437 - 439)*:

Firstly, researchers will expose themselves to the relevant literature, which provides a foundation from which new insights and data can be incorporated; this also creates a template for the development of new theory *(Fine and Deegan, 1996: 441 f)*. Equally important is the exposure to chance publications or hallway conversations which sometimes have the potential of altering one's theoretical analysis *(Fine and Deegan, 1996: 442)*.

Secondly, researchers will look for instances where the data itself speaks out, on the basis that portions of the "data" will occasionally play off each other. The researcher hopes that the "data" itself might reveal unexpected patterns, similarity or dissimilarity which has the potential to provoke an "Ah-ha!" response *(Fine and Deegan, 1996: 442)*.

Thirdly, researchers will look for a "dramatic metaphor or narrative strategy that permits him or her to conceptualize and present the problem in a novel light" *(Fine and Deegan, 1996: 442)*. Researchers typically depend on metaphorical and ironic rhetorical devices, which are often gathered through reading, thinking, and talking, to provide interesting images and make field findings and/or stories appealing. This becomes an important tool in order to share the journey of discovery found in the research project *(Fine and Deegan, 1996: 443)*.

Fourthly, a researcher may be influenced, inspired and gain new insight by being part of the scholarly world, which can be described as collective action or "invisible college" *(Fine and Deegan, 1996: 443)*. Knowledge production operates through sets of social ties, which have the potential to provide a shared intellectual community as well as fresh insights *(Fine and Deegan, 1996: 443)*.[103] Researchers make use of the social network to provide new ideas and emotional support, and it is vital to build a support system to be able to draw from. These networks are very much based on chance, as it depends on whom researchers come in contact with and the ability the researcher has in deploying this social network to the best advantage *(Fine and Deegan, 1996: 443)*. Researchers can attempt to actively seek out interesting social networks which will increase the likelihood for them to contribute to new discoveries.

Analytical serendipity as well as general serendipity involves planned insight coupled with unplanned events; this combination can be argued to be part of the core of the philosophy of qualitative research *(Fine and Deegan, 1996: 445)*. Relying on analytical serendipity as a major part of the research strategy is in part a rhetorical strategy, as illustrated by the above list of steps. Serendipity is equally visible in the context of classic social science fieldwork characterised by the researcher's ability to make sense of seemingly chance events, as for which it is the researcher's challenge to transform the qualitative results into substantive discovery *(Fine and Deegan, 1996: 437)*. In other words, it is characterised by social scientists' ability to "'keep their wits about them,' finding, in the rush of ongoing events, meanings and opportunities that might escape others" *(Fine and Deegan, 1996: 437)*.

Therefore analytical serendipity is in part the basis for this thesis' overall research strategy. To increase the likelihood of an occurance of serendipity, the research method follows the following steps and tactics: (1.) imposing a value perspective on the design literature which is not written from a value perspective, (2.) investigating and combining numerous texts and sources written from different design perspectives i.e. empirical based studies, normative work and practising architects' and industrial designers' assertions and put them all together into one coherent value perspective and (3.) following the four steps of analytical serendipity introduced above.

The three phases of analytical serendipity are important steps in achieving exposure to a wide range of experience i.e. "evidence" in the court metaphor, as well as contributing an intellectual readiness to seize any clues on the road to discovery.

1.3.1.2 Research challenges within the domain of values

> *"Properly speaking, there is no certitude; all there is is men who are certain." — Charles B. Renouvier[104] (Joas, 2000)[105]*

There are several challenges facing researchers who attempt to undertake research on the nature and characteristics of values. A key challenge is that people are often unwilling and unable to inform the researcher directly about either the content or the structure of their values ,i.e. beliefs, attitudes, orientations, and assumptions *(Ball-Rokeach et al., 1984: 28)*. Whether due to unwillingness or incapability, the lack of clarity can be caused by psychological, psychodynamic or intellectual reasons. A values researcher needs to take into account all of these potential reasons for not being able to describe or disclose values when attempting to investigate or extract them *(Ball-Rokeach et al., 1984: 28)*. It is therefore challenging for the researcher to know whether the values communicated by an individual truly represent the values that the particular individual holds. Thus, it might not be advisable "for a cognitively oriented theorist to accept at face value whatever a person says or does" *(Ball-Rokeach et al., 1984: 28)*. In other words, one should not be “so naive as to believe everything people tell us” *(Ball-Rokeach et al., 1984: 28)* with regards to issues of values.

To some extent, a given context, content or structure may reveal the true nature of people’s values, but the context, content and structure are also often extracted by consulting the individual, who then has potentially some of the same problems as mentioned. This leaves the value researcher with the burden of making correct inferences based upon what a person may say, as well as taking into account the context, content and structure *(Ball-Rokeach et al., 1984: 28)*. The researcher may or may not infer correctly; to avoid these pitfalls, values researchers tend to utilise investigative and measurement procedures which minimise the likelihood of coming to the wrong conclusion. These procedures typically include:

> “social desirability, demand characteristics, or response sets, and more generally, by employing methods that maximize convergent and divergent validity and internal and external validity.” *(Ball-Rokeach et al., 1984: 28)*

Individuals may—in addition to the above-mentioned reasons—be prevented from revealing their true values, not from unwillingness, but from the simple fact that they are not aware of what all their values actually are. Sometimes individuals need assistance to discover their implicit values in order to make them explicit to themselves and to the values researcher.[106]

Values are often linked to decision making, and the way in which values interface with decision making is often complicated and equally as challenging as the extraction process itself. Decision making is usually based on reasoning and values, but it is difficult to determine the exact reasoning and values used to make a given decision, as decision are often post-rationalised *(Shafir et al., 2000: 599)*. As with values, is it possible to ask people to report their reasons for making a given decision, but they may or may not comprehend the actual reasoning for a particular decision, as “subjects are sometimes unaware of the precise factors that determine their choices” *(Shafir et al., 2000: 599)*. In addition people will often “generate spurious explanations when asked to account for their decisions” *(Shafir et al., 2000: 599)*.[107] Thus, values theory can seldom predict exact behaviour or decision making patterns. In fact, values related research is commonly criticised on the grounds that its theories can rarely predict how and when an event will occur (this point is elaborated in chapter two).[108]

From a strictly scientific point of view, this critique is relevant as values are a particularly challenging phenomenon to research.[109] In addition to the above points, the challenge lies in the fact that values are played out in a real world context where people are concerned with real decisions and events. In summary, values exist within a thunderous, vibrant and confusing real world environment. This environment does not lend itself to predicting and/or controlling of circumstances, and will therefore seldom reveal anything with a perfect accuracy, as it is challenging to achieve a situation where "all other things being equal (ceteris paribus)" in this type of research *(Hastie and Dawes, 2001: 196)*. This is often the case within architecture and industrial design.

As illustrated by the above examples, values research is particularly challenging and requires specialised knowledge and expertise.[110] Value research is unlikely to reveal any sensible data without considerable preparation of the research and extensive analysis of the results etc. Most design scholars have neither the expertise with regard to specific value research methods, existing value literature nor general knowledge of the domain, which would equip them for these specific challenges. Thus, all of these points have contributed to the selection of the overall research strategy. But similar challenges will be faced within this thesis when the extraction of design values is attempted from both research sources and literature. The multiple sources strategy, i.e. empirical based studies, normative work and practising architects' and industrial designers' assertions, will contribute to reducing the impact of these challenges.

1.3.1.3 Research challenges within the domain of design

> *"Research is formalized curiosity. It is poking and prying with a purpose." — Zora Neale Hurston[111] (Hurston, 1984: 174)*
>
> *"To know that we know what we know, and to know that we do not know what we do not know, that is true knowledge." — Nicolaus Copernicus[112]*

For more than thirty years there has been a slow but steady growth in architectural and industrial design research, and accordingly, a varied range of research methods have been adopted and deployed within the design domain *(Cross, 2001a: 79)*. These methods include both participant and non-participant observation methods which have tended to study real as well as artificially-constructed design projects *(Cross, 2001a: 79)*. Research subjects have included both inexperienced designers, usually students, and experienced architects and industrial designers *(Cross, 2001a: 80)*. Even so, the total sum of research found within architecture and industrial design is still not as substantial as that which is found within many other professions.[113] In addition the quality of the research is varied, "often based on single or small numbers of subjects, and usually untested by repeat studies" *(Cross, 2001a: 81)*.

Within the design domain, the term research tends to be applied loosely and it incorporates a number of different traditions, which might not be regarded as research in other more science-based professions (this point is elaborated in chapter four).[114] For instance, a popular approach has been to reflect on existing architecture and industrial design, and design scholars developed a number of design theories based on these reflections *(Lawson, 1997: 306)*. Unfortunately this particular approach has its limitations, and many of the theories produced have turned out not to accurately represent actual events (when put under the empirical "microscope") *(Lawson, 1997: 306)*. In other words, the majority of these theories seldom reflect accurately what has and what is actually taking place in architecture and industrial practices *(Darke, 1979: 43)*.[115] Additionally, a number of design outcomes have not been in line with what some of these design theories are positing.

This is particularly evident in some of the design theories that emerged in the early days of the design methodology movement, which is marked by an analysis-synthesis model involving logic, rationality, abstraction, and rigorous principles *(Gedenryd, 1998: 1)*, *(Darke, 1979: 37)*.[116] Many of these theories portray and prescribe design as an orderly and rigorous procedure based on the systematic collection of information, and establishment of objectives (this point is elaborated in chapter six).[117] At times, some of these theories stipulate that it is nearly impossible to compute a design solution as, according to these type of theories design should be "following the principles of logical deduction and mathematical optimization techniques" *(Gedenryd, 1998: 1)*.[118] In short, it is often argued that many of these early theories from the design methodology movement simply just don't work or reflect what is actually taking place in actual design practises *(Gedenryd, 1998: 1)*.

Another characteristic of research within the design domain has been to deploy a strategy where design has been researched within a laboratory setting, this acted as a means to observe designers under rigorous empirical conditions. This type of research has tended to be less vulnerable to criticism from a strictly scientific i.e. empirical point of view, but unfortunately laboratory based research has turned out to be "extremely difficult to conduct with a sufficient degree of realism to be relevant to what … designers actually do in practice" *(Lawson, 1997: 306)*. This is due to the fact that the experimental settings often involve some degree of process isolation *(Craig, 2001: 26 f)*.[119] This can be considered a major deficiency, as architecture and industrial design often consist of numerous variables which occur naturally in the design studio, as well as in the everyday world in which they find their inspiration. Designers do not work in laboratories. They are always connected to a culturally rich world around them. They face a number of variables such as: co-workers and their social network,[120] a personally tuned physical environment,[121] and a meaningful image of the client *(Craig, 2001: 29)*.

To avoid the challenges that design tends to face in a controlled environment, design scholars have employed other research strategies, which include research conducted by observing designers at work in the field i.e. situated studies. This approach offers more realism than laboratory observation, but it is not without its challenges, as many of the important aspects of design are hidden in designers' heads rather than being visible *(Lawson, 1997: 306 f)*.

To overcome this problem, design scholars have applied a strategy where either architects or industrial designers have been asked to describe what they are thinking about while they are engaged in designing. This strategy includes deploying think-aloud protocols,[122] interviewing and analysing what designers have written as well as analysing their representations and drawings.[123] Think-aloud protocol and interviewing tend to be time consuming, and require considerable skill and knowledge, as the researchers must often "infer a potentially large and complex set of connections between utterances made by subjects" *(Craig, 2001: 20)*. Even if the research is empathetic towards the interviewee, the researcher runs the risk of failing to uncover all of the underlying processes involved.[124] In addition these research techniques have some additional limitations with regards to architecture and industrial design, which are described below:

Firstly, architects and designers are often not natural communicators, be it orally or written *(Lawson, 1997: 307)*, this as some designers find "it difficult to describe a non-verbal process in words" *(Darke, 1979: 37)*. Design is sometimes thought to be an intuitive process, which is inherently difficult to describe. In short, architects and industrial designers are notoriously guarded, unwilling and/or unable to talk about their own design approaches *(Salaman, 1974: 98)*, *(Blau, 1984: 65)*.

Secondly, architects and industrial designers are often concerned with impressing rather than explaining, which often makes it unlikely that they will reveal their doubts and weaknesses *(Lawson, 1997: 307)*.

Thirdly, because architects and industrial designers tend to have a sales approach towards their clients, designers often adopt a post hoc rationalisation for the design process, which tends to conceal "all the blind alleys which they went down and shows only a logical inexorable progress to what they now wish to present as the 'right' answer" *(Lawson, 1997: 307).*

Fourthly, a number of architects and industrial designers have problems with accurate recall as well as post-rationalization when asked to describe the process after the event has occurred *(Darke, 1979: 37).*

To overcome some of the aforementioned challenges found within design research, a number of architectural as well as industrial design scholars "blend together multiple strategies at once, resulting in almost as many distinct approaches as there are studies themselves" *(Craig, 2001: 14).*

Even if the above situation does not represent the full range of design research, it does provide a backdrop that illustrates several imperfections in design research methods that design researchers have to contend with. It also illustrates many of the shortcomings that can be found in the research that this thesis is based on. Thus, extracts, assertions and conclusions are drawn from less than perfect material. This can be seen as problematic because some controversial and/or generalized claims are referred to as a base for the argumentation presented in this thesis. In fact, design research in general, and this thesis in particular, would have benefited from a research base with more consistent quality and/or improved testability and repeatability.

However, some of the challenges and shortcomings found in the individual studies are addressed by deliberately making use of a wide range of existing design research, representing a range of different research methodologies i.e. empirical based studies, normative work, practising architects and industrial designers assertions etc. The assumption is that, combined, they all will contribute to a more accurate overall picture which describes the design domain *(Lawson, 1997: 308).*

By studying a diverse selection of studies, findings from one type of research method have been compared with findings from other methods. This has made it possible in many instances to substantiate a claim within this thesis by referencing very different types of research, thus cancelling out some of the above mentioned imperfections. Unfortunately this is not always the case, and to address this, notes have been extensively used to backup claims and arguments with additional information as well as at times offering sections of the research to indicate the background for the claim.[125]

In an approach that relies on previous research the quality of the research that the writer must rely upon is always a factor—this is hard to overcome in an encircling research and scholarship of integration approach. The sheer quantity of other research used in this thesis prevents a critical discussion of each study relied upon; this would have caused the manuscript to be problematically long and exceeded the time frame available for this project. Thus, apart from this general introduction to imperfections, the shortcomings in the individual studies will not be addressed throughout the study.

1.3.1.4 Reflection over practical limitations and opportunities

> *"Elaborate apparatus plays an important part in the science of today, but I sometimes wonder if we are not inclined to forget that the most important instrument in research must always be the mind. It is true that much time and effort is devoted to training and equipping the scientist's mind, but little attention is paid to the technicalities of making the best use of it." — William Ian Beardmore (Beveridge, 1950: viii)*

Theoretically there is a number of different research strategies which are applicable to any given PhD project, but some research strategies are more demanding with respect to manpower and funding than others. So the selection of a research strategy is normally heavily influenced by whether a PhD project is conducted as part of a big project i.e. a group project, or as a single researcher project.

A PhD project is normally projected to be conducted within the time frame of three years, even if many PhD project exceeds this time limitation. This particular PhD project operates within the limitations of three year time-frame and with the manpower of one person. Other practical limitations in the selection of a research strategy have been the limitations found within the Oslo School of Architecture and Design. The school has not been able to provide the project with additional staff neither as manpower nor supervisors with particular expertise in similar values based research. Similarly, as for most other PhD projects, the school has been unable to provide extra funding for extra personnel who could have contributed to the collection of data. These overall limitations have been influential in the selection of a research strategy, which allows for a realistic PhD project.

In addition, some small scale pilot testing of particular research approaches have been conducted early on in the project, which includes investigating the practicalities of doing case-based and in-depth interview-based research.[126] Both of these research strategies were disregarded for practical reasons; they were found to be unrealistic given the timeframe, manpower and funding available for the project.

The overall limitations posed by the practical aspects and the results from the pilot testing, contributed to the selected research strategy with its main focus on a value analysis of already existing research within the architectural and industrial design domains. The advantage of this strategy is that it offers the possibility to conduct research using the resources available—it is both time and cost efficient. It has thus allowed for conducting the entire research project at the premises of Oslo School of Architecture and Design. This has provided easy accesses to source material in the form of literature as the school has an outstanding library,[127] in addition to being inexpensive and non-disruptive by nature.

The benefit of conducting in-depth interviews and conducting case studies is still viewed as being interesting avenues, even if not selected as the research strategy. Both research strategies would probably make an excellent extension for this thesis project, and it is something that could be conducted in a post-doc project.

1.3.2 Framework and Logical Argumentation

> *"No one means all he says, and yet very few say all they mean, for words are slippery and thought is viscous." — Henry Brooks Adams[128] (Adams, 1918: 451)*

Generally when one makes an assertion, be it in an everyday context or within a PhD, one tends to commit oneself to the claims[129] that the assertion necessarily involves. If these claims are at any time challenged it is essential that one is able to substantiate and demonstrate how they are justifiable *(Toulmin, 1958: 97)*. The merits of a claim depend on the merits of the argument which could be produced in its support *(Toulmin, 1958: 11)*.[130] When challenged, is it common to substantiate the general claim or a sub-claim by some "facts" and present the foundation upon which the claim is based *(Toulmin, 1958: 97)*.[131]

Different strategies are employed to account for this type of challenge. A number of research supervisors, as well as literature concerned with describing how to conduct research, recommend that a research project focuses on a very narrow subject matter within a specific domain. This narrowing of the subject matter allows a researcher: (1) to become familiar with existing literature and current research in the field, (2) utilise these sources as a base for a further extension of knowledge and (3) complete it all within the imposed time and resource limits.

However, as introduced in previous sections not all research projects follow the above described path of narrowness to ensure the development of new knowledge. There are also other research traditions that attempt to encircle, integrate and/or place aspects and specialties in a larger context, as well as illuminating data from new perspectives. These broad-based research approaches ultimately attempt to develop new knowledge by embracing a wider range of perspectives and "issues".[132]

The broadness of a research project is a matter of definition, but all broad-based research projects share a strategy based on comprehensiveness as opposed to narrowness. The method chosen within this thesis is aligned with this broad-based research tradition, where making analogies and connections between different perspectives and fields is essential. This can be compared to the re-ordering of the books on the shelves of a library from a new perspective, where one starts out by separate books which, though at present adjacent, have no real connection under the new perspective, and temporarily put them on the floor in different places *(Toulmin, 1958: 253)*. This can at first give the appearance of chaos in and around the shelves, but eventually the new order of things will begin to be manifested. Initially the librarian relies on a little charity in looking past the initial chaos to the longer-term intention of the new perspective *(Toulmin, 1958: 253)*.

The following section will go into more detail concerning the methods used to identify the "books" and the specificity of the method used in arguing for the new system of "the library" (specific research method selected and its logical argumentation tradition).

1.3.2.1 Introduction to Logical Argumentation

> *"AN ARGUMENT is like an organism. It has both a gross, anatomical structure and a finer, as-it-were physiological one. When set out explicitly in all its detail, it may occupy a number of printed pages or take perhaps a quarter of an hour to deliver; and within this time or space one can distinguish the main phases marking the progress of the argument from the initial statement of an unsettled problem to the final presentation of a conclusion. These main phases will each of them occupy some minutes or paragraphs, and represent the chief anatomical units of the argument—its `organs', so to speak." (Toulmin, 1958: 94)*

Justifications and arguments within everyday life as well as research tend to differ because they address different sorts of problems. A geometrical argument is appropriate when facing a geometrical problem, "a moral argument when the problem is moral; an argument with a predictive conclusion when a prediction is what we need to produce; and so on" *(Toulmin, 1958: 167).*[133] The nature of the subject in question will therefore have to be researched and assessed using appropriate means. Thus, logical positivists famously introduced classifications that fall into categories such as: (1.) "synthetic" i.e. empirically verifiable or falsifiable, (2.) "analytic" i.e. true or false based on logical rules alone, and those which they deemed to be (3.) "cognitively meaningless" i.e. ethical, metaphysical, and aesthetic judgments etc. *(Putnam, 2002: 10).* This type of classification system and its approaches will be not be supported; instead a tradition dating back to Socrates[134], where scholars attempted to make sense of the physical and mental concepts through logical argumentation, will be drawn upon.

A logical argumentation typically attempts to create an explanatory system, which explains and orders seemingly disparate groups of factors or phenomena. These types of explanatory systems are bound by their logical frame, which sets boundaries for what the explanatory system can give clarity to, as well as its explanatory powers *(Groat and Wang, 2002: 301).*

Logical Argumentation based research[135] is a tradition which thrives in a number of subject domains including architecture and to some degree industrial design.[136] According to Linda Groat and David Wang, this tradition covers a wide spectrum within architecture, ranging from the dependence on "mathematical rules, at one end, to those that draw their logical coherence from the cultural world views they are embedded in, at the other" *(Groat and Wang, 2002: 302).* In between these far ends of the spectrum there are other systems which "share characteristics of both mathematical-formal systems and cultural-discursive ones" *(Groat and Wang, 2002: 303).*

Logical Argumentation based on formal-mathematical systems typically depends heavily upon rule-based propositions, and is readily adaptable to computer modelling *(Groat and Wang, 2002: 302 f).* At the other end of the spectrum is the culture/discursive logical argumentation which has "persuasive force because they capture a worldview and distill it into a logical argument with both theoretical clarity and rhetorical power" *(Groat and Wang, 2002: 303)*, as indicated in figure on the next page.

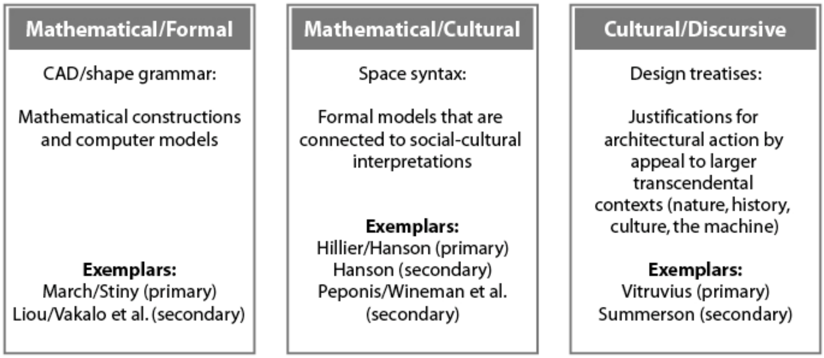


Figure 1 (Groat and Wang, 2002: 307)

Out of the relatively wide spectre within Logical Argumentation, this thesis is aligned with the cultural/discursive logical argumentation. Cultural/discursive logical argumentation typically anchors the validity of its claims by referring to larger "transcendental venue (e.g., 'nature,' moral or ethical constructs, a priori reason, national identity, the machine)" *(Groat and Wang, 2002: 303)*. This is typically achieved by rhetoric, systematic analysis and explanatory models and detailed logical connections which provide an overreaching argument etc. *(Groat and Wang, 2002: 303)*.

The PhD in question does not anchor its validity on a transcendental venue, but instead uses the general concept of profession as one of the main reference point on which to build an argument. In particular, the concept of a knowledge foundation is a pivotal point that is used extensively throughout the thesis. Thus, as for most culture/discursive logical argumentation based projects, rhetoric, systematic analysis, explanatory models and detailed logical connections will be used in order to create an overarching argument.

Logical Argumentation as indicated above is characterised by taking previously disparate, unknown and or unappreciated factors and connecting them in unified frameworks which have significant and occasionally novel explanatory powers *(Groat and Wang, 2002: 309)*. Novel explanatory systems tend to be innovative ones and have the potential of shaping a discourse at a paradigmatic level, but this impact is not intrinsically inherent. The acceptance of research based on Logical Argumentation tends to be dependent on the audience's ability to make sense of it and see that it offers relevance *(Groat and Wang, 2002: 322)*. To achieve this, it is important that the logical argumentation not be inconsistent, self-contradictory or behold favouritism *(Toulmin, 1958: 19)*.

A successful cultural/discursive logical argumentation system, within the design domain, typically enjoys widespread acceptance, albeit in a limited time frame. A number of these types of work have been able to capture a "culture's worldview in a discursive system that is perceived as a summary of its cultural 'logic' relative to design action or style" *(Groat and Wang, 2002: 303)*. In other words, a successful logical systems is characterised by finding acceptance as they "make sense" to a wide cultural audience and is looked upon as "logical" within that cultural setting *(Groat and Wang, 2002: 310)*. In the past a number of cultural/discursive logical systems have been highly influential in shaping design or in contributing to the understanding within the design domain. This type of explanatory system has often been used as contributor to the normative basis for architecture and to some extent for industrial design. They have at times been treated as treatise or have been seen as a way of "understanding some aspect of human interaction with the built environment" *(Groat and Wang, 2002: 303)*.

Unlike many other cultural/discursive logical systems, this PhD will not attempt to create a contribution to the normative basis for architecture and industrial design. Instead, it will align itself with the tradition of cultural/discursive logical systems that has attempted to contribute to the understanding of what actually takes place in the two design domains.

In the pursuit of getting the audience to come around to a particular point of view, rhetorical tactics are an important approach within the cultural/discursive system of logical argumentation. So rhetoric plays an important role when it comes to framing various elements, which are the object of discourse within the system. This particular feature is pointed out by Chaim Perelman and Lucie Olbrechts-Tyteca in the following:

> "One of the essential techniques of quasi-logical argumentation is the identifying of various elements which are the object of discourse. […] we consider this identification of entities, events, or concepts as neither arbitrary nor obvious, that is ... it is justifiable by argument." *(Perelman and Olbrechts-Tyteca, 1969: 210)*

This highlights the importance of properly defining the elements and/or perspectives included in a cultural/discursive system; this framing is in itself part of a persuasive enterprise *(Groat and Wang, 2002: 322)*.

For the PhD in question, the cultural/discursive system includes the following key elements: design, architecture, the architectural profession, industrial design, the industrial design profession, values, and frame and framing, as well as the these key perspectives: (1.) a general value perspective, (2.) a design profession perspective, (3.) a design practice perspective, (4.) an individual design perspective and (5.) finally a design process perspective.

However, traditionally, cultural/discursive logical systems have been linked to the realm of nature, morals, history and the machine, etc. within the design domain. Within the architectural domain this can be exemplified by John Ruskin's[137] "First Principles of Architectural Virtues and Quality" which states that buildings must:

> "(1.) … act well, and do the things it was intended to do in the best way. (2.) … speak well, and say the things it was intended to say in the best words. (3.) … look well, and please us by its presence, whatever it has to do or say." *(Ruskin and Links, 1960: 29)*

Ruskin's assertion and his cultural/discursive system attempts to connect architecture and general moral "considerations by a nominative leap that immediately grips reason at a provocative level" *(Groat and Wang, 2002: 322)*. This is a commonly used tactic within architecture, as claims like this contribute to legitimise a given design theory or approach simply by the connection that is being made i.e. the morals implied in the connection tends to lend support to the original claim *(Groat and Wang, 2002: 322 f)*.

Ruskin is not alone in his use of elements of cultural/discursive system as a base for his work. Other classical cultural/discursive architectural works include works by famous architects and architectural scholars like: Marcus Vitruvius[138], Leone B. Alberti[139], Abbé Marc-Antoine Laugier[140], August W. N. Pugin[141], Adolf Loos[142], Frank L. Wright[143] and Robert C. Venturi[144] *(Groat and Wang, 2002: 336)*. This tradition also has some Norwegian representatives which includes Christian Norberg-Schulz[145] and Anne Marit Vagstein[146].

A Logical Argumentation must be characterised by trustworthiness and credibility even if "hard hitting facts" are seldom available within cultural/discursive system. But this does not make all Logical Argumentation explanatory systems acceptable or equal, as some are more probable than others *(Toulmin, 1958: 21)*. The following sections demonstrate the process necessary to evaluate the inherent quality of a Logical Argumentation within a cultural/discursive system.

1.3.2.2 Testability of cultural and discursive logical systems

> *"By saying `probably' you make yourself answerable for fulfilment, if not on all, at least on a reasonable proportion of occasions: it is not enough that you have an excuse for each single failure. Only in some specialised cases is this requirement tacitly suspended—'When a woman says "Perhaps", she means "Yes": when a diplomat says "Perhaps", he means "No"."* (Toulmin, 1958: 50)

In an everyday context it is self-evident that not everyone who claims to know something actually does. Assertions like: Wolfgang Amadeus Mozart[147] wrote Oliver Twist, 5 + 7 = 11 and/or I know the meaning of Tchaikovsky's Fourth Symphony do not resemble reality or truth *(Phillips, 1987: 99), (Groat and Wang, 2002: 301)*. Everyday situations may require ways of affirming, validating or disproving, i.e. refuting bogus claims, as they may simply be a mistake and may lead to undesirable situations. To deny the possibility of mistaken knowledge or bogus knowledge claims will be to do away with the concept of a mistake *(Phillips, 1987: 99)*. If we acknowledge that bogus claims and mistakes can be made in an everyday context, it is also possible to accept the same is the case for scholarly work and knowledge production (disregarding forms of relativism[148]). This acknowledgement brings us to the nebulous subject of testability of knowledge and the fundamental question of what constitutes knowledge.

The difficulties that exist in defining what constitutes knowledge and testability of knowledge can be exemplified by an argument put forward by the philosopher Hilary Putnam[149] when he writes:

> "The Greek dramatists, Freudian psychology, and the Russian novel are all supposed by these thinkers to embody knowledge — knowledge about man. Thus they both do and do not conflict with science. They conflict with science in the sense of representing a rival kind of knowledge, and thereby contest the claim of science to monopolize reliable knowledge. But it is a rival kind of knowledge, and hence inaccessible to scientific testing." *(Putnam, 1978: 89)*

Thus, Putnam asserts that "no matter how profound the psychological insights of a novelist may seem to be, they cannot be called knowledge if they have not been tested" *(Putnam, 1978: 89)*.

A gap exists between the natural sciences i.e. positivistic traditions[150] and the humanistic sciences when it comes to acceptance of methods and testability.[151] The knowledge and insights developed within these traditions have contributed to a broader discussion of what constitutes knowledge and how and with which methods this knowledge can be obtained. In addition, the aforementioned knowledge and insights broaden the conversation on the nature of testability within research. For instance, Mats Alvesson and Kaj Sköldberg argued in their book "Reflexive methodology: new vistas for qualitative research" that it is:

> "pragmatically fruitful to assume the existence of a reality beyond the researcher's egocentricity and the ethnocentricity of the research community (paradigms, consciousness, text, rhetorical manoeuvring), and that we as researchers should be able to say something insightful about this reality. This claim is consistent with a belief that social reality is not external to the consciousness and language of people — members of a society as well as researchers (who, of course, also are members of a society)." *(Alvesson and Sköldberg, 2000: 3)*

The argument put forward by Alvesson and Sköldberg indicates that the interesting question is not necessarily whether research is of an empirical nature that is easily testable, but whether the research is able to say something insightful about the reality which it is attempting to describe or give normative recommendation for. This is a viewpoint reflected by other scholars such as Ernst von Glasersfeld[152] when he argues that "one demands of knowledge that it prove itself by a functional fit" *(von Glasersfeld, 1991: 16 f).* Similarly Jean-François Lyotard[153] has asserted a similar viewpoint albeit from a different perspective:

> "The main criterion of good theory and research is a practical or technological value, that is, that it can guide action. It will be `practitioners' who in the first instance will determine the value of knowledge on a basis of its ability to provide them with relevant insights and pointers." *(Alvesson and Sköldberg, 2000: 272)*

Thus, the ultimate test of a research project will be whether it: (1.) contributes knowledge that offers insight on reality, (2.) provides value through its functionality or accomplishment as well as relevant insights. These factors tend to be tested by a varied community, which includes: other researchers, peers, practitioners, scholars from other knowledge domains etc.[154] Each research community will tend to use its own criteria's to determine its appropriateness.

However, it is important to remember that the selection process for criteria used to validate a scientific theory is not always straightforward. This can be exemplified by both Albert Einstein's[155] "theory of gravitation and Alfred North Whitehead's[[156]] 1922 theory (of which very few people have ever heard)" *(Putnam, 2002: 142)* in which both agreed with special relativity. Both theories predicted the phenomenon "of the deflection of light by gravitation, the non-Newtonian character of the orbit of Mercury, the exact orbit of the Moon, among other things" *(Putnam, 2002: 142)*.[157] Even so, Einstein's theory was accepted on the grounds that it was simpler i.e. the equations were more "beautiful", at the expense of Whitehead's theory which was "rejected fifty years before anyone thought of an observation that would decide between the two" *(Putnam, 2002: 142)*. It can be argued that a great number of theories must be rejected on non-observational grounds, as it is virtually impossible to test every theory presented *(Putnam, 2002: 142)*. This point can be illustrated be a statement made by Jacob Bronowski[158] to his friend Karl R. Popper when he writes: "You would not claim that scientists test every falsifiable theory if as many crazy theories crossed your desk as cross mine" *(Putnam, 2002: 142)*.[159]

Cultural/discursive logical systems which this thesis is aligned with tend to address research question as What do the findings mean? and/or Is it possible to interpret what's been discovered in ways that provide a larger, more comprehensive understanding? *(Boyer, 1990: 19)*. Thus, testability of this type of cultural/discursive logical systems must be understood as being in conjunction with its influence upon the two design professions, or by its acceptance of the logical system among fellow researchers, colleagues or peers as well as its widespread influence, which all affirms its validity. In short, a valid cultural/discursive logical system should reveal new knowledge or larger intellectual patterns that are insightful about the reality which it is attempting to describe or give normative recommendation for. Thus, similarly to research in general, the ultimate test for a cultural/discursive logical system will also be whether it: (1.) contributes knowledge that offers insight on reality, (2.) provides value through its functionality, accomplishments, or relevant insights. To accomplish this a cultural/discursive logical system should not contain inconsistencies or frivolities; it should not be self-contradictory or have elements of favouritism not already part of the stated foundation of the research *(Toulmin, 1958: 19)*.

Logical Argumentation based on a cultural/discursive logical system relies on: (1.) the authority of the theorists and references used by the researcher, (2.) the selection of aspects and facts with its accompanying analysis which should lead to new insights and (3.) the researchers scholarly rigour and the soundness of his or her argumentation. When all of these aspects are put together they contribute to defining the validity of the analysis of the scholarly work. Criticism and divergent analyses of this type of work should rest on the rules of logic and argumentation. In order to refute this type of research one should be able to provide a contradictory reading and a different analysis that contradicts the accepted point of view and which subsequently becomes accepted within the intended domain.

1.4 SUMMARY

Chapter one declares the focus of this thesis: this work will serve as a comprehensive examination of the underlying values found in the architectural and industrial design professions. Values in this context are inherently linked to the ideas, beliefs, attitudes, orientations and underlying assumptions found in these two design domains. While it is common to link the term "values" to subject matters like ethics and morality, these topics will not be covered in this work; instead, this thesis will focus on the way the term values is used in a "political" context i.e. a process by which collective decisions are made within groups etc.

This value study of the architectural and industrial design professions utilises an "encircling" research approach; the focus is on the scholarship of integration rather than an in-depth analysis and scholarship of discovery. The main rationale for choosing this approach is that, in addition to in-depth analyses, there is a need for scholarly work that gives meaning to isolated research and/or put these underlying value aspects into perspective. Thus, this thesis concerns itself with forming connections across disciplines and placing aspects and specialties in a larger context, illuminating the data from new perspectives. In other words the question asked in this thesis is not *What is to be known?* or *What is yet to be found?*, but rather *What do the findings mean?* In other words, *How does already existing design research and doctrine relate to the concept of value perspectives?* and, ultimately, *Does a value analysis of the two design professions have the potential of contributing to a larger, more comprehensive understanding of architecture and industrial design?*

The thesis is based on already existing research and discourse including: empirical based studies, historical studies, normative works and the assertions of practising architects and industrial designers. Thus the "evidence" which will be submitted within this thesis can mostly be classified as “circumstantial evidence”. However, the sheer volume of this “circumstantial evidence” will hopefully serve to build up a believable case.

The research method chosen for this work is the Logical Argumentation method, more speficially, the cultural/discursive logical argumentation method. Even though many of the research projects conducted within this methodical tradition tend to anchor their validity on claims referring to a larger transcendental venue, this PhD does not follow in that same path. Instead, it will utilise the general concept of profession and employ it as one of the main reference points that the argument is built on. In particular, the concept of knowledge foundation will serve as a pivotal point used extensively throughout the thesis.

Rhetoric, systematic analysis, explanatory models and detailed logical connections will be used in order to create an overreaching argument, in line with most cultural/discursive logical argumentation based research projects. However, unlike other cultural/discursive logical projects, this PhD project will not attempt to create a normative work. Instead, it will align itself with the tradition of cultural/discursive logical systems that has attempted to contribute to the understanding of what actually takes place in the two design domains.

In this PhD, the cultural/discursive method centres on the following key terms: design, architecture, the architectural profession, industrial design, the industrial design profession, values, and frame and framing. In addition, it will be based on the following key perspectives: (1.) a general value perspective found in chapter two, (2.) a general profession perspective found in chapter three, (3.) a general design practice perspective in chapter four, (4.) an individual design practitioner perspective found in chapter five, and finally, (5.) a design process perspective found in chapter six.

Ideally, the validity of this type of PhD project should be judged on whether it: (1.) contributes knowledge that offers insight on reality, and (2.) provides value through its functionality, accomplishments or relevant insights. Within the framework of the Logical Argumentation method the aforementioned validity typically depends on (1.) the authority of the theorists and references used, (2.) the selection of facts and accompanying analysis, and (3.) the scholarly rigour and soundness of the argumentation. When all of these aspects are appropriately put together, the thesis in question should answer questions like: *What does already existing design research imply from a value perspective?*

2 Introduction to values

> *“Architecture offers quite extraordinary opportunities to serve the community, to enhance the landscape, refresh the environment and to advance mankind — the successs-ful architect needs training to overcome these pitfalls however, and start earning some serious money.”*[1] *— Stephen Fry*[2] *(Fry, 1993: 12)*

This chapter is primarily an introduction that aims to set the stage for the following chapters. The first part of this chapter discusses the nature and background of values from a number of theoretical and practical perspectives found primarily outside the domain of architecture and industrial design. This introduction of general value characteristics creates a backdrop for the following chapters with its subsequent introduction and explanation of values found within architecture and industrial design. The second part of this chapter introduces values found within the design domain. It will present some of the main discourses and set the stage for the following chapters' more in-depth look at values within architecture and industrial design.

2.1 INTRODUCTION TO VALUES FROM A GENERAL PERSPECTIVE

> *“The meaning of preference and the status of value may be illuminated by this well-known exchange among three baseball umpires. ‘I call them as I see them,’ said the first. "I call them as they are," claimed the second. The third disagreed, ‘They ain't nothing till I call them.’ Analogously, we can describe three different views regarding the nature of values. First, values exist – like body temperature – and people perceive and report them as best they can, possibly with bias (I call them as I see them). Second, people know their values and preferences directly – as they know the multiplication table (I call them as they are). Third, values*

or preferences are commonly constructed in the process of elicitation (They ain't nothing till I call them)." (Tversky and Thaler, 1990: 210)

Values is a term that has several meanings in everyday language,[3] and it is a concept that has changed meaning and emphasis during the last century. *(Hastie and Dawes, 2001: 213)*. The term values, as introduced in chapter one,[4] will be linked to attitudes, beliefs, orientations, and underlying assumptions within this thesis. In this context, the term values does not refer to facts; on the contrary, values tend to refer to belief systems, morality and implicit and explicit assumptions. In other words, values are typically "those things we care about, that matter to us; those goals and ideals we aspire to and measure ourselves or others or our society by" *(Weston, 2000: 49)*. It should be noted that this does not deny that there is a relationship between values and facts.

Though certain values are occasionally claimed to be universal, values are seldom agreed upon universally; they are often only agreed upon by small groups. According to the late Milton Rokeach, values are comprised of a "relatively small number of core ideas or cognitions present in every society about desirable end-states of existence and desirable modes of behavior" *(Rokeach, 1979: 49)*. Rokeach goes on to argue that within a given society there will be a common agreement over a number of values that are given importance. These values are introduced to individuals and kept within a society by societies placing value demands upon individuals *(Ball-Rokeach et al., 1984: 24)*.[5] In general, values and value sets are considered to be an influential factor in the shaping of behaviour and of individuals' self-identity *(Ball-Rokeach et al., 1984: 26)*.

However, agreement on general values i.e. "commonsense," within a given society, is not necessarily straightforward. What constitutes a general value may differ from different perspectives. This can be exemplified by the fact that political opponents might state their support for the same value, but disagree on what the value constitutes. For example, different politicians may agree on "freedom" as an important value, but "the interpretation of this self-evidently desirable value differs markedly, and the fascist's freedom is the democrat's dictatorship" *(Billig, 1996: 240)*.

Values are not only important concepts within society and for individuals, they are also equally important, although hotly debated, within the scientific community. Generally, values will enter into almost any argument based on scientific reasoning, at some stage. This is particularly the case in regards to the foundation of scientific reasoning, where formulation of foundation through concepts and rules constitutes the basis for scientific reasoning, as well as setting the premise of the conclusion *(Perelman and Olbrechts-Tyteca, 1969: 75)*. Nevertheless, many scientists will attempt as much as possible to avoid referring to values in scientific reasoning, to give the impression of it being value free. This is closely connected to the "value free" maximum in the "exact" sciences, which is radically different from fields such as law, politics, and philosophy where "values intervene as a basis for argument at all stages of the developments" *(Perelman and Olbrechts-Tyteca, 1969: 75)*.[6]

Within the scientific domain, values are often wrongly associated solely to ethics, when in reality, they are closely linked to "facts" *(Putnam, 2002: 28 - 30)*. The fact/value dichotomy (antagonism) is a relationship which was hotly debated during the last century, although now it is "widely" accepted that "science might pre-suppose values as well as experiences and conventions" *(Putnam, 2002: 30)*. There are a number of reasons why there has been a temptation to draw a line between facts and values, which has had the effect of excluding values from the realm of rational argument altogether *(Putnam, 2002: 43 f)*. Firstly, it is much easier to assert:

> "'that's a value judgment,' meaning, 'that's just a matter of subjective preference,' than to do what Socrates tried to teach us: to examine who we are and what our deepest convictions are and hold those convictions up to the searching test of reflective examination." *(Putnam, 2002: 44)*[7]

Secondly, it has been argued that one can't clearly provide "a metaphysical explanation of the possibility of ethical knowledge" *(Putnam, 2002: 44)*. Thirdly, it has been feared that the linking of values and facts will lay the foundation for cultural imperialism *(Putnam, 2002: 45)*.

Regardless of these objections, there is no clear line between values and "facts". Concepts such as coherence, simplicity, and so on which are pre-supposed by physical science, are all values *(Putnam, 2002: 142)*.[8] Generally it can be stated that it is not incompatible to argue that a judgments' claim should have objective validity, and at the same time "recognizing that they are shaped by a particular culture and by a particular problematic situation" *(Putnam, 2002: 45)*. This applies to "scientific questions as well as ethical ones" *(Putnam, 2002: 45)*. This is not denying that "knowledge of facts presupposes knowledge of values" *(Putnam, 2002: 145)*, which is a subject that both science and philosophy, in the last half century, has largely attempted to evade by proposing that "facts are objective and values are subjective and 'never the twain shall meet'" *(Putnam, 2002: 145)*.[9] Within the context of this thesis, it is accepted that knowledge of facts pre-supposes knowledge of values on the basis that (the following is a direct quote) : (1.) the activity of justifying factual claims pre-supposes value judgments and (2.) that we must regard those value judgments as capable of being right (as "objective" in philosophical jargon), if we are not to fall into subjectivism with respect to the factual claims themselves *(Putnam, 2002: 137)*.

2.1.1 The anthropological, social scientific and economic perspective

> *"People of good will regularly include in their descriptions of their "values" or "preferences" or "desires" a value or preference or desire to do what is right. To be a person of good will is precisely to care about doing the right thing."*
> *(Putnam, 2002: 90)*

Generally, values are hotly debated and represent diversity. Values are generally not neutral, which has led many anthropologists and other social scientists to adopt a tradition of cultural relativism, which "rejects the evaluation of another society's values and practices" *(Harrison and Huntington, 2000: xxv).*[10] It should be noted that neither cultural relativism nor any other form of relativism is supported within this thesis.[11] The background for the reluctance of values to be used as an explanatory model for cultures, be it economic progress or political attitudes among nations and ethnic groups, is often based on the point of view that value models tend to be linked to race based models *(Glazer, 2000:220).*[12] Equally, the idea that values are an explanation for culture has been rejected on the grounds of the potential consequences of changing values within a given culture *(Glazer, 2000:222).*[13] The very idea of "progress," often associated with the West, is suspect for many anthropologists and social scientists that are committed to cultural relativism.[14]

Yet other anthropologists see culture very differently, as represented by Robert Edgerton who argues that culture represents different values, where a value judgment is legitimised. This point of view can be illustrated in the following assertion:

> "Humans in various societies, whether urban or folk, are capable of empathy, kindness, even love, and they can sometimes achieve astounding mastery of the challenges posed by their environments. But they are also capable of maintaining beliefs, values, and social institutions that result in senseless cruelty, needless suffering, and monumental folly in their

> relations among themselves as well as with other societies and the physical environment in which they live." *(Edgerton, 2000: 131)*

The senseless suffering in some cultures referred to by Edgerton has not gone unnoticed, and as a response, the United Nations[15] created the Universal Declaration of Human Rights (30 articles)[16] in 1948[17] *(United Nations, 1998b: 471 - 474).*[18] The rights and obligations expressed in the UN's Universal Declaration of Human Rights have not been agreed upon and not implemented among many of the UN's own members *(United Nations, 1998a)*. Thus if we accept that even the general values found in the UN's Universal Declaration of Human Rights are debatable and not universally accepted, it should come as no surprise that values in general are also not universally accepted.

In spite of the above mentioned objections, to investigate the link and relationship between values, culture and progress, is within the domain of academic circles, a growing number of scholars, journalists, politicians, and development practitioners that focus on the role of values "as facilitators of, or obstacles to, progress" *(Harrison and Huntington, 2000: xxi).*[19] Values are used as an explanation for "economic underdevelopment, authoritarian political traditions, and extreme social injustice" *(Harrison, 2000: 296)*, and among supporters is it proposed that it offers an

> "insight into why some countries and ethnic/religious groups have done better than others, not just in economic terms but also with respect to consolidation of democratic institutions and social justice." *(Harrison, 2000: 306 f)*

The development of a link between values and progress stems from the inadequate explanatory power that colonialism and dependency theory have had as models for poverty and authoritarianism.[20] The explanatory power of geographic and/or climatological differences as foundations for economic development are also questioned, as there are several obvious exceptions to this model.[21] This has placed renewed focus on value based explanation models among some scholars.[22]

Moreover, the value paradigm is not really new, as "cultural studies and emphasis on culture in the social sciences were in the mainstream in the 1940s and 1950s" *(Harrison and Huntington, 2000: xxi), (Harrison, 2000: 306).*[23] It has since started to resurface as a "renaissance in cultural studies has taken place during the past fifteen years" *(Harrison and Huntington, 2000: xxi f).*[24] However, even though examples of the above are present within this school of thought and it acknowledges a link between values and behaviour, the relationship is not straightforward.[25] This is not helped by the fact that it is generally accepted that it is challenging to research (and argue) the impact of individual values on economic development.[26]

Values are thoroughly integrated into everyday life and it is therefore challenging to come to grips with these concepts and what they mean. Values can be very practical and down-to-earth. Equally, values can also be very theoretical concepts. In addition, values may be regarded as a map on how to live one's life, a set of instructions which assist us to navigate through life's challenges. Finally, values are a mechanism that contribute to constructing and holding together a society. This is the case even if there exists a general "discrepancy between widespread subjective value-certainty and the modern uncertainty about the foundation of values" *(Joas, 2000: 9)*.

Because values operate on so many different levels, it is difficult to pinpoint exactly what values really are; but as long as society exists, the formation of values is an unavoidable consequence. Members of societies use values and demand specific values of others members of their society; this functions to regulate and guide the action taken towards individual members of the society as well as the society as a whole etc. Thus, a society without values would be an impossibility.

2.1.2 The personal perspective

> *"Values can neither be stolen nor transferred nor bought on credit. A purpose in life and obligations to the community cannot be simply prescribed." — Ulrich Wickert (Joas, 2000: 5)*[27]

The concept of values is not restricted to the domain of society in general or commonalities between groups of human beings. In fact, values are equally present in a personal context. Personal values can be inferred from people's behaviour, but, more often, are found in people's verbalisation of attitudes and belief systems etc. *(Hastie and Dawes, 2001: 253)*. The discrepancies that often exist between an individual's behaviour and their values are a testament to the concept of "hypocrisy" *(Hastie and Dawes, 2001: 253)*.

In a personal context, values are often treated as statements of facts,[28] and they often transcend a particular situation; when individuals state that they value something they typically refer to something beyond a particular behaviour, feeling, and belief in a given situation.[29] Values tend to be implicit and the justification or foundation for a given value might be unclear or not reflected upon. Individuals often express "helplessness, and anger at this very helplessness” *(Joas, 2000: 9)* when asked about justifying values which they endorsed. This can be exemplified in the reaction of one interviewee who replied:

> “I don’t know. It just is. It’s just so basic. I don’t want to be bothered with challenging that. It’s part of me. I don't know where it came from, but it’s very important.” *(Bellah, 1985: 7)*

The general uncertainty about the foundation of values is considered to be a contributing factor to this phenomenon *(Joas, 2000: 9)*. For instance, the interviewee can: “not appeal to the Ten Commandments of the Judaeo-Christian tradition” *(Joas, 2000: 9)* and take for granted that they are both in agreement over their validity. Nor does the interviewee have at his or her “disposal a secular vocabulary of rational moral justification (Kant’s moral philosophy, for example) to defend the value of honesty” *(Joas, 2000: 9)*.

The lack of shared tacit assumptions underlying personal values often leads to deeper disagreement, or necessitates “complicated intellectual constructions which often overtax the individual” *(Joas, 2000: 9)*. Individuals tend not to exhibit “a lack of value-certainty, but a lack of communal, self-evident truths” *(Joas, 2000: 9)*. In a pluralistic democratic society, individuals will find room for and accept a wide range of values that coexist in a society—but in every society; there are limits to acting out divergent values.

2.1.3 Value hierarchies

> *“A value is not just a preference but is a preference which is felt and/or considered to be justified — "morally" or by reasoning or by aesthetic judgments, usually by two or all three of these.” (Shils and Parsons, 1951: 396)*

Societies as well as individuals tend to adhere to a significant number of different values. These values held by societies and individuals tend to add up to a value set, which is often described as a value hierarchy. An individual’s value hierarchy is typically developed during childhood from both individual needs and demands which are placed on individuals to match societal demands within a given society *(Ball-Rokeach et al., 1984: 26)*. Values and value hierarchies are standards that are applied to oneself and others, and it is a crucial factor in the shaping of individuals’ self-identity and attitude (but not automatically behaviour) toward self and others.[30]

Value sets tend to vary due to two aspects: (1.) the actual values that make up a given value hierarchy vary and (2.) the importance given to the different values in a particular value hierarchy varies. Values, which make up a value hierarchy, are not always strictly independent elements. Often values are linked to each other, and the changing of the preference of one value may affect the preferences given to other values within a given value hierarchy *(Perelman and Olbrechts-Tyteca, 1969: 81).*[31] Divergent demands and a constant exposure to value conflicts are the prime reasons why individuals feel obliged to order values in a hierarchy *(Perelman and Olbrechts-Tyteca, 1969: 82).*[32]

Researchers[33] have observed differences in value sets *(Ball-Rokeach et al., 1984: 25)*, and have attributed these differences to be primarily due to:

> "differences in culture, differential influences of society's several institutions, the person's structural position in society, and differences in sex role, age role, group membership, occupation, lifestyle, and personal experience." *(Ball-Rokeach et al., 1984: 25 f)*

These dependencies can be exemplified, for example, by the observation that: a conservatively-minded person is more likely to give a "higher position in the hierarchy of values to domestic charity than to the indiscriminate loving of neighbours" *(Billig, 1996: 244)*. Equally, a more liberal person is likely to "hold fast to a hierarchy which reverses the relative positions of these values" *(Billig, 1996: 244).*[34]

Value hierarchies are often divided into a terminal value perspective and an instrumental value perspective. The terminal value perspective implies a value hierarchy consisting of prioritized end states of existence, and instrumental value perspective implies a value hierarchy consisting of "prioritized modes of behaviour perceived to be instrumental to the realization of various end states of existence" *(Ball-Rokeach et al., 1984: 26).* Equally, from an argumentative perspective value hierarchies are often divided into two categories, where "concrete" value hierarchies are characterised by expressing views like superiority of men over animals, whereas "abstract" value hierarchies typically express views like superiority of the just over the useful *(Perelman and Olbrechts-Tyteca, 1969: 80).*

Both individual values and value sets are often expressed explicitly or implicitly in an argument, where value hierarchies are without a doubt more important to the structure of an argument, than that of the individual values which make up any given value hierarchy. This is the case as most individual values tend to be shared by a great number of a given audiences, but a "particular audience is characterized less by which values it accepts than by the way it grades them" *(Perelman and Olbrechts-Tyteca, 1969: 81).*

Different audiences may share many of the same individual values without reaching the same conclusions over a particular argument, as the different audiences are giving various individual values different importance *(Perelman and Olbrechts-Tyteca, 1969: 81).*[35]

Value hierarchies and values in general are often assumed to be more or less stable, but "unlike traits, they are not so stable that they cannot undergo change" *(Ball-Rokeach et al., 1984: 26)*. Both individual values and value hierarchies tend to be of an implicit nature, but this does not prevent value hierarchies from changing and being rearranged,[36] even if the potential of changing is greater when individual values as well as value hierarchy become explicit. Values which have been made explicit through feedback from reflection or other types of feedback, will typically force an individual to continually "compare the relative importance of the values in his or her value hierarchy" *(Ball-Rokeach et al., 1984: 26, 48 f).*[37] Feedback is essential for value change due to two main reasons: (1.) values serve as standards for evaluating self and others and (2.) values are conceived to be centrally positioned and a dominant factor within individuals' belief system "and are, thus, especially likely to activate feelings of deep-lying and long-lasting satisfaction or dissatisfaction with the self" *(Ball-Rokeach et al., 1984: 63).*[38] It is this type of continuing comparison of values' relative importance which makes human value sets so susceptible to change *(Ball-Rokeach et al., 1984: 26)*. In particular, when individuals discover that they have the "wrong" values or wrong placement of the value, "that is, among those who discover they have values that lead them to become dissatisfied with themselves" *(Ball-Rokeach et al., 1984: 59).*[39]

Not all values held by individuals and/or societies will create a discrepancy between values and behaviour, as some values are hidden, in the sense that no one seriously questions them *(Billig, 1996: 207)*. These "uncontroversial" values are part of a given society's commonsense,[40] and will typically not be part of a pro or con stance which often is associated with more explicit values *(Billig, 1996: 207, 246 f)*. Nevertheless, what constitutes a controversial issue is constantly changing[41] in western democratic societies,[42] and these changes contribute to changes in values and thus, in what is considered an uncontroversial issue, i.e. values.[43]

In summary, individuals that experience dissatisfaction with their values, be it from reflection or a change brought on by society, will undergo a value change in terms of individual values or changes to placement of values in a value hierarchy. This change in values or placement of values in a value hierarchy will occasionally lead to change in behaviours *(Ball-Rokeach et al., 1984: 60)*. Equally, individuals that experience satisfaction with their values and value hierarchy will "preserve and reinforce them and pursue behaviors that further confirm their positive self-conceptions" *(Ball-Rokeach et al., 1984: 60)*.

As indicated in this section, a change in an individuals value or in a value hierarchy might translate into change in attitudes, behaviour etc.,[44] which will be expanded upon in the next sections.

2.1.4 Values' link to behaviour and decision

> *"The central conservative truth is that it is culture, not politics, that determines the success of a society. The central liberal truth is that politics can change a culture and save it from itself" – US Senator Daniel P. Moynihan[45] (Moynihan, 1996: 63)* [46]

Individual values and the value hierarchy influence an individual's behaviour and decisions, to some extent. However, the link between values and behaviour is not straightforward (neither easily researched nor demonstrated). One of the basic problems in determining the link between values and behaviour lies in the fact that an individual will often report strong general views on a given issue, but in specific circumstances, act in the opposite manner *(Billig, 1996: 209 - 210)*.[47] One possible explanation for this finding is that values seldom operate as a single identity and tend to be part of a value hierarchy. It is possible for individuals to state a particular value and at the same time use the whole value hierarchy for determining a given action.[48] Another possible explanation is the tendency for discrepancy between general statements and a particular situation. In other words, "there is no reason for supposing that we can conveniently slot all the messy particularities of the world into our general attitudinal categories" *(Billig, 1996: 211)*.[49] Despite these possible rationalizations, the discrepancy between expressed values and behaviour is currently used as evidence of a weak link between the two.

This weak link is also demonstrated by the question of whether moral judgement predicts real-life behaviour. A number of studies have been conducted to address the issue of moral development and its link to real-life behaviour. Such studies have confirmed the existence of a link, albeit weak (typical are correlations of 0.3—0.4) *(Rest and Narváez, 1994: 21, 201, 222 - 224)*.[50] A possible explanation for this weak link is the assertion that "moral behavior is determined by several psychological processes acting together, and that moral judgment is only one of these" *(Rest and Narváez, 1994: 22)*.

Nevertheless, this is not the whole story; other studies and observations indicate that there is a relationship between values and behaviour as well as decision-making. This concept is often evidence of a society's willingness to instil and revoke values that are linked to unwanted behaviour.[51] Studies published in the "The Great American Values Test" have indicated that both public and private campaigns have the effect of changing values and, ultimately, behaviour. In fact, studies indicate that the effect was so great that the research team considered not publishing the findings.[52]

Another indication of the link between values and behaviour can be found in an individual's willingness to change either values or behaviour so that the two correspond. This phenomenon has been described and theorised by Leon Festinger[53] in his famous "A Theory of Cognitive Dissonance",[54] where he argues that we tend to change values in order to reduce the discrepancy between values and behaviour. In short, an individual will adjust their values in accordance with their behaviour so as to maintain a consistent outlook on the world *(Billig, 1996: 205).* [55]

The linkage between values and behaviour, as argued in the previous section, parallels the linkage between values and economic development.[56] In the mid-80's and beginning of the 1990's, several scholars undertook investigations of cultural values' contribution to economic development. These scholars argued that there is a clear link between economic development within a region and/or country and the values held to be important in that region and/or country *(Harrison and Huntington, 2000: xiii f).*[57]

Generally, values become influential and important where facts are disagreed upon or found insufficient to establish a common agreement. This occurs because values are not treated as unquestionable truths, but as probabilities or hope for future state of affairs.[58] The above examples illustrates the precarious and indispensable nature of values, and the important role that they play in determining behaviour and decision *(Perelman and Olbrechts-Tyteca, 1969: 74).*

As illustrated in the above sections, the impact of values on behaviour and decision-making has been researched and argued from a number of points of view. Many of these arguments and research projects confirm the existence of a link between values and behaviour. However, importantly, these sections also illustrate that the link between values and behaviour are far from straightforward. Thus, it is difficult to determine the exact link between values and behaviour.

The following chapters of this thesis will draw upon the general concepts of values, value sets, i.e. value hierarchies, and the somewhat weak but ever present link between values and behaviour. There is no clear distinction between general values and design values.[59] In the following chapters, values will be viewed from a design perspective, in consideration of the relationship between values found in society and values found within architecture and industrial design. Historically, both designers and design scholars have not limited themselves to being inspired by values found in society. On the contrary, they have long attempted to influence the values held by a society, through their design proposals etc.

2.2 INTRODUCTION TO VALUES IN DESIGN

> *"An architect does not arrive at his finished product solely by a sequence of rationalizations, like a scientist, or through the workings of the Zeitgeist. Nor does he reach them by uninhibited intuition, like a musician or a painter. He thinks of forms intuitively, and then tries to justify them rationally; a dialectical process governed by what we may call his theory of architecture" — Peter Collins[60] (Collins, 1965: 16)*

Occasionally architects, industrial designers, and design scholars grapple with the fundamental questions of design. Designing, be it architecture or industrial design, is an activity that carries a certain responsibility that, at times, weighs heavily on some designers' consciences. Reflection on "design responsibility" can lead designers to ask themselves overwhelming questions such as *Do I have the right to cause significant change to a given society or an individual?*, *What is the right approach to making changes?* as well as *What kind of changes are good/just and for whom are they to be made? (Nelson and Stolterman, 2003: 239)*. These types of questions are often connected to technological development, with its potential for large-scale societal consequences. This type of development has obligated designers to ask what consequences and ends design should aspire to *(Buchanan, 1995a: 18)*.

From a professional perspective, the designer also sometimes reflects upon other value related questions. These questions include *Is the design serving the wrong stakeholders?*, *Are architects or industrial designers overstepping their boundaries by making certain decisions?* and *Is it essential for the social, economic, and professional contexts of a given project to be evaluated and rethought before responsible design decisions can be made?* etc. *(Spector, 2001: 205 f)*. It is worth noting that both architects and industrial designers tend to work for a client and/or organisation that subsequently share some of the responsibility posed by the above questions.[61]

A number of design values as well as social, economic, and professional perspectives of a given design project are hidden within this type of reflection. The above questions and their value aspect can be so daunting as to cause many practising architects, industrial designers and design scholars to turn their back on the value discourse. This tendency has created a space for sociologists, social rights activists, politicians and policy makers to deal with the value implications of design *(Spector, 2001: 206)*.[62]

In part, architects and industrial designers tend not to reflect on and question value aspects because it is challenging to predict the exact impact new buildings and products will have on nature and society.[63] It can without doubt be challenging, but not impossible, for a designer to predict the potential impact of their work. Both architects and industrial designers often have a reasonably clear idea of the consequences that a given design will have for different stakeholders, society at large and nature etc. *(Spector, 2001: 74)*. In other words, the greater challenge tends not to lie in predicting the consequences,[64] but in determining the "worth" of these effects. This evaluation of different and often conflicting aspects of design and its potential consequence is the main stumbling block for a designer, as there is no common currency for outcomes to be measured *(Spector, 2001: 74)*. Both architecture and industrial design exhibit this lack of a common currency, the equivalent of a lack of shared values as well as shared value hierarchies.[65]

The proposed development of the Presidio area of San Francisco, USA, is one example of value conflicts and the lack of shared values within the field of architecture. The National Park Service of the United States proposed the conversion of the Presidio military base into a national park. The area is known for its beauty[66], but the beauty was obscured, and some would say spoiled, by a 524-unit government-built complex of buildings named Wherry Housing. This housing complex was characterised by a boxy design and by being clustered together *(Spector, 2001: 67)*.[67] The proposed conversion of the military base into a national park meant the demolition of the Wherry Housing estates, which would undoubtedly enhance the aesthetic qualities in the area *(Spector, 2001: 68 f)*. However, the demolition would also reduce the number of affordable housing units in an area which at the time had the worst housing affordability index in the USA *(Spector, 2001: 68)*.[68] This proposed development of a new national park in the Presidio showed a value conflict between enhancing the beauty of the area and providing a public park versus assuring affordable housing for those in need. This example illustrates that value conflicts and challenges are not necessarily a selection between good and bad, but a choice between different conflicting values that typically represents different stakeholders in the design project.[69]

The value challenges or value paradoxes, which often face architects and industrial designers, can be found in different aspects of the two design professions. Most architects believe that the most important feature of their profession (some would say calling) is the opportunity to exercise individual creativity. But at the same time, architects "also believe that the conditions of the building industry, in or with which they must work, restrict and inhibit them all" *(Symes et al., 1995: 20)* in exercising this individual creativity.[70] Another value paradox can be found in the stringent educational requirements for architects and industrial design—architectural and industrial design training is demanding and takes a number of years, but at the same time architectural and industrial design practices relying on "outside specialist advice for the solution of all serious technical problems" *(Symes et al., 1995: 20)*. [71] Likewise, another value conflict arises when an architect considers whether they are obligated to contribute to society's advancement. It is common for architects to believe they are offering a service to society, but at the same time is it common for architects to "resist the allocation of any great proportion of their professional time to scientific study of its needs" *(Symes et al., 1995: 20)*.[72] Finally, the most profound value paradox lies in the fact that "architects believe passionately in the importance of good design but disagree constantly as to its definition" *(Symes et al., 1995: 20)*.[73]

Considering the numerous value challenges and value paradoxes that architects and industrial designers must face, juggle and attempt to resolve, it is surprising that architectural and industrial design decisions are not more often challenged either by other professions or within society at large.[74] One could assume that these challenges and value paradoxes would lead to the questioning of the integrity of the professions. However, architects and industrial designers do not tend to experience an inner conflict over their own struggle for power *(Spector, 2001: 12)*. In short, most architects do not consider themselves to be in a dilemma about "how to reconcile their moral feelings with their achievement of a coercive monopoly over a segment of the building industry" *(Spector, 2001: 13)*. It should be noted that some architects are concerned with "how to represent the interests of groups that are not present during design, or how to bring meaning to desultory suburban landscapes" *(Spector, 2001: 12 f)*. Architects and industrial designers tend to focus on how best to promote the beauty of the built environment in the face of what many sees as the un-aesthetic value of capitalism.

The fact that most architects or industrial designers do not focus on value conflicts within design does not imply that design is without values and value conflicts. Both values and value conflicts are particularly evident in the recent history of architecture and industrial design, no more so than in Modernism and Postmodernism. Design history also indicates that there are, at times, links between the values (belief systems) found in other academic disciplines and the values (belief systems) found in design movements. This particular point is very much evident in Modernism and Postmodernism. For instance, Modernism tends to be closely connected to the heyday of positivism[75] with its fundamental belief in progress, especially through technological development. A similar situation occurred with Post-modernism[76] with its link to the philosophical[77] and political developments that have taken place outside the two design fields.[78] In general, post modern values are "related to an increasingly broad latitude for individual choice of life styles and individual self-expression" *(Inglehart et al., 1998: 10).*[79]

The value conflicts inherent in these architectural periods are best understood by examining the criticism directed towards the movements, for example, the emergence of criticism of positivism fueled the emerging criticism of modernistic design ideology i.e. design values *(Sparke, 1998: 192).*[80] More details regarding values found in these two design movements will be introduced in the following section.

2.2.1 Design values as indicated by design history

> *"In general architects have deeply felt beliefs about buildings: their function, what meanings they express, their style, the ideas they impart, and their rhetorical or audience effects. Thus convictions are a many-faceted mix of the cognitive and the normative." (Blau, 1984: 63)*

> *"Problems of design and environment only look like objective ones. In fact they are ideological problems." — French Group[81] (Banham, 1974: 209)*

Architecture and industrial design are concepts that are inherently laden with values. This is perhaps no more evident than in the many compromises which needs to be struck to realise a given design project,[82] where there is a need to balance a number of aspects and issues which are not necessarily easily reconciled.[83] The identification of these different aspects has roots that date back to Marcus Vitruvius time (c.90—c.20 BC). According to Vitruvius, architecture must "be built with due reference to durability, convenience, and beauty" *(Vitruvius Pollio, 1960: 17).*[84] The aspects are often in conflict and, thus, require value trade-offs *(Spector, 2001: 35).* This all needs to be balanced by architects or industrial designers when they propose designs solutions.

Historically, architects and design theorists have addressed the challenge of conflicting design values (i.e. design aspect) in several ways. Some have argued that, within the plurality of values, it is always possible to identify a superior value (i.e. design aspect) which should be prioritised *(Spector, 2001: 37 f)*. Others have argued against the Vitruvian idea of the irreducibility of architectural values; they have instead proposed other theories or a reduced version of the Vitruvian values *(Spector, 2001: 38)*. Yet others have questioned the value aspect in architecture and industrial design, by recommending the denouncement and withdrawal from any attempts to strike a compromise between conflicting values. Within this line of thought, it has been argued that: the proposed value conflicts and/or compromises found within architecture and design are a leftovers from humanist ideology, and that one should work to establish a break from this old obstructive tradition *(Spector, 2001: 38)*.

It is not only the individual features found in a design project that are riddled with values. The question of what type of relationship and purpose there should be between the design profession and its clients as well as society at large, is another aspect which is value laden.[85] These ideologies (design values) have typically been connected to religious[86], social, political and to some degree economic issues, within a design history context. One example is the religious connection typically found in the writings of John Ruskin and August W. N. Pugin. Likewise, social, political—and to some degree economic issues—can be found in a number of design movements throughout design history.[87] This is evident in design movements like Modernism and to some extent, Postmodernism.[88] Social, political and economic issues have also at times been high on the agenda within industrial design, with proponents such as Victor Papanek and Nigel Whiteley[89].[90]

Within the context of recent history, one of the most radical shifts in design values can be found in the development of a design discourse which “culminated in the Modem Movement of the 1920s in Europe” *(Larson, 1993: 6)*. An equally radical value shift can be found in the emergence of Postmodernism with its refusal to develop formal and ideological unity *(Larson, 1993: 6)*. These two design movements not only serve as examples of different values found within the recent design history, but also function as an indicator of the current condition of architecture and industrial design. Many of the values found within these two design movements remains very influential within contemporary architecture and industrial design *(Sparke, 1987: 248 f), (Sparke, 1998: 6), (Johnson, 1994: xiii f, xv)*.

Value issues, as related to architecture and design, are particularly evident in the founding principles of Modernism[91] as well as criticism of Modernism. Among the founding principles that Modernism is most known for are the aesthetic values which are closely connected to famous statements like "less is more"[92] by the modernist architect Ludwig Mies van der Rohe[93]. In particular, the modernist design movement is closely associated with aesthetic simplicity and minimalism (which within this context is considered to be a design value)[94] Another important value aspect within Modernism which has aesthetic impact, can be found in its theory and focus on Functionalism[95] *(Sparke, 1998: 42, 86)*. Functionalism contributed to modernistic assumptions such as: a building is an expression of its function and should expose its structure or use of materials in an "honest" aesthetics *(Johnson, 1994: xiv)*.[96] In short, these values were seen within Modernism as a means to "better future lifestyle and reform degenerating cities" *(Johnson, 1994: xiv)*.[97]

Within Modernism, the architect's relationship with clients and society is also riddled with values. Modernism is not known for its promotion of the design values of consultation and participation;[98] instead, it advocates for educating the public in modernistic design values. The modernistic approach towards clients and users leans towards the caricature created by Ayn Rand[99] in the novel "The Fountainhead" where the main character (whom is an architect) asserts, "I don't intend to build in order to serve or help anyone. I don't intend to build in order to have clients. I intend to have clients in order to build" *(Rand, 1994: 14)*. Moreover, the modernistic approach exhibits an attitude towards clients and users that is characterised by creativity, self-expression, and eccentric individualism. A related example may be found in the play "The Masterbuilder" created by Henrik Ibsen[100] *(Blau, 1984: 47)*. In summary, the modernistic design ideology offers clients and social design values based on the assumed superiority and special expertise of architects and industrial designers. According to the modernist viewpoint, clients and society should accept the elevated social status of the architect and make it a priority to educate themselves in aesthetics proposed by architects and industrial designers.[101]

Value issues within Modernism are further demonstrated by various criticisms of the movement. The role of design values in Modernism[102] is an issue that has been debated and criticised both within and outside the world of architecture and industrial design.[103] From an outsider's perspective, Modernism has been criticised by scholars like Jane B. Jacobs[104]. Her criticism accuses modernistic urbanism of "failing to design liveable and safe environments" *(Heynen, 2004b: 1047)*. She argues that modern architecture has led to the making of monotonous, "monofunctional, utterly boring, and even unsafe dwelling environments in which social interaction … [is] hampered rather than stimulated" *(Heynen, 2004b: 1047)*.

Design insiders have been equally critical, as indicated by Venturi when he argued that modernist values such as purity or directness lead to rigid, stereotypical design, characterised by a puritanically moral design language *(Heynen, 2004b: 1047)*. Aldo Rossi[105] formulated an equally severe criticism, claiming that the modernist design value of "form follows function"[106] is naïve, as the study of the history of a given city reveals a persistence of historical forms, as urban forms tend to endure historical changes; even if their original functions fade *(Heynen, 2004b: 1047)*.[107] The design values of Modernism have also been criticised from a vernacular[108] perspective for having a paternalistic, bureaucratic, and antidemocratic character by scholars such as Sibyl Moholy-Nagy[109], Bernard Rudofsky[110] and Amos Rapoport[111].

From a public perspective, Modernism has also been criticised for its social values. Such critics have made the argument that the social agenda and its "physical embodiment were fundamentally misguided" *(Johnson, 1994: xiii)*.[112] Modernism has also been criticised for the lack of public appreciation of modernistic architecture.[113] Some of this public based criticism came as a shock and insult to many modernistic architects, as they had not realised that the "holy" values of Modernism were not believed or appreciated by many members of the public *(Johnson, 1994: xiv)*.[114] The most heartfelt and damaging commentary was the accusation that modernistic architects were forgetting people. In particular, modern architecture was accused of lacking joy and individuality, as well as being repetitive *(Johnson, 1994: xiv)*.[115]

Returning to Postmodernism, it is similar to Modernism in that it is characterised by a number of value aspects, which can be highlighted by looking at not only its basic principals but also at the criticism that has been directed towards it.[116] Postmodernism is well known for aesthetic values, which are best summed up in Robert C. Venturi's famous assertion "less is a bore". From a design value perspective, Postmodernism cannot be easily defined, as it covers a wide variety of different architectural styles and designs. Design values associated with Postmodernism include pluralism,[117] which is often associated with feelings of fragmentation nostalgia, continuity and eclecticism[118] *(Heynen, 2004b: 1047 - 1049) (Sparke, 1998: 228)*.[119]

Postmodernism has, as Modernism, been criticised from a number of perspectives. For instance, Postmodernism has been criticised from a philosophical perspective by Jurgen Habermas[120] when he asserted that Postmodernism is "hiding a conservative attitude behind a seemingly progressive mask" *(Heynen, 2004b: 1050)*. He goes on to argue that postmodern architecture and design "have given up the project of modernity, the project of emancipation, to seek refuge in nice and pleasant but socially irrelevant formal games" *(Heynen, 2004b: 1050)*.

David Harvey and Fredric Jameson[121] are well known critics of Post-modernism from an economic perspective. Harvey argues that the underlying reason for Postmodernism is that "capitalism produces a need to express social distinctions among people and classes" *(Heynen, 2004b: 1050)*. In his point of view, the social values within Postmodernism (or the lack of) leads to social distinctions being expressed in ornaments and decorations within postmodern architecture and industrial design. For Harvey these codes and symbols dissimulate "the real geography of social unevenness by piling up a series of images and reconstructions that act as costume dramas" *(Heynen, 2004b: 1050)*. The movement is criticised by Harvey on the grounds that it is "rendering invisible the tragedies going on behind the screens" *(Heynen, 2004b: 1050)*.

Jameson asserts similar criticism towards the social values found within Postmodernism by theorizing that Postmodernism is primarily an economic necessity of capitalism. This is echoed by Kenneth Frampton when he argues that Postmodernism has a leaning toward "superficiality and sheer visual attractiveness" *(Heynen, 2004b: 1050)*. Likewise, Diane Ghirardo criticises Postmodernism from a social perspective, where she accuses star architects of failing to consider the "toughest issues in land development and the building process" *(Heynen, 2004b: 1050)*, as they are focusing on the art and appearance, which she argues are trivial matters of surface *(Heynen, 2004b: 1050)*.

From the above introduction the main values exhibited (the differences) in the two design movements can be summarised in the following: (1.) Modernism tends to advocate either/or, whereupon Postmodernism tends to subscribe to both/and, (2.) Modernism tends to subscribe to unity/purity/-order, at which point Postmodernism tends to advocate the complex order of the whole, (3.) Modernism tends to promote simple or simplified programs (i.e. separation and specialization of materials, structure, programs, and space), whereas Postmodernism tends to advocate complex programs; multifunctional buildings, elements, materials and (4.) Modernism tends to advocate the exclusion of symbolism (except industrial or mechanical), whereas Postmodernism tends to promote symbolism (vestigial vernacular, popular, commercial culture) *(Larson, 1993: 55)*.

Equally, the values connected to the role of either the architect or industrial designer is very different between the two design movements. These differences can be outlined in the following: (1.) Modernism tends to advocate heroic, utopian visions, whereas Postmodernism tends to criticize social priorities by means of irony, (2.) Modernism tends to search for a grand role for the designer, whereupon Postmodernism tends to admit to a modest role and (3.) Modernism tends to recommend innovative technology, whereas Postmodernism tends to prefers existing conventions and unobtrusive technology *(Larson, 1993: 55).*

Design values are found not only in connection with individual design movements, but also in a professional ideology, which to some extent transcends different design movements. The values held by the architectural profession are exhibited in the criticism that has been directed at its operations and relation to the rest of society *(Watkin, 2001: vii).*[122] One example of this criticism is the anti-trust action threatened by the US Justice Department in 1979 towards the architectural profession. In this action, the mandatory code of ethics of the American Institute of Architecture was pronounced unlawful as it was deemed to prevent competition. As a result, the mandatory code of ethics was temporarily withdrawn and subsequently rewritten.[123]

As demonstrated above, values are an essential part of architecture and industrial design. However, there is no evidence of an extensive value discourses within the two professions. This point will be expanded upon in the next section.

2.2.2 Contemporary value discourse

> *"Design involves the vivid expression of competing ideas about social life … But not only do different designs embody (implicitly or explicitly) distinct sociopolitical assumptions and visions of life, designing itself constitutes a new way of leading, or a leading into, different techno-logical lifeworlds."* (Mitcham, 1995: 179)

In a historical context, there is a sketchy and limited value discourse as indicated by the previous sections. And neither the recent academic or practice side of architecture and industrial design has been characterised by a vibrant or lively value discourse *(Wasserman et al., 2000: 43)*. This is commonly reflected in design literature which tends not to deal with design values and their implications *(Whiteley, 1993: vii)*. Design ideologies and their explicit and implicit value aspects are seldom explored in design magazines or books *(Whiteley, 1993: 5)*. Instead, a considerable part of the design press advocates market-led design with no question of the values base. Consequently, both designers and consumers are ignorant of many of the value implications embedded in buildings and products *(Whiteley, 1993: 166)*.[124]

Even so, there exists a limited value discourse within architecture and industrial design. This discourse is, as many other discourses within the two design professions, characterised by the fact that architects and industrial designers have a tendency not to take part in the written design discourse *(Krippendorff, 1995: 141)*. Instead, the general design discourse is often populated by other academic disciplines which tend to focus on aesthetics, function and methodology without acknowledging that these aspects have a strong value basis *(Krippendorff, 1995: 147), (Spector, 2001: 206)*.[125] Not only architects, industrial designers and design scholars tend not to take part in the limited value discourse, they often make deliberate attempts to marginalise the discourse on the basis that this type of discourse is not seen to be fruitful for architecture and industrial design *(Spector, 2001: 205)*.

It should therefore come as no surprise that many practising architects and industrial designers encounter value conflicts, and at the same time they can be characterised as overlooking them, or by attributing value conflicts to the context of a given design project. Designers often deal with value conflicts by taking steps to "recontextualize a design dilemma as a symptom of a larger or more abstract problem" *(Spector, 2001: 205)*. This is typically the situation when a designer encounters unexpected difficulties in balancing competing demands.

The above points are indicated by the lack of an explicit value discourse in offices of architects and industrial designers. Values that are central to a design firm's strategy or operations are seldom defined or made explicit in a design office, nor are these values communicated to clients, existing staff or new staff *(Cuff, 1991: 166)*. This lack of communication does not imply that staff must not share common values. In a design office, staff need to share common values or at least hold design values which complement rather than conflict with one another *(Cuff, 1991: 166)*. Moreover, the lack of explicit communication of office values does not imply that values are not communicated implicitly within the workplace. On the contrary, values which the staff should, and at times must, comply with are instilled by the leaders of a given design office. This point is illustrated by the following:

> "A firm's founders serve as role models through their own actions, but also through the memories and actions of 'old-timers' who play a critical part in passing down office heritage to throngs of newcomers […] In the office, old-timers tell about their early days with the founders in stories that embed an office ideology [(values)] […] Newcomers are expected to internalize that ideology [(values)], so that all members of the office practice on common ground" *(Cuff, 1991: 159)*

The implicit nature of communicating design values in architecture and industrial design offices forces new employees to seek out the office specific values and learn by example. This process tends to be a long adaptation, as indicated in the following assertion:

> "Now we bring in lots of young people and we have to give them a sense of the way we work. It's really a ritual of making buildings—that's what our process is. But when people haven't worked with us for long, they don't understand. Now I have to say, 'We don't do things like that' and they don't know what I'm talking about. I can't spend the time to lead each person through the office philosophy [(office values)]. I have to take command. I'm not ashamed to say that's how the office runs now. We can have academic discussions and question the program, the design, and all that. But at some point, I'm going to say, 'We'll do it this way,' and then the argument should end and we should draw it up." *(Cuff, 1991: 159 f)*

Thus, new employees not only have to acquaint themselves with the implicit design values found in a design office, they also have to constantly modify their understanding of the changing values within the office—values within a design office change over time, though at a slow pace. The changing nature of offices values can at times make them seem "ambiguous and transient, with no clear boundaries" *(Cuff, 1991: 166)*. This is particularly troublesome for newcomers, but can also present a challenge for existing staff, as they must constantly update the design values, which they are to design by. This often leads to a situation where the totality of the design values cannot be fully known. Regardless of the ambiguity, the staff must "act as if they know this stuff that cannot be known" *(Cuff, 1991: 166)*.

At times architecture or industrial design offices may radically change their design values, this type of event is often followed by a major change of employees working at the given office *(Cuff, 1991: 166)*. This is a natural consequence, because designers who work together on a design project need to share or have compliant design values in order to achieve progress and successful cooperation within the project.[126]

The above examples demonstrate the implicit nature of design values in architecture or industrial design offices and the manner in which they are passed down. The same basic mechanism is found within architecture and industrial design schools, where educational structure tends to be reminiscence of the master/apprentice relationship. Architects and industrial designers often hold a number of design values that were obtained through their design education. The next sections attempt to introduce how architects and industrial designers acquire these design values through their education.

2.2.3 Design education from a value perspective

> *"I've always been interested to find out whether a person is born an architect or becomes an architect through qualifications. I'm not quite sure — I'm joking of course. I'm very sure that somebody, who is an architect, is born an architect, and does not become one through various exams." — Claudio Silvestrin* (Silvestrin, 1999: 11)

To illustrate and bring clarity to the issues of values within architecture and industrial design education the analogy of academic students versus disciples will be introduced. The ancient Greeks introduced the concept of the academy, which is principally based on the following assumption: you know what you have understood and what you can explain.[127] This is different from the older Jewish (and Christian) tradition of disciples, a philosophy based on: (1.) accepting and believing a doctrine and (2.) knowing what has been and is being practised under the influence of this doctrine. Within academia, the prime focus is on theories rather than practical matters. On the contrary, a disciple is trained in practising what he or she believes.

In short, an academic student comprehends theoretical matters with little or no consideration for practicality, whereas a disciple is trained to become a practitioner of his or her beliefs. In other words, a disciple is educated in something that they might not understand or are unable to explain, but must practice. However, an academic student is educated in theories emphasising what can be understood or explained and any practice of the knowledge is linked to theory.

Many of the characteristics of disciple training can be found in architecture and industrial design education. For instantance, design education emphasises learning through practice through the master/apprentice relationship. Equally is the emphasis on practising a belief system i.e. a value set rather than understanding fundamental theory. The lack of theory and understanding of design fundamentals has played a part in the emergence of the "disciple" educational model.[128] It is important to note that architecture and industrial design have elements of academia, but that the overall educational approach has more in common with the disciple training than with traditional academic education.[129]

There are, of course, differences between different architecture and industrial design schools[130]. Even so, two major characteristics unite most schools. These two characteristics are: (1.) an emphasis on project based learning and (2.) a student/teacher relationship that mimics the traditional master/-apprentice relationship.[131] This master/apprentice relationship and the project based educational model are the pivotal role of disciple training found in architecture and industrial design. Design educators both consciously and unconsciously instil fundamental value-system into students, especially through design crit[132] in architectural or industrial design school studios.[133]

The education received under the master apprentice relationship sets the premise for the development of students' design values, which is later further influenced in design offices (as indicated in the previous section) *(Cuff, 1991: 44 f)*. This educational adaptation can be described as socialisation into the architectural or the industrial design profession. Students "acquire attitudes, work-habits and values that will stay with them for life" *(Banham, 1990: 23)* through this socialisation. The main source of this socialisation and enculturation takes place in the design studio, which has been described as "the distinctive holy-of-holies of architecture education" *(Boyer and Mitgang, 1996: xvii)*. This is pointed out by some anthropologists who have been known to compare the teaching methods of a studio "to a tribal long-house; the place and the rituals pursued there are almost unique in the annals of western education" *(Banham, 1990: 24)*. A particular characteristic that sustains the uniqueness of the master/apprentice relationship is "the frequency with which students are discouraged from pursuing modes of design that come from outside the studio" *(Banham, 1990: 24)*. The discouragement needs not be veiled or oblique, but can at times be very explicit. This can be illustrated by the discouragement that was not uncommon in the seventies (and still is in some schools), whereby students were influenenced to not focus on environmental aspects from statements like "Don't bother with all that environmental stuff, just get on with the architecture" *(Banham, 1990: 24)*.

In the same way that the master/apprentice relationship influences students' values, the curriculum of a given architecture or industrial design school will also be a contributing factor in instilling design values *(Schön, 1983: 103)*. This point can be illustrated by the emphasis on project-based learning found in most curriculums, where design projects tend to focus on the early stages of a design process. This is the part of the design process known as the "concept phase" and presents the best opportunity for setting the stage and foundation for how the finished building or product will finally appear *(Edwards, 1999: 151)*. The concept phase is commonly viewed as the part of the design process where architects and industrial designers have the most creative freedom *(Porter, 2000a: 26)*, as well as the part where imposed client restrictions etc. have not entered the design process. It is this creative "freedom" and its influence on the final outcome which have led most contemporary design schools to give this design stage prominence *(Porter, 2000a: 26)*.

This focus on the preliminary stages in a design process sets the stage for a number of design values that are commonly found among architects and industrial designers. For instance, the creative freedom experienced by design students is often greater than what is found in design practices. Design projects that are set in the real world are marked by the fact that designers are not the only ones that influence the design decisions in the concept phase.[134] The fact that the boundaries for creative freedom in the concept phase are not set by the designer alone is something that most design schools ignore. Most design educators "preach" a gospel (i.e. design values) that state that designers have an obligation to question the pre-design decision as well as conditions imposed by clients, market, technology etc. This is part of a creative methodology (creative design value) that has been instilled in many architects and industrial designers. This is indicated by the fact that designers are often seen to cling to "major design ideas and themes in the face of what at times might seem insurmountable odds" *(Rowe, 1987: 32)*.[135]

Due to the above factors, the majority of design students are educated in a belief system (i.e. design values) which is exempt from the careful consideration of the "structural conditions within which individuals must operate in practice" *(Cuff, 1991: 45)*. Within architecture and industrial design education there are often key aspects left out of design projects (and to some degree the general teaching). This include aspects such as (1.) clients or patrons, (2.) economics (accounting and budget management), (3.) relations of authority, (4.) office management (group decision-making processes), (5.) construction management (relations with other key professionals i.e. technical specialties), (6.) human behaviour, (7.) marketing and (8.) research *(Symes et al., 1995: 47), (Duffy and Hutton, 1998: 175), (Cuff, 1991: 44 f)*.[136] The side effect of this structure is that architects and industrial designers tend to not be trained or be alert to significant characteristics of the design process that are practiced in many design offices.[137]

In general it can be asserted that schools of architecture and industrial design not only socialize architects and industrial designers “into the values of the profession as a whole, but also that the same process instils a set of values associated with the specific institution” *(Wilson, 1996: 34)*. The specifics for a given school are relayed and instilled by the school’s selection of design canons, its standards of evaluation, its judgments of taste and the challenges set to mimic future practice *(Larson, 1993: 11)*. Through these processes and general influences schools of architecture or industrial design make an impact on student’s value sets. This is evident in the change of values seen in first year students and the values of final year students *(Wilson, 1996: 36 f)*.

However, the curriculum and the master apprentice/relationship found in most design schools is usually accompanied by a “policy” of not explicitly declaring the design value positions found in the curriculum and instruction. It is simply uncommon for architectural or industrial design teachers to explicitly and unambiguously declare their value positions. Nor is it common to introduce students to design values that the design professions are based on and characterised by. This tends to deprive the students of the opportunity to enter into an explicit design value discourse, because values tend to be instilled in an implicit manner. This implicit approach has the potential to create conflict between teachers and students, as students do not always accept the design values which teachers are attempting to pass on *(Schön, 1987: 126)*. These type of value conflicts are characterised by systematic miscommunication and normally lead to both parties failing to achieve convergence of meaning i.e. each parties “fails almost completely to understand what the other is talking about” *(Schön, 1987: 126)*. This lack of communication can affect the teacher’s ability to fairly grade students.[138] Another consequence is inconsistency between advice given by different teachers. As a result, the student may have severe difficulties in understanding what is expected of him or her etc.

Different value sets found among teachers and students are often a sure “recipe” for conflict. However, disagreements over design values do not automatically imply conflict. To avoid conflict it is essential to maintain a mutual understanding of each other’s different reference systems and then acknowledge that there is no single right set of values *(Ulrich, 2001: 94)*. But as there tends to be very little explicit value discourse in design schools value conflicts tend to be a hidden problem area within architecture and industrial design education.

2.3 SUMMARY

The first part of this chapter introduced the concept that values are occasionally claimed to be universal. However, this is questionable as values are seldom agreed upon generally. Generally, values are hotly debated, represent diversity, are non-neutral and are at times linked to both success and failure. Values operate on a general i.e. social and personal level. They tend to be implicit and thus can be hard to extract.

Individuals are characterised by having value hierarchies, which vary with regards to: (1.) the actual values that make up a given value hierarchy and (2.) the importance given to the different values in a value hierarchy. Thus, different individuals might share the same values without reaching the same conclusions over a particular argument or decision as individuals give values different importance.

Feedback is essential for a value change. Values tend to be changed when there is a discrepancy between beliefs and actions. This is due to two main reasons: (1.) values serve as standards for evaluating self and others and (2.) values are a dominant factor within individuals' belief systems.

Individuals tend to not be rational decision-makers. Thus, values and value hierarchies influence individuals' behaviour and decisions making. This is especially the case when facts are disagreed upon or found insufficient to support a decision-making processes. This is common even if the link between values and behaviour is far from straightforward. In short, values play a central role in the decision making process.

The second part of this chapter introduces the idea that architecture and industrial design are characterised by numerous value related trade-offs. However, at the same time, the two design professions exhibit a lack of common value currency (i.e. shared values and value hierarchies).

There is a sketchy and limited value discourse within architecture and industrial design, both in a historical and contemporary context. In addition, most architects, industrial designers and design scholars tend to make deliberate attempts to marginalise the value discourse on the basis that this type of discourse is fruitless for architecture and industrial design.

However, values do play a central role in a design firm's strategy and operations. This makes it necessarily for office staff to acquaint themselves with the office's values through design practice, as these tend to be published or directly communicated to either staff or clients.

Values also play a central role in design education, as it is characterised by a master/apprentice relationship and a lack of a “theoretical” i.e. research based foundation. In short, it can be argued that architecture and industrial design education is characterized by disciple-like aspects. Design schools are also characterised by: (1.) an emphasis on project based learning and (2.) student/teacher relationships that mimic the traditional master/apprentice relationship. These characteristics set the premise for students’ design values. In general, design schools tend to socialize architects and industrial designers into the “general” values of the two design professions, and at the same time instil a set of values associated with the specific institution.

However, most design schools do not explicitly declare the design value positions found in the curriculum and the teaching. Equally, it is uncommon for design teachers to declare their value positions. In addition, it is uncommon to introduce students to design values that the design profession is based on and characterised by. In summary, this tends to hamper students opportunity to enter into an explicit design value discourse.

3 Values in the design profession

> *"Deference to authority is not merely the habitual practice of educated people, it is, generally, the right thing to do, from a normative point of view. The man who persists in believing that his theorem is valid, despite the dissent of leading mathematicians, is a fool. The man who acts on his belief that a treatment disparaged by medical experts will cure his leukaemia is worse than a fool." (Haskell, 1984: x)*

Architecture and Industrial design are both occupations that are closely associated with the concept of professionalism or simply considered to be professions. It can be argued that both professions have, at times, had a troublesome relationship with the general concept of profession, which will be explored in this chapter. One reason for this troublesome relationship is that there are many implicit and explicit value aspects related to the discourse of what constitutes a profession. Thus, the troublesome relationship has at its source in a number of values found within the two design professions. Taking a professional perspective on the two design professions, which will explore the range of value aspects embedded within architecture and industrial design will highlight this.[1]

The following sections will indicate the role played by values held by "a general concept of profession", as well as indicate how the value system can be used to construct a defence mechanism in dealing with "weaknesses" that exist in the foundation of a profession. Thus, from a value perspective it is interesting to clarify characteristics common to professions, and then to take a look at characteristics specific to the architecture and industrial design professions. Subsequently, this chapter is structured in three main parts including: part one, which briefly introduces the general concept of profession, part two which introduces the values that exist specifically within the two design professions, when compared to the general concept of a profession. Finally, part three, which introduces the value relationship that exists between the two design professions and the rest of society.

3.1 THE CONCEPT OF PROFESSION

> *"The professions dominate our world. They heal our bodies, measure our profits, save our souls. Yet we are deeply ambivalent about them. For some, the rise of professions is a story of knowledge in triumphant practice. […] For others it is a sadder chronicle of monopoly and malfeasance, of unequal justice administered by servants of power, of Rockefeller medicine men."* (Abbott, 1988: 1)

In Western society the concepts of profession and professionalism have become familiar features and a part of everyday life and language. The list of different professions has over time become longer and more extensive. It is commonplace to associate the concept of a profession with prestige, approval and a sense of exclusivity, as well as an obligation held by the professionals towards society. Professions tend to be given certain privileges in return for offering expert services to its clients and/or the public. This makes it common practice to conceptually link professionalism to aspects such as elitism, organised exclusivity and self-defined power, offering self-governance, esoteric knowledge, special skills, and demanding particular codes of ethical behaviour.

A society based on expertise grants professions special status based on the belief that the profession has developed and is administering special knowledge as well as particular skills *(Wasserman et al., 2000: 71)*. In short, professions are often believed to represent sanctioned expertise, where educational credentials are the means to sustain the societies' belief in authority and skills *(Beckman, 1990: 125)*. The special status of professions is considered by some to imply that they are granted "authority"[2] based on the knowledge, which is at times formalised by law *(Beckman, 1990: 126 f)*.[3] The status of both architecture and industrial design follows this pattern, but whether they should be regarded as professions or simply as occupations is not straightforward.

Generally, it is often argued that a profession is a social construction, which is linked to a specific field of knowledge and competence that require extensive study and mastery. Fields of competence such as law, medicine, military, nursing, clergy and engineering are generally considered to be professions.[4] Over time, many professions that started out being considered as occupations[5] or guilds[6] have been transformed into professions. This transformation and classification is dependant upon the all-important definition of what actually constitutes a profession. The following section will introduce the discourse that exists around this issue, and will indicate what is considered to be an appropriate definition of a profession within the context of this thesis. This definition will subsequently be used to shed light on the profession-related values within architecture and industrial design.

3.1.1 Defining the concept of profession

> *"Politics is supposed to be the second oldest profession. I have come to realize that it bears a very close resemblance to the first."* Ronald Reagan[7]

The concept of profession is challenging to define, as the field has been inundated with an increasing range of conceptual approaches, which have brought both refinement and confusion as to what one defines as a profession *(Beckman, 1990: 115).* The challenge related to defining of professionalism can be summed up in that, from a scientific point of view, it might be possible to give an exact definition of a profession. But an ideal scientific statement which denotes exactly what a profession is, tends to connote "nothing", whereas many of the existing definitions of professionalism tend to denote exactly "nothing" and connote "everything" *(Beckman, 1990: 115).*

Within this broad range of definitions and outlooks there are several main traditions engaged in studying professionalism. One tradition defines professionalism by the English linguistic convention, which typically includes "doctors and lawyers and some other academically trained occupations" *(Beckman, 1990: 116).* This particular tradition suggests that professionalism is linked to the historical rise and fall of these groups *(Beckman, 1990: 116).* A second tradition can be found in linking professionalism with an established knowledge base and the subsequent authority. Essential concepts within this tradition are sanctioned expertise and expert knowledge *(Beckman, 1990: 116).* Another tradition links professionalism to the raising of the social standing of occupational groups which mainly achieved this "by means of higher requirements of formal training, not necessarily academic" *(Beckman, 1990: 116), (Selander, 1990: 141 f).*[8] In addition, there are several other terminological conventions formed by various brands of the professionalisation theory, which in this context are of less importance.

The following will focus on definitions that links professionalism with a distinct knowledge base, even when acknowledging the broad range of different definitions of professionalism, and that a profession is a social construction that can be defined by a number of criteria. The rationale for choosing a knowledge-oriented perspective is based on the assertion that it is often the knowledge base that creates the opportunities for the profession to exist in the first place. Or to put it another way, without a knowledge base, no lasting foundation for a “viable” profession tends to exists.

The validity of these assertions is reflected in the fact that society tends to grant a profession special privileges based on their spatial knowledge and skills.[9] In addition to being granted special status, professions are expected to engage in further developing its knowledge base through research and knowledge application. Another indication of the importance of the knowledge base can be found in the fact that societies tend to support research and educational contributions to that knowledge base. They provide or contribute to the funding of schools and universities which administer and/or develop the knowledge base, to ensure that every individual professional offers their expertise at an expected level within the profession *(Barrows and Tamblyn, 1980: 5 - 7)*. Further, support for the importance of the knowledge base is indicated in that some professions have ceased to exist, principally because there was no longer any demand for their expertise or knowledge base *(Abbott, 1988: 28 f)*.[10] Equally, the importance of the knowledge base is indicated by the constant power struggle that tends to exist between adjacent professions, where developments in the knowledge base can lead to increased status and new professional domain and/or sub-domains.

This knowledge base perspective does not prevent other aspects of professionalism to be included in the definition of a profession. An example of this can be found in the work of sociologist Eliot Freidson[11] who introduced three categories of professional aspects: expertise, credentialism, and autonomy all of which, he argues identify the concept profession. According to Freidson, expertise is an inescapable consequence of the division of labour which characterises the western societies *(Haskell, 1984: xxi)*. He argues that credentials are vital as they provide a degree of economic protection justifying the initial investment accruing the knowledge base i.e. in becoming a professional.[12] In short, a profession according to Freidson might be defined as occupation that claims special esoteric competence and works to obtain the:

> “exclusive right to perform a particular kind of work, control training for and access to it, and control the right of determining and evaluating the way the work is performed” *(Freidson, 1971: 22)*

Scholars, such as Wilbert Moore and Ralph L. Blankenship, echo Freidson’s perspective. For example, Moore argues that a profession is a scale rather than a cluster,[13] but still mainly characterised by:

> "(1) the substantive field of knowledge that the specialist professes to command and (2) the technique of production or application of knowledge over which the specialist claims mastery." *(Moore, 1970: 141)*

Similarly, Blankenship uses the following criteria in determining the change from an occupation into a profession:

> "(1) The work becomes a full-time activity. (2) University training schools are established. (3) Local and then national professional associations are formed. (4) The task is divided into preferred work and dirty work—the latter being delegated to others. (5) Those members who seek to upgrade the professions win power over the older members. (6) Neighboring occupations are brought under professional dominance. (7) Legal protection is sought through political influence. (8) A code of ethics is generated." *(Blankenship, 1977: 14 f)*

This synthesis can be summarised and elaborated by forming three main aspects that characterise most professions, which are: (1.) specialised knowledge, (2.) legal sanction credentialism and autonomy and (3.) protection of the public interest.

The first criteria of "Specialised knowledge" implies: (1.) a unique knowledge base often received at university-level education, (2.) research and skills development which further develops the knowledge base and (3.) practices with an ensured minimum entry-level performance (based on the knowledge base). In addition, the specialised knowledge must be profession-specific i.e. it must not readily be found within adjacent or other professions. In short, the profession must be able to enclose a field of knowledge *(Selander, 1990: 148 f), (Symes et al., 1995: 45).*[14] Finally, the knowledge base must be recognised as specialised knowledge and be needed in the eyes of the service recipients and the public at large *(Symes et al., 1995: 45).*

The second criteria "Legal sanction credentialism and autonomy" is linked to: (1.) autonomy granted by society through state licensing etc. and (2.) the establishment of associations which ensures protection, standards for licensing, systems of education etc. This implies that members of a profession who have obtained the specialised knowledge are identified to the public as those who are capable of providing the particular knowledge and skills. The identification might take the form of a licensing, registration or through a governmental and/or private unit assurances *(Symes et al., 1995: 45)*. This is essential to professions as individuals outside the profession have significant problems in identifying and validating the sanctioned expertise offered by a given profession. It is this inability on the part of people outside of the "expert authority" that is the primary reason why it needs to be validated by recognised forms of identification including licensing *(Beckman, 1990: 127 f).*[15] A profession cannot be effective without engaging trust from those who are unable to judge it. Even so is it worth noting that some professions have been able to preserve their self-interest by deliberately preserving incompetence among others and by "keep the alleged specificity of presumed expertise hidden from inspection" *(Beckman, 1990: 128).*

Professional autonomy gives the professions the opportunity through various means to regulate and restrict membership through licensing and accreditation.[16] This autonomy tends to allow the professional authority to set the rules of appropriate conduct, and enforcing codes of discipline within the profession, as well as regulating the size of the profession.[17] However, it is worth noting that a legal monopoly or legal barriers for providing a service are not in itself an indication of a profession. For instance, the legal monopoly of chimney sweeps in Norway and Sweden to sweep chimneys is based on credentials of proved skills *(Beckman, 1990: 119)*, but does not qualify as a profession within the above three criteria.

Finally, the third criteria "Protection of the public interest linked" is linked to (1.) code of ethics that regulates the relationship with clients and society and (2.) legal obligations towards protecting the clients and society. This often implies that there is a clear importance given to public interest, such as health, public safety and public welfare. With legal rights there are often legal obligations. This has made it common for professions that enjoy autonomy to also be covered by legal legislation that aims to ensure that any professionals with "fiduciary responsibilities could make himself liable for severe legal penalties" *(Haskell, 1984: x)*. This is typically the case if medical professionals fail to "consult appropriate authorities about the treatment of assets under his care" *(Haskell, 1984: x)*. Similarly, someone who is building a bridge without consulting professional expertise on constructing issues, like calculating stress and load factors, would put other people in danger and thus be liable.

Protection of the public interest often implies that special knowledge of a given profession "is needed by the society and its members for the protection of the public" *(Symes et al., 1995: 45)*. It also implies that if someone who "did not have the knowledge base were to attempt to provide this service, harm to the recipient of the service would be likely" *(Symes et al., 1995: 45).* In addition, it is often linked to an obligation to provide the necessary services and access to members of the community who cannot afford the service. This typically includes the medical profession's obligation to provide emergency medical care.[18] Finally, this aspect is often linked to an obligation to respect the privacy rights of clients, as well as an obligation to provide a certain amount of information about professional matters to clients and/or the public *(Wasserman et al., 2000: 71)*.

The three main aspects (introduced above) that characterise a profession make a clear distinction between a layperson and a professional. It also denotes the aspect of more liberal definitions of a profession.[19] A definition based on the above criteria tends to exclude a number of occupations that in everyday language are referred to as professions. For instance, a football player and a moviemaker are often referred to as professionals, but they are both outside this somewhat "strict" definition of professionalism. Another example can be found in that the claim of professionalism within the advertising industry, which also falls outside this definition of professionalism.[20]

Similarly, within this definition of professionalism, it is difficult to accept that teachers have ever transformed themselves from being an occupation into being a profession. They are often referred to as professionals, but this claim can be disputed on the grounds that they lacks legal sanction, credentialism and autonomy. This as teaching also takes place outside the traditional school environment where there often is no prerequisite for teaching credentials. Equally, it can be challenged on the grounds that there is no self-regulating system in place in the teaching occupation, as it is politicians or bureaucrats (laypeople) in state legislatures and/or boards of education that typically regulate these issues. It should be noted that by using a similar argumentation the status of architecture and industrial design professions can be challenged (this will be further deliberated on later in this chapter).

These three aspects also illustrate the range that exists between different professions and other occupational concepts. For example, the notion of "professionalized politicians" shows the difference between semi-professions and full-blown professions. Professionalized politicians are "performers of what both in a legal and customary sense is lay community work as a full-time paid job, acquiring expertise as professional 'decision-makers'" *(Beckman, 1990: 123)*.[21] However, it is difficult to argue that policies are based on any particular and specialised knowledge base, as any democratic debate will reveal that policies are mainly based on values and belief systems.

To overcome some of the exclusions which this and similar definitions of profession implies, Nathan Glazer[22] introduced the terms "major", "near-major" and "minor" professions. These terms distinguishes clearly between established professions i.e. adhering to the strict definition with specific knowledge, institution, legal protection and recognised credibility, from the weaker professions. “Minor” professions are characterised by being based on a knowledge base which have “lesser” academic respectability, weaker institutions, little or no legal protection, and credibility which can and is often disputed compared to more well established professions *(Glazer, 1974: 347 f)*.

The concept of “major”, “near-major” and “minor” professions also indicates the knowledge based power struggles that exist between different professions for turf and responsibility. Power struggles are most common between adjacent professions.[23] Take, for example, doctors who find themselves “fighting both the authority of administrative directors of hospitals and the unauthorized expert authority of `quacks'” *(Beckman, 1990: 131)*. Professionals tend to argue their position from conflicting perspectives.[24] This is often cited as the reason behind the somewhat “chameleon-like features of behaviour of professional groups” *(Beckman, 1990: 132)*.

Professional power struggles are not without their limitations, as the specialist knowledge of professionals is to some extend subject to supply and demand from clients and the society at large. This supply and demand has the characteristics of a market, which is traditionally seen as a mechanism for establishing price, labour and capital, but there are some crucial differences which apply to professions *(Gibbons, 1994: 12)*. The difference lies in that professions have an influence over the supply of new professionals through the academic institutions. It is also common to grant professions leeway in demanding a minimum fee for their service.[25] But this “freedom” has not prevented some professions from ceasing to exist *(Abbott, 1988: 28 f)*.[26]. In short, numerous professions have decreased in size or disappeared; equally, some have grown.[27] Successful professions have developed juridical protection and have managed well the power struggle with adjacent rival professions *(Abbott, 1988: 30)*. This success tends to be dependant on the power of the profession’s knowledge base. It is the abstract power of the knowledge which allows professions to hold at bay other professions and retransform when circumstances change.[28]

3.1.2 The emergence of professions

> *“I hold every man a debtor to his profession, from the which, as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends, to be a help and ornament thereunto; this is performed in some degree by the honest and liberal*

> *practice of a profession, when men shall carry a respect not to descend into any course that is corrupt, and unworthy thereof, and preserve themselves free from the abuses wherewith the same profession is noted to be infected; but much more is this performed, if a man bee able to visit and strengthen the roots and foundation of the science itself; thereby not only gracing it in reputation and dignity, but also amplifying it in profession and substance." — Francis Bacon* [29] *(Bacon, 1969)* [30]

In ancient times spiritualists and knights held a specific status on the basis that they could offer special "competence" to different groups of a society, often founded on skills and knowledge such as symbolic language, religion and war techniques *(Selander, 1990: 141)*. It can be argued that this makes these occupations amongst the first in time-profession ("proto-professions"). The constant development of these and similar groups into more developed occupations or guilds, and then into full-blown professions is a well-established and documented process. However, it tends to be difficult to exactly pinpoint the moment an occupation is transformed into being a profession.[31] This difficulty is related to the problem of exact definition of profession as introduced in the previous section.

The emergence of professions is often associated with a particular sequence of events. This sequence often starts out with the establishment of a professional association that had explicit membership rules and the power to exclude the unqualified *(Abbott, 1988: 11)*.[32] The second step is often considered to be a change of the occupation's name in order to make a clear break with the past.[33] The third event on the road to professionalization is often considered to be the setting up of a professional code of ethics—one that reduces the internal competition as well as asserts social utility. This code is also often used to regulate the relationship with clients. The final step is often considered the effort made by occupations to obtain legal recognition, which starts out by limiting the use of the professional title, and later a criminalizing of unlicensed work in what is considered to be the professions jurisdiction *(Abbott, 1988: 11)*.

This sequence of events can be attributed to numerous factors, where the development of new knowledge and technology plays a crucial role. This link is specifically evident in the 19th century, with its rise in technological development and division of labour with a subsequent formation of new occupational specialisation. However, not only technological development contributed to a development of occupations claiming professional status. Political and social development also played a crucial role in contributing to the foundation for the transformations of occupations into fully-fledged professions.

Occupations before the 19th century were intrinsically linked to guild-societies,[34] the state-defined office and what can be described as state professions. These occupations were often closely linked to the centralised bureaucratic state of a given country *(Siegrist, 1990: 193)*.[35] During this period any academic based knowledge or credentials were of a secondary importance, and at times missing altogether *(Siegrist, 1990: 194)*. Instead, privileges enjoyed by occupations were often closely linked to their proximity to the dominant political elite. The circumstances of a given occupation were, in many regions of Europe, decided by the local territorial authority, which had the sole prerogative to decide “who was permitted to practise as a physician, a lawyer, a priest or an engineer” *(Siegrist, 1990: 194)*. It can be argued that before the 19th century occupations enjoyed privileges as a result of many states inability “to adopt or enforce unanimously centralized regulations on the division of labour” *(Siegrist, 1990: 194)*.

A major change took place when many societies transformed into more civil and liberal societies during the course of the 19th century. One influential factor causing these changes was the increased emphasis on the principle of social self-regulation *(Siegrist, 1990: 193)*.[36] This trend coincided with the increased importance of centralized states, which took place in the 18th and early 19th century continental Europe. This centralization had the effect of repressing the old “social mechanisms which had traditionally defined the general division and function of labour” *(Siegrist, 1990: 194 f)*. In addition, the general course of education as well as academic requirements were reformed within these changing societies, where a growth in universities and professional schools played a crucial role in transforming occupations into professions.[37]

Universities have generally played a vital role in supplying professions with the knowledge and special skills base, even if this is not the case for all aspects and for all occupations.[38] The curriculum of “modern” universities have developed and diversified, which in turn has produced new areas of competence which subsequently have created the knowledge bases and status for the different professions *(Jackson, 1970: 4)*. On the back of these developments it can be argued that the 19th century “saw the first development of professions as we know them today” *(Abbott, 1988: 3)*.[39] It is important to note that with this change came an increased focus on ability and knowledge with regards to being admitted to a “professional” practice.[40]

However, even if this can be argued to be the general trend, not all professions have emerged from the expanding knowledge base developed and/or thought of in university. In addition, this transformation did not take place without a struggle, as some practitioners stood to gain from this academic affiliation and others stood to lose.[41] Professions lack of an absolute link to university and a research foundation can be indicated by the lack of logic in the division of the early medical field. Where teeth (as the only part of the human body) did not fall under the jurisdiction of the early medical profession, instead was it served by the separate profession of dentistry *(Rittel, 1976: 78)*. Similarly it can be argued that there is a strange logic operating whereby some parts of the engineering domain "are defined in terms of gadgets (automotive engineering, naval architecture) and others according to classes of phenomena (mechanical, electrical)" *(Rittel, 1976: 78)*. Thus, it can be argued that the "map" of professions is in an addition to the knowledge foundation, the product of wars where the result has been determined by the result of political and social changes, as well as from annexations, treaties, etc., as "professional realms have to be claimed and defended" *(Rittel, 1976: 78)*.

Whilst the above examples and arguments acknowledges that there are a number of different contributing factors to the transformation of occupations into professions, it can be argued that this transformation was spurred on mainly due to the development of knowledge and technology. This is not denying that in many instances political and social development, in particular within the social welfare states, have played a role *(Selander, 1990: 141)*.[42] For instance, changing political conditions have contributed to various notions as to how professions and their corresponding social functions were to be supported and regulated *(Siegrist, 1990: 195)*,[43] as much of the educations of professionals have been under the patronage of the social welfare states. Equally, professions have tended to be given state functions such as in supervising professional activity *(Siegrist, 1990: 197)*. Many occupations and professions have, and still are, to some degree negotiating their autonomous status with government or organized clients within changing political climates. These negotiations have given many occupations and professions the characteristics of a union *(Siegrist, 1990: 197)*.[44] This has changed arrangements between professions and the state in a number of western countries. On the back of these changes, some occupations were either forced to change into professions or chosen to do so. Others changed in order to tap into the increased prestige that often follows the transformation into a profession.[45]

Occupations and their transformation into professions is to a great degree determined by the time in which a given transformation took place, as well as the above introduced sequence of social and political changes *(Siegrist, 1990: 198)*. Thus professions are also extensively influenced by the different historical periods that their occupational background was connected to. In particular, the previous way of thinking, its old inner structure and earlier way of practising etc. *(Siegrist, 1990: 198)*. This historical roots are at times very influential as most 19th century occupations "stood outside the new commercial and industrial heart of society" *(Abbott, 1988: 3)*. Instead were many occupations characterised by being organized in a collegial manner drawing on the "Old Regime" from which they acquired a civil servant quality *(Abbott, 1988: 3 f)*.[46] This particular point can be illustrated by the fact that a number of medical professions still cling to an ideology of unselfishness and adheres to the concept of the profession as "a calling" in a highly industrialized and competitive market *(Beckman, 1990: 122), (Siegrist, 1990: 198)*.[47]

This points to the fact the historical roots of professions tend not to follow a strictly logical development, but are instead linked to the old ways of its preoccupation phase. In short, the characteristics of a profession are somehow woven together with its occupational background *(Siegrist, 1990: 198)*. However, the emergence of professions has been and still is to some degree also dependent on the developments that take place in adjacent professions and their knowledge fields. The central questions of how professions develop are to a substantial degree "tied up with questions of interprofessional relations and the content of professional activity" *(Abbott, 1988: 23)*. As illustrated in this section, professionalization has emerged on the back of a complex pattern of contributing factors that includes occupational background, knowledge development, political and social changes, jurisdictional competition and interprofessional relations.

3.1.3 Critique and challenges linked to professions

> *"All professions are conspiracies against the laity." — George Bernard Shaw[48] (Shaw, 1914a: 136)*

Professions have traditionally enjoyed widespread admiration and considerable status, but in general have it not escaped criticism and scrutiny. Before the 1930s, there was a general assumption, held by scholars and the public alike, that professionals were less selfish and held themselves accountable to higher ethical standards than the general public. Professionals were seen to have the “power to free their members of the crasser forms of self-interest and make them ‘disinterested’” *(Haskell, 1984: xxix)*. This idea of “disinterestedness” among professional experts was the central tenet of the progressive faith in professionalism. *(Haskell, 1984: xxix)* This view laid the foundation for why the great expansion of many professions “authority during the early decades of this century could seem to pose no threat to the public interest” *(Haskell, 1984: xxix)*. But the increased status and authority have been challenged from a number of perspectives by different academic scholars, in additions to criticism emerging from within the different professions *(Schön, 1983: 39), (Rittel and Webber, 1973: 155 f)*.

A critique of professions is not a new phenomenon and has strong historical roots, but it intensified during the 1960 and 1970 *(Abbott, 1988: 5), (Haskell, 1984: xiii)*. Critics have been arguing that the solution proposed by professionals’ expertise can create more problems than those they design to solve *(Schön, 1983: 4)*.[49] Professions were conceived to propose and carry out solutions that have produced unintentional side effects, unacceptable to large segments of a given society *(Schön, 1983: 4)*. Critics of professionalism assert that the challenges that a society faces are problems which can not be resolved through professional expertise, according to these critics solutions only can be found in moral and political choices *(Schön, 1983: 10)*.

This type of argument gained certain momentum when the peace movements and civil rights movements joined forces and turned against the professionals “whom they saw as instruments of an all-powerful establishment” *(Schön, 1983: 10)*. In this climate, many professions found themselves in the unfamiliar role of villain. Equally did a number of public scandals like Medicare and Medicaid[50] and Watergate[51] and its aftermath contribute to moral and ethical disarray among many professions, as highly esteemed professionals were seen to have misused their privileges and autonomy *(Schön, 1983: 4), (Schön, 1983: 293)*. In short, the moral and ethical currency of many professions was questioned as a result of these events and scandals. This subsequently led to the questioning of the self-policing structure found in most professions. It also contributed to the questioning of the “disinterestedness” i.e. ethical standards that had previously been expected to be higher among professionals than the general public. An after-effect of these scandals and the criticism directed towards professions was that it eroded some of the confidence in professions held by the public and by the professionals themselves *(Schön, 1983: 11)*. The exposure of their failures and problems “gave rise to the so-called ‘crisis of the professions’” *(Haskell, 1984: xiii), (Schön, 1983: 11)*.

Another important contributing factor to the increase in criticism directed towards the professions can be found in the very development of the knowledge foundation of the professions. The constant improvements of expert knowledge, replacing previous ideas, had the effect of exposing the invalidity of previous claims by professionals.[52] This type of revelation and its questioning of previous competences and the foundation for the competences was very unsettling for many professions, as it sometimes shook the very foundation of a given profession. As a result of these potential consequences, professions are generally reluctant to expose themselves to this type of revelation, which is often revealed by a "cognitive rebel … who knowingly rejects the opinions or methods of reasoning of the experts" *(Haskell, 1984: xxxiii), (Schön, 1983: 11)*.[53]

The very nature of the problems which professionals are concerned with is another contributing factor for criticism of the professions. Ideally, professionals only deal with problem solving within their domain of knowledge and expertise, but problems are set in a particular context and tend to have consequences outside of the knowledge domain of a given profession. Professional decisions tend to be taken on two distinct levels where one level is within the knowledge domain of a given profession, and the other extends outside of the professional expertise. Criticism directed towards the level where professions exceeds their expertise are often more difficult for a given profession to repulse, as they have no exclusive expertise on these more general problems i.e. problems or consequences set outside of the knowledge domain of a given profession.

Professions have also been criticised from the democratic point of view, where critics have argued that the increased number of professionals and their claim of expert knowledge limits and shrinks the areas where commonsense is considered adequate, thereby excluding a wide range of questions relevant to a citizen's wellbeing from political debate *(Haskell, 1984: xxii)*.[54] The fact that professionals have been given the task of solving an increasing number of societal problems have made political and ethical debates and reflections less prominent *(Alvesson and Sköldberg, 2000: 116)*.[55] Thus, political decisions and conditions are hidden underneath professionalism and a "technocratic ideology", which often leads to a situation where the problems formulated and the solutions suggested are those best suited to a narrow professsional perspective.

The end result of the criticism, based on the above numerous perspectives, has been a decreasing faith in professional judgement, calls for external regulation of professional behaviour and activities *(Schön, 1983: 4)*.

3.1.4 Ethical guidelines and standards

> *"For better or worse, codes of ethics do not resolve all ethical questions in the professions." (Weston, 2000: 302)*

Professionals are a collection of individuals sharing a common knowledge base, duties and some obligations towards clients and/or society such as health, public safety and public welfare. In return, society has granted professionals some special privileges through legislations and accreditation. The general public is often forced to trust that professionals will not take advantage of their special privileges.[56] Professions reinforce and attempt to cement trust by the development of ethical codes, guidelines and standards that reinforce professional ethical behaviour, as well as regulating the relationship between professionals.[57] Ethical codes also serve the purpose of helping people to understand what can be expected from a professional.

Ethical guidelines and standards have a long tradition within some professional i.e. pre occupation communities. A classic example of ethical codes is found within the medical professions, in the form of the ancient Hippocratic Oath[58] attributed to Hippocrates[59], a Greek physician of the fifth century BCE *(Weston, 2000: 299 f).*[60] Contemporary medical professionals tend to practice according to the oath where more contemporary issues are included , such as any treatment should be provided "unrestricted by considerations of nationality, race, creed, age, sex, politics, or social status" *(Weston, 2000: 300)* and a general commitment to contributing to the community at large. Ethical codes etc. tend to be reviewed and changed as a response to the development within the knowledge base of the profession and external pressures from clients or society.[61]

The objectives for the development of ethical codes etc. have been to formulate and reinforce general guiding moral principles and particular rules of conduct, which "express the considered opinion of the profession on ethical matters in order to protect the profession and guard against liability problems" *(Fisher, 2000: 172)*. In addition, it has been important to protect certain professions from public dismay. As previously mentioned, some code of ethics will imply an obligation to provide necessary services and access to members of the community which cannot afford the service, as well as an obligation to respect the privacy rights of clients and their right to adequate information *(Wasserman et al., 2000: 71).*

Ethical codes of conduct typically deal with a set of general principles or rules regulating issues such as business practice, fiduciary trust, insurance or liability, often with subsidiary guidelines governing specific issues and behaviours. Equally, the choice of ethical guidelines and standards features a sets of global claims, characterises the profession's ethos, and illustrates its theoretical foundation *(Fisher, 2000: 172)*. However, it should be noted that an ethical code does not disclaim responsibility for ethical consideration on the part of individual professionals.[62]

As this section on professionalism comes to an end it is important to note that in the general definition of professions, its development, criticism and ethical issues discussed in this and previous sections are relevant for architecture and industrial design. The issue of classifying architecture and industrial design as professions or occupations will not be concluded at this stage, but will instead be explored through the following sections. The issues of architecture and industrial design's development, criticism and ethical issues will also be indicated in the following sections. The main focus within the next section will be to compare this general picture of professions with that of the two design professions, in other to highlight values issues found with architecture and industrial design.

3.2 THE DESIGN PROFESSIONS' SPECIFICITY

> *"Go as far away as possible from home to build your first buildings. The physician can bury his mistakes,—but the architect can only advise his client to plant vines." — Frank Lloyd Wright (Wright, 1953: 218)*
>
> *"Architecture, as a profession, promotes a series of self-referential and autonomous values" (Till, 2005: 166)*

Making buildings and products is an activity that stretches back to the beginning of time *(Larson, 1993: 3)*. But it was not until the emergence of the Renaissance[63] that, many design scholars, deems that occupations like stone-cutters, goldsmiths, cabinet-makers and painters started to act like "architects" *(Larson, 1993: 3)*. "Acting like architects" implies in this context a separation between planning and drawing a building and the craft of making one. As a result, it can be argued that architects first laid claim to the responsibility of designing buildings during the Italian Renaissance *(Larson, 1993: 3)*.[64] However, it was not until the 18th and the 19th century that a considerable amount of practitioners, who had attended architectural schools, were calling themselves architects. For instance, in 1898 there were only nine professional architectural schools in the USA with an enrolment of 508 students *(Weatherhead, 1941: 63)*.[65] During the same time period it was reported that there were 10,581 persons calling themselves architects

(Noffsinger, 1955: 49). This implies that anyone in the USA could hang out a shingle claiming to be an architect as "there were no state licensing laws at all until Illinois set the precedent in 1897" *(Draper, 1977: 215)*.[66]

Similarly, the development of what is known as industrial design is, by many design scholars, judged to start no earlier than mid-nineteenth century when the Industrial Revolution set its mark on society *(Bürdek, 2005: 17 - 19)*. The increasing divisions of labour that followed in the wake of the Industrial Revolution resulted in the fact that products were no longer mainly produced "by one and the same person, as had previously been the case" *(Bürdek, 2005: 19)*. Over time, this development contributed to the separation of making and designing products.[67] Even so, is it not uncommon for design scholars to attribute the emergence of industrial design, as we know it today, to the beginning of the 20th century *(Sparke, 1998: 6), (Dorst, 1997: 16)*.[68] In fact, it was not until 1945 that industrial designers emerged that had received training aimed at their specific role *(Sparke, 1998: 6), (Dorst, 1997: 16)*.[69]

This indicates that both professions are relatively young. Without putting too much emphasis on the starting point of the two professions, the following sections will focus on comparing architecture and industrial design to the general concept of profession (and other professions) introduced in the previous sections. The general concept of profession will be used as a reference point for the professional characteristics found within architecture and industrial design. Throughout this comparison, attempts will be made to highlight pertinent values related to the two design professions from a number of perspectives. This will include the link between art and the two design professions, and the unsettled relationship between designers and clients and/or society. In addition, the following sections will attempt to indicate whether architecture and industrial design should be classified as occupations or professions. In short, the following sections will highlight some of the particularities i.e. values found within architecture and industrial design from a general profession perspective.

3.2.1 The artist that lives inside the professional designer

> *"The social function of the architect is to create a work of art." — Minoru Yamasaki[70] (Burchard and Bush-Brown, 1961: 394)*

“Architecture is walking the streets today a prostitute because "to get the job" has become the first principle of architecture. In architecture the job should find the man and not the man the job. In art the job and the man are mates; neither can be bought or sold to the other.” — Frank Lloyd Wright (Wright, 1953: 219)

Architects and industrial designers represent specific skills and to a lesser extent detailed “knowledge” which they bring to a design project,[71] but designers differ from other professionals in that they represent an artistic element, which they utilise to propose and create aesthetic forms and appearances. The quest for a particular aesthetical expression and the will to give form is seen by many architects and industrial designers as the most important aspect which they offer their clients and society *(Blau, 1984: 46 f).*[72] Due to this artistic aspect of architecture and industrial design, some design scholars have compared architects and industrial designers to musical composers and playwrights rather than other professions like law and medicine indicating a strong link to art *(Collins, 1971: 90).*

Within the realm of architecture there has for a considerable time existed a debate as to whether architecture is a profession or an art. The historical roots related to the question of professionalism within architecture can be illustrated by the controversy sounding a Bill introduced in 1891 to the British parliament seeking to make “architecture a closed profession of architectural practitioners” *(Collins, 1971: 120).* The idea behind the Bill was to make architecture only accessible by passing examinations and obtaining diplomas as was and is the case for many other professions *(Shaw and Jackson, 1892: xxx).* But the Bill was successfully challenged by a number of leading architects and artists at the time and did not become law in the United Kingdom until 1938 *(Jenkins, 1961: 222 - 226).* The resistance towards the British Bill of 1891 was not only based on the governmental control in limiting the “practice of architecture to persons having passed an examination” *(Collins, 1971: 121)*; the real issue was the assertion that architecture was not really a profession at all, but merely an occupation closely linked to art. It is worth noting that the French Government had “been awarding architectural diplomas to graduates of its École des Beaux Arts[73] since 1867” *(Collins, 1971: 121)*[74] and a few years later legislation to this effect was introduced in a number of states in the USA *(Bannister, 1954: 356 f).*[75]

The debate as to whether architecture and industrial design is or should be linked to art or formal educations has and still is influenced by the fact that a number of prominent architects and industrial designers have had none or very little formal training *(Fiell, 2001)*[76]. For instance, Le Corbusier[77] left "school when he was thirteen, and had no subsequent formal education apart from an apprenticeship in engraving watches" *(Collins, 1971: 128)*. This and similar stories lead scholars like Roscoe Pound[78] to define a profession as a "learned art" *(Collins, 1971: 128)*. The prestige surrounding figures like Walter Gropius and Le Corbusier is such that it is still possible to find a subconscious belief that in some undefined way; architectural and industrial design studies should not be "academic" in the manner implied by other professional curricula, but be mainly linked to art *(Collins, 1971: 128)*.

On the back of this it can be argued that creativity and aesthetics have and still are the master values of architecture and industrial design. This can be substantiated by assertions like: "architecture is increasingly defined as important only insofar as it is art" *(Blau, 1984: 58)*. Consequently, architects and industrial designers will argue for and work hard to achieve implementation of art aspects through aesthetics qualities i.e. artistic elements. However, in most design projects, aesthetic qualities must be balanced with other design aspects like functionality and costs. This is not unproblematic as art, in general, tends to be viewed as being "independent of exigencies of its context generally and of the political economy of capitalism in particular" *(Blau, 1984: 62)*. Within both design professions and in art, generally there are disagreements about just how autonomous, or isolated, art is from "practical activities and from the rest of social life, and about the historical and social processes in which this isolation was produced" *(Wolff, 1993: 88)*.[79] For instance, it can be argued that art is autonomously based on artistic ideologies, or alternatively can it be argued that aesthetic convictions are not subject to historical, social, and economic constraints, "and may even exist in opposition to these constraints" *(Blau, 1984: 63)*.

Regardless of the discourse of artistic freedom, an architect or industrial designers is rarely, in a commissioned project, given the opportunity to fully explore his or her artistic creativity without any restrictions or boundaries. These common restrictions combined with the master value of creativity and aesthetics makes most architects and industrial designers destined to fail to realize all their artistic aspirations *(Blau, 1984: 59)*. However, this fact does not prevent them from trying.[80] A designer's efforts to incorporate artistic elements into a project can sometimes overshadow other considerations and create conflicts with other stakeholders in a design project. This point is illustrated in the following account of a meeting between an architect and his clients:

> "'I need him to understand,' this frustrated real-estate powerhouse said of the architect, 'that he cannot keep showing me his design for a stainless steel curtain wall when it is not in the

> budget. No matter how many times I insist that he take down his facade drawings and show me alternate schemes, he continues to put them back up, every meeting.' The architect by my side then proceeded to renew his argument with the developer about the sanctity of his design, ignoring the warning signs that this issue could threaten his status as the project architect. Only when I asked for a recess of the negotiations and explained, in private, what would happen to him if he persisted … did he reluctantly agree to take down the offending drawings." *(Wasserman et al., 2000: 157 f)*

These artistic efforts can make architects and industrial designers seem pretentious and single-minded as architects often convey an impression of being aloof and superior in their expertise to clients and the public *(Wasserman et al., 2000: 158).*[81] The eagerness found among some architects and industrial designers to achieve artistic goals sometimes leads to a "I know what's best" attitude, which rarely will generate future commission and which is questionable from a service perspective *(Wasserman et al., 2000: 158).*

This means that architects and industrial designers are often faced with the dilemma of balancing their urge to create aesthetically appealing design with the goals of satisfying clients' demands and input. Most architects and industrial designers regularly experience that the aesthetic expertise they bring to a project is seldom fully understood and/or supported by other stakeholders (including clients). This leaves them struggling with an inner conflict over how to best promote the aesthetic qualities of their design of the built environment in the face of perceptions connected to the financial or functional requirements (what can be described as the anti-aesthetic values of capitalism) *(Spector, 2001: 12).* The artistic efforts i.e. aesthetical qualities can be described as a double-edged sword within architecture and industrial design. This as the unflattering image of an architect and/or industrial designer struggling for the understanding of their artistic elements is hard to reconcile with a trusting relationship between client and designer, but at the same time is it these artistic aspects that are often seen as the main asset that designers bring to a design project *(Symes et al., 1995: 45).* It is mainly the designer's artistic qualities that make both clients and society commission architects and industrial designers in the first place.[82]

The boundaries for the artistic freedom in a particular design project, which the architect or industrial designer is given, are seldom set in advance. Neither is there an established agreement within the design profession on what the boundaries for the artistic freedom should be, or how they should be set. Clients understanding, allowance of or demand for artistic expressions varies from project to project. Equally, the public acceptance of designer's self-expression through the built environment varies. As the support for artistic freedom or demand from clients, the public and the two design professions is variable, is extensive artistic freedom something that architects and designers cannot rely upon. Architects and industrial designers are therefore forced to negotiate these boundaries for the artistic freedom in each design project.

Within recent historical and contemporary architecture and industrial design, societal groups (i.e. communities, city councils, neighbourhood associations) and regulatory bodies (i.e. public agencies, planning boards) have played an increasingly important role in determining designers artistic freedom *(Cuff, 2000: 354), (Cuff, 1991: 74)*. Democratisation has increased the amount of involvement of societal options and regulatory bodies, which have through their electoral support, limited the artistic freedom of architects and to some degree the industrial designers *(Edwards, 1999: 28), (Cuff, 2000: 354)*. The traditional role of big clients being patrons of architecture, where designers were given substantial artistic freedom, has change "in conjunction with broad social and economic forces" *(Cuff, 1991: 74), (Cuff, 2000: 354).*

Today's western social climate combined with clients' attitudes have made it less common to find commissions where the "client" is willing to fund architecture for architecture's sake *(Cuff, 1991: 74)*. This change has tended not been reflected in the architecture and industrial design schools; where the design value of artistic freedom is still often extensively promoted *(Blau, 1984: 47)*. This emphasis within design schools might not be considered surprising as the aesthetics design values have considerable historical roots. For example were ancient Greek "architects" often defined in terms of creativity. Equally, the Renaissance period promoted the notion of genius in "architecture", laying the foundation for promoting individual designers as celebrities (an image that Michelangelo[83], in particular, did much to promote). *(Blau, 1984: 47), (Cruickshank, 2000: 78)*. In more recent times, design scholars, such as Martin S. Briggs, have reiterated that the concept of architect as creative genius, this is exemplified when he argues that:

> "We, at any rate, must know that the design and erection of every large and complicated building in the past involved the control of some master-brain, that no group or committee could have taken its place" *(Briggs, 1974: 2)*

Since the Renaissance, architects have "considered themselves to be, in large part, artists" *(Blau, 1984: 47),*[84] which is also supported when Briggs asserts that a great architect must be "born something of an artist, with ideals and ambitions beyond mere construction and far beyond the mere earning of a livelihood" *(Briggs, 1974: 382)*. This tradition of linking architecture and industrial design with artists and genius was to some extent challenged, with decline of the traditional patronage system and the subsequent competition for state and private contracts *(Blau, 1984: 8)*. Increased competition intensified the tension that exists between the definitions of architecture being primarily responsible towards the arts, and that of the more dominant responsibilities towards the client *(Blau, 1984: 8)*.

Due to this emphasis in architecture and industrial design schools, it can be argued that many would-be designers are unaware or have little knowledge or ability to manage all the participants who will have a say in any given design project.[85] The emphasis on the individual designer, which is implicit in the design value of artistic freedom, is in a stark contrast to how most design projects have been and are developed in practice, where a number of professionals contribute to the result.[86] Many design classics which are officially attributed to a single designer have in reality being developed by a number of designers working under supervision of a head designer*(Cuff, 1991: 73 f)*. It is only the simplest of jobs within both architecture and industrial design that can be completed by a single designer. This as nearly all other projects are of a complexity that require a set of in-house designers and draftspersons, as well as other professionals to be conducted *(Cuff, 1991: 76)*. However, these factual characteristics of most design processes are to a large degree ignored by many architectural and design schools. One indication of this can be found in many schools consistent call for a return to an architecture about architecture *(Cuff, 1991: 74)*.

Both architecture and industrial design schools and the two professions promote aesthetic design values through design heroes and canons i.e. star designers which are hailed for their artistic qualities and are treated very much as "pop artists".[87] Design critics, historians, and practitioners tend to operate on the assumption that only the work that legitimates architects and industrial designers deserves to be treated as art and be included in the design discourse *(Larson, 1993: 5)*. This emphasis has scholarly and historical roots and tends to lave buildings and products designed by members of other professions on the waste side of the design discourse.

Within the framework of linking architecture and industrial design to art, it is common for artists, architects, critics, and even design scholars to assert that: shared responsibility among designers leads to mediocre design projects *(Cuff, 1991: 73)*. It is not uncommon to argue that the "quality of a work of art decreases in proportion to the number of people involved in its creation"

(Cuff, 1991: 73). This value position is one of the main contributors to why the small office remains the "ideal" of architectural and industrial design, and why an award-winning work, regardless of large or small design office, nearly always will be attributed to a single designer *(Cuff, 1991: 73)*. This design value also reinforces the steep hierarchy found in design offices, where head designers and/or partner make nearly all the important decisions and junior designers are left to draw out these decisions *(Cuff, 1991: 76)*.[88]

The artistic master value within architecture and industrial design has tended to exclude or overshadow other aspects such as: engineering, technology interior design, restoration, social planning, landscaping, ecology studies, regional studies etc. *(Blau, 1984: 58 f)*. Some of these aspects have even been considered to unworthy or para-architectural within the architectural profession and to some degree within industrial design *(Blau, 1984: 59)*. This has led to a development where technical aspects of buildings and products have been neglected by architects and industrial designers, and have instead frequently been offered by non-architects and non-industrial designers such as: engineers, project managers, facility managers, etc. *(Symes et al., 1995: 45 f)*. This coincides with the public perceptions of both architecture and industrial design which has over the past 40 years or so been increasingly focused on the artistic or sculptural aspects rather than the technical aspects *(Symes et al., 1995: 45)*. One of the underlying reasons for this focus can be found in that architects and industrial designers have not been promoting the technical aspects towards clients or the public. This has made the artistic abilities and aesthetics qualities the main selling point of what architects and industrial designers offer their clients and the public *(Symes et al., 1995: 45)*.

This emphasis on creativity and aesthetics as master values within architecture and industrial design can be seen as problematic from a professional perspective as "no Western society licenses (or provides legal sanction in any other way) for its artists" *(Symes et al., 1995: 46)*. Thus, the link between art and architecture and industrial design makes the professional status of both professions questionable. Art with its artistic aspirations is not "knowledge" in the traditional sense, but has distinct qualities, and these qualities can be challenging for architects and or industrial designers to get across within a professional context. Negotiation of the artistic vision with other issues as functionality or costs is considered to be a complex and challenging task within the professions.[89] However, it can be argued that it is exactly these artistic qualities that distinguish architecture and industrial design professions from other adjacent professions.

3.2.2 Pluralism tendency within design profession

> *"The formation of the architectural profession in England is intimately bound up with two major intellectual and social changes over the past four centuries—the transition from medieval to modern processes of thought and the shift from an agrarian to a capitalism-based society through the Industrial Revolution. The inter-disciplinary character of the modern architectural designer is the product of the first change; the professional organization through which he fulfils an increasingly specialist role is the result of the second; and the inherent conflict between these two aspects remains unresolved."* (Wilton-Ely, 1977: 180)

Throughout the history of design a number of different aesthetic styles have been created. These different aesthetic styles are founded in and are a result of different forms of design thinking and design values i.e. design ideologies. Different aesthetic styles and design ideologies have been documented and grouped by design historians into design epochs. These epochs have traditionally been grouped and characterised by a dominant aesthetic style, or use of material *(Walker and Attfield, 1989: 7)*, as opposed to design thinking and design values which have been given a lesser role. This focus on epochs has limited the exposure of the aesthetic pluralism that has tended to exist throughout architectural and design history, as well as conceal the pluralism of design values that has existed throughout the design history *(Woodham, 1997: 9)*.[90]

Throughout all these "coherent" epochs, one finds examples of individual architects and industrial designers trying to carve out their specific brand of design by creating an individual aesthetic "style" and subscribing to design values which deviate from the "main stream". The sum of these individual efforts to create individual design aesthetics implies some form of pluralism even within a given "coherent" epoch. According to design historians, a given epoch is followed by a new epoch that tends to be a reaction to the previous epoch. Logically this implies that some designers are questioning and rethinking the design aesthetics and design values that exist in one "coherent" epoch.[91] All in all the coarse grouping of architecture and design into epochs does not reflect the different design values found within the context of a given epoch nor the diversity that exist in aesthetic styles. This can be exemplified by the epoch classified as Modernism which in itself was diverse, which can be reflected in the that it has been considered to include Conservative Modernism[92], Progressive Modernism[93] etc. *(Sparke, 1998: 42), (Sparke, 1998: 86), (Woodham, 1997: 165)*.

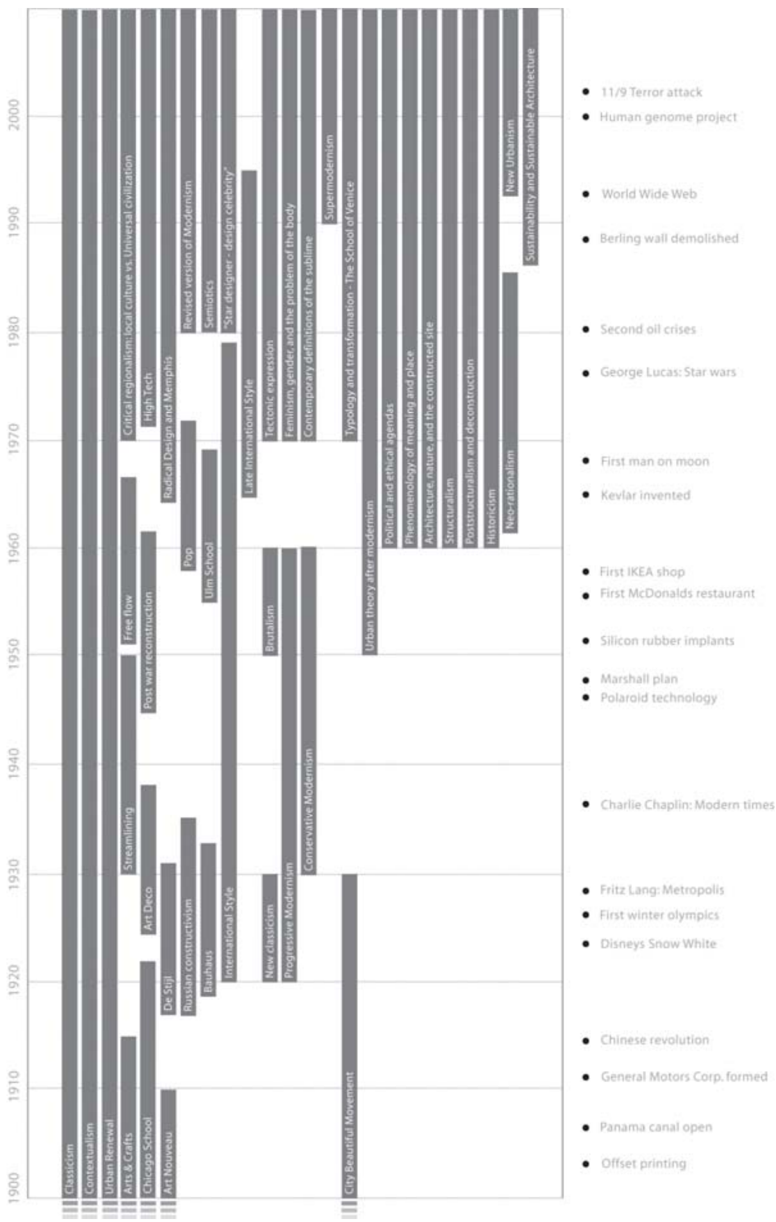
Equally, this value diversity is indicated by the fact that during the time of Modernism a number of industrial designers were following very different design values depending on if they where influenced mainly by European or American design values. For instance, USA based industrial designers were much less high-minded or ideologically driven, when compared to their European counterparts *(Sparke, 1998: 86)*. It was not uncommon for US based industrial designers to aim for designs which were offering consumer goods that had a competitive edge through attractiveness based on "speed" and "modernity" *(Sparke, 1998: 86)*. Many European based industrial designers were more closely connected to the Modernistic design value such as functionalism, purity, order and material honesty.[94] Design conceived under the USA design values "dramatically refashioned the world of refrigerators, cash registers, cameras and, last but not least, automobiles" *(Sparke, 1998: 86)*. Many of these products found their way into both Conservative and Progressive modernistic architecture, often place next to European based products, creating in design terms a mixed environment.[95]

This mix of aesthetic and design values found in many design movements and epochs will raise questions as to the appropriateness of the traditional way of dividing the design development into epochs. One could argue that the problems (i.e. the denial of the implicit diversity of aesthetic styles and design values) in epochs become less of a problem at the end of Modernism. This as the coarse grouping of different design epochs by many design historians tends to end with the epoch of Modernism, which finishes in the 1960s (see figure 2 and 3 below) *(Blau, 1984: 13)*. The tendency of establishing epochs is then replaced by a greater openness towards the pluralistic nature of design aesthetics and design values, where the focus is on "proliferation of styles, by novelty, and by competing ideologies" *(Blau, 1984: 13)* (see figure 2 and 3 below).

This change coincides with the questioning of the modernist values which come into force in the 1960s, and which explores the validity of key concepts such as "form follows function", "radical break" with history,[96] "honest" expression of material and structure,[97] etc. *(Nesbitt, 1996: 16)*. The criticism of Modernism and the exploration of alternatives made the tendency within architecture and industrial design to advocate the position that there is a "correct" way of designing (implying a "correct" set of design values) less prominent—some would even claim that it is starting to diminish *(Sparke, 1998: 192)*. Stylistic and value pluralism is one of the characteristics of the pluralist period which follows Modernism imprecisely often referred to as Postmodernism, with its embarrassment of stylistic pluralism *(Nesbitt, 1996: 16 f)*.[98]

The trend of pluralism continues during the 1970s, 1980s, and 1990s where new design approaches and design values are added to an increasing complex overview of architecture and industrial design movements and ideologies (see figure 2 and 3 below) *(Sparke, 1998: 192), (Sparke, 1998: 228)*. This is also the case in contemporary architecture and industrial design where a number of design approaches, values and philosophies influence contemporary architects and industrial designers.

20th Century Design History



The pluralistic nature of contemporary design has had a fundamental impact on what is seen to constitute design as a profession, as both architectural and industrial design firms “specialize in the provision of services that are, in fact, quite substantially different” *(Larson, 1993: 8)*.

Competing design value sets create to some extent uncertainty, instability and value conflict, with regards to what constitutes the two design professions. From this pluralism stems: (1.) a number of competing images of what are the role of the two design professions, (2.) role of the professional, which contributes to (3.) controversy with regards to what should be considered the central design values and (4.) what is the relevant knowledge and skills base *(Schön, 1983: 17).*

The pluralistic nature of the design poses a predicament for architects and industrial designers which must choose among multiple approaches on how to practice design or devise their own way of combining them *(Schön, 1983: 17)*. Thus, the individual designer’s interpretation of the design role will differ which in turn makes it difficult for other professionals to know and determine the designer’s role and what are designers’ main contributions.[100] Due to this confusion over the designers’ role it is not uncommon for architects and industrial designers to be sidelined in cross-profession projects. Equally, contributes the design pluralism to a unclear definition of what should be the contribution i.e. deliveries among designers, thus is it common for design teams to take a long time to form a working relationship *(Gorman, 2003: 231 f).*

3.2.3 Designer’s unsettled relation towards society

> *“Professionals are neither the heroic avant-garde … nor a villainous elite who prevent the people from taking control of their lives. Professionals are more appropriately seen … as participants in a larger societal conversation; when they play their parts well, they help that conversation to become a reflective one.” (Schön, 1983: 346)*

The very concept of a profession implies some sort of relationship towards a society which grants the profession the privileges and legal protection that makes the formation of a profession possible *(Schön, 1983: 4), (Schön, 1987: 7).*[101] This relationship towards a given society suggests that the role of architects and industrial designers involves potential obligations towards society. This point can be argued as response to at least two sets of needs: (1.) where members of a society require someone to construct buildings and products that seemingly accord with their needs and (2.) “the public at large requires someone to protect it from the potentially devastating effects of poor and insensitive building practices” *(Spector, 2001: 6)*. Architects and industrial designers address these needs through the medium of the built environment, where they contribute in assuring the public against the dangers of shoddy and insensitive building and products. In addition, aspects of architects’ relationships with society and stakeholders are regulated to some extent by law in most countries *(Spector, 2001: 5 - 7)*. These laws typically regulate matters with regard to “conduct and on the sorts of protections they are to provide the public” *(Spector, 2001: 6)*. It is worth nothing that in assuming these obligations both an architect and industrial designer are “charged with resolving often incommensurate demands” *(Spector, 2001: 5)*.[102]

In contrast to the legal and medical profession, architects often find themselves in “embarrassingly ambiguous situation when called upon to make judgements in the public interest” *(Collins, 1971: 125)*.[103] Architects and industrial designers, unlike surgeons, cannot “justify an abortion on the grounds that it is necessary for their patient’s health” *(Collins, 1971: 125)*. Neither can they like a Court judge “rely on their competence, integrity and scrupulous regard for public duty to ensure for themselves an adequate and regular stipend” *(Collins, 1971: 125)*. In short the medical profession “stakes its legitimacy on life and health, law on personal legal protection and public safety” *(Blau, 1984: 135)*, whereas architecture and industrial design have no public recognition of comparable domains.[104] Even the general nature of architect’s and industrial designer’s public service is difficult to ascertain compared to that of the medical or legal professions,[105] where, for instance, “the lowest standards of public service are relatively easy to define in law, and relatively easy to justify in public” *(Collins, 1971: 125)*. Consequently the integral importance of architecture and industrial design to the public is far less than that of medicine and law *(Blau, 1984: 135)*.

Most professions will offer a degree of voluntarily obligations and commitments towards society, but the level of clarifying their voluntarily obligations and commitments towards society varies. For instance, on one end of the spectrum is the medical profession with its Hippocratic Oath.[106] On the other end is architecture and industrial design, which lacks the same degree, agreed or clearly stated obligations and commitments towards the society at large.[107] Uncertainties related to obligations, commitments and lawful obligations are on the fringes of the medical profession (like mercy killing etc.), whereas the uncertainties related to obligations, commitments and lawful obligations within architecture and industrial design relates to the core of the two design professions.

It can be argued that the uncertainties that exist with regards to the obligations of architects and industrial designers towards society, squares badly with the impact architecture and industrial designs have had on society and its inhabitants.[108] The potential uneasiness this creates is often indicated in reflections found among young designers who worry and feel uncomfortable with their role in contemporary design and its relation to society *(Buchanan, 1995a: 17)*. Equally, this uneasiness in the relationship between architecture and industrial design and society is also manifested in the debates between designers such as: whether one should accept a project which one as a designer views to have serious downsides for a given society or if it should be refused *(Collins, 1971: 205)*.[109]

The questionability of the relationship of the two design professions to society and its inhabitants is illustrated by the fact that architecture is by some considered to be the most arrogant art that is publicly inescapable *(Gibberd, 1997: 149)*. The background for this viewpoint tends to be found in the lack of logic that exist when architects and industrial designers believe that users' values, needs, and preferences ought to be taken into account, without asking the user, and by producing an architecture and product that assumes and determines those same values, needs, and preferences *(Blau, 1984: 85)*. One could argue that there is a "hint of imperialism and professional protectionism lurking here" *(Blau, 1984: 85)*, as architects, "despite their social awareness, are not very receptive to the findings of social research" *(Blau, 1984: 85)*. This point can be illustrated by the architect Kevin Roche[110] whom argued that sociology based research is valuable and can be a good idea, but it is not very useful to architecture *(Cook and Klotz, 1973: 55)*.

Equally, it can be illustrated by the questions raised from a societal perspective towards the design values formed by the foundation for buildings designed by star architects like Le Corbusier and Ludwig Mies van der Rohe. For example, the somewhat "dictatorial" design values behind the design of a twin block project[111] by Mies Van Der Rohe have been questioned on the grounds that no balconies or curtains were allowed. The argument for this denial was that they might break and compromise the purity of the geometry of the block i.e. the aesthetical qualities of the façade *(Gibberd, 1997: 149)*. The end result was that tenants were left with flats that at time had an uncomfortable, and some would assert untenable, heating coming in from the façade of the building. One resident out of desperation even "fried an egg in August behind his uncurtained window" *(Gibberd, 1997: 149)* to illustrated the problem (after this incidence metallic blinds were allowed). This indicates that some architects have adhered to design values that encourage solutions that "ignores" or "neglects" some of the stakeholders' needs and input. It can be argued that this is something which some architects have done to varying degrees for centuries, as a number of architects have been designing buildings in which inhabitants have had to adapt, as opposed to designing according to design values that encourage tenant participation and influence *(Gibberd, 1997: 149).*[112]

Both architecture and industrial design are professions that are not based extensively on specialised knowledge (this point is elaborated in chapter four), and this makes the relationship with society and its inhabitants particularly difficult.[113] This point can be illustrated with the challenges that are associated with user involvement, participation and influence within design. As for all professions, stakeholders in a design project are not trained and educated in the specifics of design and have therefore not the same competence as the design professionals. Stakeholders can therefore not be expected to consider all the aspects in the same way as a professional. Canvassing of stakeholders opinions can therefore be seen as unacceptable on the basis that people are notoriously ill-informed and untrained in a given domain decision making (compared to specialists) *(Spector, 2001: 72)*. But as architects and industrial designers do not have a research-informed knowledge base, but a skill base, that separates them from the stakeholders, it is legitimate to question whether they actually have a superior base upon which decisions can be based *(Spector, 2001: 72).*[114] It is worth noting that the complexity surrounding stakeholder involvement vis-à-vis professions is not specific for the design profession, but because of the lack of a knowledge foundation within architecture and industrial design is this issue more fundamentally problematic, compared to many other professions.

Architects and industrial designers mainly use their skill base and their values to make design decisions (this point is elaborated in chapter six), it is therefore reasonable to question the validity of their foundation in the face of the needs of stakeholders with a different value set. For instance, if "we accept the view that it is appropriate and even desirable for architects to have a value system that is slightly at variance with the general population's" *(Spector, 2001: 72)*, is it then legitimate that architects consult these values rather than that of stakeholders? Alternatively, if an architect consults the preferences of stakeholders is he or she then diminishing the basis for architecture? One could argue that an architect's values are more informed by professional considerations and expertise *(Spector, 2001: 72)*. However, at the same time, there is no universalizing professional element when an architect is consulting his or her personal values. This creates a paradox that consists of the following. (1.) If an architect consults stakeholders opinions is he or she abdicating and discarding his or hers role as a “professional”. On the other hand (2.) if an architect does not consult stakeholders opinions, is he or she without a research based knowledge base disregarding other peoples values, and are instead utilising personal values (and skills). This even if it is the stakeholders that are left with the practical implications of the choices made *(Spector, 2001: 72)*. This is a classic problem that faces both architects and industrial designers, as their task is often viewed as a balancing act between stakeholder input and with their own skill base and design values. This paradox is to a large degree an unresolved issue within the two design professions.

Some scholars argue that these issues can be avoided by simply placing oneself in the other’s stakeholders shoes i.e. position *(Spector, 2001: 72)*. This is a simplistic point of view as design is very much involved in value conflicts that are manifested in negotiations and compromises between different design aspects.[115] Equally, this is problematic, as stakeholders’ position change according to which stakeholder the designer is attempting accommodate.[116] Finally, it is complicated, as architectural and industrial design education tends to “effectively removes students from the world from which they came, instigating a denial of the ordinary in the pursuit of the extraordinary” *(Till, 2005: 172)*. Thus, by the end of their education many students have forgotten that they too are users and are removed from many of the stakeholders’ perspectives *(Till, 2005: 172)*, which makes them unsuited to placing themselves in stakeholders’ shoes.[117]

To further complicate the relationship between designers and stakeholders, one of the most influential design values in contemporary architecture and industrial design is to create something new i.e. the novel design value and influence the future through design (this point is elaborated in chapter four). The British architect and author Peter Moro, illustrates this point in his assertion concerning the Queen Elizabeth Hall in London where he argues:

> “In matters connected with architecture the layman seems easily irritated by the unfamiliar, and his qualitative judgement is often confused when confronted with a new experience ... Strangely, only buildings with architectural significance seem to invite public scorn and abuse.” *(Moro, 1968: 252)*

The boundaries for the expression of design values such as originality and individuality have long been debated, but “even the most passionate devotee of architectural originality must find it difficult to accept the implications of the view expressed by Peter Moro" *(Collins, 1971: 175)*. Even so, if stakeholders accept the novel design value, the stakeholder will be obligated to focus on novelty, which implies making the same mental leap into new solutions i.e. the future, as designers tend to do, in order to give valuable input to a design project. Many stakeholders find it challenging to make the cognitive leap into new design solutions, as they do not necessarily have the same training, skills base and talent for this type of enterprise as architects and industrial designers do. Thus, Moro's scorn of the layman's i.e. non-professional's qualitative judgement is to some extent justified. But simultaneously it can be argued that architecture and industrial design must be very peculiar professions, as instantaneous "public acclaim is seldom a sign that a new law, or a new surgical operation, lacks significance" *(Collins, 1971: 175)*.

Another aspect that influences the relationship between designers and stakeholders is the fact that many architects and industrial designers see their role as being a mediator between private and public demands. Some architects particularly consider themselves as hired in part by clients to resolve these issues. At the heart of the architects' somewhat undefined professional obligation towards society is their need to negotiate a balance between legitimate public concerns and private demands as well as the designers "personal" design values and intentions *(Spector, 2001: 7)*. This complex balancing act contributes to a designer's unsettled relationship with society. Another contributing factor to the unsettled relationship between the two professions and stakeholders and society is the lack of clarity in viewing architecture and industrial design as either occupations or professions. This is particularly evident within industrial design, where it has been debated whether industrial design is simply a business[118] or a profession[119] *(Whiteley, 1993: 160)*. This debate highlights the ambiguity the industrial designers have with regards to responsibility towards society.[120]

3.2.4 Designer's unsettled designer-client relationship

"To be in hell is to drift; to be in heaven is to steer." — George Bernard Shaw (Shaw, 1903: 134)

"I am not obliged, nor do I intend to be obliged, to say either to your Highness or to any other person what I am bound or desirous to do. Your office is to obtain the money and to guard it from thieves, and the charge of the design for the building you must leave to me" — Michelangelo (Vasari, 1979: 1898)

A professional-client relationship within the context of professionalism can be described as: a contract between the two parties which consist of a set of anticipated deliverables and shared norms which govern the behaviour of each party *(Schön, 1983: 292)*. Within this mindset, professionals are expected to deliver his or her services within the limits of his or her distinctive competence, while respecting and without falling for the temptation to misuse the confidence granted by the client *(Schön, 1983: 292)*. In the same way, clients are expected to act as if they accept the specialised authority of the professional *(Schön, 1983: 292).*[121] Professionals are thus within the terms of the contract accountable to clients, but due to clients' lack of specialist competence within the domain of the profession, it is difficult for clients to "determine whether or not legitimate expectations have been met" *(Schön, 1983: 293)*. The real accountability for professionals will therefore often be to their peers, as professional accountability is often best judged by other professionals, as they are best equipped to establish whether a professsional has performed adequately *(Schön, 1983: 293).*[122]

These aspects tend to influence the professional-client relationships, but the role of the professional towards the client and vice versa are not always straightforward. For instance, the idea of an "all-powerful" architect as indicated by Michelangelo's assertion, cited at the beginning of this section, is one particular, arguable extreme, professional-client relationships.[123] Historically Michelangelo's ideal of an all powerful designer has not always been upheld or supported by other architects and industrial designers *(Cuff, 1991: 73)*. For instance, the development of Gothic cathedrals was marked by "creative and mutually respectful co-operation between many crafts and trades" *(Cruickshank, 2000: 337)*. Even so, it is possible to argue that architects' ideal version of designer-client relationship has traditionally been to control the entire design and building process without interference from a client, as attempted by Michelangelo. Within this line of thought of the all-powerful architect, patrons have been expected to subsidise the architect's art in the same way as they used to subsidise the painter's and sculptor's art i.e. without having much influence or input *(Cuff, 1991: 73)*. The conditions for this concept had a fertile ground in the Middle Ages and early Renaissance when the church was the main patron. It became less acceptable when landowners became the primary patrons for architecture, as they had more of a personal interest in the design of their buildings *(Cuff, 1991: 73)*. It can be argued that early periods with patrons like the church and considerable landowners have led to an "idealised" version of designer-client relationship within architecture, where exaggerated artistic freedom is one of the main characteristics.[124] During the last century, patrons have played a lesser role within architecture. Unlike doctors and lawyers that have made their services indispensable “to nearly all economic groups except the very poorest” *(Cuff, 1991: 33)*, architects and industrial designers have fail to replace the patrons with a general indispensability of their service to most people.[125]

The formation of the designer-client relationship can also be attributed to another factor, found in the nature of what architects and industrial designers’ offer their clients. With the exception of designers operating as entrepreneurs, neither architects nor industrial designers sell their buildings or products, but are selling a service that enables their client to produce buildings or products. Within the context of consulting, neither architects nor industrial designers know exactly what they are selling until after the service is sold and the design is created *(Cuff, 1991: 95 f)*. In the same way, clients do not know what they are buying until after they have bought the design service and the design has been completed and attained. As it is unclear to both parties what the final outcome of the deign process will be, will both designer and client try to influence the final design through the design process *(Cuff, 1991: 75)*. Within this context, the “contract” between clients and designers is often unclear as to the exact nature of the service and the nature of the power balance between the two parties.

Even the concept of serving or helping the client is complicated within the designer-client relationship, where some designers see themselves as helping the client, and others see themselves as serving the client.[126] This lack of clarity indicates that a clear concept of a design service is not generally accepted within contemporary architecture and industrial design. Within this unclear context, clients will tend to want their input to have significant impact on the final outcome. But at the same time both architects and industrial designers are expected to have the competences which make them best suited to determine the possible and final design outcomes, as well as be best able to foresee the consequences of different solutions *(Cuff, 1991: 75)*.[127] The willingness to influence design projects found among clients can be seen as surprising, as most client hire architects to “help” them, and as some clients value the “magic” supplied by architects and or industrial designers. Most clients recognise that only the architect and or industrial designers are skilled to provide the “magic” element in a design process *(Jackson, 1993: 15)*.[128] Nevertheless, at the same time, many clients do reveal a belief that they can perform or contribute to part of the desired services themselves, which is a notion that makes some clients contribute in more ways than the architect or industrial designers might wish or accept *(Cuff, 1991: 75)*.

A design process is often a negotiation process, conducted mainly between the architect and/or industrial designer and their clients. This negotiation process is often started at a surprising point from the client perspective; where architect's and industrial designer's "first priority is not to work within the client's constraints, but to try and change these constraints" *(Jackson, 1993: 15)* (this point was introduced in chapter two and is elaborated in chapter four).[129] This often gives the client the impression that their needs are neither heeded nor accommodated by the architect and or the industrial designer *(Jackson, 1993: 15)*. This strategy among designers is linked to design values such as novel design solutions instilled in the design education.[130] Due to this somewhat surprising staring point, the negotiations between clients designers are often characterised by both parties attempting to establish control. Each party will attempt to get control through different means, including control over knowledge and information, where the different design parties will stage and limit the information and manipulate the accuracy of the information contributed to each other *(Cuff, 1991: 39)*. For instance, clients will typically keep their financial resources private, whereas architects and or industrial designers will employ mysterious justifications and tactics like the art defence "and scientific justifications … as means to withhold information from clients" *(Cuff, 1991: 39)*. In addition, designers will to some extent try to capitalise on their client's lack of knowledge of the design process and their lack of relevant design knowledge.[131] This is typically used to control those issues that are negotiable and provide some degree of control over the design outcome.[132]

However, negotiation tactics are not without their limitations. Architects, for instance, will often accept basic constraints, like when a corporate client wants a new image and a building to convey it, most architects will not suggest an advertising campaign instead *(Cuff, 1991: 93)*. Most architects will propose a building as requested by the client (but not all). Equally, architects will often accept the constraints imposed by a given site, as indicted by the fact that when a client already owns a site architects will only occasionally deem it unsuitable for potential designs *(Cuff, 1991: 93)*.[133]

The ultimate threat that exists within the negotiation between clients and designers is the capability of both clients and designers to call an end to the cooperation *(Collins, 1971: 205)*, *(Cuff, 1991: 75)*. One could expect that because architects and industrial designers are dependent on projects for their financial wellbeing, this would on the whole be an empty threat by designers. However, designers do not only get work through existing clients, clients are referred by other designers or by their colleagues. In addition, architects and industrial designers get clients through competitions and publicity. Professional recognition among peers is therefore a strategy which is potentially successful in getting and convincing prospective clients *(Cuff, 1991: 105)*.

Some designers will therefore challenge their client's wishes to a breaking point to achieve projects that will give them professional recognition among their peers. This phenomenon is some times referred to as "double coding", where an architect is addressing fellow architects in their work as much if not even more than their clients *(Larson, 1993: 14)*. The phenomenon of double coding is most evident in architectural offices which prices "quality design and peer recognition above all other stakes" *(Cuff, 1991: 105)*.[134] The underlying logic for this approach is the notion that innovation depends on new ideas, and clients cannot be trusted to understand or "account for the development of new concepts of architecture nor even entirely for their consolidation into styles" *(Larson, 1993: 14)*. To avoid this particular designer-client strategy large corporate clients i.e. universities, businesses, or government will sometimes avoid hiring architects directly, but will instead employ a knowledgeable "third party" to mediate between them as a client and the practising designer *(Larson, 1993: 120)*.[135]

Both architects and industrial designers practise according to and apply strategies to overcome challenges imbedded in the designer-client relationship. From a designer's point of view these strategies will typically include approaches that are characterised by being closely linked to the concept such as: artist,[136] facilitator,[137] technician,[138] expert[139] and entrepreneur.[140] These strategies are often only partially followed or they are combined in making new variations. In their purest state, these strategies will often be seen to limit in fulfilling the full potential of the design profession. This point is illustrated by the fact that "strong service" firms tend to give experienced and reliable service, and tend to engage the client on a collaborative level, but at the same time subordinate their own contribution *(Cuff, 1991: 248)*. On the other hand, "strong idea" firms are known for a tendency to dominate their clients, that tend to end up with the same collaborative challenge, in reverse, where architects and industrial designers subordinate their clients' contributions *(Cuff, 1991: 248)*.

As indicated in a previous section,[141] the amount of different designer-client relationships practised within the design professions makes it difficult for individual designer to know, determine and communicate their specific role in a design project. This pluralism also creates difficulties for clients, as it is equally difficult for clients to know and determine their role towards the designers, as well as knowing what can be expected from an architect and/or an industrial designer.[142] This is made even more complex by the emergence of specialised professions such as space planners, laboratory consultants, manufacturing specialists, trend spotters or colour experts, which overlap or offer additional design services to clients. Some of these extend into what used to be the "sole" domain of architects and industrial designers *(Jackson, 1992: 17).* [143]

Architects and industrial designers have generally failed to acknowledge the transferability of their skills to other professions *(Jackson, 1992: 18 f)*. This has led to a situation where clients are less dependent on architects and industrial designers. This is evident within architecture where many "clients are by no means inclined to rely upon architectural advice as uncritically as they once did" *(Jackson, 1992: 2)*. Instead many clients are "seeking ways of procuring buildings in which the architect no longer plays a central role - if indeed any part at all" *(Jackson, 1992: 2)*.

Clients have tended to become much more professional in acquiring design services, which in turn has lead to clients becoming "increasingly unwilling to accept at face value the forms and terms of service that architects have been accustomed to offer in the last three decades" *(Jackson, 1992: 5), (Catháin, 2003: 1)*. This development has had an especially crucial impact on designer's role as strategic advisor to clients, which was previously considered an essential precondition for achieving successful design projects (from the designers point of view). Through the loss of the strategic advisor role, architects and to some degree industrial designers have lost a vital part of their previous "tool" in controlling and managing the production process of a design realisation *(Jackson, 1992: 5)*. The primary source for clients' reluctance and scepticism towards hiring designers as the strategic advisor and/or project manager, can be founded in clients' perceived, and to some extent factual, impression that architects and industrial designers are lacking understanding and knowledge in both economic and project management *(Jackson, 1992: 5), (Rittel, 1976: 79).*[144] It is often asserted that architects often fail to operate within cost and time limits set by clients, which all contributes to "fundamental difficulties in the relationships between architects and the clients" *(Jackson, 1993: 10)*.

The difficulties found within designer-client relationship have at times resulted in a large gap between the expectations of architects and industrial designers and those of their clients *(Catháin, 2003: 1)*, especially with regards to what architects and industrial designers deliver and what clients expect as deliverables. This gap has in recent years put pressure on the role and status enjoyed by architects and industrial designers *(Jackson, 1992: 18), (Catháin, 2003: 1).* Contemporary architecture professionals have in some countries experienced an lowering of status which have led to a downward spiral in fees paid for their services *(Jackson, 1992: 18 f).*[145] The downward trend of status within architecture has been attributed to values and charac-teristics such as: exclusivism, false dichotomies, sub-optimisations, mini civil wars, as well as failure to operate within cost and time limits *(Jackson, 1993: 3).*[146] The dissatisfaction expressed by clients typically includes: "consistent and deep unhappiness with the quality of service offered by architects, especially in the area of cost and project management" *(Jackson, 1993: 10).*[147] In addition, clients have questioned architects lack of ability to work as part of the project team, and their tendency to assume "leadership without either the authority of the client or by gaining the respect of other team members" *(Jackson, 1993: 14).*

In reaction to these dissatisfactions, clients have responded by: (1.) replacing the architect form their previous role of strategic advisor to clients i.e. "client's friend" by hiring project managers and quantity surveyors *(Jackson, 1993: 10)*. In addition clients have (2.) restricted other aspects of the role of the architect, (3.) increasing in-house knowledge and confidence, (4.) reduced the architects involvement in developing the project brief and finally (5.) involved a number of other professionals *(Jackson, 1993: 10 - 15)*.

To summarise, a number of clients of all sizes (small individual clients [148], big public clients and corporation clients) experience and express their perception that architects and industrial designers are to some extent "arrogant and inflexible in their approach and mindset" *(Jackson, 1993: 12)*. This implies that many architects and industrial designers must be failing to understand and respect their client's needs and expectations. Thus, a number of values found in designer-client relationship are severely constraining designers ability to deliver services to their clients' satisfaction *(Jackson, 1993: 12).*[149]

It is not uncommon to come across an argument that asserts that architects must satisfy the client, but they must also make architecture, even despite the client's wishes *(Larson, 1993: 14)*. On the basis of this type of assertion and the values indicated in this section, some critics will argue that the architectural profession as a whole is in denial regarding their client's dissatisfaction *(Catháin, 2003: 2)*. The discrepancy that exists between the self-image held by the design professions and the view held by their clients and the general society[150] is possibly greater than what is found in other professions *(Catháin, 2003: 1)*. This at times troubled relationship between clients and designers indicates that some of the general concepts of a profession are not always fulfilled within the two design professions.

3.2.5 The design profession's peculiarities and abnormalities

> *"As the level of professional education among engineers has been raised, architects have not kept up, and their role has become a secondary one, limited to that of design subcontractors." (Edwards, 1999: 73)*

As indicted in a previous section, a general concept of profession is typically characterised by: (1.) specialised knowledge, (2.) legal sanction credentialism and autonomy and (3.) protection of the public interest.[151] In particular, many professions are characterised by administering a clearly defined research based knowledge base, which is the main foundation for these professions existence and its performance. Within the boundaries of these general observations is it common for a profession to have variations with regards to: values, subspecialties, experience and perspectives *(Schön, 1987: 33)*. Even when bearing this type of pluralism in mind, the two design professions differ from other professions with regards to a number of aspects, which will be introduced in the following.

The most profound difference between architecture and industrial design and many other professions is that the two professions do not have a research-based knowledge base (this point is elaborated in chapter four).[152] The skill base and knowledge base that exists within architecture and industrial design is not as clearly defined as it is for most other professions.[153] This is highlighted by the fact that within contemporary architecture and industrial design there is a growing acceptance that there is no agreement as to what constitutes the core or specialized domain of the two professions *(Blau, 1984: 6)*. Consequently there is "no consensus on an area for which designers could claim professional competence exclusive of other professions" *(Krippendorff, 1995: 149)*. In fact, both professions are resisting a definition of their boundaries and internal specialization (this point is elaborated in chapter four) *(Blau, 1984: 7)*.[154] These aspects have a profound impact on the state of the profession, where architecture and industrial design are often characterised as "weak" or "minor" professions *(Blau, 1984: 135)*.[155] The "weak" nature of the professional foundation, especially in the knowledge aspect, makes it difficult for the two design professions to argue that the two professions contain expertise and knowledge that no other professions can supply.

Instead of a clearly defined competence, both architecture and industrial design are often seen as "jack of all trades" and they have been described as "interdisciplinary eclecticism" professions. A generalist value is a central component behind this characteristic,[156] as architects and industrial designers claim to have some measure of knowledge in both art and a number of applied sciences (this point is elaborated in chapter four) *(Blau, 1984: 7), (Symes et al., 1995: 4).*[157] More specifically, designers tend to know the rudiments of engineering, they tend to be familiar with elements of ergonomics, some see themselves as advocates for consumers or they view themselves as artists *(Krippendorff, 1995: 149)*. In addition are they partly expected to act as: "businessman, lawyer, advertiser, author journalist, educator and psychologist" *(MacKinnon, 1965: 274)*. In short, it can be argued that architects and industrial designers know a little bit of everything and nothing in considerable depth. The generalist nature of the two design professions sets them apart from other professions and is "a major obstacle to the possibility of the profession's securing an exclusive mandate with respect to its pre-empted and pre-eminent activity" *(Blau, 1984: 7)*. The emphasis on "interdisciplinary eclecticism" is radically different from the strategy chosen by most other "professions, which have marked an exclusive domain for themselves and within that domain have defined a variety of discernable specialties" *(Blau, 1984: 7)*.

The effect of this eclecticism is that engineers tend to know more about engineering than architects and industrial designers do, equally, ergonomics which industrial designers claim knowledge in, is an area that is preformed and developed outside the design profession *(Krippendorff, 1995: 149)*. Market experts, executives, and sales people often claim to know the consumer better than architects and industrial designers, and even tend to present evidence to this effect *(Krippendorff, 1995: 149)*. Finally many professional artists tend to consider architects and industrial designers as second rate artists *(Krippendorff, 1995: 149)*. This has contributed to a state where architects and industrial designers are notoriously uncertain about the nature of their own expertise, as they are torn between numerous quite diverse self-images *(Rittel, 1976: 80).*[158] The end result is that, unlike a number of other professions that have been successful in establishing a monopolistic control over their domain,[159] architecture and industrial design have been historically unsuccessful in establishing this type of monopoly over their services and the market. This is mainly due to the values held by the two design professions and the success of a variety of other professions such as: engineers, interior designers, speculative builders *(Blau, 1984: 8).*[160]

The "jack of all trades" characteristic makes it hard for companies to understand and evaluate the contribution of architects and industrial designers. This is particularly the case within industrial design where the potential positive and specific contribution made by industrial designers in a company context is often undocumented.[161] Another characteristic that promotes uncertainty and confusion surrounding the "jack of all trades" characteristic is the lack of authoritative criticism within architecture and industrial design. Many of the journals within architecture and industrial design are characterised by being less concerned with the dissemination of knowledge, they are instead more focused on examples and normative declaration *(Collins, 1971: 206 f)* , *(Symes et al., 1995: 11)*. This is radically different from the periodicals which are found within professions like law and medicine *(Collins, 1971: 206 f)*. This point can be highlighted by the normative character of architectural work concerning feeling *(Langer, 1966: 35 - 50)*, codes of meaning *(Bonta, 1980: 275 - 310)*, intentions *(Norberg-Schulz, 1965)*, morality *(Scruton, 1979: 237 - 256)*, deep structure *(Broadbent, 1980: 119 - 168)*.

Another difference is that most other professions depend upon theories which "changes relatively slowly (the theory of genetic transmission, learning theory, or Newtonian physics, which suffices for most engineering fields)" *(Blau, 1984: 134)*. Whereas architecture and industrial design are characterised by frequently undergoing apostasies where "conceptions about design, function, and scale are routinely re-evaluated" *(Blau, 1984: 134 f), (Symes et al., 1995: 5 f)*.[162] This is particularly the case from an historical perspective, where studies have indicated that the architectural and industrial design professions have "placed, or been encouraged to place, emphasis on different dimensions of its professionalism at different periods in its history" *(Symes et al., 1995: 5)*.

The ever-changing character of architecture and industrial design means that a design for a building or product can be outdated before it is completed. It also means that it is possible for anyone to introduce a whole new approach, and that the relationship between design theory and technology is highly variable *(Blau, 1984: 135)*. Thus the fluctuation found within architecture and industrial design is an important contributing factor to "why members of the profession are not closely integrated and often unable to act in concert on major issues facing the field" *(Blau, 1984: 135)*. This is evident in the diverse emphasis found within design education and certification standards within architecture and industrial design schools, where different schools put different emphases on issues like: "artist, business expert, bureaucrat, social reformer, user advocate [and] technician" *(Blau, 1984: 135)*.

Design education for the two professions tends to focus on aspects such as imagination, conceptual cognitive capacity, work experience and artistic capabilities (this point is elaborated in chapter four).[163] These cognitive and skill-based capabilities distinguishes the two design professions from other professions. It can be argued that design has a special character "since the resulting design is something produced by imagination, something notyetexisting" *(Nelson and Stolterman, 2003: 204)*. Within this line of thought is the idea of holism an essential value (this point is elaborated in chapter four),[164] as it combines imagination, conceptual cognitive capacity, work experience and artistic capabilities in to a whole. The holistic design value combined with the generalist design value makes it natural for the two design professions to assume responsibility for a number of issues related to buildings and product design *(Banham, 1990: 23)*. This is different from other professions that tend to be notorious in avoiding an overall responsibility, instead focusing on a particular aspect or domain.[165]

Architecture and industrial design as professions are also set apart from other professions by a historical and contemporary acceptance that design has an essential element of art, as introduced in a previous section (and revisited in chapter four).[166] Architects, and to some degree industrial designers, have since their conception "considered themselves to be, in large part, artists, and they have been so considered by others" *(Blau, 1984: 47)*. Unlike many other professions, both architects and industrial designers tend to claim to contribute to the creative culture of their country *(Symes et al., 1995: 4 f)*. This is manifested through the fact that there is hardly any other professions that "alone generates products of great utility and artistic value" *(Fisher, 2000: 171)*. These aspects are not always fully understood by other professions or businesses, as they tend to focus more on "traditional financial relationships, without the additional factors of aesthetic value, intellectual property, or the status of shelter as a human need" *(Fisher, 2000: 171)*. Architects and industrial designers on the other hand, are faced with the value-laden challenge of balancing financial, functional etc. aspects with the artistic elements. This balancing act "leads to the promotion of competing preferences and interests" *(Fisher, 2000: 171)*, where there often is a conflict between the effort and aspirations of an individual designer and the needs and desires of a client and/or society at large.

Within most professions, a set of values, preferences and norms will define what is considered as acceptable professional conduct, and will define the boundaries within which a profession operates. These values, preferences and norms are set by a discourse within the profession and through the legislation imposed on the profession. Contemporary architecture and industrial design professions distinguishes themselves from other professions by having less generally accepted value references and norms than many other professions. Instead the two design professions are characterised by allowing an array of different sets of values, preferences and norms within which architects and industrial designers can operate.[167] This pluralistic acceptance of different design values within contemporary architecture and industrial design exists without an influential academic discourse with regards to these value preferences. This point is indicated in that many designers “feel no need for a professsional code” *(Whiteley, 1993: 133)*, and have a lukewarm relationship to the concept of design as a profession. It is also reflected in that most architects and industrial designers are not members of a professional society *(Whiteley, 1993: 133)*.[168] This lack of interest in professional code and professional society reflects that “the majority of designers think of designing as a business rather than a profession” *(Whiteley, 1993: 133)*.

These abnormalities found in both architecture and in industrial design contribute to a circumstance where a number of dilemmas are confronting contemporary design practitioners. This includes a somewhat unclear distinction between the domain of the two design professions and that of other adjacent professions like engineers, developers or contractors *(Blau, 1984: 4)*. Equally, practitioners are faced with a lack of correlation between those to whom the architect and/or industrial designer is ethically responsible to, which for example include residents of a housing project, and those to whom the architect and/or industrial designer is accountable to, such as client that is the commissioner *(Blau, 1984: 4)*. Finally, the holistic and generalist design value found within architecture and industrial design contributes to a situation where practitioners within these domains are facing an ever increasing complexity *(Blau, 1984: 4)*.

3.3 THE DESIGN PROFESSION FROM A SOCIETY PERSPECTIVE

> *“I should of course have mentioned that an architect must be able to lie. He (or she) must be adept at lying in public fluently and easily. `This building will stand for ten years', `St Paul's Cathedral is ugly and needs to be surrounded with objects of beauty', `This block of flats is built around human dimensions and needs', `Architecture is first and foremost about people'. I doubt if even the most sophisticated detector would have challenged one of those statements, outrageous tissues of litanies of catalogues of farragoes of lies that they were.”* [169] *— Stephen Fry* (Fry, 1993: 13)

Professions in general are given rights and privileges, which some academic scholars will argue add up to a “contract” between society and a profession.[170] The foundation for the contract from a society perspective is its access to the professions’ particular knowledge and skills, in matters of importance for the societies at large and for its individual citizens. In return society has tended to grant the professions the authorization of conducting social control in their fields of specialization through licensing that determine the requirements needed to assume the privileges of the professional authority *(Hughes, 1959: 447 f)*, and by granting the professions a substantial degree of autonomy.[171] There is a societal acknowledgment of the benefits of specialisations through the allowance of the formation of professional specialisation and by delegating authority to those best able to exercise it in their areas of expertise.[172] Within this mutual benefit model both society and professions will to some extent make explicit and implicit promises and obligations *(Spector, 2001: 11)*.[173]

Architecture and industrial design professions distinguish themselves from more traditional professions like law and medicine with regards to the contract i.e. promises and obligations made to a given society. Both the legal and medical professions have a contract with society that can be described as explicit and these domains are very much part of a public discourse. Whereas the contract between society and the architecture and industrial design professions are to a large extent undefined, implicit and much less part of the public discourse.[174]

The concept of a contract between society and professions is not generally accepted. There exists an alternative view of the relationship between society and professions within sociology, as represented by Magali Larson, who argues that no form of a contract actually exists between society and the professions. Instead, the development of professions are first and foremost seen as a vocational group asserting itself for its own gain *(Larson, 1977: 157 f) (Larson, 1977: 243)*. Within this tradition it is commonly argued that professionalism is little more than a process of self-elevation; where an occupational group is attempting to establish itself as a profession, through the legitimisation of its skills and knowledge base. From the perspective of scholars like Larson this is achieved by establishing the profession as part of the diverse academic curriculum, as well as by asserting social control over entry into the profession. According to this perspective, the foundation of a profession is further developed through the development of standards and guidelines for the practice of the profession, and by securing governmental approval and legal protection of their restrictive practices. In short, this argument can be summed up by Larson's assertion that the establishment of a profession is set up to (1.) protect against infringement by other vocational groups and would-be professionals and (2.) as a means to demand public recognition of their professional status *(Larson, 1977: 238 f) (Larson, 1977:*

219).[175] It should be noted that this perspective is not extensively supported within this chapter.[176]

Even so, from a societal perspective, this tradition is particularly interesting and relevant with regards to the architectural and industrial design professions. Both architecture and industrial design are characterised by not having an extensive academic research-base as its foundation for design theories, knowledge and technical expertise (this point is elaborated in chapter four).[177] This lack of research-based knowledge base limits the acceptance of the two design professions' expert opinions by the society at large, advocates of public interest groups, counterprofessionals and even among members of other professions.[178] The practical implication for this lack of research-based knowledge and theories is that both architects and industrial designers' expert opinions are generally seen as unsubstantiated and subjective.[179] This is not without its foundation, as without a research-based knowledge base, architects and industrial designers are left with value based judgments, based mainly on professional and or personal preferences (this point is elaborated in chapter six).[180] This implies that these preferences have no claim to represent universal value judgement, as:

> "If an architect is charged with consulting his or her personal values, then no claim can be made for universalizing his or her design thinking, and hence, acting according to what would maximize the good. Only a tyrant can maintain that his personal values are the public's." *(Spector, 2001: 72)*

A possible solution to the limitations of architects and/or industrial designers' individual value judgements not being universal could be to consult stakeholders on their preferences, which is in line with participatory design methods. However, as indicated in previous sections,[181] the classic problem with most forms of participatory design is that stakeholders are consulted on their uninformed design opinions. Stakeholders may well have expressed a different set of opinions if they had been exposed to the same expertise, knowledge and training which is held by the designer. It is possible to argue that the designer may have abdicated and denounced his or her superior skills and knowledge if one consults stakeholders in an attempt to avoid the shortcoming of value judgement being universal. This sets the stage for a potential value conflict between design professionals and public interest groups, or counter-professionals. The differences in values particularly come into play when research-based theories, knowledge and techniques are lacking or are inapplicable,[182] which is often the case within architecture and industrial design. In these type of situations and predicaments professionals will be excluded from claiming legitimacy and authority by their expert opinion. This leaves both professional and counter-professionals on a level playing field, were the conflict concerns different value frames representing differences in human values and interests.

Another indication of the appropriateness of Larson's concept of profession with regards to architecture and industrial design can be found in that there often only exists a sketchy and undefined contractual relationship between society and the two design professions. Equally, the lack of public discourse about design related issues, and the arrogance found throughout history which some designers have allowed themselves to treat society and its stake-holders, can reflect and support Larson's assertion *(Gibberd, 1997: 149)*.

Based on these observations, within Larson's line of though, it may be reasonable from a societal perspective to argue that the two design professions are first and foremost vocational groups asserting themselves for their own gain and are to some degree employing a self-serving rhetoric *(Larson, 1977: 157 f) (Larson, 1977: 243)*. From a society's perspective the two design professions are elbowing their way to the top of society's authority in the quest of influence and self-expressions problematic. Equally, it is the lack of research that exists with the two design professions problematic from a society perspective, as this lack makes it doubtful whether the two professions are efficient in identifying and proposing solutions to issues of importance to the societies at large and its inhabitants. One would be forgiven to think that this line of thought would be considered to be a major dilemma within both architecture and industrial design. There is little evidence that Larson's concept of professions and the link to the two design professions resonates with architects, industrial designers or design scholars.[183] On the contrary, there is "no evidence to support that architects experience inner conflict over their own egotistical struggles for power" *(Spector, 2001: 12)*.[184]

From society's perspective, the development of professions in general and their granting of rights and privileges have not been without controversy (as introduced in previous part of this chapter).[185] During the last couple of decades, a climate of criticism, controversy and dissatisfaction with professions in general has emerged. Both architecture and industrial design have to some degree been affected by this trend, as both professions have for the last couple of decades been challenged by public pressure groups etc. This trend is particularly evident in the general rise of public review in the design and planning processes *(Cuff, 2000: 354)*. For example, this can be exemplified in events taking place in California at the beginning of the 1970s; where legislation was passed on a state level making it illegal to "block public access to the beach and the view to open water along the attractive, physically variegated Pacific Coast" *(Edwards, 1999: 28)*. A coastal commission was created to enforce the legislation, which has been characterised as the "the hearing from Hell" era of architectural planning in California. Within this setup it was not uncommon for architects to be exposed to public hearings, where they "could be roasted by the public and by journalists for proposing new construction" *(Edwards, 1999: 28)*. Equally an indications of this trend can also be found in the activities of HRH the Prince of Wales (Prince Charles)[186] and his public scorning of contemporary architecture. Another indication can be found in the establishment of neighbourhood design boards in some countries *(Cuff, 2000: 354)*.

All in all it can be argued that "architects are more constrained than ever before by the will of those who are stakeholders but not owners" *(Cuff, 2000: 354)*. Public pressure groups have been increasingly successful in challenging the authority of the established professions, through changes made in policy, laws and regulations. These have all contributed to curbing the influence and autonomy of the established professions in general, as well as affecting the architectural and industrial design professions *(Schön, 1983: 340 f)*.[187] A reasonable assessment of these current trends might be that both "the general public and clients have assumed new power in the design process" *(Cuff, 2000: 354)*, as both architecture and industrial design have lost some of its state support while public regulation of design has increased substantially *(Cuff, 2000: 354)*.[188] This has made design more contentious in the past three decades *(Cuff, 2000: 355)*. A classic example of the needs of minorities influencing design within western countries can be found in the introduction of law and regulations demanding accessibility for disabled people in public buildings. Architects and industrial designers have from a societal perspective "tended to respond to these new conditions defensively rather than creatively" *(Cuff, 2000: 355)*.

Practitioners within architecture and industrial design often encounter the need for public support in order to achieve the realisation of a particular design. This public support ranges from: (1.) not opposing a given design proposal, (2.) active support of a design proposal to the (3.) consumption of buildings and products. In order to obtain public support for a given design project architects and industrial designers will attempt to convey their design proposals in a favourable way to the public. However, both architects and industrial designers often find it challenging to communicate and promote a design proposal (they tend not to be extensively trained in consulting people, just delivering solutions).[189] These difficulties are often due to the fact that there is little or no overlap between the main values found among clients, users and the public compared to that of design professionals *(Rittel, 1976:*

82). The architecture and industrial design practitioners will often reflect value sets which can be found in the "official" professional discourse,[190] which is mostly centred "around a value system which has not much commonality with the outside world" *(Rittel, 1976: 82)*. Consequently aspects that are of importance to the society and clients like cost, rent ability, users' convenience, ease of maintenance are frequently overlooked, as they tend not to be the dominant emphasis among architects and industrial designers *(Rittel, 1976: 82)*. On the contrary, these aspects are often left out of design practice as well as journals and classroom education. Or to put it another way, the societal values are often in sharp contrast to the esoteric values considered essential by many design professionals *(Rittel, 1976: 82)*.

These value differences sometimes arise as full blown conflicts between designers and citizens' groups, minorities and counter-professionals *(Schön, 1983: 345)*. They have also contributed to a situation where architecture and industrial designers are seen as an elitist club without consideration for non-members. This type of value discrepancy and potential conflict has been and is "particularly critical when the non-members are supposed to inhabit, live with or pay for the products of the club" *(Rittel, 1976: 82)*.

These challenges have not gone completely unheeded within architecture and industrial design. It has led to a situation where architects typically experience and some times acknowledge that the complexity found within contemporary buildings are mainly the result of social rather than physical or technological complications *(Edwards, 1999: 124)*. In the same way, many industrial designers experience that public opinion is a complicating factor in design projects. Consuming individuals can influence companies, which make use of design professionals services, by not buying a product or building (part of the building) *(Whiteley, 1993: 126)*. This potential lack of consumption might influence a company to change its future "products, and perhaps even its policies, towards political, social and environmental issues" *(Whiteley, 1993: 126)*. Individual consumers have even more impact when individuals organise themselves in consumer boycotts.[191] This means that industrial designers cannot ignore public opinion out right, even if this is not always reflected in the values found among individual industrial designers and in the industrial design profession as a whole.

However, not all architects and/or industrial designers are equally challenged by the public, as some individual designers have design values which makes them see themselves as prime representatives of minorities and citizens' groups, championing the public through considering the needs of present and future generations (this point is elaborated in chapter five) *(Nelson and Stolterman, 2003: 65)*.[192]

Society's expectations towards architecture and industrial design professions are not constant. On the contrary, they are constantly changing due to the development within the professions and among its “opponents”. It can be argued that these groups are in “constant” value battle over the demarcation of professionalism and its influence on society. This power struggle is to some extent swept under the carpet by many design scholars.[193] It is possible to argue that this is somewhat surprising. Especially as a society which grants professions rights and privileges in return for specialised expertise are bound to at some point, as illustrated in the “hearing from Hell”, to experience tension between an expert’s knowledge and recommendations, versus the demands of democratic influence by different user groups and the society as a whole. There is potentially a built-in tension between democracy and professionalism, as democratic movements can influence and change the way a profession operates, whereas professions often will resist these changes on the grounds that they might diminish their power and influence over societies.

However, professions tend to change their values to some degree to accommodate changes that are taking place in societies. This has in the past been particularly evident within the domain of engineering,[194] where for example the development of engineering ethics code reflects changing values *(Mitcham, 1997: 263)*. This can be illustrated in the changes that have taken place in the engineering profession, where:

> “opposition to nuclear weapons in the 1950s and 1960s, together with the consumer and environmental movements of the 1960s and 1970s, provoked some engineers to challenge both national and business directions. In conjunction with a renewed concern for democratic values-especially as a result of the civil-rights movement-this challenge led to new ideas about engineering ethics.” *(Mitcham, 1997: 263)*[195]

This type of change based on public value change, with its subsequent pressure towards professions, is less evident in the two design professions.

The first part of this chapter introduced the idea that both architecture and industrial design are occupations that have a troubled relationship with the general concept of a profession. The varying characteristics that have been introduced in this chapter have highlighted this troubled relationship, and have indicated that both architects and industrial designers often do not see themselves as members of a profession, but a business or occupation. Based on this chapter it is possible to conclude that both architecture and industrial design have a number of values that are not in line with what is commonly found in the general concept of professions. Thus is it reasonable to assert that architecture and industrial design occupations are not professions in a strict definition of the concept of profession. However, it might be argued that both architecture and industrial design are “weak” or “minor” professions. It should be noted that the architectural and industrial design occupations will in the remaining of this thesis be referred to as professions.

3.4 SUMMARY

This chapter asserts that there is no straightforward manner by which to determine whether architecture and industrial design are primarily occupations or professions. Furthermore, value aspects play a central role in decideing how architecture and industrial design are to be defined.

In general, professions can be considered to be a state where an “occupation” is given certain privileges in return for offering expert services to its clients and/or the public. These privileges tend to be based on the belief that the profession has developed and is administering special knowledge and skills that benefit the society. Professions tend to be characterised by three main aspects, which are: (1.) specialised knowledge, (2.) legal sanction credentialism and autonomy and (3.) protection of the public interest. These criteria tend to exclude a number of occupations from being considered as professions. To overcome this discrepancy, scholars have introduced the concept of “major”, “near-major” and “minor” professions. Professions are often marked by their occupational histories, histories based in contributing factors like occupational background, knowledge development, political and social changes, jurisdictional competition and inter-professional relations.

Both architecture and industrial design are from the general profession perspective relatively young professions and they differ from other professions in that they include an artistic component. The boundaries for artistic freedom are not “universally” agreed upon, neither among individuals within the two professions nor their clients. Thus architects and industrial designers are faced with having to negotiate the “room” for artistic freedom, and balancing their urge to create aesthetically appealing design with the goals of satisfying clients’ demands and input. The emphasis on artistic freedom within the two professions has tended to exclude or overshadow other design aspects such as engineering, technology interior design, restoration, social planning, landscaping, ecology studies and regional studies. This has allowed non-architects and non-industrial designers such as engineers, project managers, facility managers, etc. to offer services that used to be supplied exclusively by architects and industrial designers. However, the aforementioned artistic qualities distinguish architecture and industrial design professions from other adjacent professions.

Architectural and industrial design history is marked by numerous aesthetic styles and design values i.e. design ideologies. Design historians group design into design epochs, a classification system that often oversimplifies the diversity of aesthetic styles and design values present in the two professions' history. Contrary to the opinion of many design historians, historic and contemporary architecture and industrial design are characterised by pluralism of both aesthetic styles and design values. From this pluralism stems a number of competing images commenting on what the role of the two design professions and/or design professionals are and should be. This contributes to controversy with regards to what should be considered as central design values and what is the relevant knowledge and skills base for the two design professions.

This lack of clear definition and classification makes it hard for individual designers and their clients to form expectations regarding the role of the architect and/or industrial designer. This tendency for uncertainty also makes it common for architects and industrial designers to be sidelined in cross-profession projects and may even hinder working relationships within design teams. In addition to their interprofessional relationships, architects and industrial designers also hold a "contractual" relationship with society as a whole—these societal bonds are often marked by uncertainties due to the aforementioned issues.

It is not uncommon for members of the public to regard architecture—and to some degree industrial design—as an "arrogant" art that is publicly inescapable. This perception exists, in part, due to the prevalence of design values that encourage design solutions that "ignore" or "neglect" stakeholders' needs and input. However, though stakeholder participation is a fundamental part of the design project, it is not necessarily straightforward or easily captured by the designer or design team; thus, architects that rely on stakeholders' opinions are to some degree abdicating and discarding their own professionalism. Contrarily, architects or industrial designers that do not at least strongly consider stakeholders' opinions are disregarding other people's values and input, a valuable resource in an often murky professional environment. This situation can be problematic because, as stated previously, architecture has little research-based knowledge on which to form a standardized professional code or tenets. However, it is a rather delicate situation that does not call for relying entirely on stakeholders: inherently, they lack appropriate design training, a skills base and/or talent. Stakeholders lack the ability to make the necessary “mental leap” into a new design solution; in part, these deficiencies justify designers’ reluctance to seriously take advice from stakeholders. These issues regarding the appropriate role of participants/-stakeholders remain largely unresolved within the two design professions.

Traditionally, an architect’s ideal version of designer-client relationship has been to control the entire design and building process without interference from a client. However, there are fewer and fewer patrons that are willing to accept this arrangement. Instead, clients display an increasing interest in influencing the design process. This is somewhat inconsistent with the fact that clients hire designers to create a design and introduce “magic” into a design project.

Due to the ongoing struggle over artistic freedom described above, a lack of knowledge and service provided by the two design professions have made many clients opting to become more professional i.e. have more in-house competence in acquiring design services. This has led to an increased unwillingness to accept the terms of service that architects and industrial designers have been accustomed to offer. This gap between expected and delivered service has put pressure on architects and industrial designers, causing the public to reconsider their role in society. As a result, design professionals have experienced a loss of status and a downward spiral in fees paid for design services. A number of design values have been contributed to this situation, including: (1.) exclusivism, (2.) false dichotomies, (3.) sub-optimisations, (4.) mini civil wars, (5.) failure to operate within cost and time limits, (6.) lack of ability to work as part of a project team and (7.) tendency to assume leadership without either the authority or respect of other team members. In general, clients have responded to this situation by (1.) replacing the architect and/or industrial designer as a strategic advisor, i.e. hiring project managers and quantity surveyors, (2.) limiting other responsibilities of the designer, (3.) increasing in-house knowledge, (4.) reducing the designer’s involvement in developing the project brief and (5.) involving a number of other professionals in the design project. Thus, a number of values found in designer-client relationship are severely constraining the designer’s ability to deliver services that meet clients’ expectations. Architects and industrial designers are often in denial over their client’s dissatisfaction; in part, their self-image does not correspond with how clients and society view them. This discrepancy tends to be greater in architecture and industrial design than in other professions.

Architects, and to some degree industrial designers, have increasingly been challenged by public pressure groups etc., as evidenced by the increase of public reviews of design and planning processes. This has led to more regulations with their subsequent constraints on design. Thus, architects (and to some degree industrial designers) are increasingly dependent on public support for their design proposals. The related impact ranges from: (1.) not opposing a given design proposal, (2.) active support of a design proposal to the (3.) consumption of buildings and products. However, architects and industrial designers often find it difficult to secure public support, as there is little or no overlap between the core design values and the values of the public. These challenges have not gone unheeded where some designers acknowledge that the complexity found within contemporary buildings and products is not only due to physical or technological aspects, but are as much the result of social complications.

Overall, this chapter demonstrates that both architecture and industrial design are occupations that have a troubled relationship with the concept of a profession. This occurs for a number of reasons. First and foremost, design values are individualistic and this contributes to a situation where the two design professions cannot easily reach the consensus necessary to claim professional competence exclusive of other adjacent professions. Thus the two design professions are readily classified as “weak” or “minor” professions.

4 Values in design practice

"An essential part of wisdom is the ability to determine what is uncertain, that is, to appreciate the limits of our knowledge and to understand its probabilistic nature in many contexts." (Hastie and Dawes, 2001: 324)

Architectural and industrial design practices have both an external and internal realm that are both set and closely connected to a number of values. Some of the external limitations and opportunities are to a large degree imposed on architects and industrial designers, but at the same time it is a value judgement as to how these imposed limitations are tackled by practising designers. In much the same way, a number of the internal design opportunities and limitations are also, to a large degree, self imposed and set by the values found among practising architects and industrial designers. The way designers tackle both the external and internal limitations and opportunities, and how they are set is closely linked to the knowledge foundation found within both professions. The premises for the knowledge base found among practising architects and industrial designers tend to be set by a number of values.

In order to indicate and introduce the value aspects of architectural and industrial design practice, this chapter will introduce the main aspects of the external, internal realm, and the knowledge base from a value perspective. Emphasis will be put on how architects and industrial designers tackle the external and internal opportunities and limitations found within their work. Equally, the knowledge base will be highlighted, as it is the foundation for many of the values found within architectural and industrial design practice.

4.1 THE EXTERNAL DESIGN REALM FROM A VALUES PERSPECTIVE

"Why is it that humans can put people in space but cannot clean up the slums of Harlem or Calcutta, that they can discover the secrets of subatomic particles but cannot stop

the loss of 17,000 plant and animal species each year?' One reason is that people seem more competent at developing science or technology than at correcting the social and environmental problems associated with it. Humans' intellectual progress often outstrips their moral and ethical development." (Shrader-Frechette and Westra, 1997: 3)

There exists a number of external opportunities and constraints that greatly affect architectural and industrial design practice. Amongst these is the increased pace of technological development that has taken place over the last couple of centuries. Whilst this has dramatically changed the opportunities for designers in terms of possible design solutions, it has also to some extent changed the way architects and industrial designers work, as well as the tools they can use. Economic factors also influence the opportunities and constraints an architect or industrial designer has to work within. They set the premises for design solutions as well as the working conditions for architects and industrial designers. Another factor that tends to influence design practice considerably is clients' and many other stake-holders' extensive contribution to design projects, especially as it is not uncommon for designers to work in teams representing different professional specialisations. This form of cooperation sets premises for design solutions as well as influences how architects and industrial designers practise. Finally, design projects are often characterised by a substantial complexity that affects design practice.

Within the following sections, these issues and characteristics will be introduced from a value perspective, and values that are essential for these aspects will be introduced. The emphasis will be put on identifying and indicating the value strategies that architects and industrial designers tend to apply in order to tackle the introduced issues.

4.1.1 Technological determinism, possibilities and challenges

"If we are to avoid mistakes similar to those of the first industrial revolution, then we have to make sure that modern technology is geared to take us where we want to go, and not just where the next step happens to place us." (Whiteley, 1993: 48)

Technology has been an important factor in influencing architecture and industrial design through new materials, working methods, tools etc., and the constant development of new technologies continues to set new premises for architecture and industrial design, allowing them to explore new possibilities and create new aesthetics *(Till, 2005: 169), (Cruickshank, 2000: 337).* The ongoing technological advancement and its increasing development pace makes it likely that this trend of development of new design approaches will continue, and that new aesthetic forms will be created as a result of these new possibilities *(Cruickshank, 2000: 334), (Schön, 1983: 15), (Duffy and Hutton, 1998: 177), (Till, 2005: 169).*[1]

Even if technological development has existed through out history, the 19th and the 20th century were marked by new technology which changed society on a scale which had never previously been seen *(Sparke, 1998: 10).* Consequently, everyday life of people was irrevocably changed with the introduction of mass-manufactured goods, mass-communication systems and mass-transportation.[2] These considerable changes in 19th and the 20th century, as a result of technological development, were viewed as rational, progressive and unstoppable within broad sections of Western society, including architects and people acting like industrial designers *(Sparke, 1998: 10).*[3] Many architects and industrial designers welcomed new technological developments, as it gave them a break from a previous climate of traditional design, which can be characterised as preferring safety and the relics from the past.[4] Technological development was not only seen as a chance to create new styles, but it was seen as offering opportunities for introducing a new way of life *(Sparke, 1998: 10).*[5]

The technologically driven contemporary state of affairs is qualitatively different from that of the past in the sense that the changes are more radical and emerging on a faster rate than in previous times. This raises the value related issue of how to manage the change and what should the change be. These issues have been highlighted by Emmanuel G. Mesthene which summarised the impacts of this technological development by arguing that: (1.) our tools are more powerful than any before,[6] (2.) which have made society and individuals aware of technology advances as an important determinant of peoples lives and institutions and (3.) as a result does both society and individuals see the need to understand and control technology *(Mesthene, 1997: 74).*[7]

Technological advances change the way people live and do things, which is particularly evident in Western societies.[8] It can be argued that contemporary technological development seems to be characterised by a reluctance to investigate, debate, or judge technological innovations beyond the technical aspects.[9] Some scholars like Langdon Winner[10] have even characterised what he considers to be the uncritical acceptance of the technological advances as "technological somnambulism" i.e. sleepwalking *(Winner, 1997: 61),* and has expressed puzzlement over the contemporary willingness to "sleepwalk through the process of reconstituting the conditions of human existence" *(Winner, 1997: 61).*[11]

The backdrop for these types of statements comes from the fact that little research exists which highlights the full consequences of the technological development on contemporary society as a whole.[12] This lack of academic research regarding technology's impact can, according to Mesthene, be connected with three somewhat caricatured views i.e. values which are wide-spread among contemporary academics (as well as architects and industrial designers).[13] These three views are: (1.) technology is an unalloyed blessing for man and society,[14] (2.) technology is an unmitigated curse[15] and (3.) technology is not worthy of special notice[16] *(Mesthene, 1997: 72 f).*[17] One could argue that they are all oversimplifications that do not yield much understanding.[18]

The design profession, in conjunction with many others professions, contribute to the development of society through technological advancements and materialisation, but architects and industrial designers and other professions are not bound to a technological determinism, which they cannot influence.[19] This fact implies that it is possible to assert that architects and industrial designers should accept responsibility for what they are making and its societal effect *(Winner, 1997: 68)*. However, both architects and industrial designers are mainly focused upon the possibilities and opportunities technology creates rather than determining the potential side effect and challenges *(Till, 2005: 169).*[20] This is not surprising, because as pointed out above, there is not much research readily available that determines new technology's impact on society generally or within architecture and industrial design. This as general research and design-based research tend not to be engaged in studies that exposes past and current technological challenges.[21] Thus, the architects and industrial designers' values related to technological development tend to be mainly dependent on the following. (1.) Which technological perspective the architect or designer holds i.e. such as pointed out by Mesthene, (2.) current methodology and value perspective supported by design schools and the design profession and (3.) the individual designer's own values and moral take on what should constitute the future society.

Regardless of the practising architect's or industrial designer's value position towards technological development, technological advances have created new opportunities for architecture and design approaches. They have created an environment where new design approaches have emerged in order to accommodate them *(Cross, 2000: 45), (Duffy and Hutton, 1998: 177).*[22] It can be argued that contemporary architects and industrial designers are faced with new challenges that have never existed before, "so the designer's previous experience may well be irrelevant and inadequate for these tasks" *(Cross, 2000: 45)*. These challenges imposed by technological development can be illustrated by the rate which new materials are emerging, and the way in which they tend to preclude any architect's or industrial designers full knowledge of all materials available and their capabilities *(Cuff, 2000: 348)*.

These technical developments have also influenced and changed the tools design professions use within the design process. This phenomenon is most evident in the changes which have occurred as a result of new computer-based design tools *(Duffy and Hutton, 1998: 177)*.[23] The computer has had a profound impact on architecture and industrial design. It has solved issues such as distance and time constraint through improved communication via email etc., and it has enabled greater collaboration between fellow designers and other consultants, engineers etc. on projects of great complexity *(Cuff, 2000: 347, 349)*.[24] Equally, computer based technology has enabled, and to some existent, increased globalization within the design professions *(Cuff, 2000: 349), (Jackson, 1992: 18 f)*.[25] In addition, internet-based technology as well as databases have made a considerable amount of information readily available for architects and industrial designers *(Cuff, 2000: 347)*.[26] Another change attributable to computer technology is the ability to: calculate, visualize, and detail complex geometric forms before construction, so that unforeseen architectural and industrial design forms are now both imaginable and buildable *(Till, 2005: 169), (Rosa, 2003: 25 - 38), (Cuff, 2000: 347)*.[27] Equally, there has been a change of the presentation and visualisation techniques of buildings and product, from a somewhat static nature to animated visualisations and presentations. Finally, computer related technology has contributed to eliminating and superseding steps between conception and production of design proposals, which has contributed to reducing the lead-time for a new product or building. This has in turn influenced and reduced the time which is allowed for and/or allocated to the design process *(Cross, 2000: 46)*.

Similarly, the development of environmental technology i.e. sustainable technology transformed much of the technology, materials and processes utilised in design projects over the past four decades.[28] The environmental technology along side environmental values has affected architecture and industrial design. This influence can be seen in the widespread introduction of legislation with an emphasis on "eco-regulations concerning renewable resources, energy consumption, sick buildings, smart buildings, recycled materials, and sustainability" *(Cuff, 2000: 348)* (these points are elaborated in chapter five).[29]

These and other technological developments have increased the technological complexity found in many contemporary architectural and industrial design projects, which in turn has put new demands upon designers and their role in design projects.[30] But these new demands tend not to be addressed by architectural and industrial design schools nor by practitioners, which can be indicated by the fact that over the past twenty years a number of architecture schools have reduced rather than increased the technological aspects of their curriculum *(Symes et al., 1995: 46 f)*. This reduction is attributed to the fact that "students come to architecture school to enter a profession that permits them to be an artist, shunning the technological subjects" *(Symes et al., 1995: 47)*. Architects and industrial designers tend to be unprepared, both individually and collectively, for the impact of new technological demands, as they are not sufficiently skilled in the identification of and adoption to newly emerging technologies *(Symes et al., 1995: 15 f)*. Some design scholars have even "suggest that architects have consistently and over a long period failed to absorb new technical knowledge into their modus operandi [i.e. foundation, approach and method of working]" *(Symes et al., 1995: 16)*.[31]

Consequently in rivalry with building engineering etc. it has been "easier for architects to base their professional claims on the aesthetics of construction than on technological mastery or scientific methods" *(Larson, 1993: 4)*. This is maybe not as surprising as almost the entire technological development relevant to architects and industrial designers takes place outside the boundaries of both professions.[32] Thus, it can be argued that the identity of modern architecture and industrial design remains centred on the subordination of technology versus aesthetics *(Larson, 1993: 4)*.

Instead of accruing the technological knowledge needed to address the technological complexity found in contemporary architecture and industrial design, a growing number of architectural and industrial design practitioners are cooperating or working in cross-profession design teams that address this technological complexity. These teams are typically characterised by representatives from a number of different professions, including technical specialists, which are all collaborating in and contributing to the design process and the final design outcome *(Cross, 2000: 45)*. A cross-profession team approach to design is characterised by a need to have an explicit and organised design process, where different specialised contributions are taken into account and are available at the right time, as well as division of task into sub-problems where team members are allocated appropriate sub-tasks *(Cross, 2000: 45)*. These characteristics tend not to square with the way most practising architects and industrial designers operate, which often cerates tension in cross-profession design teams (this point is elaborated in a subsequent section).[33] Thus technically complex projects are often associated with high risk and cost due to the costs of research, development, setting up of the manufacturing plant and buying raw materials etc. *(Cross, 2000: 45 f)*, and tend to be marred by value-based disagreement between the participants within projects. Value conflicts and strategic disagreements can be particularly challenging for architects and industrial designers. This as they tend to hold a holistic point of view on the design process (this is introduced in a subsequent section),[34] and because designers often prescribe to a set of values that are not extensively shared by other professions taking part in cross-professional teams (as introduced in chapter three).

Architects and industrial designers' reluctance to acquire mastery of the technological aspects and development has also had the consequence of what designers can deliver in terms of service and is not always compliant with what is expected by clients and society (as introduced in chapter three).[35] As a consequence of this a number of other (some adjacent) professions have started to eat into the domain of architects and industrial designers.[36]

These developments have spurred on a discourse among design scholars, design practitioners and educational institutions concerning the need for increased specialisation versus the traditional emphasis on the design generalist i.e. the generalist value (this point is elaborated in a subsequent section).[37] From a technological development perspective the generalist value found within architecture and industrial design is problematic, as the technological development has contributed to a situation where the technological complexity faced by architects and industrial designers is largely unintelligible *(Cuff, 2000: 346)*. From a pure technological perspective, design professions would benefit from creating sub-disciplines, in order to acquire the substantial technical knowledge that is available and make use of new technological opportunities. If sub-disciplines where to be developed on the back of technological development, it would change a number of design values including the holistic design value, the generalist design value and the values that governs knowledge development within architecture and industrial design.[38] The fact that the creation of sub-disciplines is resisted, to a large extent within both architecture and industrial design, is in itself a value decision that tends to ignore the technological development that has taken place.

4.1.2 Economy in design

> *"Perhaps the worst mistake made by the British architectural profession in this century has been to tolerate the delegation of responsibility for estimating building costs. Strategic advice to clients depends upon a grasp of `building economics', i.e. relating building costs to clients' financial planning. To claim to advise clients on their interests without reference to costs is a fantasy - and a particularly easily exploded one. Design without costs is meaningless."* (Jackson, 1992: 8)

Successful design must incorporate many factors, but few factors have more impact on architecture and industrial design than the economic conditions. Even so, architects and industrial designers have traditionally been reluctant to acknowledge the full range of influence the economy has on the design outcome *(Pye, 1978: 43), (Jackson, 1992: 8).* Instead, the emphasis has been put on other factors for example: overall concept, aesthetic and function, which have largely overshadowed the importance of economy in design. All in all this focus has contributed to concealing the fact that it is the economic not the physical constraints which are the major influence in design, as they directly and indirectly sets the most fundamental constraints *(Pye, 1978: 89), (Jackson, 1992: 8).* However, the business aspect of architectural and industrial design professions forces designers, to some degree, to act inside business boundaries set by the economical realities of the real world.

Economic realities like the clients' necessity to make a profit from the investment in design or their need to comply within a given budget significantly influences the design. This is particularly evident in industrial design where clients do not primarily ask if a new device will be good for the consumer, but if it is possible to manufacture and sell it at a profit *(Cowan, 1985: 215).*[39] Within capitalist business realities profits[40] are more or less always the bottom line for clients, architects and industrial designers alike all must operate within these realities *(Cowan, 1985: 215).*[41] But these harsh economic realities are sometimes seen as an obstacle or challenge to design by architects and industrial designers. Both building and products which are designed without a focus on economic realities tend only to exist on the margins of the western capitalist system and tend not to enter the mainstream *(Whiteley, 1993: 114).*

Economic influences in design can, for the sake of clarification, be divided into two main groups: where one group is the economic ramifications for the output of the design—the cost-effective production of the artefacts, and the second group concerns the budget allocated to the design process. The first category represents efficient use of scarce resources etc. thought cost calculations and supporting tools like “cost-benefit analysis” etc. However, unlike in the engineering domain, this aspect tends not to be made explicit within the domain of architecture and industrial design. In much the same way, economic resources management of the design process tends not to be an explicit priority within architecture and industrial design. This as designers—unlike engineers—are inclined not to employ tools and procedures that manage costs i.e. making sure that the design process is not becoming dissipated, and that the design process is following lines of inquiry that have been proven to be fruitful. Instead architects and industrial designers will vary their approach according to the design project at hand *(Cross, 2001a: 91), (Cuff, 1991: 84) (Blau, 1984: 10),*[42] where the focus is on the final design outcome, not economic efficiency in the design process. It should be noted that the division of the economic influences into two categories is useful as clarification, but has some clearer limitations in practical design projects, as there tends to be a clear relationship between the two categories in practical design projects.

The economic conditions for a given design process are usually influenced or set by the budget of the expected implementation of the design outcome. For instance, the rule of thumb within architecture and industrial design states that: within the budget of big projects there is usually substantially more economic resources for a thorough design process than in smaller projects *(Cuff, 1991: 69)*. This rule of thumb tends to work, even when one takes into account the complexity and human resources needed in large-scale design projects.

Both the architecture and industrial design professions have been unable to secure a monopolistic control over the design of buildings and/or products. This has made both architecture and industrial design extremely vulnerable to economic fluctuations *(Blau, 1984: 12)*, which is indicated by the fact that in previous times of economic recessions both architects and industrial designers have been among the first to be hit and often last to benefit from an economic recovery *(Rittel, 1976: 82 f)*. Historically and in recent times one finds that only a small fraction of buildings in most countries have actually been designed by architects, and this share is shrinking in some countries *(Rittel, 1976: 82)*. This economic vulnerability has been a constant source of repeated controversy over what professional design firms can and cannot do in order to “keep a foothold in the market without jeopardizing professional ethics and integrity” *(Blau, 1984: 12)*.

On a more practical level, economic realities have set some conditions that design professionals must pay attention to in order to have economic success. These include aspects such as (the following is a direct quotation): (1.) staying on schedule, (2.) estimating the amount of work remaining prior to completion, (3.) coordinating consultants and in-house staff, (4.) maintaining contacts with prospective clients, (5.) acquiring new work, (6.) managing the number of projects that are in the office at any one point in time, getting agreements in writing, (7.) writing legally competent specifications, (8.) staying as close as possible to the construction budget, (9.) staffing the office in an optimal manner, (10.) gaining publicity for work completed and (11.) developing effective office procedures *(Cuff, 1991: 69)*. Most of these activities are found in all design offices, so architects and industrial designers must be able to manage all of these aspects successfully, as well as commanding a viable fee from the client in order to achieve a healthy design business. Within most design businesses most of these responsibilities are handled at a management level, and in offices which are of a considerable size, have even tended to hired dedicated people, whom are not necessarily designers, to handle the business side of design *(Cuff, 1991: 70)*.

Many architects and industrial designers often dread the financial and business side of architecture and industrial design practice, as their focus is often geared towards achieving successful design quality rather than achieving successful economic expectations. This is the basis for a design value which can be characterised as “voluntarism” or “charrette ethos” commonly found among practising architects and designers *(Blau, 1984: 44)*. The “volunteer” value is founded in the belief that good architecture and industrial design requires commitment beyond the prearranged time, accountant’s budget, and normal hours *(Cuff, 1991: 70)*. Implicit in the “volunteer” value are elements of the following claim present: (1.) Best design works comes from offices or individual designers which are willing to put in overtime (sometimes unpaid) for the sake of the design outcome, (2.) good architecture and industrial design is rarely possible within fees offered by clients and (3.) architects and industrial designers should care enough about buildings or products to uphold high design standards regardless of the payment offered *(Cuff, 1991: 70)*. The “volunteer” design value can be seen as a reaction to and a rejection of the client’s influence and control over the design project. Both architects and industrial design often ignore the financial considerations by overlooking and extending the design work beyond the clients’ limits, and by creating design proposals that exceed the client wishes. This approach allows architects or industrial designers to assert some independence from the client *(Cuff, 1991: 70 f)*.

The “volunteer” design value resonates with the traditional separation of architecture and industrial design as art from that of a business *(Cuff, 1991: 71)*. This tradition has roots that go back to the time of Vitruvius and is indicated by his appraisal of the “gentleman” architect in contrast to what he saw as the suspect architect of “wealth”. This point is clarified when Vitruvius asserts that:

> “I have never been eager to make money by my art, but have gone on the principle that slender means and a good reputation are preferable to wealth and disrepute” *(Vitruvius Pollio, 1960: 168)*

In his celebration of architects (and industrial designers), Vitruvius identifies mainly with the artistic side of architecture and industrial design, and disregards the business aspects of architecture and or industrial design. This is not only a traditional phenomenon, but is still present in sections of contemporary architecture and industrial design professions.

The lack of emphasis on economic perspectives within architecture has been indicated in studies conducted on behalf of the Royal Institute of British Architects[43], which concluded that few architecture offices “see cost and project management as a’ core competence’ of the practice” *(Jackson, 1993: 14)*. This is backed up by the fact that not many architecture offices have “systems which can ensure that they can deliver against their clients’ constraints of cost and timetable” *(Jackson, 1993: 14)*, nor are architects within design offices trained in job costing skills or supplied with suitable software which would have enable them to do so easily *(Jackson, 1993: 15)*. As mentioned in the previous chapter clients tend to value the “`magic’ supplied by the architect and recognise that only the architect can provide this element in the building process” *(Jackson, 1993: 15)*, but most clients find it hard to accept “that architects cannot deliver the best possible building within their stated constraints on time and budget” *(Jackson, 1993: 15)*.

Contemporary architectural and industrial design schools tend to reinforce the separation of the art and the business side of architecture and industrial design, by simply not addressing the business side of architecture and industrial design in their curriculum.[44] Instead, students are trained in design projects where the financial realities are mainly left out, which deprive students of the implications of economic hurdles and limits. Design projects in design schools tend instead to focus on design quality which is the predominant criteria that both teachers and fellow students use to evaluate a given design proposal *(Cuff, 1991: 72)*.[45]

Architectural and industrial design offices tend themselves to be "either private or corporate enterprises and as such assume many of the characteristics of all other money-making establishments" *(Blau, 1984: 44).*[46] But unlike many other businesses, architecture and industrial design establishments are seldom big in terms of company size, turnover and or profit.[47] These economic realities have implications with regards to the average size of an architect and industrial design office. It is common for both architects and industrial designers to practise alone in freelance or be part of a small company, as there exist very few big local or global architect or industrial design firms (this point is elaborated in the appendix).[48] Big design firms are often viewed with suspicion by smaller firms and individual architects and industrial designers, as the values often found among practising designers "are seldom, if ever, attached to the rationalized "corporate" form of professional practice" *(Larson, 1993: 8).*

There is a difference between the way in which small and large firms operate, where the larger firms are more likely to be doing large, costly projects and international work as they are able from a practical professional perspective to "offer clients unmatched guarantees of competence, efficiency, reliability, and technical support" *(Larson, 1993: 7).* Whereas the smaller firm is often doing smaller projects within their local, state area or country *(Cuff, 2000: 353).*[49] Small design firms do, however, benefit from the larger design firms, through hiring individuals familiar with the technical competence and economic efficiency, which is often considered characteristic of the larger design firms. These individuals typically are either former employees or have been attending apprenticeship in the larger design firms *(Larson, 1993: 9).*

When considering the fact that many architects and industrial designers adhere to design values which are not compliant with conventional economic thinking, might it be considered surprising that economic rhetoric is often heavily used to sell both architecture and industrial design. The emphasis placed on economic rhetoric within architecture and especially industrial design can be considered suspect, as designers tend not to be familiar with economic realities and by the fact that there exists very little empirical evidence that supports the idea that design is a substantial economic factor. This is not disavowing the fact that design tends to be a differentiating factor for consumers when all other factors are equal i.e. same functions, price availability etc. Contrary to the rhetoric often found within industrial design, there exist numerous products that are considered as having a substandard design and sell tremendously well. These products tend to make a mockery of any argument that says that design is the most important contributor to sale statistics. It should be noted that design is at times the most distinguishing factor in products which are closely linked to lifestyle and or which enables a consumer to climb the ladder of society and/or sophistication.

The current prevailing western capitalist system of free markets and profit making implies both consumerism and globalisation, and makes some of the design values and approaches found among both architects and industrial designers difficult to sustain. For instance, there are several indications that design offices often have attributes which are in direct opposition to the principles of the capitalist enterprise, including: (1.) that each architect or industrial designer is trained to carry out the same work (there is no specialisation),[50] (2.) there exists a large degree of voluntarism and egalitarianism within design offices and (3.) artistic autonomy is often valued over economic success *(Blau, 1984: 44)*. All in all there are a number of design values contributing to a situation where many practising architects and industrial designers do not have a straightforward relationship with economic realities.

4.1.3 Participants in the creation of design

> *"Architects were not meant to design together; it's either all his work or mine." — Paul Rudolph[51] (Jones, 1961: 175)*
>
> *"Everyone has heard the well-worn joke that a camel is a horse designed by a committee. Behind it lies an accusation that has implications for architectural practice." (Cuff, 1991: 195)*

Contrary to popular belief, design is seldom an activity conducted by one genius. A design office often consists of senior designers who have primary design responsibilities and more junior designers who are "employees who engage in the more technical professional work, such as detailing, drafting, and writing of specifications" *(Blau, 1984: 36)*. The realisation of a design project within this structure is generally a team effort, and tends to include a number of different profession and expertise (often found outside the design office, as these tend to be small).[52]

The mythical perception of a single designer as the sole creative force behind buildings and products has its foundation in a number of different aspects including popular culture, historians' assertions and design education. An example of cultural reinforcement can be found in Ayn Rand's novel "The Fountainhead" with its central character of the sole architect hero, Howard Roark *(Rand, 1994)*. In the same way (as described in the previous chapter) historians and design scholars contribute to sustaining this myth by demonstrating a general reluctance to credit buildings and products to a collective group of contributors.[53] As a group both design scholars and historians tend to attribute buildings and products to a sole designer *(Cuff, 1991: 4)*. Architectural and industrial design educators' contribution to the reinforcement of the sole creator myth and can be indicated in that; most design students are trained in design projects where clients and/or other important contributors to a design outcome are nonexistent (as well as often not focusing on user participation) *(Cuff, 1991: 81)*. Curriculum in contemporary architectural and industrial design schools tends to be characterised by very little theoretical and/or practical focus on design solutions which emerge through complex interactions among the interested parties involved in the design process *(Cuff, 1991: 4)*. The inconsistency that exist between design projects set in design schools and the nature of design projects which take place in the real world, contributes to the reinforcement of the sole creator myth of the designer *(Cuff, 1991: 1 - 4)*.[54]

Real life architecture and industrial design projects tend to be complex, involving a number of different experts and ranges of knowledge. The complexity often found within design projects, when combined with the generalist design value (this value is elaborated on in a subsequent section)[55] leaves both architects and industrial designers dependent on additional expertise and knowledge, found within other professions *(Cuff, 1991: 85)*. This dependence on other professional participants in design projects has, as pointed out in a pervious section, increased as a result of the technological developments that have taken place, as the amount of knowledge and expertise needed to control all the issues involved have expanded tremendously *(Cuff, 1991: 258)*.[56] However, the emphasis on generality within architecture and industrial design combined with the holistic design value (this value is elaborated on in a subsequent section),[57] contributes to a state where designers often trying to control or influence all the different aspects of the design project *(Cuff, 1991: 77)*. Architects and industrial designers "claim" to be the sole creators of a design outcome and/or their "claim" to be the sole representatives for the holistic overview, is generally a misconception with regards to three main aspects. Firstly, clients and sometimes other members of the design team will generally hold an equal claim over the holistic overview of the design outcome *(Kristensen, 1998: 221 f), (Cuff, 1991: 178 f)*. Secondly, complex design projects are usually undertaken by more than one designer, where a senior designer acts as head designer over a team of designers *(Cuff, 1991: 1), (Davies-Cooper and Jones, 1995: 84 f)*. Thirdly, architects and industrial designers are often part of a design team representing a number of professions and experts whom have a shared, even if not necessarily equal, responsibility for the design outcome *(Jevnaker, 1998: 30 f), (Cuff, 1991: 77)*.

The type of experts and participants found in a design team tend to depend on the actual design task and will typically vary with respect to the technology utilised and the complexity involved in the design project. Bearing this variation in mind, a complex architectural design projects will typically have contributions from: (1.) architects, (2.) engineers, (3.) interior designers, (4.) specialist consultants, (5.) construction managers, (6.) clients and financial advisors and (7.) public agencies *(Edwards, 1999: 11), (Cuff, 1991: 77, 178)*. Equally, complex industrial design projects will typically have contributions from: (1.) industrial designers, (2.) graphic or packaging designers, (3.) technology personnel and or engineers, (4.) sales personnel, (5.) marketing personnel, (6.) manufacturing and or production managers, (7.) quality personnel and (8.) clients and financing personnel *(Bruce and Morris, 1998b: 46 - 51), (Ulrich and Eppinger, 2003: 3 f), (Davies-Cooper and Jones, 1995: 84 - 86)*.

The broad spectrum of competence commonly found in complex architectural and industrial design projects indicates that design is very much a social process that involves constant negotiation among the different parties that contributes to the design outcome. The values held by architects and industrial designers as well as the other contributors to a design outcome are therefore of utmost importance. This as the negotiation which takes place in architecture and design teams tends to be of a cross-profession nature, which tends to have a built-in tension between the different representatives of the different types of expertise and knowledge *(Bucciarelli, 1994: 71, 112 f), (Jevnaker, 1998: 30), (Buchanan, 1995b: 19)*.[58] This might not be considered surprising, as the different groups tend to view design outcomes from very different perspectives. For instance, architects and industrial designers tend to focus on what is possible in the conception and planning of buildings and products, whereas engineers tend “to stress what is necessary in considering materials, mechanisms, structures, and systems” *(Buchanan, 1995b: 19)*. While marketing representatives tend “to stress what is contingent in the changing attitudes and preferences of potential users” *(Buchanan, 1995b: 19)*. Because of these differences in perspective are these groups sometimes regarded as bitter opponents in the design enterprise *(Buchanan, 1995b: 19)*.

The conflict between designers and other professions represented in design teams is not well documented, but there exist numerous anecdotal indications of this types of conflict within cross-profession design teams *(Kristensen, 1998: 222), (Jevnaker, 2001: 141)*. The effective management of the power relationship between the participants in a design projects is therefore a crucial factor for the success of the design outcome *(Cuff, 1991: 39, 75)*. This as the most powerful actors in a design team tend to be able to impose their professional and/or individual design values and preferences at the expense of other members values and preferences *(Schön and Rein, 1994: 184)*. However, in order to achieve a good working relationship within cross-profession design teams it is important that the different team members share or respect the design values and framing which is set for the design outcome.[59] But, as architectural and industrial design projects tend to be set in an environment with distributed powers, there is seldom an agreement and shared respect for the values and framing set for the design outcome. It is therefore often vital that the different team members enter into a communicative relationship with their perceived "opponents". The ability to negotiate and agree upon common design values and framing of the design project is of utmost importance, especially at the start of the project, for a successful working relationship between the team members and for the final design outcome *(Kristensen, 1998: 222), (Cuff, 1991: 179)*. To successfully achieve this it is important that members of a design team enter into value and frame-reflective design policy conversation where they have the ability to put themselves in one another's shoes etc. *(Schön and Rein, 1994: 184 f)*.

The failure of architects and industrial designers to appreciate and accept clients and other members of a design team's point of view have led to a development, where the boundaries for the creative freedom in design projects are largely set at the point in time were architects and industrial designers tend to have minimum influence. This is particularly evident within architecture, where by the time a building is commissioned most of the key decisions are already made *(Porter, 2000a: 26)*. Or put in another way, the real action is "upstream" from the point of commission of the architect *(Porter, 2000a: 28)*.[60] Clients often make sure to complete a "risk assessment" so by the time the architect is engaged can the overall risks be managed *(Porter, 2000a: 28)*. The mismatch between the creative freedom experienced by most students in design schools and the creative freedom available within most design practices *(Symes et al., 1995: 20)* contributes to the situation where: architects and industrial designers who value innovation as part of their ethos are arriving on the scene at the moment of closure i.e. at the point at which risk has been put in a cage by the commissioning process *(Porter, 2000a: 28)*. This makes it difficult for many architects and industrial designers to find their place in cross-profession design teams, and accept the fact that the team as a hole may not accept their particular design values and approaches. Instead, architects and industrial designers often challenge the preconditions clients and others have put in place to manage the risk of a project, as they are trained to do so in design schools.[61]

An additional factor that contributes to architects' and industrial designers' resistance to accept the design values of fellow team members is that it is not only the clients and cross-profession team members that have influence on the design outcome. Design tends to also be influenced substantially by fellow peers, design critics and consumers, all be it in an indirect way *(Gemser and Wijnberg, 2000: 328)*. This indirect and hidden influence on the design process has its rationale in the aspiration that many architects and/or industrial designers and their clients have for the recognition, credibility and legitimacy that the design activity occasionally brings *(Cuff, 1991: 105)*. In addition, this is influenced by the economic impact a celebrated design might represented through consumers influence by consumption *(Gemser and Wijnberg, 2002: 66)*.[62] Many architects and designers (and some few clients) will attempt to influence the design process and the design outcome based on their aspiration to achieve peer recognition, especially within the design community.

Peer recognition, credibility and legitimacy can be obtained within what can be described as the cultural industries—of which both architecture and industrial design are a part. It is typically obtained from three main arenas which include: (1.) market i.e. consumers, (2.) peers i.e. fellow practising designers and (3.) design scholars i.e. design experts *(Wijnberg, 1995: 232), (Gemser and Wijnberg, 2000: 323), (Cuff, 1991: 197)*. The market is typically influenced through direct or indirect large-scale consumption of a product and/or use of buildings. Peers within the two design professions exercise influence through publicity that typically takes the form of design books and/or articles etc., and as members of juries awarding design prizes. Design scholars command influence through publicity as do design critics through books and articles *(Wijnberg, 1995: 232), (Gemser and Wijnberg, 2000: 323), (Cuff, 1991: 197)*. More specifically, design scholars typically influence design through their work as: design educators, educating practising designers and developing design theory etc. And in the same way as peers, design scholars are also influencing design through there role as members of juries awarding design awards, as well as through their role as curators determining selection for museums and exhibitions etc. *(Wijnberg, 1995: 232), (Gemser and Wijnberg, 2000: 323), (Cuff, 1991: 197).*

The aspiration to achieve recognition through design on the part of architects and industrial designers is not solely a result of an individual designers' desire to achieve professional acknowledgement, but can have considerable financial implications *(Gemser and Wijnberg, 2002: 66)*. Some architectural and industrial design firms use recognition as a business strategy, as indicated in design offices which "prize quality design and peer recognition above all other stakes" *(Cuff, 1991: 105)* to attract commissions from clients who seek architectural and industrial design credibility. This professional model is often found among innovative young firms, "with numerous outstanding projects and awards but no capital, pursuing aesthetic goals that outweigh" *(Cuff, 1991: 105)* all other interest including the business aspect.[63]

Appreciation in the three main arenas mentioned above can have the potential to generate not only direct economic gains, such as better sales and higher profit margins, but also have the potential to enhance a firm's reputation[64] in the marketplace *(Gemser and Wijnberg, 2002: 66)*. This enhanced reputation can generate a better ability to charge higher premiums on consultancy fees, whether for buildings or products. It can also contribute to attracting and retaining talented staff and clients *(Gemser and Wijnberg, 2002: 65 f)*. An enhanced reputation often has the added advantage of deterring competitive imitation from competing designers, as designers tend to avoid copying publicly recognised architects or industrial designers, as this may lessen their status and credibility. Both architects and industrial designers concerned about their reputation will normally take special care to avoid copying award winning and/or publicly praised designs, as publicised recognition makes it more likely that any imitation will be discovered. *(Gemser and Wijnberg, 2002: 65)*.

The indirect contribution and influence commanded by the market, peers and design experts over the design outcome, makes it important and valuable for architects and industrial designers to know, understand and adhere to the design values that these groups use to determine their design judgement and/or their critique. The design values held by these groups will influence design projects substantially—albeit indirectly. It is therefore a force to be reckoned with in architecture and industrial design.

All things considered, architects and industrial designers' relationship to participants in the creation of design outcomes is influenced by a number of design values which includes values i.e. issues like: generalism, holism, challenge of the preconditions, peer recognition etc.

4.1.4 "Wicked problems" in design

> *"I don't think you can design anything just by absorbing information and then hoping to synthesize it into a solution. What you need to know about the problem only becomes apparent as you're trying to solve it."[65] — Richard McCormac[66] (Cross, 1999: 29)*

Architects, industrial designers and design scholars alike tend to argue that design projects are characterised by "wicked problems"[67] i.e. ill-structured problems or ill-defined problems, as opposed to relatively "tame problems"[68] i.e. well-structured problems or well-defined problems found in other domains *(Cross, 2001a: 81), (Whelton and Ballard, 2002: 377), (Buchanan, 1995b: 15), (Cuff, 1991: 62), (Rittel and Webber, 1973: 161 - 166), (Simon, 1973: 181), (Dorst, 1997: 21)*. But the concept of wicked problems is not a characteristic which is unique to the design context; this is the case even if it is frequently used as a description of the specificities found in architecture and industrial design *(Zimring and Craig, 2001: 135 f)*. Generally a number of everyday tasks have been associated with the concept of "wicked problems" as oppose to "tame problems" which are typically problems solved in a classroom settings *(Nelson and Stolterman, 2003: 17), (Wagner, 2002: 43)*.[69]

Classroom problems i.e. tame problems tend to be characterised by being: (1.) well-defined, (2.) formulated by others, (3.) have all information required available for the problem solution, (4.) have only one correct answer, (5.) "have one or at most several methods for obtaining the correct answer; and (6) be unrelated to everyday experience" *(Wagner, 2002: 43)*. This is in sharp contrast to the characteristic of more practical everyday problems, which can be described as being: (1.) ill-defined, (2.) manly formulated by the problem solver, (3.) missing information essential to the solution, (4.) having multiple solutions which is often "associated with liabilities and assets; (5) … having multiple methods of obtaining each solution; and (6) related to everyday experience" *(Wagner, 2002: 43)*.

Within the context of "wicked problems" and "tame problems" is the notion of a problem, often understood as a question or situation that presents uncertainty, perplexity, or difficulty *(Buenaño, 1999: 12)*.[70] But problems might be referred to differently as indicated by scholars like John Dewey[71] whom defined problems as "constructed situations of indeterminacy, problematic situations, that we apprehend through the experience of worry, trouble or doubt" *(Schön, 1983: 357)*. Without going into details authors like Thomas D. Weldon have pointed out the difference between the concepts of problem, difficulty, and puzzle *(Weldon, 1953)*. Yet, others have focused on describing the characteristics of different problems, including prominent authors like Herbert A. Simon[72], Horst W. J. Rittel[73] and Melvin M. Webber (which is extensively referred to within this section). Problems within the domain of architecture and industrial design are often linked to realisations of design values i.e. ideas for a given design "solution" *(Cross, 2001a: 81)*. Design problems tend to incorporate a number of different values and issues, and are therefore not easily defined within the context of design.[74] The common view that a designer should act as an interventionist, which implies a person who acts not only by his/her contemplation *(Buenaño, 1999: 14)*, but by his/her ideas, also adds to the complexity of problem definition within the design domain. This attitude implies an objective to change certain courses of action, ideally for the better *(Buenaño, 1999: 14)*.[75] However, it is important to note that between themselves, architects and or industrial designers do not necessarily agree on what is the better, as they often adhere to different value sets. A consequence of this interventionist aspect of design is that architects and industrial designers, "unlike scientists, do not seem to have the right to be wrong" *(Lawson, 1997: 127)*. It is commonly accepted that a disproved theory may advance science, but it is rarely acknowledged that a similar contribution can be made by mistaken designs *(Lawson, 1997: 127)*. This aspect leaves problem definition within a design context somewhat radically different to what is found in many other academic domains *(Rittel and Webber, 1973: 166 f)*.

The concept of wicked problems within architecture and industrial design was formulated by Horst W. J. Rittel in the 1960s[76] as a reaction to the linear, step-by-step model which was the dominant model of design thinking at the time *(Bazjanac, 1974: 10)*.[77] It is worth noting that the linear, step-by-step model is still found attractive among some contemporary design scholars, business professionals, as well as designers *(Buchanan, 1995b: 13 f)*. According to Rittel and Webber "wicked problems" can be described as problems that cannot be resolved solely with the traditional analytical approaches. According to the two authors, wicked problems can be characterised by 10 characteristics (the list is direct edited quotation): (1.) there is no definitive formulation of a wicked problem; (2.) wicked problems have no stopping rule; (3.) solutions to wicked problems are not true-or-false, but good-or-bad; (4.) there is no immediate and no ultimate test of a solution to a wicked problem; (5.) every solution to a wicked problem is a "one-shot operation"; because there is no opportunity to learn by trial-and-error, every attempt counts significantly; (6.) wicked problems do not have an enumerable (or an exhaustively describable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan; (7.) every wicked problem is essentially unique; (8.) every wicked problem can be considered to be a symptom of another problem; (9.) the existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution; and (10.) the planner [designer] has no right to be wrong *(Rittel and Webber, 1973: 161 - 166)*.

The concept of wicked problems and tame problems has been identified and discussed by other scholars like Herbert A. Simon, who describes and uses labels like ill-structured (or ill-defined) problems versus well-defined (well-structured) problems *(Simon, 1973)*. Simon points out a similar line of thought as Rittel and Webber when he argues that the concept of ill-structured problem (ISP) or ill-defined problem are characterised by being a problem whose structure lacks definition in some respect. Or to put in another way: a problem is an ISP if it is not a well-structured problem (WSP) *(Simon, 1973: 181)*. This can be rephrased as: a ISP has "unknowns associated with the ends (set of project goals) and means (set of process actions and decision rules) of the solution" *(Whelton and Ballard, 2002: 377)*.

Diana Cuff supports and amplifies the argument of Simon and Rittel and Webber when she argues that within the realm of architectural practice, design problems can be characterised by the following six principal characteristics (the list is a direct quotation): (1.) Design in the Balance. Architecture tries to unite ideologically contradictory forces in the union of art and business, so that at each step, the primary professional value, design, is challenged. (2.) Countless Voices. The influence brought to bear on any project is distributed across numerous participants, each having a voice in the matter. (3.) Professional Uncertainty. Practice is a dynamic situation in which the responsibilities, procedures, authority, allegiances, and expertise in a project are ambiguous. (4.) Perpetual Discovery. Since the information needed to make decisions is never complete and each constraint can be challenged, design is a process of perpetual discovery that could go on endlessly. (5.) Surprise Endings. Although a single specific solution is sought, the possibilities are limitless and participants cannot predict the outcome. (6.) A Matter of Consequence. Design participants are highly motivated since the stakes are significant and the consequences serious *(Cuff, 1991: 62)*.

Other scholars who have contributed to the concept of wicked problems include Gilberto Buenaño whom has built on the work of Rittel (and Webber), but has added that within a wicked problem setting "facts, beliefs, ideas, discrepancies, causes and consequences continuously interplay" *(Whelton and Ballard, 2002: 377)*. This addition to the concept of wicked problems has been reflected and echoed by scholars like Craig Zimring and David Latch who also suggest that social interaction plays a unique role in solving wicked problems *(Whelton and Ballard, 2002: 377)*. By summarising the concept of wicked problems described by the above scholars one is left with three main characteristics that identify wicked problems. These are: (1.) uncertainty, (2.) multiple objectives (different value framing) and (3.)

multiple participants (with often adheres to different value sets). This is significantly different from the earlier mentioned tame problems (well defined problems) that are characterised by having the end goals already sufficiently prescribed and/or they are inherently apparent, which implies that their solution requires mainly the provision of appropriate means *(Whelton and Ballard, 2002: 377).*

The design of a house can be an appropriate example to illustrate the differences between wicked problems (ill-structured) and tame problems (well-defined problems) within an architectural and industrial design context. The design of a house holds no initial definite criterion for testing a proposed design solution, and no mechanical process to apply the criterion of design solutions *(Simon, 1973: 187).* The challenge of designing a house cannot in its purest state be defined in any meaningful way that determines the final design outcome. This as the design problem does not offer a definition of what would encompass solutions to aspects such as the structure, which can be every thing from “a geodesic dome, a truss roof, arches, an A-frame, cantilevers, and so on and on” *(Simon, 1973: 188).* Neither is there anything in the initial problem setting that determines which materials should be used (i.e. wood, metal, glass, etc.). Even the design process or the construction is not given by the initial design problem, as is possible “start with floor plans, start with list of functional needs, start with facade” *(Simon, 1973: 188)* etc. This all indicates that the task of designing a house is characterised by being a wicked challenge *(Simon, 1973: 187).*[78]

The numerous possibilities posed by designing something which is a wicked problem, as in the house example, implies that there is no true-or-false solutions to wicked problems, but only “good-or-bad” solutions *(Rittel and Webber, 1973: 162).* This implies that many parties are “equally equipped, interested, and/or entitled to judge the solutions” *(Rittel and Webber, 1973: 163),*[79] which indicates that “none have the power to set formal decision rules to determine correctness” *(Rittel and Webber, 1973: 163)* within architecture and industrial design. This is potentially very problematic within both architecture and industrial design as judgments are likely to differ widely, based on the “group or personal interests, their special value-sets, and their ideological predilections” *(Rittel and Webber, 1973: 163).* Because there are many possible answers to a design project, and there are multiple objectives that an architect or industrial designer may select, designers will attempt to reduce the multiple possibilities at the start of a design process by imposing a value based framing which reduces the wickedness of a design project (this point is elaborated in chapter six).[80] The processes of structuring (and formulating) “the problem are frequently identified as key features of design activity" *(Cross, 2001a: 96)*. A framing is typically based on a personal value set and on the specific circumstances (includes client's brief etc.) for a given design project *(Buchanan, 1995b: 16).*[81] For instance, the design value of structure honesty[82] will be utilised by some designers when selecting the structure for a given design project. Equally, some designers will adhere to design values such as self-expression, manifestation based on the spirit of the times, consultation and participation or environmental sustainability when selecting the design process for a given design project.[83] All of these values set limitations on a design problem reducing its "wickedness". This initial framing is often reframed during the course of iterative designing i.e. the iterative design process.[84] During the design process designers will often reframe the initial framing of a given design project. The defining, redefining and the challenging of the brief, is the main response that architects and industrial designers apply to resolve wickedness in design projects. Or restated, designers oscillate between the partial structuring of the problem and the developing of the solution to the problem *(Cross, 2001a: 96)*, based mainly on the value frame (this point is elaborated in chapter six).[85]

In addition to value framing, architects and industrial designers tend to rely on the skill of sketching i.e. visualising,[86] as a means to develop design proposals within a wicked context. Sketches are typically used to assist in problem structuring—the development of solution attempts within a given value frame *(Cross, 2000: 25)*. Sketching is a particularly useful tool with which to tackle wicked problems, as the key benefit of sketching is in its ability to rapidly enable both an exploration of the problem space and the solution space at the same time *(Cross, 2000: 25)*, *(Cross, 2001a: 97)*. It assists the architect or the industrial designer in developing the understanding of the design problem, along side the development of solution proposals for the given design task or project. It also assists in exposing emergent features and properties of a design solution *(Cross, 2001a: 97).*[87] But even with the tool of sketching and/or other simulation tools like computer modelling, physical models and logical argumentation, unforeseen consequences of a given design project will very often occur *(Cuff, 1991: 96).*[88] This shows that designing appears to be a "search for a matching problem-solution pair, rather than a propositional argument from problem to solution" *(Cross, 2001a: 96)*.

In a number of studies, experienced[89] architects and industrial designers are repeatedly found "to be proactive in problem framing, actively imposing their view of the problem and directing the search for solution conjectures" *(Cross, 2001a: 96)*. This repertoire and oscillation between problem and solution requires a great degree of self-confidence (as argued by Nigel Cross) as architects and designers have to have “self-confidence to define, redefine and change the problem as given, in the light of solutions that emerge in the very process of designing” *(Cross, 2000: 25)*. It can be argued that “people who prefer the certainty of structured well-defined problems will never appreciate the delight of being a designer” *(Cross, 2000: 25)*.

However, the value approach as well as the other aspects of the wicked problem strategies employed by architects and designers is not always appropriate, as sub-problems within the design domain are often well structured. A study[90] conducted by John C. Thomas and John M. Carroll concluded that designers’ behaviour can be characterised as treating all problems as ill-defined problems, regardless of the fact that some were clearly well-defined problems *(Cross, 2001a: 82)*. Thomas and Carroll sum up their findings in stating that design is a type of problem solving process in which the problem solver perceives his or her “problem or acts as though there is some ill-definedness in the goals, initial conditions or allowable transformations” *(Thomas and Carroll, 1979: 5)*. This tendency among architects and industrial designers is frequently inappropriate as many overall wicked problems (ill-structured problems) tend to be made up of well-defined sub-problems, often characterised by fixed constraints *(Simon, 1973: 190)*.

According to Simon, well-defined sub-problems can be identified by some of the following characteristics (the list is direct quotation): (1.) there is a definite criterion for testing any proposed solution, and a mechanical process for applying the criterion. (2.) There is at least one problem space in which can be represented the initial problem state, the goal state, and all other states that may be reached, or considered, in the course of attempting a solution to the problem. (3.) Attainable state changes (legal moves) can be represented in a problem space. (4.) Any knowledge that the problem-solver can acquire about the problem can be represented in one or more problem spaces. (5.) If the actual problem involves acting upon the external world, then the definition of state changes and of the effects upon the state of applying any operator reflect with complete accuracy in one or more problem spaces the laws (laws of nature) that govern the external world. (6.) All of these conditions hold in the strongest sense that the basic processes postulated require only practicable amounts of computation, and the information postulated is effectively available to the processes i.e. available with the help of only practicable amounts of search *(Simon, 1973: 183)*.

Sub-problems in a design project tend to have a more structured characteristic, as Simon’s list indicates, than the overall design challenge. A sub-problem within a design task might start of as an ill-structured problem i.e. start at an ill-structured state, but will often convert itself through the design process into a well-structured problem *(Simon, 1973: 190)*. The nature of well-defined sub-problems within wicked problems often leads to a need for applying different strategies in resolving the two types of problem. The fact designers are neither trained in nor focused on these well defined sub-problems *(Cross, 2001a: 82)* is a value decision and not something given by the wicked nature of the overall design problems. This emphasis on ill-definedness found among architects and industrial designers, is a result of the interrelations among the various well-structured sub-problems and the overall wicked problem likely to be neglected and/or under-emphasized *(Simon, 1973: 191)*. A contributing factor to this neglected area of well-structured sub-problems is that sub-problems have a tendency to be "undone at a later stage when new aspects are attended to" *(Simon, 1973: 191)*. This is characteristic of side effects which tend to accompany all design processes of a certain complexity, as most design projects start out with an initial problem which is not clearly defined (or understood), this includes both the overall problem (the wicked problem) and the potential sub-problems. The overall wicked problem, which affects the well-structured sub-problems, is un-defined and un-structured, due to the fact that the requirements are often based on a mix of constraints imposed by clients, the designers and other more general and specific constraints and criteria.

Practical experience in design projects shows that some of the initial definitions of what is required will often be re-defined during the project *(Cross, 2001a: 81)*.[91] The end result is often that a final design solution will satisfy all the overall requirements, whereas "it may violate some of the requirements that were imposed (and temporarily satisfied)" *(Simon, 1973: 191)* with regards to sub-problems identified at an earlier stage of the design process. The knowledge of these characteristics tends to create a "confusing" starting point for most design projects, and in response to these characteristics architects and industrial designers alike do not tend to attempt to define the design problem rigorously (by information gathering and analytical processes) *(Cross, 2001a: 81)*. These characteristics, in addition to the holistic design value (this value is elaborated in a subsequent section),[92] are major contributing factors, as to the development of strategies to tackle the tame sub-problems (well-structured sub-problems) within the design domains have to a large extent been prevented.[93] Or to put in another way, the wickedness of architecture and industrial design projects is often attributed as one of the main sources as to why no particular subject matter is recognised as being worth deep understanding and competence within the two design professions.[94] Rittel even goes as far as to argue that, because architecture is characterised by wicked problems there is "no body of expert knowledge which would be sufficient to cope with their problems, and that these problems are truly non-disciplinary" *(Rittel, 1976: 81).*

Based on these characteristics it might not be considered surprising that the history of design is characterised by "changing views of subject matter held by designers" *(Buchanan, 1995b: 18).* These changing views has been manifested in "concrete objects conceived, planned, and produced as expressions of those views" *(Buchanan, 1995b: 18).*[95] This is in sharp contrast to many other disciplines (particularly in the filed of science), "which are concerned with understanding the principles, laws, rules, or structures that are necessarily embodied in existing subject matters" *(Buchanan, 1995b: 15).*[96] It is important to note that architecture and industrial design are not the only professions that face wicked problems. Design values (which to some extent stems from the way design scholars as well as designers tackle the wicked nature of design problems) differ from the values that can be found in other professions that tackle wicked problems.[97] Based on this, it can be argued that the wicked nature of design problems is used as a rationale for creating a professional "fence" around the domain of architecture and industrial design. But this "fence" has little justification, as the knowledge needed most to tackle wicked problems is normally outside of the fence.[98]

The practical implication for practising architects and industrial designers of the wickedness of the overall design task, especially at the starting point of a design project, is that it makes it challenging for designers to determine which information is relevant or helpful to any given design project. All in all, it might be an insolvable challenge to gather all the relevant information for a given wicked problem, as there "is a massive amount of information that may be relevant, not only to all the possible solutions for a design problem, but simply to any possible solution" *(Cross, 2000: 24), (Rittel and Webber, 1973: 161).* This information challenge associated with wicked problems poses a considerable challenge for architects and industrial designers. Some of these challenges can be overcome by not defining the initial design problem too rigorously *(Cross, 2001a: 81).* But even with a loose information strategy it usually becomes an essential task to limit the amount of relevant information for a given design process. As mentioned above, architects and designers typically impose a value based frame to reduce the wickedness of a design project, which in addition to "simplifying" the design task, it also has the effect of reducing the relevant information needed for a given design project *(Rittel and Webber, 1973: 161 f).*[99] An additional strategy employed by designers in tackling the information challenge in design projects is to only seek information when it is felt to be relevant for a specific stage of the design process (applicable to a particular sub-problem). So the information gathering tends to be a continuous process as the architect or industrial designer considers the implications of the solution concept as it develops *(Cross, 2000: 24 f).*

Another practical implication that contributes to the wickedness in architecture and industrial design can be found in the cross-professional nature of design teams (introduced in the previous section). It is often argued that the wickedness of design problems would not be so complicated were it not for the involvement of other stakeholders, and for the fact that most design projects have some potential consequences which will be imposed on these stakeholders *(Buenaño, 1999: 37).* The outcome of most designs proposals will have consequences that extend over a virtually limitless period of time *(Rittel and Webber, 1973: 163),* as more or less all design implementations have long and short-term consequences, even if to varying degrees.[100] Consequently, opinions with regards to design solutions tend to vary widely among stakeholders in a given design project. Which solution of a given design problem should be developed and implemented is a matter of subjective judgment, as there is no agreement upon the way of determining what should be the judging criteria for the selection of a given design solution (this point is elaborated in chapter six).[101] Equally there is "no criteria which enables one to prove that all solutions to' a wicked problem have been identified and considered" *(Rittel and Webber, 1973: 164).* This is a critical aspect of the wickedness found in design problems, as different individuals often represent "different world views and different ways of approaching them" *(Buenaño, 1999: 37).*[102]

The earlier mentioned need for self-confidence in order to tackle wicked design problems can come in conflicts with the development of the design rationality, as most design projects have a number of different stakeholders whom often hold different points of views in regards to a potential design solution.[103] Both architecture and industrial design can be seen as a social construction where both architectural and industrial design practice emerge through complex interactions among all interested parties *(Cuff, 1991: 62).* This implies that within the architectural and industrial design practice there exists countless voices: numerous participants whom will attempt to have their voice heard in regards to the matter at hand *(Cuff, 1991: 62), (Buenaño, 1999: 37).*Designers will (to a varying degree) consult these numerous stakeholders in a design project.[104] Consequently, a design rationale is often mainly derived from the designers' own design values and reflective inquiry, where the communication with clients and other team members plays a secondary role *(Schön and Rein, 1994: 169).*[105] But to avoid conflicts related to the ill-defined nature of wicked problems, architects and industrial designers will "seek to arrive at agreements about the problems they are trying to solve" *(Schön and Rein, 1994: 169)*. Hence, the communication of the design rationale, including the design values, is an essential activity to achieve a common understanding of a given design task among all the stakeholders, in order to achieve a consensus in the evaluation criteria which guides the design process towards the final design outcome (this point is elaborated in chapter six).[106]

To achieve a common understanding among all the participants in a cross-profession design team, architects and industrial designers will typically probe the meanings that are behind the messages they receive from other team members (including other designers) *(Schön and Rein, 1994: 170)*. This is a part of a striving for convergence between the design rationale and the design values which all influence what is to be made *(Schön and Rein, 1994: 170)*. Complex design projects require that architects and industrial designers alike maintain a sufficient level of mutual trust between themselves, other team members, clients and other stakeholders. This trust is of high importance, to sustain the cooperative inquiry needed to solve wicked design problems. The trust level can be of significant importance within the domain of design, as architects and industrial designers are typically not the sole owners of the problem area in which they operate.[107]

On the whole, design problems are hard to define as they are mainly made up of wicked problems with subsequent well-defined sub-problems. The overall wicked design problems are typically characterised by three main characteristics: uncertainty, multiple objectives and multiple participants. This wicked nature of design problems makes design values essential as a means to reduce the wickedness. Thus, design values are an essential component in design practice, but the focus on wicked problems in architecture and industrial design tends to overshadow well-defined sub-problems, which can be solved using a knowledge-based strategy.

4.2 THE INTERNAL DESIGN REALM FROM A VALUES PERSPECTIVE

> *"The design studio was, and still is, in many ways an anachronism within the university context. For some people, its role seemed uncomfortably craft-like and imprecise, without rigour when compared with the intellectual arts, or objective credibility when compared to the methods of the natural sciences" (Johnston, 1995: 46)*

There exist a number of internal opportunities and limitations that greatly affect both architectural and industrial design practice. Among these is the issue of design versus art, which is an important factor in architecture and industrial design. Equally, the emphasis on novel design solutions is another important determining factor in how architecture and industrial design is practised. Finally, the emphasis on holism that is often found among architects and industrial designers is an important internal factor in setting premises for the practice of architects and industrial designers.

The following sections will introduce these above-mentioned issues and their characteristics from a value perspective. The emphasis will be put on identifying and indicating the value strategies that architects and industrial designers tend to apply to tackle these issues.

4.2.1 Design versus art

> *"It is folly to pretend either that design is simply a problem-solving activity or to pretend that it is simply an art. It is both." — David Pye[108] (Pye, 1978: 94)*
>
> *"Norms of artistic integrity are clearly central to the conception of architecture as art as well as a purely utilitarian profession. Without the ability to consistently exercise aesthetic choice in their work, architects would be incapable of producing recognizable or identifiable styles of design." — John Brewer (Blau, 1984: 28 f)*

As introduced in chapter three, architecture and industrial design are commonly viewed as disciplines that partially cover a whole array of subjects that also connect to other professions.[109] Of all of the fields whose roots connect and "belong principally" to other professions, art is probably the one subject matter that architects and industrial designers brush up against most frequently and substantially.[110] The boundaries between the two design professions and other art occupations tend to be blurred *(Dodson and Palmer, 1996: 3)*.

Architects and industrial designers have often adopted the quest for artistic freedom along with its artistic values; even if this freedom has to be exercised within the limits and conditions imposed by clients, stakeholders, the character of the site, the cost of construction and materials, and legislation *(Blau, 1984: 28)*. These constraints distinguish the practice of design from the practice of art which, in a historical context, has had fewer restrictions and a greater emphasis on artistic freedom and expression *(Blau, 1984: 28)*.

Unlike art, architecture and industrial design are not pure "art", yet architectural and industrial design require aesthetic elements and artistic creativity *(Blau, 1984: 28)*. Since the end of the Renaissance, architecture has been closely linked to paintings and sculptures or has even been considered an art in itself, as indicated by individuals like Giorgio Vasari. Vasari's way of linking art and architecture was generally accepted and later reinforced by the two following centuries of theories about "aesthetics" *(Collins, 1971: 133)*.

Historically the issue of art versus design has never been completely resolved. This is indicated by the fact that the issue has been debated throughout history. For instance, as introduced in chapter three, art versus design was a central underlining issue in a Bill introduced in 1891 into the British parliament which attempted to make architecture a closed profession *(Shaw and Jackson, 1892: xxx).*[111] The debate on the Bill highlighted the tension that exists between the concept of architecture as a profession and that of architecture as an art. Some debaters made the connection between architecture, painting and sculpture, as underpinned by Thomas G. Jackson[112] with his assertions that:

> "To a true artist his art is an individual matter purely between himself and his artistic conscience.
>
> […]
>
> If architecture is ever to live again amongst us, the professional idea must disappear." *(Shaw and Jackson, 1892: vii, xxviii)*

Whereas others focused on the professional aspects of architecture, arguing that architects need professional training to achieve the knowledge level needed to practise as fully-fledged architects. Even if the Bill in question was rejected, it provided the basis for the later Bill, passed in 1938, that ensured that an architect had to pass some official examinations in order to practise in the UK *(Jenkins, 1961: 222 - 226)*. The introduction of compulsory education for architects and to some degree industrial designers has not resolved the issue of art versus design. It is still a hotly debated issue, as there is no common consensus on whether architecture and industrial design are professions or arts, or whether they are both a profession and an art etc. For instance, architectural and industrial organisations tend to concentrate on what are indisputably organisational aspects of architectural and industrial design practice, whereas historians tend to see architecture and industrial as mainly a visual art.[113] In contrast, sociologists tend to accept architecture and industrial design as both a profession and an art, where the art element is often regarded as the chief eccentricity.

These different perspectives indicate the challenge of distinguishing between what is considered art and what is considered design. There exists a considerable amount of literature that has attempted to draw the line between the two, even if art as well as architecture and industrial design is characterised by being a difficult area to define. Scholars who have attempted to draw a line between design and art include Jerry Palmer, who asserts that it is complicated to "reconcile the criteria for design-based artefacts with the traditional aesthetic criteria applied to the arts" *(Dodson and Palmer, 1996: 3)*. He argues that this is because the basis for art:

> "is the universality and non-utilitarian nature of beauty, whereas the basis of design is that the object in question is created for the benefit of some group of potential users, and is therefore aimed at satisfying some need, desire or economic demand." *(Dodson and Palmer, 1996: 3)*

But Palmer goes on to acknowledge that the boundary between "art" and "design" is always to some extent fluid insofar that it can be argued that all artefacts "have elements of both in them, whether the artefacts in question are conventionally classified as 'art objects' or 'design objects'" *(Dodson and Palmer, 1996: 3)*.[114]

Even if this illustrates the fact that architecture and industrial design are closely connected to art, yet not the same, is it commonly accepted that the link between art an design is problematic insofar as 'design' and 'aesthetics' often "refer to divergent traditions of understanding creative activity" *(Dodson and Palmer, 1996: 3)*. But, regardless of the debate whether architecture and industrial design are or are not art; the developments within the art community such as the invention of abstract art *(Maxwell, 2004: 5)*, and the development of the avant-garde art values, have inspired and had a profound impact on architecture and industrial design *(Heynen, 2004a: 97)*.

The influence of the values and aesthetics of art practice has been so substantial that it can be argued that architecture and industrial design has "benefited as much from that new artistic vision as it has from directly adopting new technology" *(Maxwell, 2004: 5)*.[115] Historically, both professions have been inspired, as a whole and as individuals, by developments that have taken place in the art communities, in terms of new aesthetics expressions and new artistic values. For example, the International Style credo that implied that decisions in architectural and industrial design should result from a rational analysis of the functions, replaced a "traditional practice of starting from precedent, which was suffused by convention and custom" *(Maxwell, 2004: 6)*. Equally, art movements and their values have inspired architectural movements such as: De Stijl[116], Productivism and Constructivism[117], Expressionism[118] and Novembergruppe in Germany[119] *(Heynen, 2004a: 97).*[120]

From an aesthetic perspective have art movements like Cubism[121] had a considerable impact on architecture and industrial design through artists like Piet Mondrian[122] with his gridded and neoplasticist compositions and Kasimir Malevich[123] with his ineffable weightless rectangles *(Maxwell, 2004: 6)*. The innovative language of abstraction found in art movements like Cubism was not so much a gateway to freer personal expression within architecture and industrial design, as it was an escape from the conventions of traditional construction and layout *(Maxwell, 2004: 6).* Art developments inspired developments where architects no longer considered it necessary "to affix the Antique orders to facades or to follow academic rules of ordonnance and symmetry in drawing plans" *(Maxwell, 2004: 6)*. This new found artistic inspiration also influenced previous "formal" design principles—new abstract forms generated little challenge to the idea of an architectural plan freely following a program *(Maxwell, 2004: 6).*[124] The development of abstract art has inspired architects and industrial designers alike, throughout the whole of the 20th century, this can be exemplified by works by prominent architects such as Richard Meier[125] and Rem Koolhaas[126] *(Maxwell, 2004: 6)*.

The influence of both artistic aesthetics and values are perhaps no more evident than in the influence that the avant-garde art movements have had on Modernism within architecture and to a lesser degree industrial design *(Heynen, 2004a: 97).*[127] Avant-garde art influenced both the aesthetic style and values found in Modernism, which can be illustrated in Modernism link to avant-garde logic of the destruction of the old and construction of the new *(Heynen, 2004a: 97)*. Equally, was the rejection of the bourgeois culture of philistinism, with its use of ornament and kitsch elements (which where closely linked to eclecticism) found within avant-garde art, adopted by Modernism within architecture and industrial design.[128] In its place gave the Modernism precedence to aesthetic purity and authenticity.[129]

On a more individual level some key avant-garde values, that can be found in the term avant-garde, have been adopted by many architects and industrial designers. The avant-garde term has its roots in the concept of the vanguard, which is a small troop of highly skilled soldiers that explores the terrain ahead of a large advancing army and plots a course for the army to follow. In much the same way as the "vanguards" within a military context, many individual designers view themselves as small bands of intellectuals, with a mission to open pathways through new cultural or artistic terrain for designers and society to follow. The implication of these avant-garde values implies a degree of elitism that has been adopted by many artists as well as designers. For instance, the avant-garde art value of being one step ahead of society can be found among architects like Le Corbusier when he remarks that “perhaps it is a good thing to be still criticized abusively … at the age of 70” *(Collins, 1971: 185).* The satisfaction he derived from being abusively criticized by many, this pioneer of the Modern Movement, demonstrates this avant-garde art value of attempting to stay ahead of fellow peers as well as society as whole.

The influence of artistic avant-garde values is no more visibly potent than in the elitist value i.e. avant-gardism and the tension it creates between design as an art and design as professionalism. This is highlighted by the fact that few leaders of any other “profession, however suffused with reformatory zeal, … have made such a boast” *(Collins, 1971: 185)* as Le Corbusier at the very height of his fame. Architecture unlike most other professions has consistently been led by such “pioneers who based their whole philosophy on a scorn for the professional ‘Establishment’ and the official dignities it bestowed” *(Collins, 1971: 185).* The difference between the design professions and other professions might not be considered surprising as the avant-garde value of elitism have less often been closely linked to professionalism in other professions. Whereas the two design professions have taken inspirations from the mystique of the avant-garde art displayed at the Salon des Refusés[130]. In addition, the avant-garde value of elitism has often been linked to “political or religious minorities which derive spiritual strength from being in a constant state of rebellion and dissent” *(Collins, 1971: 185),* which fits with architecture and industrial designs on creativity and novel design solutions (these points are elaborated in the subsequent sections).[131] It is important to note that even if the influence of the avant-garde art movements was considerable on architecture during the 1920s and later, the architectural vanguard did not become as uncompromising and as radical as its counterpart in the world of art and literature did. This as “most architects, for example, never renounced the principle of rationality, even if it stood for a bourgeois value” *(Heynen, 2004a: 97).*

The influence of art movements on contemporary architecture and industrial design has been considerable, as a result the issue of design versus art is commonly found among practising architects and industrial designers. Individuals in both groups tend to consider themselves professionals, and to some extent artists. At the same time is it widely accepted among the same groups that architectural and industrial design integrity cannot be based on the expression of the individual designers’ personality untrammelled either by the needs of a client and/or society. Thus, it can be argued that designer's self-loyalty and artistic aspirations must not reach the extent where it becomes his or her only or supreme value code *(Collins, 1971: 141)*.

Many architects and industrial designers will, for instance, demand latitude for artistic freedom of expression in much the same way as many artists. However, from a client perspective artistic freedom is often associated with artistic values such as: (1.) little concern for factual events i.e. artistic licence to change things, (2.) aesthetic considerations (such as composition, balance etc.) overrides other issues, (3.) the overall concept is considered more importantly than the individual aspects, (4.) a commission that does not fit the artist's vision will attempt to be changed through reframing of the original commission.[132] These aspects tend to be more acceptable to the traditional patron of art than the average contemporary architecture and industrial design client. Thus, it can be argued that within an architectural and industrial design context these value conflicts associated with artistic values and professionalism have the merits of "Art for Art's sake"[133] versus professionalism. The value of "Art for Art's sake" has value as academic exercise *(Collins, 1971: 141)*, but its applicability in a professional context is questionable as "Fine Arts" tend not to "progress" in the same way as most other professions progress. This can be illustrated in the fact that "Fine Art" of high quality can be found in every epoch and at every "intellectual level because it does not depend on advances in technology and in the social sciences to keep abreast of the needs of mankind" *(Collins, 1971: 186)*. It is this difference between the development within art and that of the two design professions which to some extent brings architectural and industrial design in line with those of the other learned professions and distances it from the occupations of the art world *(Collins, 1971: 141)*.

However, this difference is not as clear-cut, as both practising architects and industrial designers tend to proclaim both a degree of professionalism as well being an artist to some degree.[134] The importance of the artistic aspect of architecture is indicated by the fact that most designers will highlight both art and creativity as the distinctive qualities of architects and industrial designers *(Blau, 1984: 46)*. The importance of artistic inspired values within the two design professions can be indicted in that during the last century started building rationales like civic, social, political, religious considerations along with the criteria of efficiency and function, to become indisputably subordinated to that of design aesthetics among some architects *(Blau, 1984: 48)*. This change is revealed and reinforced by statements made by a number of leading architects such as Minoru Yamasaki opening up the issues by proclaiming that "The social function of the architect is to create a work of art" *(Burchard and Bush-Brown, 1961: 394).* This was followed up by architects like Richard Meier whom asserted that "Architecture is high art" *(Diamonstein, 1980: 106),* Paul Rudolph equally argues: "If an architect is not an artist, he should not be called an architect" *(Cook and Klotz, 1973: 96)*. In the same way was Gio Ponti asserting that: "We must always start by considering a work of architecture a work of art and the architect as the artist" *(Blau, 1984: 48),* and finally Edward D. Stone[135] who argued that:

> "There is too much conformity in contemporary architecture. I like to think of architecture as an individual creative expression … An architect should try to fond his own expression." *(Heyer, 1966: 177)*

But this does not imply that all designers agree on what art and creativity implies for the two design professions, as some will focus on creativity as "synthesizing in nature, whereas others dealt with the personal and individualistic qualities of creativity" *(Blau, 1984: 46)* often focusing upon personal expression.

Another indication of the disagreement over what art and creativity implies in the two design domains can be found in the different approaches individual architects and industrial designers have towards using art as an inspiration or as a design approach. These differences tend to manifest themselves in that different designers tend to subscribe to five different approaches, that include: (1.) art as the grand gesture; where architects and industrial designers strive for artistic merit,[136] (2.) art as avant-garde; where architects and industrial designers endeavour to be radical, challenging and provocative (which may take the form of a grand gestures), (3.) art as consummate skill; where architects and industrial designers focus on displaying the skilled aspects through the design outcome in much the same way as artists are admired for their ability to master the craft of for instant painting "realistic" etc.,[137] (4.) art as picture making; an approach adhered to by architects and industrial designers which values formal qualities such as balance and harmony in creating a design compositions and (5.) art as symbol making; where architects and industrial designers aim for creating something "meaningful" or "symbolic" utilising implicit and or explicit symbols *(Thompson, 2000b: 71 f).*

Within the context of art versus design it is appropriate to point out that architecture and industrial design are much more closely linked to engineering than art is to engineering,[138] as argued by prominent architects like Jacobus J.P. Oud[139] and Le Corbusier. These architects have linked research, discovery and an interest in the novel and not already known within architecture and industrial design to that of engineering *(Maxwell, 2004: 6)*. It is commonly accepted that architects and industrial designers at times utilise some of the knowledge aspects found within engineering. The link between art and engineering through design is something that manifests itself through contemporary architectural works like the Guggenheim Museum[140] in Bilbao, Spain, by the architect Frank O. Gehry[141]. The museum's abstract and dynamic form derives "from the capacity of the computer to control the fabrication of complex components" *(Maxwell, 2004: 7)*, which has allowed Gehry to design an architectural composition as powerful as any of the art work displayed inside the functional building *(Maxwell, 2004: 7)*. Developments within engineering and its subsequent new building technology has allowed contemporary architects like Frank O. Gehry, Peter Eisenman[142], Daniel Libeskind[143], and Zaha Hadid[144] to create architecture with expressive gesture, that reflects the development which has taken place within abstract art. Design is in some respect the intermediary between art and engineering. One can argue that design attempts to bridge the gap between art and engineering through manifesting artistic elements into buildings and products. Moreover, if one were to eliminate the aesthetic aspects i.e. the art component from architecture and industrial design, it would be increasingly difficult to distinguish between engineering and architecture and/or industrial design.

Numerous designers and design scholars have attempted to make the connection between the aesthetical aspects and the more conceptual (often functional) aspects of architecture and industrial design, by creating both practical and theoretical positions on the aesthetic aspects of design.[145] However, these practical and theoretical frameworks have not been generally accepted within the two design professions, neither in the art community or the society at large.[146] For instance, the last century was marked with debates surrounding the importance of function determining the form within the architecture and industrial design domain. This point is clear from debates declaring "form follows function", "less is more" and the counter argument of "less is a bore" of the last century.[147] If "form follows function" was a "natural" feature, it would be possible through a linear analysis of the function to accurately predict the form. This implies that one should be able, through function analysis, to arrive at the optimum form *(Pye, 1978: 11 f)*.[148] But it is commonly accepted that this type of universal rule does not exist within architecture and industrial design,[149] neither is there a common agreement on what is the optimum form for a given building or product should be (this point is elaborated in chapter six).[150]

This lack of common agreement on form and artistic elements has not restrained the appetite of architects and industrial designers' to argue the case for a particular form. The aesthetic qualities in a given form or an artistic element are often linked to an argument based on the belief that art in design influences the progress of the human race *(Pye, 1978: 104 - 107)*. This is based on a line of thought that argues that aesthetic qualities in designs have some unquestionable qualities that are testament to humanities unwavering devotion to the arts. This argument is linked to a notion that important aspects beside the functional is self evident in much of what is considered art *(Pye, 1978: 90)*.

The issue of art versus design is among many factors that are linked to viewpoints held in architecture and industrial design as learned professions. If architecture and industrial design are considered to be learned professions and not art, there must be aspects about design that differentiates it from art. From a professional perspective it can be asserted that architecture and industrial design are different from art, in that they are characterised by excellence and professionalism, unlike art, cannot include infant prodigies, equally, can spontaneity not solely be a criterion of excellence within design *(Collins, 1971: 89)*.

4.2.2 The emphasis on novel design solutions

> *"Our job is to give the client... not what he wants, but what he never dreamed he wanted; and when he gets it, he recognizes it as something he wanted all the time."[151] — Denys Lasdun[152] (Cross, 1999: 28)*
>
> *"If you want to enable someone to sit, it will be idiotic to proceed in the way that students of design are sometimes advised to do, and think out the whole problem from first principles, as though all the people who for the last four thousand years have been making and using chairs were half-wits. Where the problem is old, the old solutions will nearly always be best (unless a new technique has been introduced) because it is inconceivable that all the designers of ten or twenty generations will have been fools." (Pye, 1978: 59)*

It is common within contemporary architecture and industrial design to find emphasis on creating novel design solutions, which is often accompanied by an equally common lack of emphasis on studying of the appropriateness of any already existing design solution. This emphasis found among practising architects and industrial designers tends to be introduced and encouraged by design schools *(Porter, 2000a: 26), (Pye, 1978: 59).*[153] It has historical roots dating back to early design movements such as Modernism, with is emphasis on "starting from zero" *(Wolfe, 1981: 12).*[154] The focus on novel design solutions is linked to the design value of novelty, which is instilled not only by design education, but also by peer evaluation.[155]

The celebration of original and novel design solutions is, by many designers and design scholars, considered one of the main aspect i.e. design values within architecture and industrial design. This design value is often manifested through the working methods of designers, with their emphasis on the "big idea" and tendency to cling to major design ideas and themes, even if these themes and ideas are faced with insurmountable challenges *(Lawson, 1997: 45 f), (Rowe, 1987: 36), (Porter, 2000a: 28), (Cross, 2004: 435)*. The emphasis and the willingness to pursue design novelty is often so strong among practising architects and industrial designers that the very ideas themselves create difficulties which hampers the design process *(Lawson, 1997: 46)*. But the emphasis on design novelty is also associated with progress and new design solutions that, without this emphasis, would not see the light of day. This point is highlighted by scholars like the psychologist Mihaly Csikszentmihalyi[156] when he asserts that:

> "Creative people are constantly surprised. They don't assume that they understand what is happening around them, and they don't assume that anybody else does either. They question the obvious—not out of contrariness but because they see the shortcomings of accepted explanations before the rest of us do." *(Csikszentmihalyi, 1996: 363)*

The importance of creativity, linked to the novel design value described by Csikszentmihalyi, can be indicted in the contra concept, which is often described as "design fixation" within a design context. In short "design fixation" is often seen as a readiness "to re-use features of known existing designs, rather than to explore the problem and generate new design features" *(Cross, 2001a: 86)*. Most practising architects and industrial designers tend not to be overly bound by "design fixation" as they tend pursue a innovative design approach, regardless of whether the design problem appears to be set in a routine or in an innovative context *(Cross, 2001a: 86)*. It is therefore justifiable to assert that the only major fixation that exists among most practising architects and industrial designers is the fixation to be different through novel design solutions *(Cross, 2001a: 86).*

The effect of this fixation related to the design value of novelty that has surprised some design scholars such as Bryan Lawson, who found it odd that novel design ideas and themes can hamper the design process and that difficult “big ideas” are not more readily rejected by architects and industrial designers *(Lawson, 1997: 46)*. Other design scholars like Harold G. Nelson and Erik Stolterman promote and defend this fixation on novel design solutions, by asserting arguments like: “design will always be about creating something that does not yet exist. It is not about finding something already in existence” *(Nelson and Stolterman, 2003: 31)*. This argument is often based on a belief that other fields of knowledge can primarily assist with description, or explanation, of already existing things, whereas insight into what should be brought into existence can—more or less—only be provided by intention, imagination and innovation, which is a key aspect of design *(Nelson and Stolterman, 2003: 31)*.[157] This can be indicated by a similar kind of argument by Herbert A. Simon when he stated that:

> “Engineering, medicine, business, architecture, and painting are concerned not with the necessary but with the contingent—not with how things are but with how they might be—in short, with design” *(Simon, 1969: xi)*

A client or indeed society may view the emphasis on novel design solutions found among architects and industrial designers as a straitjacket. This is particularly the case in design projects where the main emphasis, from the clients point of view, is not on creating new radical design concepts, but instead on making incremental modifications to existing design solutions *(Cross, 2000: 163), (Rowe, 1987: 36)*.[158] On the other hand, clients will typically appreciate novel design solutions when a commission coincides with a clients desire to express something new. This typically takes place when clients experience a shift in their own expectations and seek:

> “environmental changes to reflect and catalyze less tangible changes in their lives and organizations, so that design becomes not just the expression of a new attitude but the formation of it” *(Cuff, 1991: 96)*.

From an architectural and industrial design point of view the emphasis on novel design solutions has made it important for architects and industrial designers to enter the decision process at an early stage, as the conditions for creating a novel design solution is largely shaped by clients, policy makers at the outset of a design commission *(Porter, 2000a: 26)*. In practice many architects and industrial designers find themselves entering the design project or receiving the commissioned, when most of the key decisions and boundaries i.e. framing that sets the premise for the design project, have already been made *(Porter, 2000a: 26 - 28)*. This is due to the fact that novel design solutions tend to add a considerable element of risk from the commissioning point of view.[159] As many architects and industrial designers tend to champion novel design solutions, many professional clients, who are aware of this tendency, will be inclined to frame the commission in a way that limits the freedom the architect and designer is given. In general, experienced clients tend to make sure that “commissioning is accompanied by risk assessment so that, by the time the architect is engaged, the risks can be managed” *(Porter, 2000a: 28)*.

However, many architects and industrial designers will deliberately ignore the client’s effort to have an appropriate risk management strategy. The design value of novelty will, in many instances, lead practising architects and industrial designers to questioning the fundamentals of a given design commission, even if it is in conflict with the clients expressed wishes. This practise among designers can not be considered to be surprising as most architectural and industrial design schools educates designers to question the fundamentals of a design briefs regardless of the state of the brief and/or the client’s expressed wishes *(Lawson, 1997: 54 f)*.[160]

The emphasis found among architects and industrial designers on design novelty has also led to a situation where few architects and industrial designers will admit to a practice which is based on “thorough” studies of other projects and other practitioners *(Heylighen, 2000: 123)*, *(Collins, 1971: 25)*. This reluctance to accommodate the clients “real” wishes and to engage in studies of existing buildings and products has historical roots that can be linked to the conditions such as the extravagances of nineteenth-century eclecticism[161] *(Collins, 1971: 25)*.[162] In short, many architects and industrial designers express views that give the impression that “originality” and “precedents” are mutually exclusive. Many practising architects and industrial designers will invariably make a limited study of existing buildings or products which are appropriated for a given commission,[163] but the public justifications of such a study of precedents often proclaim that these studies are only conducted to avoid all of the precursors mistakes and shortcomings *(Collins, 1971: 25)*.

Even if the design value of novelty is a dominant force within architecture and industrial design, it is important to note that not all designers subscribe to this value,[164] and that novelty has not always been a core value within the two design professions. For instance, the enlargement of the Louvre Museum[165] in Paris, France is an indication of the change in values related to novelty among architects. The museum was originally designed by Pierre

Lescot[166] in 1546 and a succession of architects, including Claude Perrault[167], quadrupled the size of the museum between 1625 and 1750 without noticeably deviating from the precedent (the new design vocabulary of the Renaissance) established by Pierre Lescot *(Collins, 1971: 26)*.[168] But the views of many architects changed over the last century—no longer valuing convention over originality. The value of following precedents was considered insignificant when Ieoh M. Pei[169] designed a pyramid extension to the Louvre museum. Equally, was the extension to Royal Festival Hall[170] in London, England, which was originally designed by Leslie Martin, Peter Moro and Robert Matthew[171] and given a new "style" which contrasted with the original design (it was design for contrast rather than design for precedents) *(Collins, 1971: 26 f)*.[172] The venue was again extended by another contrasting design, designed by RFH architects and Allies & Morrison.[173]

It can be argued that the design value of novelty combined with the drive that architects and industrial designers have towards their own self-expression often have lead to design proposals being based on novel design solutions rather than being based on precedents. However, at the same time the design value of novelty is not generally accepted within either architecture or industrial design. This is indicated by the debate in architecture, focusing on whether buildings should harmonize with the surroundings in that they are situated in or not *(Collins, 1971: 28)*, as well as the point of view that design should be based on traditional topology and design styles i.e. classical and vernacular base architecture.[174] The same issues are indicated within the industrial design domain by the debate around the value of retro design an if it should be accepted or not.

4.2.2.1 Creativity in design

> *"It is good for the mind to go back to the beginning because the beginning of any established activity of man is its most wonderful moment. For in it lies all its spirit and resourcefulness, needs." — Louis I. Kahn (Scully, 1962: 115 f)*[175]

Closely linked to the design value of novelty is the value of creativity—often given high importance, as seen in architecture and to some extent industrial design. Creativity is increasingly defined as important only insofar as it is seen as art *(Blau, 1984: 58)* and/or that it represents an innovative design concept. Creativity is often linked and characterised by a number of aspects which include (the following is a direct quotation): (1.) creativity arises under special conditions, (2.) creativity is manifested either through a product or a process, (3.) creativity spans a considerable range of activities and products, from the sciences to the arts to everyday occurrences, (4.) the product of a creative act is novel and unusual in some sense, (5.) it is possible to discern some gradation of creativity among these products and processes, for instance, in terms of their social or lasting value *(Akin and Akin, 1996: 343)*.

Creativity has considerable roots in art which can be highlighted by artists like Auguste Rodin[176] who argues that an artist and designer must be a free and spontaneous creator, which implies that he/she should not submit them-selves to a preconceived set of norms, and he/she should mistrust whatever may sterilise inspiration *(Senosiain, 2003: 11)*. Creativity also links playful and careless inspiration etc. This point is indicted by Felix Candela[177], whom asserts that:

> "We should exert all our efforts, all our capacity for distressed and anxious work, in the elaboration of any task we decide to start. In order for the final result to be considered a work of art, however, it must seem to have been accomplished without any effort, as if it were the fruit of playful and careless inspiration."
> *(Senosiain, 2003: 11 f)*

In addition, creativity within a design context has often been linked to the ability to create innovative design concepts and to develop new forms and/or aesthetic styles and elements. Both architects and industrial designers have emphasised the role of intuition in the generation of new design solutions, and creativity has been widely seen as an essential element in design thinking where "creative leap" or "sudden mental insights" has been a central concept *(Cross, 2001a: 88)*. Creativity and creative thinking has tended to be regarded as mysterious and has often been linked to talents found among practising architects and industrial designers.

However, the "mysteriousness" of creativity is starting to be reduced as new explanatory descriptions of creativity have emerged from empirical studies within both design domains as well from other fields *(Cross, 2001a: 97)*. Some of these studies suggest that it is no longer appropriate to advocate "the key feature of creative design as dependent upon an intuitive, heroic 'creative leap' from problem to solution" *(Cross, 2001a: 97)*. Instead is it suggested that concepts like "problem framing, co-evolution, and conceptual bridging between problem space and solution space" *(Cross, 2001a: 97)* are better descriptions of what is actually taking place in the creative design processes *(Akin and Akin, 1996: 360)*.

Today the setting of frames of reference—either by the problem itself or by the designer, and how these are broken out of in realizing the "creative leap" or "sudden mental insights"—is considered to be the key ingriedient in a creative design process *(Akin and Akin, 1996: 360).*[178] Or to put it another way, in order for creative leaps or sudden mental insights to take place it is essential that the soil which this type of insight germinates from to be properly and painstakingly prepared *(Akin and Akin, 1996: 345).*[179] In the case of architecture and industrial design this can at times be a laborious process *(Akin and Akin, 1996: 345)*, which among other things is linked to designers' ability to sketch. This as freehand sketching is believed to encourage discoveries of unintended features and consequences *(Goldschmidt, 1994: 164), (Schön and Wiggins, 1994: 155).*[180]

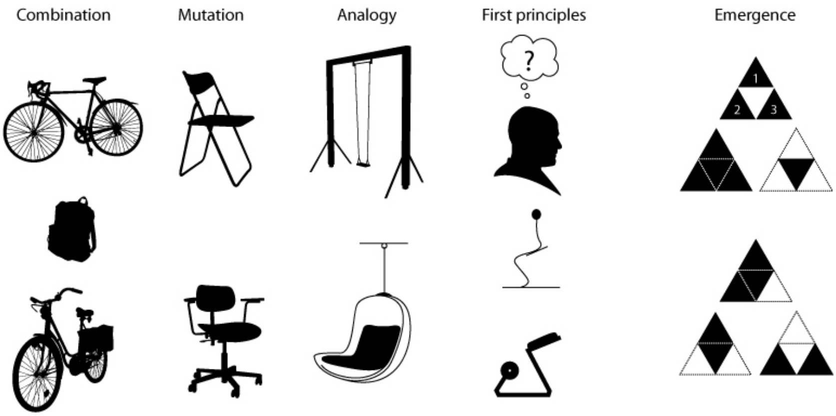
Unexpected discoveries that come from sketching in architecture and industrial design are often believed to be the strong impetus for creativity and "invention of important design requirements of a given problem" *(Suwa et al., 2000: 540)*. This is supported by the following assertion made by the design scholar Gabriella Goldschmidt who argues that:

> "One reads off the sketch more information than was invested in its making. This becomes possible because when we put down on paper dots, lines and other marks, new combinations and relationships among these elements are created that we could not have anticipated or planned for. We discover them in the sketch as it is being made, and some of these new configurations can potentially provide useful clues." *(Goldschmidt, 1994: 164)*

All in all is it often asserted within architecture and industrial design that it is not until ideas are externalised on paper that designers are able to find new aspects of the problem and can then use this understanding to generate new ideas *(Robbins, 1994: 27), (Goldschmidt, 1994: 164).*

Generally endeavours at understanding and promoting creative thinking in architecture and industrial design, in addition to sketching, often have their focus on techniques and approaches such as free-association thinking which includes brainstorming or forced associations etc. *(Cross, 1997: 315).*[181] This is often classified as a type of automatic thought process *(Hastie and Dawes, 2001: 4)*. Associative thinking is often brought on by: an idea which the "environment" brings to mind, an idea suggesting another idea or an idea retrieved from memory etc. *(Hastie and Dawes, 2001: 4, 115 f).*[182] Associative thinking is often seen as being at one end of the thinking spectrum where a controlled thought processes is at the other end.[183] In architecture and industrial design there is very little tradition of what is here described as controlled thinking, whereas lots of the design education and practice in design offices is geared towards gaining associative (automatic) skills and or knowledge.[184]

In this context of associational thinking and creativity tends to stem from five procedures suggested by John S. Gero and Michael A. Rosenman which are: combination, mutation, analogy, design from first principles[185] and emergence[186] *(Rosenman and Gero, 1993: 126 f) (Gero, 1994: 278 f).*[187] These are all illustrated in the following figure:



The illustration is taken from John S. Gero and Michael A. Rosenman's article "Creativity in Design Using a Design Prototype Approach" and John S. Gero's article "Computational Models of Creative Design Processes".

These procedures tend to be "widely accepted as useful explanatory models of creative design" *(Cross, 1997: 315)*. A challenge for creative thinking in architecture and industrial design can be found in challenges from scholars like Reid Hastie and Robyn M. Dawes, who argue that associative (automatic) thinking processes "systematically lead us to make poorer judgments and choices than we would by thinking in a more controlled manner about our decisions" *(Hastie and Dawes, 2001: 7)*. But they also point out that controlled thinking is not always preferable to an intuitive thought process *(Hastie and Dawes, 2001: 7)*. This gives food for thought if the focus on creativity within architecture and industrial design leads designers in some instances to utilise and celebrate associative (automatic) thinking where controlled thinking is more appropriate. The lack of emphasis on analytical skills, fact based knowledge and skills within the domain of design indicate that controlled thinking may, at the expense of creativity and design novelty, be an overlooked area within the two design professions.[188]

The creativity-led problem-solving strategy used by architects and industrial designers tends to be “different from that employed by other kinds of problem solvers” *(Cross, 2004: 432)*. Problem solving outside the design domain is often marked by attempts to define and or understand the problem fully before making any solution attempts, whereas designers “move rapidly to early solution conjectures, and use these conjectures as a way of exploring and defining problem-and-solution together” *(Cross, 2004: 432)*. Studies have indicated that experienced practising designers use “‘generative’ reasoning, in contrast to the deductive reasoning employed more by less-experienced designers” *(Cross, 2004: 432) (Lloyd and Scott, 1994: 133), (Lawson, 1979: 66 f)*. This is particularly evident in the approach applied by designers who have specific experience in the problem area they are attempting to resolve. Experienced architects and industrial designers tend to “approach the design task through solution conjectures, rather than through problem analysis” *(Cross, 2004: 432)*. This suggested that:

> “it is the variable of specific experience of the problem type that enables designers to adopt a conjectural approach to designing, that of framing or perceiving design problems in terms of relevant solutions.” *(Cross, 2004: 432)*

In addition, practising architects and industrial designers tend to be solution-focused not problem-focused *(Cross, 2004: 439)*. The link between conjectural approach and creativity among architects and industrial designers is an essential characteristic of the reflective decision making practice conducted by most designers, where problem framing is an essential concept.[189] The processes of structuring and formulating a given design problem is a key feature of design expertise and design decision process, which is indicated by the fact:

> “Successful, experienced and—especially—outstanding designers are found in various studies to be proactive in problem framing, actively imposing their view of the problem and directing the search for solution conjectures.” *(Cross, 2004: 439)*.

Another aspect of the designers’ way of solving design problems is the trademark visual thinking[190] which is a non-linear thought process *(Hastie and Dawes, 2001: 4), (Davis and Braun, 1997: 9 f)*.[191] Visual thinking is regarded to be particular suited to deal with lots of data and/or complex systems *(Davis and Braun, 1997: 10), (Hastie and Dawes, 2001: 183 f)*, which is commonly found in the wicked problems facing practising architects and industrial designers.[192] In addition visual thinking is associated with thinking in mental pictures of concepts and/or ideas *(Davis and Braun, 1997: 10)*. Verbal thinking, which is less strongly associated with architecture and industrial design, on the other hand, is characterised by being a thought process which involves linear reasoning and follows the structure of language *(Davis and Braun, 1997: 10), (Hastie and Dawes, 2001: 183 f)*. A number of scholars including Hastie and Dawes argues that individuals differ in the degree to which they use either mode of thinking *(Hastie and Dawes, 2001: 4), (Davis and Braun, 1997: 10)*, but it might be reasonable to assume that architects and designers generally have a greater component of visual thinking than is found among individuals generally. This is based on the observation that architects and industrial designers use sketches etc. as a core component in their creative and problem solving strategies.

The phenomenon of visual thinking is often linked to architects as well as inventors, electronic engineers etc. People like Nikola Tesla[193], Albert Einstein and Walt Disney[194] are all considered significantly visual thinkers. A visual thinker is often characterised by the following characteristics: (1.) they have problems remembering abstract chains of letters; like names, (2.) difficulty in explaining concepts they have invented, (3.) writing in a very convoluted style, (4.) natural ability to "quick read" whole sentences instead of word for word, but when asked to read out loud what they have read they often use other words than what is actually written, (5.) ability to remember exactly the location and relative position of objects they have placed somewhere and (6.) the ability to intuitively come to conclusions that are very hard to reach by using normal linear reasoning.[195]

However, creativity within architecture and industrial design is not without its problems and challenges. There are indications that when practising architects and industrial designers focus on creativity, it sometimes prevents them from solving "a problem in the 'easiest' way, or certainly with more ease than novices" *(Cross, 2004: 429)*. This is often due to the fact that creativity in design is closely linked to architects and industrial designers approach related to "wicked problems", which makes most designers treat most problems as ill-defined even if they by nature might be well-defined problems (as introduced in a previous section).[196] Studies of expert designers suggest that the "wicked problem" value within design causes creative experts to see problems as "harder" problems than novice designers might see them *(Cross and Cross, 1998: 148)*. Equally, studies have linked creativity to making priorities and taking decisions early on in the design process. Creativity is also associated with approaches that do not focus on gathering lots of information about the design challenges in the initial design process *(Cross, 2004: 430)*. Some studies even indicate that design students who focus on gathering lots of information are less successful creatively than their follow students which do not focus an information gathering *(Christiaans and Dorst, 1993: 136 f), (Cross et al., 1994: 42 f, 50)*. This as some students tend to become “stuck on information gathering, rather than progressing to solution generation” *(Cross, 2004: 430)*. It is important to note that design is often conducted in an iterative fashion where iteration is commonly found in the data gathering and identification of requirements stage, as well as the synthesis-evaluation stages *(Kruger and Cross, 2001: 225)*.

In the name of creativity a number of design scholars and design educationists will often describe and recommend architecture and industrial design students to develop a wide range of alternative solution concepts, but this approach appears not to be norm among architectural and industrial design practitioners *(Cross, 2001a: 97)*. Practising designers are generally reluctant to abandon early concepts *(Lawson, 1997: 45 f), (Rowe, 1987: 36), (Porter, 2000a: 28), (Cross, 2004: 435)*, as well as generating a wide ranges of alternative solution proposals *(Cross, 2004: 435)*. These observations are in conflict with the understanding proposed by a number of design theorists and design educationists, and are even in

> “conflict with the idea that it is the exploration of solution concepts that assists the designer’s problem understanding; having more than one solution concept in play should promote a more comprehensive assessment and understanding of the problem.” *(Cross, 2004: 435)*

Consequently, creativity within architectural and industrial design practices is not closely related to the development of a wide range of alternatives. A number of studies “suggested that the generation of a relatively limited amount of alternatives may be the most appropriate strategy” *(Cross, 2001a: 97)*. This confirms the anecdotal view that most practising architects and industrial designers tend to develop a limed amount of problem-space and the solution-space studies during the design process *(Suwa et al., 2000: 567)*, where creativity is the factor used in bridging the gap between the problem and solution-space *(Cross, 1997: 317)*.[197]

The focus on creativity i.e. the creative design value has been a contributing factor in preventing any attempt at proposing systematic models for the design process to be widely accepted within either architecture and industrial design *(Cross, 2001a: 91)*. Most architects and industrial designers tend to practice in a rather ad-hoc and unsystematic way and are “wary of systematic procedures that, in general, still have to prove their value in design practice" *(Cross, 2001a: 91)*.

Both architecture and industrial design are most certainly characterised by creative processes, but design tends "not take place in a vacuum, with a completely free choice of colours, shapes, and materials" *(Bürdek, 2005: 225)*. More often than not design is the result of a "development process influenced by various—not only artistic—conditions and decisions" *(Bürdek, 2005: 225)*, as:

> "socio-economic, technological, and cultural developments, in particular, along with the historical background and the conditions of production technology, play just as important a role here as ergonomic and ecological demands, economic and political interests, and artistic-experimental aspirations." *(Bürdek, 2005: 225)*

Design will therefore always entail value-related compromises between the different "conditions" which characterise a given design project. The focus on creativity and novel design solutions will often lead to disappointment among practising designers, due to the lack of opportunity to use their "skills and knowledge acquired in training and especially the lack of opportunities to participate in design" *(Blau, 1984: 59)*. This disappointment can be manly linked to the value of design creativity, as most architects and industrial designers "are destined to fail to realize their aspirations and they know that" *(Blau, 1984: 59)*.

As indicated in this section there is a gap between some creative theories and actual design practice, one possible explanation for this discrepancy might be that many design scholars have been reluctant to take design value into their explanation for how architects and industrial designers actually work in real life. In addition, it has been indicated that design education and many practising architects and industrial designers, as well as design scholars, place emphasis on creativity and novelty. It should therefore not come as a surprise that there exists a reluctance for and lack of empirical study in design (which is described in more detail later in this chapter).

4.2.3 The "holistic" approach

> *"The whole is greater than the sum of its parts"*[198] — *Eugene Odum*[199]

Architecture and industrial design are often seen as enterprises, which constitute a whole, or to put it another way, design is often argued to be a holistic enterprise. Holism[200] has no universal accepted definitions,[201] but some commonalities exist in that the concepts of holism tend to incorporate claims of comprehensiveness as well as "inclusive understanding of the relationship of everything to everything" *(Nelson and Stolterman, 2003: 120)*. In architecture and industrial design holism tends to imply an all-inclusive design perspective, which is often regarded as somewhat exclusive to the two design professions *(Nelson and Stolterman, 2003: 117)*. Holism is often considered as something that sets architects and industrial designers apart from other professions that participate in design projects. This view is supported and advocated by practising designers and design scholars alike, who often argue that architecture and/or industrial design have a distinct holistic character.[202] The fact that design education, architects and industrial designers as well as design scholars often put emphasis on the totality of a design project constitutes a particular design value, which is the holistic design value.

The holistic emphasis found within architecture and industrial design has had implications for design education, which can be illustrated in the differences that tend to exist between the training of architects as well as industrial designers and that of for instance civil engineers. Traditionally civil engineering schools adopted a pedagogical system that states "do not start by designing an entire structure, but by studying detailed problems inherent in the design of a certain type of structure" *(Collins, 1971: 97)*. Whereas architectural and industrial design students have conventionally been expected to design total entities from the very beginning, any progression is found where students are being given progressively larger and more complex problems to solve.[203] The adherence to the holistic design value has traditionally meant that practising architects and industrial designers focus on and try to incorporate and solve a wide range of different issues through the design process.[204] Based on this, one would be forgiven in thinking that the holistic design perspective found within architecture and industrial design would make system thinking an unavoidable or natural phenomenon, but there are few general common characteristics between system thinking[205] and design thinking.[206] Instead, architects and industrial designers tend to approach complex problems through a trial and error approach, which is often described as an iterative development of a design project.

This emphasis on holism leads to the tendency that exists among architects and industrial designers to see themselves as the only champion of the holistic aspect of the creation of buildings or products. This tendency is illustrated by an assertion made by the Swedish architect Carl-Gustav Hagander which states that “you don’t try to look like you know everything … but you have to be able to put all the parts together” *(Edwards, 1999: vii, 125)*. By this Hagander implies that architects have to support comprehensive thinking, which means “that several people are contributing creatively to the same project, and the architect acts as a coordinator and guide” *(Edwards, 1999: 125)*. Based on this holistic design value architects and industrial designers tend to try to control or influence all the different aspects of a design project, and consider themselves as the natural person to be in charge of the design process *(Cuff, 1991: 77)*.

However, architects and industrial designers tend not to be the sole representatives of the holistic approach, and their attempts to influence, control and be in charge of the design process are increasingly challenged by their clients and other professions.[207] Conflicts often arise between different members of a design team who make claims to have a “the holistic” overview of a given design project. The different members often adhere to different types of holistic viewpoints, based on their different value sets.[208] This makes the different holistic perspectives an important source of conflict between the different participants in design projects. This as conflicting holistic perspectives held by the different participants leads the different parties to view a design brief significantly different in addition to being a source for different priorities among the different stakeholders.[209] The difference in holistic perspectives can be illustrated in urban housing strategies, which have at times included opposing holistic perspectives such as “prophylactic slum clearance” and “preservation of natural communities” *(Schön and Rein, 1994: 29)*. The overall design rationale will significantly differ if one subscribes to “prophylactic slum clearance” as oppose to “preservation of natural communities” and vice versa.

As indicated in the previous section, often practising architects and industrial designers’ will insist on carrying through a design concept, regardless of the obstacles which may face the implementation *(Lawson, 1997: 45 f), (Rowe, 1987: 36), (Porter, 2000a: 28), (Cross, 2004: 435)*. This attitude is not only connected to their emphasis on questioning the preconditions as part of a creative methodology, but is also strongly influenced by a holistic approach to design.

From a holistic perspective every design concept appears to have a breaking point where an initial design concept can be compromised to such an extent that it loses its genuine character or essence *(Nelson and Stolterman, 2003: 279)*. Any concept has a certain amount of flexibility built into it, but no matter how flexible a design concept is, it will eventually have a breakpoint

(Nelson and Stolterman, 2003: 279). A watered-down design concept will, from an architect or industrial designer's holistic point of view, at a certain point, loose its essential quality.[210] Architects and industrial designers' willingness to fight for the completeness of a design concept as well as essential elements, is linked to elements such as: (1.) design concepts breaking point, (2.) the creative methodology of questioning the preconditions and (3.) the focus on and attempts to incorporate and solve a wide range of different issues through the design process.

The holistic design value within architecture and industrial design is also closely connected to escalation[211] and regression[212]. Escalation in a design context implies a designer's tendency to escalate problem area far beyond the original design brief and or the original design problem. This tendency for escalation far beyond the original design problem is humorously illustrated by John P. Eberhard in his somewhat cautionary story found in his article "We Ought to Know the Difference", where Eberhard describe what he assumed would happen if he gave a designer the task of designing a doorknob for his office door:

> "If I gave a contract to a designer and said, 'The doorknob in my office does not have much imagination, much design content. Will you design me a new doorknob?' He would say 'Yes,' and after we establish a price he goes away. A week later he comes back and says, 'Mr. Eberhard, I've been thinking about that doorknob. First we ought to ask ourselves whether a doorknob is the best way of opening and closing a door.' I say, 'Fine, I believe in imagination, go to it.' He comes back later and says, 'You know, I've been thinking about your problem, and the only reason you want a doorknob is you presume you want a door to your office. Are you sure that a door is the best way of controlling egress, exit, and privacy.' 'No, I'm not sure at all.' 'Well I want to worry about that problem.' He comes back a week later and says, 'The only reason we have to worry about the aperture problem is that you insist on having four walls around your office. Are you sure that is the best way for organizing this space for the kind of work you do as a bureaucrat?' I say, 'No I am not sure at all.' Well, this escalates until (and this has literally happened in two contracts, although not through the exact process) our physical designer comes back with a very serious face. 'Mr. Eberhard, we have to decide whether capitalistic democracy is the best

> way to organize our country before I can attack your problem.'" *(Eberhard, 1970: 364 f)*

As illustrated in the above example, the imaginary designer starts by attempting to take a holistic view of the design task of designing a doorknob. The holistic design value leads the designer to question the original design brief and to escalate the design problem. Unchecked escalation of the design problem can potentially lead designers to propose the complete redesign of the client's organisation, in response to the original design brief, exemplified here in creating an office doorknob. But it need not stop there; it can escalate to proposing such radical system changes, as the extreme escalation in the above example illustrates, with the questioning of the very political system which allows this organisation to exist *(Lawson, 1997: 54)*.

From the perspective of architects and industrial designers, escalation of design problems often leads to difficulties in setting appropriate boundaries for a given design task. This tendency among practising designers is indicated in a joke which was made at the expense of William L. Pereira[213] which states that "if Pereira were given the right project, he would come up with a plan for the rest of the world" *(Edwards, 1999: 25)*.[214] Another humorous example illustrating this characteristic of escalation (some will argue, hang-up) is found in a legend concerning the landscape architect Capability Brown[215], which states that one of his:

> "rivals is reported to have said that he hoped he would die and come to heaven before Brown did so that he could see it as it was before Brown started making changes."[216] *(Edwards, 1999: 293)*

Equally, regression is a tendency found among architects and industrial designers that is linked to holism (this might at first glance appear surprising). Regression is characterised by an over developed focus on a particular detail of a specific design problem which goes far beyond the intended boundaries of the original design problem. The characteristic of regression is illustrated by Bryan Lawson's account of a design student, and his approach to the design task of designing a new central library building. The student in question decided that he would start the design process by studying the various methods of loaning and storing books *(Lawson, 1997: 54)*.[217] This subsequently led to an "over" focus on loaning and storing books that became overwhelming and excluded other important issues.[218] This sole focus on loaning and storing amounted to regression with regards to the original design brief, and it led Lawson to conclude that it "looked more as if he was preparing for a degree in librarianship than one in architecture" *(Lawson, 1997: 54)*.

In the case of Lawson's architectural student, by studying librarianship he or she may use the limited focus as a design method to question the original design brief (which is encouraged in many design schools).[219] The student may become convinced that:

> "a new central library building is no answer. The problem, he may argue, lies in designing a new system of making books more available by providing branch libraries, travelling libraries or perhaps even using new methods of data transmission by television." *(Lawson, 1997: 55)*

This assertion of redefining the original design problem through regressions leads to a new holistic view of what may be the appropriate solution to designing a new central library. Both escalation and regression tend to lead architects and industrial designers to propose design solutions, as well as acquire new holistic perspectives, which can be far from the expectations stated in the original design brief. In addition, these two phenomena are not mutually exclusive, as escalation and regression are often found together in design projects *(Lawson, 1997: 55)*. Escalation and regression are even used as a design method to encourage and stimulate the creation of creative and innovative solutions.

The emphasis on the holistic design value, which is often found within architecture and industrial design, tends to create challenges in being able to frame a given design task in a coherent way, especially when escalation and regression are involved. This is due to the fact that the holistic approach can make it difficult to know what problems are relevant and what information will be useful for the design project *(Lawson, 1997: 54 f)*. Depending on the broadness of the holistic approach it can lead to holism-inhibition, which occurs when the designer is unable to formulate a means of bounding or limiting the comprehensive expansion of a design task *(Nelson and Stolterman, 2003: 133)*.

4.3 KNOWLEDGE FOUNDATION FROM A VALUES PERSPECTIVE

> *“Although we can easily imagine what a legal scholar might contribute to the profession of law (as is evident in the recent development of critical legal theory), or what a scholar of medicine might offer to his or her profession, we still have little understanding of how a design scholar might be able to bring theory, criticism, or history to bear on issues central to the design professions, whether these issues relate to practice, education, or even public perception of design and designers. […] For design to be taken seriously by educators, policymakers, and the public, we must develop a body of serious and useful research which can make the benefits of studying design's history, theory, and criticism more evident, not only to educators and professionals but also to the public. This latter audience is particularly important because it is members of the public that both commission and make use of design, as consumers or as taxpayers who support public works and other civic programs.”* (Margolin, 1989: 4 f)

As indicated in the previous sections of this chapter, as well as in the previous chapters, the knowledge foundation within architecture and industrial design is different from that which is found in many other professions. There are a number of values within architecture and industrial design that contribute to sustaining this difference between the knowledge bases found within the two design domains and that which are found in other professions like medicine, law and engineering.

Thus, the following sections will introduce some of the main values and aspects that contribute to the specific skill and knowledge development found within architecture and industrial design. It will also attempt to highlight some of the differences that can be found between architecture and industrial design and other professions like medicine, law and engineering from a knowledge perspective. Some indications will also be given to the historical roots for some of these differences, as well as the implications for practising architects and industrial designers.

4.3.1 Design generalist versus specialisation

> *"I am an architect and like all architects I know nothing about anything, but I have to make decisions about everything. That is a terrible burden. Architects are often condemned for the foolish things they do and they do many of them. But if you look at it from the architect's point of view, he starts with an empty site with a blank piece of paper, an equation with thousands of unknowns and relatively few knowns. He has to solve the equation by Friday and make it beautiful too. With a problem like that, designers have to guess the unknown on the basis of the best information available. It is important that this is understood by all of the other professions involved, such as health, social medicine, behavioural medicine, finance, building management and building maintenance." — Geoffrey Hewland Hutton (Walker Bryan and Singh, 1996: ix)*

Specialisations within a particular knowledge domain exist in most professions, but specialization generally plays a different role within architecture and industrial design, when compared to other established professions such as: law, medicine and engineering *(Blau, 1984: 37)*. The clear branches dividing the knowledge domain into a range of diverse practices within, for instance law, medicine and engineering, have not emerged in the same way within the filed of architecture and industrial design *(Blau, 1984: 37)*. This is not to say that within the domain of design any form of division of expertise does not exist. On the contrary, there exists a range of division of expertises such as architecture (architecture and urban planning), industrial design (product design), furniture design, graphic design and systems design.[220] But, when compared to the specialisations found in other professions such as law, medicine and engineering, it is of a different characteristic, as the main branches of specialisations within the two design domains do not represent the same level of knowledge specialisation which can be found in other professions *(Blau, 1984: 44 f)*. It can be argued that the division found within the design domain is of a "weak" and "fluid" character,[221] as architecture is often seen as the mother of all design professions. Another indication of this "weak" and "fluid" character can be found in that it is not uncommon for architects to venture into the domain of the adjacent design professions by designing furniture, products, or graphics. Equally is it is not uncommon for designers from more or less all other design disciplines to venture[222] into the domain of the neighbouring design professions.

Design professions are traditionally characterised by a continuing resistance to being defined by boundaries and internal specialization *(Blau, 1984: 7)*. Within architecture and industrial design it is often argued that design as a liberal art has a spatial overview which cuts across other subject domains *(Buchanan, 1995b: 19)*, and that designers have a spatial expertise which makes them particularly suited to shaping the useful and beautiful, regardless of their core design domain.

The "weak" and "fluid" character of the boundaries between the different design professions is generally of little concern to design scholars as well as to practising architects and industrial designers. This is in line with fact that one of the main values found within most of the design professions is the design value of a generalist as opposed to a specialist, which is uncommon in other professional domains. A generalist in a design context tends to imply an overall as well as a varied competence and skills base which can be utilised in different fields and design activities. What is generally reflected in the design value of a generalist can be highlighted by assertion made to describe the competencies needed to conduct a successful design project. A number of design scholars as well as practising architects and industrial designers tend to argue for a broad spectrum of knowledge and skills required to successfully conduct a design project. This argument concerning the diversity of competence can be illustrated by an argumentation made by Donald W. MacKinnon, who asserts that:

> "If an architect's designs are to give delight the architect must be an artist; if they are to be technologically sound and efficiently planned he must also be something of a scientist, at least an applied scientist or engineer. Yet clearly if one has any knowledge of architects and their practice, one realizes that it does not suffice that an architect be at one and the same time artist and scientist if he is to be highly creative in the practice of the profession. He must also to some extent be businessman, lawyer, advertiser, author journalist, educator and psychologist." *(MacKinnon, 1965: 274)*

This assertion reveals the broad spectrum found in the design value of a generalist, which dates back to the time of Vitruvius. In much the same way as MacKinnon supports Vitruvius' argument for a general expertise and broad knowledge and skill base among architects, which can be illustrated by Vitruvius' following argument:

> "Let him be educated, skilful with the pencil, instructed in geometry, know much history, have followed the philosophers with attention, understand music, have some knowledge of medicine, know the opinions of the jurists, and be acquainted

> with astronomy and the theory of the heavens." *(Vitruvius Pollio, 1960: 5 f)*

The potential broad knowledge and skill spectrum that architects and/or industrial designers are expected to acquire if they were to adhere to the knowledge and skills prescribed by design scholars such as MacKinnon and Vitruvius, would have been—even in Vitruvius time—a considerable burden for his contemporaries. Equally, it is a colossal burden for twenty-first century architect or industrial designer, as behind the assertions of Vitruvius and MacKinnon there is in fact a tremendous demand for a range of expertise and knowledge. It would also place a considerable burden on architectural and industrial design schools, if they where to follow the recommendations as a basis for their curriculum.

Architectural and industrial design schools have generally not been offering a curriculum that incorporates the recommendations of Vitruvius and MacKinnon for an appropriate knowledge base. Instead, most architectural and industrial design schools have focused on educating their students in what is considered to be general design skills, with little focus on an extensive formal knowledge base. This has typically implied a focus on creativity, aesthetics, building "technology" and history of architecture etc. *(Symes et al., 1995: 47)*. The generalist approach found in design schools has tended not to cover other subjects like: "office management, budget management, construction management, human behaviour, marketing, research and accounting" *(Symes et al., 1995: 47)*. Neither has it covered the many other forms of more specialised expertise which are often needed by architects and industrial designers *(Symes et al., 1995: 47)*.

The generalist approach found in design education is in line with, and contributes to, the fact that most designers and design scholars argue that the general complexity found within a design project tends not to be related to technological issues, but is instead related to the overall solution (holistic solution)[223] of a given design project. The contemporary institutional and ideological trend has been to train design generalists, which is evident in the broad and relatively standardised curriculum, which is found in most architectural and design schools, and which is followed through in accreditation as well as in the multisectioned architectural registration exam found in some countries *(Kvan and Thilakaratne, 2003: 2), (Cuff, 1991: 258)*.

Another indication of the acceptance and importance of the generalist versus the specialist within architecture and industrial design can be found in that it is not uncommon for students and fresh graduates to receive acclaim in professional architectural or industrial design competitions. The fact that student and fresh graduates are able to compete with established firms in design competitions implies that the competitions organisers are not looking for specialised knowledge and expertise which only long practise of further education could supply. This is indicated by the 520 designs submitted in the competition for the first stage of the Toronto City Hall in April 1958, where a graduate student at M.I.T. architecture department was among the seven finalists *(Collins, 1971: 88)*. Equally it is indicated in celebrated architects like Le Corbusier "who had no formal academic architectural training whatsoever" *(Collins, 1971: 89)*. From these examples, one is able to argue that, within the generalist approach commonly found in architecture and industrial design, it is possible to become an excellent designer, without much formal specialisation or much specialist practise.

The trend of a generalist approach in architecture and industrial design schools is mirrored in architectural and industrial design firms.[224] Generally designs firms are characterised by having employees that are mainly design generalists and are therefore characterised by less specialisation compared to what is found in comparable firms that are based on competencies found in other professions *(Blau, 1984: 44 f)*.[225] The employment of design generalists in architectural firms is often seen as a "fundamental and distinctive component of the architectural profession precisely because of the absence of recognized specialties" *(Blau, 1984: 45)*. Outside the context of architecture and industrial design, specialisation tends to be connected to positions of status and power, as they are generally granted to those with the most in-depth specialisation *(Blau, 1984: 45)*. For instance, the neurosurgeon and the constitutional lawyer are the ones with the most status within their retrospective professions, and other professionals within the same fields tend to rely on their specific expertise *(Blau, 1984: 45)*. This is not the case in the two design professions where the lack of clearly defined specialties based on subknowledge domain tends to obscure the sources and nature of power. This is particularly evident when the two design professions are compared to what is commonly found in other professions that have developed "clear branches of knowledge and practice that divide the fields (within, for example, medicine and engineering)" *(Blau, 1984: 38)*. Consequently, the lack of specialisation within the two educational systems and within design firms, means that it is only after years of experience that an architect for instance can become an expert in hospital design *(Cuff, 1991: 258)*. A legitimate question regarding the design professions' lack of specialisation while facing an increased complexity[226] is whether experience should be the only route to gain some sort of specialised expertise *(Cuff, 1991: 258)*.

Even if most architects and industrial designers are mainly trained as generalists, most architects and industrial designers variably operate outside the scope offered by their education. Many architects and industrial designers do at times operate as a "businessperson, market analyst, psychologist, contractor, politician, and arbitrator" *(Cuff, 1991: 85)*, which is clearly outside the scope of design education. Even so, it is not uncommon to hear architects make statements such as: "'The social grouping in a dorm should not exceed 20 people,' 'Its hard to sell a condominium with more than two bedrooms'" *(Cuff, 1991: 85)*. The factual quality of these statements is uncertain, as they are neither grounded in the architect's education nor in their general domain of expertise. At the same time it is not uncommon for architects and industrial designers to assume and/or be assigned responsibility in accordance with such statements *(Cuff, 1991: 85)*. Most architects do not consider it a problem that this type of issue is outside the domain of their expertise, as they (as well as industrial designers) subscribe to the design value of a generalist. From an architectural generalist perspective (as well as experience point of view) the above statement is within the domain of knowledge and expertise found in architecture. The logic for taking on these issues without any educational training or research-based knowledge is related to the fact that the design value of a generalist is consistent with other design values. These consistencies include design values such as: the design value of holism,[227] the push for novelty that exists in design,[228] the lack of empirical study in design,[229] as well as the design professions' relationship to art *(Blau, 1984: 7)*.[230]

However, the generalist design value found within architecture and industrial design has come under pressure from the general technological development and advances, which have put pressure on the traditional established design approaches and working practices.[231] As previously introduced in this chapter it can, from a technological point of view, be argued that the technological advances that have taken place the last couple of decades have changed the body of knowledge that affects the two design professions. This is the case, to such an extent that, in order to live up to the expectations from clients and other stakeholders the design professions have in the past needed to rethink the generalist design value.[232] For instance, an indication of this change can be found in the 19th century at the École des Beaux Arts where teachers like Julien Guadet[233] were arguing that architectural design consisted of three processes which were referred to as composition, proportion and construction *(Collins, 1971: 81)*. The subsequent technological development has become so complex that, from a contemporary and technological point of view, Guadet's assertions now appear to be an oversimplification.

Equally, the pressure asserted by the technological development on the generalist value can be found in an assertion made by Horst Rittel when he argues that:

> "The territory of architecture has been shrinking. Architecture has never proliferated into specializations. Whenever an area within architecture became systematized and showed signs of life, it was happily abandoned and left to the claims of other professions—new or old." *(Rittel, 1976: 79)*

Other design scholars have reiterated Rittel's assertion and, as pointed out previously, have even gone as far as arguing that "architects have consistently and over a long period failed to absorb new technical knowledge into their modus operandi" *(Symes et al., 1995: 16).*

Technological advances have lead to the development of new professional specialisation (outside of the design domain), the consequence is that many aspects that were formerly considered to be within the domain of architecture and industrial design have been surrendered to other professions *(Symes et al., 1995: 16, 47), (Rittel, 1976: 79).* For instance, the engineering professions have been surrendered aspects like heating and environmental control problems of building *(Rittel, 1976: 79).* In much the same way other professionals have absorbed the overall responsibility of a design project, as the architectural and industrial design professions have not been concerned with making the building and/or product economically viable and making the financial problems part of their core domain *(Rittel, 1976: 79).*[234]

From a technological point of view it has been argued that the "increasing complexities of the architectural profession's larger context have grown virtually unintelligible" *(Cuff, 2000: 346).*[235] This assertion is based on the tremendous technological change that has emerged in the last century, regarding both the core as well as in the adjacent areas of the architectural and industrial design professions. These changes involve an increased complexity in areas such as: (1.) structural systems, (2.) mechanical systems, (3.) electrical systems, (4.) communication and transportation, (5.) acoustics, (6.) lighting design (7.) landscape design, (8.) materials, (9.) experimental structures, (10.) prefabrication, (11.) alteration of existing structures and (12.) restoration and preservation etc. *(Blau, 1984: 37).*

From a pure technological perspective the two design professions would benefit from creating sub-disciplines; it would enable them to acquiring the substantial available technical knowledge that already exists in a number of areas. It would also equip them to make better use of the new emerging technological opportunities. It can be argued that the generalist approach found in the two design professions is problematic from a technological development's point of view, as many architects and industrial designers are unprepared both individually and as a group in coping with the effects of the rapid changes resulting from the technological development *(Symes et al., 1995: 15 f).*[236] It also prevents designers from being "sufficiently skilled in the identification of newly emerging market requirements and the adoption of new technologies" *(Symes et al., 1995: 16).*

The general adherence to the generalist design value that exists in architecture and in industrial design has left the designers with little basis to argue from a factual point of view.[237] This strategy has in the past (and still does) left architects and designers more or less incapable of arguing and justifying a design proposal from a strictly factual point of view. Consequently, architects and industrial designers are, to a large degree, left with only value related argumentation and reasoning, as opposed to the factual argumentation conducted by the other professions like engineering. But as pointed out in a previous section, this lack of factual knowledge among architects and industrial designers is to some extent, made up for in cross-profession project teams that consists of members from different professions. In modern collaborative design projects an architect and/or industrial designer will be able to consult other team members with regards to their expertise in specific details or factual questions.[238] They will typically consult engineers, other designers, and other specialists, who have specific knowledge and expertise in a given domain. An example of this type of collaboration can be found in projects of a large size or complexity such as design of a museum facility. In large projects an architect (or an architectural office) will normally consult with a number of other professionals, which will typically include professionals such as: building engineers, interior designers, a lighting expert and a landscape architect *(Cuff, 1991: 85).*

One of the main effects of the central position that the generalist design values hold within the design professions, is that the design discourse shows little or no progress. This as the central topics discussed have remained very much the same for a considerable amount of time, and the fact that there has been little advancement in the treatment and discussion of these topics *(Rittel, 1976: 80).* Generally it can be argued that the discourse within architecture and industrial design notoriously tends to start from scratch, "generously disregarding previous results, even if published" *(Rittel, 1976: 80).* This has contributed to the common uncertainty of accumulated expertise, which is frequently found among practising architects and industrial designers *(Rittel, 1976: 80).* Instead of a clear understanding of their expertise, many practising architects and industrial designers are torn between numerous and quite diverse self-images of their expertise, which tend to include: the artists who express themselves, social engineers or environmental controllers, coordinators of numerous stakeholders etc. *(Rittel, 1976: 80)*. This is in stark contrast to the self-conscious and self-assured postures which can be found in other professions such as medicine or law *(Rittel, 1976: 80)*.

The lack of specialisation within architectural and design practices has the effect that the two design professions define their skill and knowledge base very broadly. As pointed out in chapter three, this has made it difficult for clients to recognise the specialist skills which the design professions are able to provide *(Jackson, 1992: 16)*, simply because, compared to other professions is the skill and knowledge base not very specialized. The lack of a core knowledge which is solely administered and distributed by the design professions has put them under strain as "clients are becoming much more professional in the way they procure both buildings and design services" *(Jackson, 1992: 5)*. Clients and society for which they are designing are increasingly unwilling to accept at face value the forms and terms of service that architects and industrial designers have been accustomed to offering *(Jackson, 1992: 5)*.[239]

The constant development and advances found within the domain of technology in conjunction with other developments have spurred on a discourse among some design scholars with regards to the need for an increased specialisation within the design professions *(Cuff, 1991: 258)*. This discourse has been debated on the lines of: should one intensify the generalist education of architects "to cope with the vast and complex array of issues that will confront them?" *(Cuff, 1991: 258)*, or should one on the other hand "accept the increasing specialization within architecture and train experts in the relevant sub-disciplines?" *(Cuff, 1991: 258)*. The prevailing view among design schools, design scholars and practising architects and industrial designers has so far been to adhere to the design value of a generalist. However, it is questionable if this position will be attainable and sustainable in the future, as it is under pressure from the technological developments and from the success of the emerging skills and knowledge base found in adjacent professions.

4.3.2 Tacit knowledge in design

> *"We know more than we can tell. This fact seems obvious enough; but it is not easy to say exactly what it means. Take an example. We know a person's face, and can recognize it among a thousand, indeed among a million. Yet we usually cannot tell how we recognize a face we know. So most of this knowledge cannot be put into words." — Michael Polanyi*[240] *(Polanyi, 1967: 4)*

A wide variety of "knowledge" found within architecture and industrial design is often described as "tacit knowledge". The term tacit[241] knowledge was first defined by Michael Polanyi towards the end of the 1930s. Polanyi's development and defining of the concept of tacit knowledge took place as a result of a general concern regarding the prevailing positivist climate of the 1930s *(Putnam, 2002: 29 f).*[242] In response to this climate Polanyi developed a theory of knowledge that encompassed all kinds of knowing where the concept of tacit knowledge is a cornerstone. Tacit knowledge is based on the observation that "people often know more than they can tell—their knowledge cannot be put into words" *(Phillips, 1987: 92)*. These characteristics can be found in the above quotation by Polanyi, where he asserted that people have the ability to recognize human faces without necessarily the ability to explain how they did it. Another example can be found in the chicken-sexer who is able to sort chickens by sex, whilst not being able to say how this is done *(Phillips, 1987: 92)*. Equally, a champagne-maker knows "how much to twist the bottles during a tour of the cellars" *(Phillips, 1987: 92)*, but is unable to describe how he/she knows the degree to which each bottle needs to be turned *(Phillips, 1987: 92).*

Polanyi's concept of tacit knowledge has some qualifying elements that have often slipped the attention of a number of design scholars when they have been referring to, referencing and/or using his concept. Although Polanyi's work states "that people sometimes know how to perform skilled tasks without being able to explain how they are able to do them" *(Phillips, 1987: 93),*[243] can not any unaccounted skilled tasks be accounted for as tacit knowledge. This as Polanyi's work does not state that any skill or knowledge that can not be accounted for can be accepted as tacit knowledge *(Phillips, 1987: 93)*. On the contrary, Polanyi's tacit knowledge concept has two main qualifying principles which are: (1) "a person need not be able to articulate the theory behind his or her skill" *(Phillips, 1987: 93)*, (2) but it should be possible to "recognize that this person is skilled by judging the performance against explicit standards" *(Phillips, 1987: 93)*. It is this second qualifying principle of the original concept of tacit knowledge that design scholars often fail to acknowledge and emphasise. Out of a wide variety of "knowledge" which is often described as tacit within architecture and industrial design, most of it tends to lack an explicit recognisable standard against which it can be judged.[244] The idea that claims that tacit knowledge needs to be put through a form of testing is often not emphasised or omitted by practising architects and industrial designers as well as design scholars. In short, the concept of tacit knowledge which is found in a design context seldom referrers and adheres to Polanyi's original definition *(Phillips, 1987: 94)*.

However, as most concepts, the concept of tacit knowledge has been further developed. Recent academic deliberation on the concept of tacit knowledge has extended its scope to also including a link to "attainment of goals people value" *(Sternberg, 2002: 233)*. For instance, scholars like Robert J. Sternberg[245] are arguing that tacit knowledge is characterised by three main features which are: (1.) tacit knowledge is procedural, (2.) relevant to the attainment of goals people value and (3) acquired with little or no help from others *(Sternberg, 2002: 233)*. Sternberg views tacit knowledge as being intimately related to action and "as a form of 'knowing how' rather than of 'knowing that'"*(Sternberg, 2002: 233)*.[246] He also argues that:

> "Tacit knowledge is wedded to contexts, so that the tacit knowledge that would apply in one context would not necessarily apply in another. People may not see things in this light, however. They may believe that if they make wise judgments in one domain, they are generally wise across domains. This belief in their own wisdom is often what brings them down." *(Sternberg, 2002: 234 f)*

It can generally be argued that, within the domain of architecture and industrial design, skills and design knowledge are largely linked to the concept of "tacit knowledge" as opposed to the concept of empirical research.[247] Within a design context, the term is often used as a justification and explanation for the "knowledge" that exists within the professions, and as a defence for the lack of empirically based knowledge. This is connected to the practical behaviour of many architects and industrial designers that shows that they are relying on skills adopted from experience rather than knowledge gathered from textbooks or procedures manuals, which is indicated in the following:

> "Practice is the embodiment, indeed the expression, of the practitioner's everyday knowledge. In practice, the architect does not refer to textbooks or procedures manuals to determine how best to behave. […] The architect finds it difficult to explain how to persuade a client, recognize an acceptable

compromise, work within the budget—these are things you 'just do'." *(Cuff, 1991: 4 f)*[248]

Architects and designers' behaviour in practical design work suggests that the skills and the knowledge which they apply bears the hallmark of tacit knowledge, even if the type of knowledge does not necessarily comply with the original or subsequent definition of tacit knowledge. Design scholars and practising architects and industrial designers who argue that design knowledge consists of a considerable amount of tacit knowledge seldom refer to the above observations; which describe a link between tacit knowledge and: (1.) peoples values, (2.) the fact that tacit knowledge is characterised by context dependency and that (3.) tacit knowledge should be judged according to explicit standards.

Tacit knowledge is acknowledged by many design methodologists to be "an essential component of the skills and qualitative decision-making processes of designers" *(Whiteley, 1993: 145)*. Design scholars and practising architects and industrial designers alike tend to argue that tacit knowledge is derived from design experience, "and often makes the difference between doing something in a satisfactory manner, and doing it well" *(Whiteley, 1993: 145)*. A sober and maybe more appropriate account of tacit knowledge in design is argued by Dana Cuff when she asserts that the notion of tacit knowledge encompasses "unspoken assumptions, interpretations, expectations, and conventions" *(Cuff, 1991: 43)* within architecture. She goes on to argue that tacit knowledge is the substance of a professional ethos among architects "affecting both espoused theory and theory-in-use" *(Cuff, 1991: 43)*.

If one accepts the above assertion that tacit knowledge in design is characterised by assumptions, interpretations, expectations and conventions, it is more rational to link tacit knowledge to values in design, as opposed to experience, which is in-line with Sternberg's assertions of what characterises tacit knowledge. According to Cuff's and Sternberg's definition of tacit knowledge the acquisition of tacit knowledge within two design professions is linked to the ability to absorbing the current design ethos and subculture, which in essence forms the currently prevailing design values, rather than getting tacit knowledge from design experience.

However, as stated earlier the common understanding of tacit design knowledge within an architectural and industrial design context is the belief that tacit design knowledge is derived from design experience, gained in conducting or participating in design projects. This belief is the prime justification for why many design schools use design projects as the main teaching methods *(Kvan and Thilakaratne, 2003: 6), (Cuff, 1991: 72)*. If one accepts Sternberg's assertion that tacit knowledge is linked to a particular context, is it difficult to see how the emphasis on tacit knowledge in architecture and industrial design squares with the emphasis on the design generalist value.[249] This is because a design generalist will have to utilise the tacit knowledge in very different contexts, which is exactly what Sternberg finds objectionable.

If for arguments sake, one accepts that tacit knowledge is learned and developed through experience in design projects, is it plausible to investigate whether design projects tend to bear the hallmarks of the characteristics for effective learning with regards to tacit knowledge. Effective learning generally takes place when "accurate and immediate feedback about the relation between the situational conditions and the appropriate response" *(Tversky and Kahneman, 2000: 222)* is available. The necessary feedback that is essential for learning is often as unavailable for the decisions made by architects and industrial designers, as it is for other professionals like managers, entrepreneurs, and politicians. Generally, the lack of feedback is due to the following characteristics:

> "(1.) Outcomes are commonly delayed and not easily attributable to a particular action; (2.) variability in the environment degrades the reliability of the feedback, especially where outcomes of low probability are involved; (3.) there is often no information about what the outcome would have been if another decision had been taken; and (4.) most important decisions are unique and therefore provide little opportunity for learning" *(Tversky and Kahneman, 2000: 222)*

Most design projects are characterised by having a number of, if not all, of these characteristics that identifies lack of feedback. The conditions for organizational learning within design are hardly better, as it is affected by the same conditions as described above. In addition to the lack of feedback are the limitations towards learning in design projects reinforced by the two design professions' general reluctance towards empirical study in design projects, along side a more general lack of research within design education.[250]

The development of tacit knowledge in design firms is also to some extent hampered by the focus of the design generalist among architects and industrial designers.[251] This point can by indicated by scholars like Michael Gibbons who argues that the term tacit knowledge (used with a wide scope) is not restricted to the individual designer, but is also found in design firms' institutional cultures etc.[252] According to Gibbons, elements of a firm's knowledge base are both public and/or proprietary knowledge, and some elements of a firm's culture typically of a tacit nature. A consequence of this tacit knowledge phenomenon is that the tacit knowledge of a competing firm can only be acquired by hiring the people who possess it, which it is the principal way a firm may refill the basket of new tacit knowledge *(Gibbons, 1994: 25 f)*. But the two design professions distinguish themselves from other professions by having a majority of design firms that tend to be a one to two person establishment and have employed mainly design generalists.[253] These factors and the emphasis on the design generalist contribute to less specialisation and diversity among design professionals and its institutional cultures, than what is commonly found in other comparable firms.[254] Consequently, the development of a rich diversity of tacit knowledge is less likely to emerge within the design firms compared to other firms based on other professions where specialisation is encouraged and celebrated.

Another objection to the legitimatisation of skills and knowledge found in architecture and industrial design by the concept of tacit knowledge, can be found in that the practice in general does not make experts superior to other people at integrating information *(Hastie and Dawes, 2001: 62)*. There is generally no evidence that experts think differently from other people, even if experts tend to be better at knowing where to look than novices *(Hastie and Dawes, 2001: 62)*. Contrary to popular belief among practising architects and industrial designers, a considerable amount of general research indicates that a substantial amount of expert judgments could: "be made more equitably, more efficiently, and more accurately" *(Hastie and Dawes, 2001: 63)* by utilising statistical models alongside expert judgments, compared to relaying solely on expert judgments *(Hastie and Dawes, 2001: 63)*. This point was indicated at by Paul E. Meehl in his book "Clinical versus statistical prediction", where he asserts:

> "a very considerable fraction of clinical time is being irrationally expended in the attempt to do, by dynamic formulations and staff conferences, selective and prognostic jobs that could be done more efficiently, in a small fraction of the clinical time, and by less skilled and lower paid personnel through the systematic and persistent cultivation of complex (but still clerical) statistical methods." *(Meehl, 1954: vii)*

This point was reiterated in an later article called "Causes and effects of my disturbing little book", where he argues that within a number of studies "predicting everything from the outcome of football games to the diagnosis of liver disease" *(Meehl, 1986: 374)* statistical models show that decisions based or assisted by statistical models are more effective than experts judgment *(Meehl, 1986: 374)*. Meehl indicates a number of reasons why this research has failed to influence the way experts make their decisions, which are (the following is a direct quotation): (1.) sheer ignorance,[255] (2.) the threat of technological unemployment,[256] (3.) self-concept,[257] (4.) theoretical identifications,[258] (5.) dehumanizing flavor,[259] (6.) mistaken conceptions of ethics[260] and (7.) computer phobia[261] *(Meehl, 1986: 374)*. These reasons are also likely to be found within the two design professions. The findings which indicate that statistical based judgments outperform trained experts in a number of instances is not a popular assertion among experts in general *(Hastie and Dawes, 2001: 64)*, and particularly not among practising architects and industrial designers nor among design scholars. Research that points to the above has had little to no effect on the practice of expert judgment in most domains including architecture and industrial design *(Hastie and Dawes, 2001: 64)*.[262]

A possible explanation for the lack of acceptance of the above, and the lack of a fit between the concept of tacit knowledge found within design, and Polanyi's original definition, is the value aspect introduced by scholars such as Cuff and Sternberg. An indication that tacit knowledge is linked to design values is found in the general observation of the importance of design schools as enculturating institutions, and its relation to the professional success of its graduates. For instance, research indicates that there is no correlation between success as a student in a school educating professionals and success in professional practice *(Cuff, 1991: 43 f)*.[263] The correlation between success as a student and successes as a professional was, according to some studies, approaching zero *(Cuff, 1991: 43 f)*. But this lack of effect of professional education can to some extent be accounted for by pointing out that the primary role of the professional school may be seen more as socialization than simply training *(Cuff, 1991: 44)*. The socialization aspect is particularly prominent in architecture and industrial design education as introduced in chapter two,[264] and as suggested by Cuff when she argues:

> "My own work indicates that in school, preprofessionals learn the roles, values, vocabulary, assumptions, and set of reasonable expectations appropriate to the subculture." *(Cuff, 1991: 44)*

The gap between success in design schools and in a professional context is by Cuff attributed to be the general mismatch that exists between the ideals and values i.e. ethos commonly found within schools and professions, and the circumstances i.e. economic, clients, societal realities of architectural and/or industrial design practice *(Cuff, 1991: 44)*.

Based on the above observation it is possible to argue that students that are effective in absorbing the “tacit values”, the values that architecture and industrial design schools are attempting to instil in students, face the risk of being hampered by their ability to absorb these “tacit values”. This is especially the case when students do not have personal reservation and reflection or corrective experience from professional practice. Their ability will in fact become something that is actually working against their facility of becoming a successful practising designer. As illustrated above the link between design skills and knowledge and the concept of tacit knowledge is not necessarily straightforward, but tacit knowledge within the design domain can be as much linked to design values as it can be linked to practical design skills.

4.3.3 Skill based as opposed to knowledge based

> *“Architecture is not a discipline of scholars or experts, but rather defined (and united?) by a "community of problems"” (Rittel, 1976: 90)*
>
> *“The architecture profession considered research as irrelevant and expect more practice-oriented content in the curricula.” (Kvan and Thilakaratne, 2003: 3)*

From a more general perspective architecture, and to some degree industrial design, have a long tradition of intellectual theorising and discourse, represented by design scholars like Vitruvius, Alberti, Filarete, Serlio, Palladio[265], Colonna, Guarini, Carlo Lodoli[266], Laugier, Pugin, Loos, Wright and Venturi etc. *(Groat and Wang, 2002: 336), (Bazjanac, 1974: 4)*. This tradition has aimed at supplying normative[267] theories, aimed at improving and contributing to the development of a skill and “knowledge” base within the architectural and industrial design professions. Or, to put it another way, the normative theories have been “pre-dominantly concerned with the concept of Beauty (i.e. what in architecture is ‘beautiful’ and how is it achieved)” *(Bazjanac, 1974: 5)*. Whether this tradition of theorising and discourse qualifies as knowledge from a design profession and practice perspective, and should be included in what is regarded as research within the two design professions, depends largely on one’s outlook as to what qualifies as knowledge and research. This has been a contentious issue within the academic domain of both architecture and industrial design, as this section will illustrate. The issue of what constitutes knowledge and research has been an equally contentious issue in other academic fields, but as the following will indicate, has it not been contentious in the same way as it has within the design domain.

What constitutes knowledge and research has traditionally been debated from a number of perspectives. Philosophers and other academic scholars have studied the theory of knowledge for centuries. Much of the debate has been centred on the concept of epistemology[268] etc. *(Buenaño, 1999: 40 f)*. However, as briefly introduced in chapter three, the emergence of a professional perspectives have given rise to a separate and wide range of discourse, literature, and inquiry *(Buenaño, 1999: 40)*, which has tended to be conducted within each professional discipline on the terms of its unique knowledge filed. Generally, the development of professional knowledge fields has been of crucial importance, as they form one of the main benchmarks related to what constitutes a profession—its claim to special knowledge.[269] Thus, is it not uncommon for the two design professions to claim special knowledge, but this special claim is seldom critically examined *(Buenaño, 1999: 40)*. Much of the knowledge base within architecture and industrial design has not to a substantial degree "been put through the crunch of rigorous proof of its validity" *(Buenaño, 1999: 44)*. Because of these observations, the issue of what constitutes knowledge and research will be introduced and indicated from a professional perspective rather than the philosophical perspective in the following section.

Accepting that this is a contentious issue and that there exist different traditions within the domain of theorising about architecture and industrial design, it can be argued that the emergence of the De Stijl and Modern Movement represents a partly break from the normative theorising tradition, which has characterised much of architecture and industrial design *(Cross, 2000: 94), (Cross, 2001b: 49)*. It is particularly the case with the focus and aspiration to "scientise" architecture and industrial design which is often associated with the De Stijl and Modern Movement that emerged at the beginning of 20th-Century *(Cross, 2000: 94), (Cross, 2001b: 49)*. The desire to "scientise" architecture and design was typically advocated by the champions of the De Stijl movement *(Cross, 2001b: 49)* and by prominent figures of the Modern movement. These efforts revealed a desire to produce works of art and design based on objectivity and rationality i.e. on the values which are often associated with the natural sciences *(Cross, 2000: 94)*. However, the effort of "scientising" design is not restricted to De Stijl and the Modern Movement as it resurfaced within the design method movement of the 1960s, with its focus on scientific design processes *(Cross, 2000: 94), (Cross, 2001b: 49)*. The design method movement with its design methodology[270] can also be found in contemporary design discourse as it is still being developed by some contemporary design scholars *(Bayazit, 2004: 16), (Cross, 2000: 94)*.

In parallel to this emphasis of "scientising" design was a shift taking place from the apprenticeship-based approach to educating architects and industrial designers in design schools.[271] This shift contributed to an increased interest in the development of a knowledge base, which would contribute to distinguishing the skills and knowledge obtained in the education system from that which was previously obtained in an apprenticeship system *(Kvan and Thilakaratne, 2003: 3)*. Within both architecture and industrial design these events and other factors contributed to the development of a desire to gain professional recognition. This in turn led to a degree of embarrassment of the general concept of professionalism, which can be exemplified with the Oxford Conference (1958) on Architectural Education, that mandated professional qualification as the only means of entry into the profession, and which meant abolishing the apprenticeship system *(Martin, 1958: 279 - 281)*.

The change of paradigm towards professionalism required architectural education, and to some degree industrial design education, to move from a vocational training set in distinct design schools to a situation where many design schools found themselves in university settings *(Kvan and Thilakaratne, 2003: 3)*.[272] This shift put pressure on cultivating a culture of professional knowledge, which meant a shift in the "focus on pedagogy, requiring demands of academia to be reconciled with those of practice" *(Kvan and Thilakaratne, 2003: 3)*. In addition, many independent architecture and industrial design schools have focused on achieving academic recognition. This has exposed design schools to the general expectation of a high level of research output, and an intellectual connection to the curriculum, traditionally found within university systems *(Kvan and Thilakaratne, 2003: 3)*. These exceptions are often reinforced by government evaluation procedures *(EDITORS, 2001: 291), (Kvan and Thilakaratne, 2003: 3)*, and have put some external pressure on architectural and industrial design education "to become increasingly knowledge-based and to reach levels of scholarship as defined by the university community" *(Kvan and Thilakaratne, 2003: 3), (Brown and Gelernter, 1998: 64)*.

But this pressure has been seen as problematic by large sections of the two design professions, due to the fact that architecture and industrial design subject matters have traditionally "dealt with practical knowledge, not abstract principles or empirical research" *(Brown and Gelernter, 1998: 64)*. The reluctance among architecture and industrial design schools to embrace the expectations found within the university system has, on numerous occasions, been exposed by university research funding schemes and research assessment exercises. These studies have repeatedly drawn attention to the lack of publications and research output found in architecture and industrial design schools *(EDITORS, 2001: 291), (Kvan and Thilakaratne, 2003: 3)*.

It is not only the educational institutions for architecture and industrial design that display a lack of focus on research, which is unlike what is commonly found in other academic fields. Another indication can be found in the fact that the two design professions still do "not expect graduates to be conversant with the practice of research" *(Kvan and Thilakaratne, 2003: 3 f)*. This is radically different from the attitudes found in other professions like medicine, law and engineering. Unlike the architectural profession which "places no value on a graduate with research skills" *(Kvan and Thilakaratne, 2003: 4)*, research is an embedded part of practice within medicine and engineering, and thus their professional schools have a considerable emphasis on research and knowledge development *(Kvan and Thilakaratne, 2003: 4)*. Architectural and industrial design schools on the other hand have, up to now, been more focused on developing traditional design skills and getting the student acquainted with the normative theories within the design domain.

The contemporary design professions have come under increased pressure to justify and clarify the knowledge which forms the basis of the professions *(Kvan and Thilakaratne, 2003: 3), (EDITORS, 2001: 291)*. This pressure is not coming solely from external sources, but is to some degree being advocated within the design profession itself. For instance, architects and design scholars such as Francis Duffy have argued that:

> "The entire architectural profession will have to overcome the habit of aversion to intellectual matters, … that has been encouraged in architecture by the combination of the stubborn persistence of the anti-intellectual materialism of the arts and crafts tradition and the inferiority complex engendered by proximity …. There is, to summarize, an urgent need for architects to reaffirm the intellectual basis of their profession, to align it with other rapidly-developing disciplines to make sure that the design of the built environment takes its proper place in a society based increasingly upon the development and transmission of all kinds of knowledge." *(Duffy and Hutton, 1998: xiv)*

Duffy has added to this assertion what he considers as being some of the root causes for the lack of knowledge clarification and knowledge development within the architectural profession. He argues that architecture needs to become knowledge-driven, and points out that one of the main root causes that prevent architecture from becoming knowledge-driven is exclusivism, when he points out that:

> "Exclusivism, which the architects of the early nineteenth century had to rely on because of their urgent need to distance themselves from graft, has far worse effects than snobbery and self interest—exclusivism cumulatively diminishes the development of knowledge. For professional that is death. The opposite of intellectual and political isolation is achieved by redefining our professional boundaries in terms of knowledge. Knowledge is our only real source of power, our only real lever to achieve change." *(Duffy and Hutton, 1998:152)*

From a professional perspective, as pointed out in chapter three and by Duffy, the design professions have an increasingly uphill struggle with regards to justifying and commanding general respect from outsiders. The main cause is the issue of a knowledge foundation within the design professions, especially from an academic and professional perspective.

The issue of what should be the basis for knowledge in architecture and in industrial design, and what qualifies as research, has been hotly debated within the design professions (as well as within the arts) during the later decades of the 20th century and the beginning of the 21st century *(Bayazit, 2004: 16 - 28)*. This debate has been given renewed importance within the two design professions with their increasing number of doctoral degrees awarded within the fields of architecture and industrial design *(Frayling, 2001: 2), (Cross, 2000: 98)*. The essence of this contentious discourse has been summarised by Christopher Frayling in his article "Research in Art and Design" *(Frayling, 1993)*. In this article Frayling attempts to categorise design research, based on Herbert Read's[273] famous distinction about art education *(Frayling, 1993: 2)*. Frayling proposes three main categories, which are the following: (1.) research into art, (2.) research through art and (3.) research for art *(Frayling, 2001: 3), (Frayling, 1993: 5)*. Without passing too much of a judgment, it is worth noting that Frayling's categories differ from research categories typically found in other professions.

If one allows oneself to use Frayling's categories as a base, and at the same time exclude the large body of normative design theories i.e. design manifests, which are generally based on individual designers and design scholars design values,[274] research categories found in design will typically fall into the following categories: (1.) Research that aims to develop knowledge and understanding of how designers work and how they have worked in the past. (2.) Research conducted through working as an architect and/or industrial designer—implicit in this is a notion that the design has an inherent element of research that can be found in most design projects. Or to put in another way, architecture and industrial design is in itself a research enterprise. (3.) Research that aims at establishing a verifiable knowledge base (core knowledge within the profession) that designers should draw upon when designing (this also includes to some extent aesthetic and perceptual research).

Research category number one i.e. research on how designers work tends to be conducted from a number of perspectives such as social, economic, political, ethical, cultural, technical, material and structural. In addition, general design historians conduct historical research within the domain of design. It has a well-established contemporary “tradition” which is represented by prominent design scholars and researchers, such as Donald A. Schön, Dana Cuff, Bryan Lawson etc. These scholars have adopted and utilised many of the research methods found in the social sciences and used these to describe how architects and designers work in practice *(Lawson, 1997: 306 - 308)*. The second research category i.e. design is in itself research, is a line of thought that is advocated by some design practitioners and design scholars alike *(Frayling, 2001: 3)*. The assertion that design is a research enterprise in itself is often followed by a further definition of some qualifiers that attempts to qualify what type of design practice should qualify as research.[275] These qualifiers are stated to avoid a situation where all design work is eligible for research grants or an honorary doctorate degree *(Frayling, 2001: 4), (Cross, 2000: 98)*. Research category number three i.e. verifiable knowledge base has a link to the aspirations found in the De Stijl, Modern Movement and the Design methods movement with their emphasis on developing and basing the process of design, buildings and products of design on objectivity and rationality i.e. developing of a scientific basis *(Cross, 2000: 94), (Cross, 2001b: 49)*.[276] The third research category is inline with what has been a successful enterprise in many other professions outside the design and art domain.

Out of all of these three categories, is it research category number two that is the most controversial, hotly debated and contested within the design research community. The debate over category number two has been with the design professions for decades, which can be illustrated by Donald P. Grant when he in an article published in 1979 called “Design Methodology and Design Methods”, writes the following:

> “Most opinion among design methodologists and among designers holds that the act of designing itself is not and will not ever be a scientific activity; that is, that designing is itself a

> non-scientific or a-scientific activity—that it, that designing is itself a non-scientific or a-scientific activity” *(Grant, 1979: 46)*

A similar but more contemporary assertion is made by Bryan Lawson in his article “The subject that won’t go away”, when he argues that:

> “There are without doubt differences between the act of designing and the act of traditional research. Most striking of these must be that traditional research tends to be largely descriptive, whereas design tends to be largely prescriptive. That is to say design primarily concerns itself not with the way the world is or was, but the way it might be or should be.
>
> […]
>
> But design work is no more automatically to be valued as research than is writing. Simply because something is published we do not necessarily regard it as research. So the problem now becomes one of identifying the attributes of design, which are needed before we can raise it to the level of original work that provides understanding.” *(Lawson, 2002: 110 f)*

As shown by the arguments by Grant and Lawson research category two i.e. design is in it self research is a problematic category, no more so than from a general professional perspective[277], as it rarely contributes to a knowledge foundation which is generally accepted within the design professions. This is due to the fact that most architects and industrial designers tend to bring “their own intellectual programme with them into each project” *(Lawson, 2002: 112)*. These programs are often based on experiences and skills gained through a considerable amount of “study” and development, but this “knowledge” is often not shared across the practising design community as it is not written down *(Lawson, 2002: 112)*. Equally, it is not shared in terms of any form of agreement that a given knowledge derived for a personal experience can be or is accepted as universal knowledge for either of the two design professions. This is in line with the fact that practising architects and industrial designers, as well as design scholars, do not agree upon which building, products or designers they feel should be considered to be great, as any artefact or designer which is seen to be the greatest “for one, is a mediocre hack for somebody else” *(Rittel, 1976: 81)*. It is not uncommon to find claims among architects and industrial designers that are “competing and divergent as to what is the knowledge of the profession” *(Buenaño, 1999: 44)*.

From a value perspective this is not surprising, as designers tend to conduct their work according to different core values.[278] As a result of these different core values, there will, more often than not, be a disagreement over the relevance of particular design knowledge or approaches derived from research conducted within category two.[279] This can be indicated by fact that even if central concepts such as “Space”, “Form”, “Scale” etc. have a considerable history within design, these concepts are particularly vague within the two design professions *(Rittel, 1976: 79 f), (Bazjanac, 1974: 3).*[280]

Generally, the personal “knowledge” which is conducted within the research of category two, which is published, is seldom accepted as “research” that should create precedence and be used as new design knowledge in design projects. On the contrary, most prominent architects and industrial designers tend not to make use of already published “personal knowledge”, but instead go out of their way to create an alternative personal knowledge, creating the basis for their “personal” design as well as design approach.[281] This does not indicate a lack of architectural discourse, as there is much of it, but it does indicate little progress within the discourse, as there is little advancement in topics discussed. As pointed out in previous sections, design debates do “notoriously start from ‘scratch,’ generously disregarding previous results, even if published” *(Rittel, 1976: 80).*[282]

It is not only research category number two that is controversial within the design domain. The research category number three (i.e. verifiable knowledge base) is surprisingly debated within the two design professions. This may come as a surprise, as category number three is uncontroversial with regards to other professions like engineering, medicine and law. To clarify the controversy that exists with regards to research category number three, is it useful to look at the academic discipline that provides the research that falls into the third research category within the design domain.

The source of research which falls into the third research category can from a profession and/or academic discipline’s perspective be divided into two main categories: (1.) research primarily conducted within the two design professions and (2.) research conducted within other academic disciplines (which the two design professions rely upon). The development of research within category three has not been extensive within the two design professions. Instead has much of this type of research utilised within architecture and industrial design been developed within other academic disciplines. This can be illustrated by the fact that architecture and industrial design typically make use of knowledge gained from research conducted within other domain such as: mechanical, structural and industrial engineering, as well as ergonomics, environmental sciences, economics, science of materials, all the social sciences from psychology to anthropology, information technology etc. *(Bayazit, 2004: 22 - 28), (Duffy and Hutton, 1998: xiv).* These academic and professional domains contribute with invaluable research and knowledge, which is utilised to a varying degree in the both design professions. The knowledge development within these domains is not primarily driven forward by the two design disciplines, on the contrary, the contributions in research in these knowledge domains by architectural and industrial design professions is fairly limited.

There has been little development within the research category three in architecture and industrial design. An indication of this assertion is found in the lack of specialisation found in the design professions,[283] which sets the design professions apart from most other professions like the medical and engineering professions, where an elaborate system of advanced qualification has been developed to deal with the increased amount of research based knowledge *(Jackson, 1992: 6 f), (Blau, 1984: 37).*

From a professional perspective it is problematic that most of the research used and relied upon in the two design professions is not developed within the two professions, but is instead mainly taken from other disciplines and professions. The problem lies in that it is not only the design professions which can make use of this type of knowledge (as it is readily available within other domains and professions). Thus, this research cannot create a separate base for a distinct professional knowledge that the design professions could build on in their professional practice. To overcome the problem of not having a distinct knowledge base design scholars tend to present arguments asserting that architects and industrial designers combine or draw upon knowledge from different domains. By combining the knowledge into a multidisciplinary knowledge will it become a distinct knowledge base, which is unique for the two design professions.

The obvious problem with this type of argument is that the idea of combining knowledge from different fields is not restricted to architecture and industrial design. On the contrary, is this a common approach that can be found in a number of academic fields and professions.[284] This can be illustrated by an example taken from the domain of medicine, where the medical profession typically draws on knowledge developed within other academic disciplines such as science of chemistry and biology. The difference lies in that the medical profession tends to use this knowledge to develop new specific knowledge that is “exclusive” to the profession. For instance, the knowledge base for diabetes[285] is based on research conducted within other academic subjects like chemistry and biology. It is research conducted with a medical perspective that has established the link between the body’s failure to produce insulin and a failure to regulate the insulin viruses the sugar eaten, which is known as diabetes. The knowledge regarding diabetes is mainly developed, taught and utilised within the medical profession, as oppose to biology and chemistry, which are mainly developed within their specific academic disciplines, but utilised within a number of other academic disciplines.

To create an exclusive knowledge base in the same way as the medical profession, research utilised in architecture and industrial design professions must have an element of exclusivity attached to it. In order to achieve this exclusive knowledge base both design professions have to generate research that establishes: (1) genuine new knowledge that belongs primarily to the two design professions, or (2) new knowledge gained by combining knowledge found in other domains (engineering, ergonomics, environmental sciences, or economics for example), however it has to be combined in a new way that is exclusive to the two design professions.

A consequence of the "absence" of these two elements in research category three within architecture and industrial design is that some "myths" within these professions are not exposed or amended. An example of this type of myth is that design scholars and designers alike often argue that architects and industrial designers are in the best position to speak for the user in a given design project, compared to other professions *(Jackson, 1992: 5)*. This type of statement does not reflect the fact that in reality, very little research is conducted within the design profession regarding users, both academically and among practising architects and industrial designers. Of course exceptions exist, which can be found in research such as Post-occupancy evaluation (POE) within architecture, but relatively few organizations and architectural offices "fully incorporated lessons from POE programs into their building delivery processes, job descriptions, or reporting arrangements" *(ebrary Inc., 2001: 4)*. This is due to a number of reasons[286], but the most crucial for the two design professions is that the base for POE does not correspond with some design values held by many practising architects and industrial designers, which include design values such as the holistic design value and the design value of design novelty.[287]

It can be argued that users' needs remain mostly anecdotal, and such research is rarely seen as a subject matter for architectural and/or industrial design professional expertise *(Porter, 2000a: 26)*. This point can be exemplified by a personal observation concerning queues outside the woman's toilets in concert halls, theatre, cinema, or nightclubs. Architects never seem to change their design practice in order to accommodate the well-known phenomenon of queues outside the woman's toilets in public venues. It is not uncommon to find a considerable queue in front of the ladies toilets compared to that of men's toilets in the same building. If architects had more than anecdotal knowledge of this problem (through for instance, POE or observational research describing the toilet challenges in concert halls, or clubs), identifying this as a problem, this would most likely lead architects to plan the distribution between men's and women's toilets more appropriately (compared to what is commonly found in contemporary architecture). It may be fair to argue that if POE research findings were widely utilized within architectural offices, the toilet problem would start to diminish in new concert halls, and clubs.

The profession perspective used in this section when describing what constitutes knowledge and a research practice within architecture and industrial design, is not a perspective that is commonly used by many design scholars. Instead, is it often proclaimed by design scholars that architecture and industrial design should not be compared to other professions and academic fields. This argument is based on the notion that the design professions consider themselves to be a different intellectual enterprise altogether and have their own forms of knowledge. This type of assertion can be exemplified by argument made by Nigel Cross in his article "Designerly Ways of Knowing", where he writes:

> "What designers especially know about is the 'artificial world'—the human-made world of artifacts. What they especially know how to do is the proposing of additions to and changes to the artificial world. Their knowledge, skills, and values lie in the techniques of the artificial. (Not 'the sciences of the artificial.') So design knowledge is of and about the artificial world and how to contribute to the creation and maintenance of that world. Some of it is knowledge inherent in the activity of designing, gained through engaging in and reflecting on that activity. Some of it is knowledge inherent in the artifacts of the artificial world (e.g., in their forms and configurations—knowledge that is used in copying from, reusing or varying aspects of existing artifacts), gained through using and reflecting upon the use of those artifacts. Some of it is knowledge inherent in the processes of manufacturing the artifacts, gained through making and reflecting upon the making of those artifacts. And some of each of these forms of knowledge also can be gained through instruction in them. Just as the other intellectual cultures in the sciences and the arts concentrate on the underlying forms of knowledge peculiar to

> the scientist or the artist, so we must concentrate on the 'designerly' ways of knowing, thinking, and acting." *(Cross, 2001b: 54 f)*

Cross's assertions are limited in that they ignore, to some extent, the development of complexity that has taken place in the field of architecture and industrial design. Nor does it take into consideration the knowledge development that takes place in adjacent professions, that is both utilised by designers and which is challenging to the architects and the industrial designers position and domain. With these deficiencies, Cross's arguments illustrate how value laden the architecture and industrial design enterprises are, as opposed to research based, as he refers to reflection and experience rather than a knowledge foundation. This is not necessarily a weakness, as this value laden enterprise has existed for more than a century and has contributed to the built environment in a way which is it impossible to disregard. But as illustrated in this section it is problematic from a profession perspective,[288] as the design professions are characterised, and some would argue limited, by not having much research based core knowledge which is taught and utilised within the professions or utilised within design projects. This is especially the case when compared to other professions like medicine, law and engineering. Some design scholars, architects and designers will argue that this is the case for good reasons and this will be expanded upon in the next section.

4.3.3.1 Empirically-based research and its influence

> *"Westminster and Brussels can't be trusted to protect architectural values because they cannot be expected, on their own, to understand architecture even as it is today - let alone the directions in which it is developing. To address this issue, it seems to me to be absolutely necessary for architects to be very explicit themselves about the special features of their professional discipline. This means defining architectural knowledge in a way that is verifiable, open to scrutiny and sufficiently robust to distinguish it from other kinds of knowledge."* (Duffy and Hutton, 1998: xiii)

As introduced in the previous section, research is conducted from a different perspective within architecture and industrial design, and generally, there is very little empirical research conducted within the design domain of architecture and industrial design. The lack of empirical research within the design domain is connected to design values generally and in particularly to the holistic design value and the design value of design novelty,[289] as discussed in the previous section. Generally, it can be argued that it is uncommon to "scientifically" research and evaluate the appropriateness of novel design solutions proposed within architecture and industrial design, both by practising designers as well as design scholars (Post-occupancy evaluation, standards of lighting, velocity gradients in wind tunnels, and similar problems are some of the exceptions).[290] As pointed out in the previous section, much of the knowledge of existing design and its consequences is merely anecdotal and is rarely seen as a core subject of the design professions *(Porter, 2000a: 26)*.

Further indication of this can be found in a survey conducted by the American Institute of Architects[291] where practitioners were questioned about the role of research in their design practice *(Kvan and Thilakaratne, 2003: 4)*. The study showed that only 12% had undertaken any investigation or research into how design influences the behaviour and perception of building *(Kvan and Thilakaratne, 2003: 4)*. Fewer than 5% noted that they maintained a research relationship with a research institution, such as a university. "The conclusion of the survey was that research played little role, if any, in the delivery of design" *(Kvan and Thilakaratne, 2003: 4)*. Equally, the lack and scepticism towards empirical studies of design solutions has been pointed out by design scholars, which can be exemplified by Paul-Alan Johnson when he asserted that architects on the whole tend to mistrust empiricism and find it unreliable whereas mysticism and idealism is sanctioned within the profession *(Johnson, 1994: 5)*.

Architectural and industrial design schools have reinforced this attitude, as they have not emphasised teaching students to conduct research. This is radically different from the education found within other professions like the medical and engineering profession. The difference is particularly evident in accreditation within the design professions compared to other professions. Thomas Kvan and Ruffina Thilakaratne argue this point in their article “The Role Of Accreditation”, where they write:

> “The attitude projected from these accreditation documents is that architects, unlike practising doctors or engineers, are expected only to use knowledge generated by other people, using their research to inform design but not undertaking research as an activity to discover knowledge or to use design as a research tool.” *(Kvan and Thilakaratne, 2003: 7)*

The fact that research is not being valued within the two design professions is reinforced by the fact that validation within design schools fails to place any emphasis on empirical research *(Kvan and Thilakaratne, 2003: 5)*. Thus most architectural and industrial design schools have contributed and reinforced the notion that research skills are not valued within the two design professions *(Kvan and Thilakaratne, 2003: 5)*.

The lack of enthusiasm for empirical studies is somewhat radically different from other professions with a similar stake in the creation of buildings and products like engineering. Empirical studies in engineering are considered to be a cornerstone of the development of the profession. Even engineering failures are considered to be of the most value, as they provide a valuable source for gaining new knowledge and developing new and more reliable engineering standards.[292] Failures in engineering terms as in design terms can have devastating effects on those humans that the particular failure affects. This realisation has made the engineering profession value both laboratory testing and empirical studies, and the evaluation of engineering failures in the public domain. *(Mitcham, 1997: 269)* Even if failures within architecture and design can have similar devastating consequences, the design professions have not developed similar strategies as in engineering to identify and address these failures through empirical research etc.

The trend for very little emphasis on empirical work within the two design professions is not without its challenges. It has laid design professions open for criticism from other academics fields, as the following remake indicates:

> “practitioners of town planning and architecture have engaged in large scale and disruptive social change with very little theoretical, let alone empirical, base; though it could be said that what passed for theory in this case far outweighed experience or even common sense.” *(Preece, 1994: 31)*

The counter argument from design scholars to this type of criticism has often been based on pointing out the inherent difference between design practice and the research context “all of which have to do with the relationship between changing things and understanding them” *(Schön, 1983: 147)*. The argument is that scientific researchers are mainly occupied with finding explanations and theories of existing phenomena, whereas designers are focused on transforming the situation from what is, to something which they deem to be better *(Schön, 1983: 147), (Lawson, 2002: 110)*. Equally, it is often asserted that from an architect or industrial designer’s point of view that there is no point in researching the life of a product and building, as it cannot be evaluated definitively (this especially applies to buildings). The argument is based on the challenge of timelines in research of buildings or products, as they take on a changing character over time, through use, and can therefore be continuously re-evaluated at any given point *(Cuff, 1991: 96)*.

The appropriateness of minimal focus on empirical research within the design domain is also argued from a “nature of design” point of view. An illustrative example of this type of argument can be found in Donald A. Schön assertions in his book “Educating the reflective practitioner”, where he argues that the nature of design cannot be captured by problem-solving concept alone. This type of argument is closely connected to the wicked versus tame problem which has been described in a previous section.[293] In his view, design is characterised by complexity and synthesis *(Schön, 1987: 41 f)*, and he goes on to argue that design has a specific nature which is in contrast to an analytical and critical approach. Design is instead, according to Schön, characterised by a process where:

> “designers put things together and bring new things into being, dealing in the process with many variables and constraints, some initially known and some discovered through designing. Almost always, designers’ moves have consequences other than those intended for them. Designers juggle variables, reconcile conflicting values, and maneuver around constraints—a process in which, although some design products may be superior to others, there are no unique right answers.” *(Schön, 1987: 42)*

The idea of there being “no unique right answers” and the notion of “discovery through designing” by Schön and other design scholars i.e. design teachers, practising designers etc. indicates that they see empirical research to have a limited contribution to architecture and design.[294] Some even actevly discourages research by questioning its relevancy for architecture and industrial design. This view ignores, to a large degree, the existence of well-defined sub-problems within the context of an overall wicked problem, which would benefit from empirical research, as introduced in a previous section.[295]

Another justification for the reluctance of design professions to take on empirical studies can be found in an argument that is based on the fact that many design solutions are only part of a bigger system, that makes it inherently difficult to establish the true consequences of a design solution *(Mitcham, 1995: 180)*. The full scale consequences of design solutions as part of a bigger system tend to occur only at secondary or tertiary level *(Mitcham, 1995: 180)*. This has led to the conclusions that:

> “A consequentialist Judgment of designing readily strikes any designer as an abstract, far-fetched focusing on remote contingencies into which an indefinite number of variables may intervene.” *(Mitcham, 1995: 180 f)*

As with Schön’s argument, this line of thought ignores the existence of well-defined sub-problems within the context of an overall wicked problem.[296] It also ignores the fact that not all design solutions are part of a bigger system, or are characterised by having consequences that can only be measured on the secondary or tertiary level. Some design solutions have immediate effect on the physical and sociological environment.

Yet another explanation for the lack of interest displayed by the design profession towards empirical studies in architecture and design and its effects may be linked to the misconception that creative geniuses are born with the special abilities, and need only moderate training and knowledge input to develop their talents. This is a misconception which is rooted in a popular conception of the development of extraordinary talents of famous creative geniuses, such as: Wolfgang Amadeus Mozart, Paul Cézanne[297], Samuel Taylor Coleridge[298], Albert Einstein and Ludwig van Beethoven[299] *(Dweck, 2002: 35 f)*. True creative geniuses are characterised by being ordinarily smart or talented people who devote themselves to their vocation be it music, science, poetry, or philosophy, and who have little fear of revealing ignorance or low ability and summarily have little fear of daunting and inevitable obstacles *(Dweck, 2002: 36)*. This process of development from ordinarily smart or talented to extraordinary creative genius cannot take place without constant evaluation of past performances. One would be forgiven in thinking that a successful evaluation within architectural or industrial design context needs to be based on a form of empirical research, but instead it is primarily based on a value judgment (this point is elaborated in chapter six).[300]

Generally it is often argued that architecture and industrial design are about a commitment to lifelong learning *(Kvan and Thilakaratne, 2003: 8)*. It might therefore be considered surprising that both design schools and practising architects and industrial designers are not strongly committed to gaining increased understanding through empirical research. It is possible for architects and industrial designers through empirical research to get an increased understanding of the state of affairs of architecture or industrial design. However, research will often only be related to a particular point in a building or product's life, or the nature of change a building or product goes through. The existence of Post-occupancy evaluation (POE) indicates that it is possible.[301]

One could argue that the design profession needs to rediscover that "learning comes through a research attitude and is integral to the successful practice of architecture, not ancillary" *(Kvan and Thilakaratne, 2003: 8)*, this as design professions "are in the business of applying current and relevant knowledge to the solution of client problems" *(Kvan and Thilakaratne, 2003: 8)*. As indicated by the previous section and this section, the lack of focus on empirical research within architecture and industrial design is closely related to a number of design values. This is supported by Kvan and Thilakaratne when they argue that in order to change the attitude towards empirical research within the two design professions, they "must be cultivated and embedded as a way of working, and the place to start that is while students are in schools" *(Kvan and Thilakaratne, 2003: 5)*.

4.3.3.2 Philosophy based knowledge

> *"There are two great classes of men: the people and the scholars, the men of science. For the former, nothing exists but that which directly leads to action. It is for the latter to see beyond. They are the free artists who create the future and its history, the conscious architects of the world." — Johann Gottlieb Fichte*[302]

As pointed out in previous sections, architects and industrial designers tend to not engage in research. Thus research is very seldom the basis for, or used as, inspiration and justification for design projects. However, instead of research, a number of architects and industrial designers use philosophy as a rescores for inspiration and legitimisation of their work. This is done by utilising and reinterpreting different philosophies. Thus, is it not uncommon for architects and to some extent industrial designers to take an external idea from the world of philosophy and convert it into form *(Till, 2005: 168)*. For instance, the late twentieth century was marked by a frenzy of such activity, where "translation of the complexities of philosophical deconstruction to 'deconstructivist' architecture" is one example *(Till, 2005: 168)*.

The approach of taking and translating a philosophical theory into an architecture and/or industrial design form is not without its challenges. Design scholars such as Karsten Harries point this out, stating that there is a considerable difference between many of the everyday questions facing designers and philosophical questions. Everyday questions pose themselves against a background of established and accepted ways of doing things, whereas philosophical questions generally lack this kind of background, as argued by Karsten Harries in the following:

> "Genuinely philosophical problems ... emerge whenever human beings have begun to question the place assigned them by nature, society, and history and to search for firmer ground. [...] The fundamental question of philosophy remains: where should we be going?" *(Harries, 1997: 11)*

The link between the philosophical discourse that is attempting to solve general problems, and the everyday design decisions taken by designers, is not always obvious one and not even relevant. This fact has not prevented designers in general, especially architects, to use philosophy as an inspiration and rationale for a design outcome, as well as a backdrop for creating new design methodologies and design values.

However, the link between a particular philosophy and design is usually a loose one, as designers tend to utilise philosophy and modify it in a way in which they deem appropriate. Very few designers have a classical training in philosophy. This can be exemplified in the struggle that a number of architects and design scholars display when attempting to take in the intricacies of the early work of philosophers and thinkers like Gilles Deleuze [303] and Pierre-Félix Guattari[304] *(Till, 2005: 168)*. The fact that designers are usually not trained in classical philosophy makes their interpretation and usage of classical philosophical writings different from what you would expect from classically trained philosophers. This makes this use of philosophical writings questionable from a trained philosopher's point of view.

There is a general tendency among architects and industrial designers to treat "philosophers of the past as contributors to a single debate with a relatively unvarying subject-matter" *(MacIntyre, 1985: 11)*, which has the effect of treating philosophers like Plato[305] and David Hume[306] and John Stuart Mill[307] as contemporaries. Equally, this approach often ignores the fact that there is considerable development over time, as the philosophical discourse tends to build on previous assertions from other philosophers. This all contributes to a general abstraction of the ideas by philosophers "from the cultural and social milieus in which they lived and thought" *(MacIntyre, 1985: 11)*, and from the previous discourse which they build on. Thus, the use of the history of philosophy thought by architects and industrial designers "acquires a false independence from the rest of the culture" *(MacIntyre, 1985: 11)*.

However, architects and industrial designers' usage of philosophy can be defended on the grounds that it can be characterised as "creative usage", where the emphasis is not on the strict interpretation, but rather on inspirational aspects and on justification. This creative usage of philosophy by architects and industrial designers will seldom be recognised by classically trained philosophers as true versions of the original text or the context it was written in.[308] The "creative usage" of philosophy is not without its problems, as in the same way as it can be seen to be wrong to confuse avant-garde form with avant-garde thinking, it can be seen as "wrong to assume that formal complexity will be followed by occupational complexity" *(Till, 2005: 178)*. Architects and industrial designers that use philosophy as a basis for their design decisions and arguments, by selecting what they consider interesting, have a tendency to act as if they are shopping around in the world of philosophy. This approach can be viewed as a hunt for justification for already existing design activities and design values rather than as a part of an informed process.

4.4 SUMMARY

This chapter illustrates that architecture and industrial design practices have both internal and external realms that are closely connected to a number of values. These "realms" are also set by outside circumstances i.e. technical developments and changes in other professions. The technological development that has taken place since the industrial revolution has influenced architecture and industrial design greatly, as it has affected: (1.) availability and the nature of design tools, (2.) communication between designers and other participants in design projects, (3.) availability of design information, (4.) lead time between design and production and (5.) availability of building technology. In summary, technological developments have greatly increased the complexity found in most design projects.

This increased complexity has not necessarily been embraced by individual architects, industrial designers and/or design schools. Instead, the two design professions have traditionally relied on other professionals for support in handling the increased complexity. Consequently, architects and industrial designers have lost some of the status and influence that they previously enjoyed. Thus, from a technological perspective, the two design professions would benefit from creating sub-disciplines as means to acquire available technical knowledge and make use of the new opportunities. However, the idea of creating sub-disciplines has been met with resistance in the general design community (which is in itself a value decision).

In addition to technological development, the economy plays a central role in most design projects. Architects and industrial designers are well known for proposing design solutions that are outside a client's budget. This is due to a number of design values that prevent designers from focusing on economic realities. Thus, the economic stewardship of contemporary design projects is often handed over to other professionals. This is consistent with the fact that both design professions are characterised by design values such as "volunteerism" and "charrette ethos", values based on beliefs and attitudes such as: (1.) quality designs only come from offices or individual designers that are willing to put in overtime, (2.) quality designs are rarely possible with fees offered by clients and (3.) designers should care enough about buildings or products to uphold high design standards regardless of the payment offered.

This chapter demonstrates that, contrary to popular belief, architecture and industrial design do involve a broad spectrum of professionals working in "cross-professional teams". Thus, design is indeed a social process that involves constant negotiation among different parties contributing to the design outcome. Opposing values among the team members often lead to conflict in group work situations. Architects and industrial designers commonly fail to appreciate and accept clients and other team members' points of view, due to differences in design values and a general quest for peer recognition. Consequently, many clients have begun to set strict boundaries for the creative freedom enjoyed by designers, boundaries that are established before designers are allowed to get involved.

This chapter also introduces the two major categories of design problems—"wicked problems" and "tame problems". Within the design context, "wicked problems" are characterized by: (1.) uncertainty, (2.) multiple objectives (different value framing) and (3.) multiple participants (who often adhere to different value sets). The wickedness of a design problem may be reduced by imposing value based framing, thus making design values essential within the design context. However, the situation is a bit more complex; within "wicked" design problems there are sub-problems that can be classified as "tame problems" i.e. well structured problems. Architects and industrial designers tends to approach all design problems as if they are of a "wicked" character, thus they often use an inefficient approach to solve the "tame" sub-problems. Therefore, the focus on wicked problems in architecture and industrial design tends to overshadow well-defined sub-problems, which can be solved using a knowledge-based strategy.

This chapter also illustrates the tendency of architects and industrial designers to adopt the art profession's quest for artistic freedom along with artistic values. Thus, artistic values and the aesthetics of artistic practise have had a substantial influence on the fields of architecture and industrial design. This is particularly evident in artistic avant-garde values, which are characterised by a degree of elitism. In more general terms, the adoption of artistic values have led to the further promotion of design values such as: (1.) little concern for the facts, (2.) aesthetic considerations (such as composition, balance etc.) overriding other issues, (3.) the overall concept taking precedence over individual aspects, (4.) a commission opposing the artistic vision will be attempted changed through reframing of the original commission. However, architects and industrial designers differ as to the adaptation of artistic based values. Thus, different designers employ various approaches, which include: (1.) art as the grand gesture, (2.) art as avant-garde (3.) art as consummate skill, (4.) art as picture making and (5.) art as symbol making.

This chapter also discusses the fact that both architecture and industrial design are characterised by an extensive focus on original and novel design solutions, which ultimately amount to the novel design value. However, at times, both clients and society have viewed this emphasis on novel design solutions as a straitjacket. Designers' emphasis on design novelty has led many clients to frame the commission in a way that limits the "artistic freedom" given to architects and industrial designer. Even so, many designers will deliberately ignore these limits, as most design schools educate architects and industrial designers to question the fundamentals of a design brief, regardless of the client's expressed wishes. Design schools' focus on creativity has led designers to approach design tasks through solution conjectures rather than problem analyses. Thus, they are accustomed to utilising associative (automatic) thinking even where controlled thinking is more appropriate. This focus on novelty and creativity within the two design professions and design schools has created a gap between the design values found in architecture and industrial design and the opportunities most architects and industrial designers face in their professional life.

This chapter also demonstrates that architecture and industrial design are seen as a holistic enterprise. Traditionally, this has meant that practising architects and industrial designers focus on and try to incorporate and solve a wide range of different issues through the design process. However, other professions tend to make similar claims to holistic understanding. Thus, designers' attempts to influence, control and be in charge of the design process are increasingly challenged by their clients and other professions.

All of the above introduced design values and characteristics tend to be linked to the knowledge foundation found within architecture and industrial design. More specifically, the generalist design value—the focus on generalities versus specialisation—is an important factor in shaping the design knowledge base. Because the fields of architecture and industrial design lack clear branches dividing the knowledge domain into a range of diverse practices, the generalist design value further contributes to "weak" and "fluid" boundaries between different design professions. Nevertheless, even if most architects and industrial designers are mainly trained as design generalists, most designers variably operate outside the scope offered by their education. This as they often operate as a business person, market analyst, psychologist, contractor, politician and/or arbitrator in addition to an architect or industrial designer. Even if the generalist design value is widely accepted within the world of architecture and industrial design, it has come under pressure from general technological development and advancement. More specifically, the generalist approach is challenged by increased complexity in areas such as: (1.) structural systems, (2.) mechanical systems, (3.) electrical systems, (4.) communication and transportation, (5.) acoustics, (6.) lighting design (7.) landscape design, (8.) materials, (9.) experimental structures, (10.) prefabrication, (11.) alteration of existing structures and (12.) restoration and preservation etc. Thus, it may be said that the generalist design value tends to prevent many architects and industrial designers from preparing both individually and as a group to cope with the increased complexity found in contemporary buildings and products. It also leaves designers with little basis for argument, from a factual point of view. Consequently, architects and industrial designers are to a large degree left with only value related argumentation and reasoning. It has been pointed out that the lack of factual knowledge among architects and industrial designers is to some extent made up for in cross-professional project teams. Finally, the generalist design value contributes to little or no progress within the design discourse, demonstrated by the fact that core topics have remained the same for decades; there has been little advancement in the handling of these topics.

This chapter discusses the fact that much of the "knowledge" found within the fields of architecture and industrial design, is often characterized as "tacit knowledge". However, architects, industrial designers and design scholars usually fail to acknowledge the link between tacit knowledge and: (1.) individual's values, (2.) context dependency. In addition, they generally fail to recognize that tacit knowledge should be judged according to explicit standards. Thus, numerous skills are wrongly attributed to tacit knowledge within the architectural and industrial design worlds. Many of these skills are actually more closely related to assumptions, interpretations, expectations and conventions. Consequently, these unaccounted for skills and "knowledge" i.e. "tacit knowledge" can be linked to both design values and experience. Within the two design professions the term "tacit knowledge" is often used as a justification and explanation for the lack of an empirically derived knowledge-base.

Architecture, and to some degree industrial design, have a long tradition of intellectual theorising and discourse. However, from a formalistic knowledge and general professional point of view (as introduced in chapter three), it is questionable whether this tradition of theorising and discourse qualifies as knowledge. Much of the "knowledge base" found within architecture and industrial design has not been put through a rigorous test of its validity, which corresponds with design schools' reluctance towards embracing the expectations found within university systems. What constitutes and should be the basis for knowledge in architecture and industrial design has been hotly debated during the later part of the 20th-century and the beginning of the 21st century. Within this debate, three main research positions have emerged: (1.) research that aims to develop knowledge and understanding of how designers work and have worked in the past, (2.) research that is conducted through working as an architect and/or industrial designer—architecture and industrial design is in itself a research enterprise and (3.) research that aims to establish a verifiable knowledge base.

Research category number two has been the most controversial, hotly debated and contested: design work cannot automatically be valued as research just because it has been published. The "personal knowledge" derived from research category two, knowledge which is subsequently published, is seldom accepted as the type of "research" that creates precedents or forms groundbreaking design knowledge. On the contrary, most architects and industrial designers do not utilise already published research regardless of which category it is developed from. They tend instead to go out of their way to create an alternative “personal knowledge” which then forms the basis for their “personal” design as well as their personal design approach.

The “little” research based knowledge that exists in architecture and industrial design is often based on research conducted in other professions and in other knowledge fields. From a professional perspective this is problematic, as it is not only the two design professions that can make use of this research based i.e. type of knowledge, this as it is not profession specific. Thus, this research (i.e. profession base) does not create a separate knowledge base that is distinct for the two design professions. An exclusive knowledge base would have to be based on research that establishes: (1) genuine new knowledge that belongs primarily to the two design professions, or (2) new knowledge gained by combining knowledge found in other domains, assembled in a new way that makes it exclusive to the two design professions.

Architectural and industrial design schools have reinforced the lack of an exclusive knowledge base by not teaching design students how to conduct research. Despite the serious implications, a number of design scholars i.e. design teachers, practising designers etc. still support this lack of emphasis on research and even discourage research by questioning its relevancy for architecture and industrial design. However, this support tends to ignore the well-defined sub-problems that exist within the overall wicked design problems, a situation that would certainly benefit from empirical research. One possible explanatory model for this discrepancy might be that many design scholars have been reluctant to take design value into account when explaining how architects and industrial designers actually work in real life. However, the lack of a research derived knowledge base within architecture and industrial design is not necessarily a weakness, as design as a value laden enterprise has existed for more than a century and has contributed to the built environment in a way that is it impossible to disregard. Nevertheless, from a formalistic knowledge and general professional perspective is it still problematic.

To overcome some of these deficiencies a number of architects and industrial designers have turned to philosophy as a source for inspiration and legitimisation of their work. However, this is not without its challenges, as there is a considerable difference between many of the everyday questions facing architects and industrial designers and the fundamental philosophical questions. It is also problematic because there is a tendency among architects and industrial designers to treat philosophers of the past as contributors to a single debate and ignoring the fact that philosophical discourse tends to build on previous assertions from many philosophers. This has led to a situation where architects' and industrial designers' use of individual philosophies has acquired a false independence from philosophical discourse. Designers that use philosophy as a basis for their design decisions and arguments by selecting what they consider interesting, have a tendency to act as if they are shopping around in the world of philosophy. This approach has the hallmarks of a hunt for justification for already existing design activities and design values rather than being part of an informed process.

5 Designers' distinctive design values

> *"Convictions serve practitioners—artists and architects—in essentially the same manner that theories serve critics and the public."* (Blau, 1984: 64)

Architects and industrial designers alike have value sets that consist of values introduced in the previous chapters. In addition to these values, a value set consists of more personal, and to some degree societal, based design values. These individual distinctive design values will be introduced in this chapter. However, the aim is only to introduce a patchy indication of the most influential of the designers' distinctive values. The aim is not to attempt to give a complete overview of all values that exist in the two design professions. Nor is it to introduce each value at any great level of detail. Instead, the emphasis is on giving a brief indication of each value based on elements drawn from its historical background, scholarly discourse, and what it has, and still, tends to imply for architects and industrial designers. Manifestations in buildings and products as well as designers and organisations which adherers (or promotes) each of the values will be introduced in notes when appropriate.

Within a limitless PhD project could a more complete overview be given with a detailed and in-depth outline of each of the distinctive values, but as pointed out in chapter one, this is out of reach in this PhD project. Thus, the aim of this chapter is only to briefly introduce a "patchwork" of individual distinctive values at an introductorily level.[1] Indeed, it would need a separated PhD project if a more complete overview, with each of the individual values introduced thoroughly, should be presented. Thus, this is only meant as a first at attempt to map out the most influential distinctive architectural and industrial design values.

This value map is of importance as it partly indicates why there are differences in value sets among individual architects and/or industrial designers. In addition, these values also account to some degree for the differences that exist in the design proposals proposed by different architects and industrial designers (this point is elaborated on in chapter six).[2] This implies that these values represents some of the rational that is behind design proposals and design outcomes, thus, are a distinctive value map of importance for the design decisions (which is the emphasis in the next chapter).

Many of the distinctive design values presented in this chapter are closely related to societal and political trends in general. However, it should be noted that the emphasis will not be on political trends in general, even if political trends often influence design values and designer's value set. The selection of values will instead be based on their prominence within architecture and industrial design literature.[3]

Values within this chapter are organised in value categories, which indicate the main spectrum of values that can be found in design literature, as well as organising the values for the benefit of the reader. These categories are Aesthetic Design Values, Social Design Values, Environmental Design Values, Traditional Design Values and Gender-based Design Values.

5.1 MAPPING OUT DESIGNERS' DISTINCTIVE DESIGN VALUES

> *"Buildings are designed and built in accordance with, and are judged by, the values of the people or communities that commission them; they are usually evaluated as "good" in some way that is contingent upon the culture and place within which they were initially built."* *(Wasserman et al., 2000: 6)*

Architects and industrial designers tend to arrive at the starting point of a design project with a sets of values which they utilise and apply to the design process (this point is elaborated in chapter six) *(Lawson, 1997: 162)*, *(Rowe, 1987: 2)*. This implies that designer's individual values are of importance within the design profession, as architects and industrial designers do not approach design problems with a blank slate[4].[5] The premise for a design project is more often than not a combination of the constraints derived from the initial design setting, clients input and the individual designer's value set, as well as design values found in the two design professions. This implies that values are a factor that influences design projects.[6]

Designers' distinctive values are to some extent a reflection of values found in society at large. The design values found among individual designers are therefore often partly a reflection of what is fashionable in the general society at a given time, and this tends to vary in different epochs *(Birkeland, 2002: 114 - 117)*. These links between particular design values and values commonly found in the general society are evident in a contemporary and historical context,[7] as a number of different mainstream thoughts and philosophies have had a considerable impact on architecture and industrial design *(Birkeland, 2002: 114 - 117).*[8] For instance, the concept of social “progress”, often found in socialism, has influenced a number of architects and industrial designers.[9] Environmental values have also started to influence architects and industrial designers alike.[10]

As introduced in chapter two, individual architects and industrial designers tend to adhere to a value set and not a single value. This is often reflected in design movements, illustrated by the design movement Brutalism,[11] which was concerned with a number of issues, indicted in concerns such as:

> “if building is for the people, should it not be of the people (vernacular forms)? If building is to invoke virtue, should it not itself be virtuous (truth in materials)? If building is to be meaningful, should it not embody meaning in itself (social worth)?” *(Boyle, 2004: 182)*

These concerns of Brutalism are treated as separate values within this chapter. This means that a design movement and a particular architect or industrial designer might be referred to in a number of sections, as they adhere to several distinctive design values.

Even so, research conducted by Margaret A. Wilson described in “The Socialization of Architectural Preference” indicates that architectural students’ preferences are likely to be very predictable within stylistic movements such as Modernism, Postmodernism, Neo-Vernacular and High Tech *(Wilson, 1996: 37).*[12] This is due to the fact that these design movements have some primary values which the student adheres to.[13] So even if some of the following values, which are briefly introduced in this chapter, can be found in many design movements, is it possible to map out some core values that identify differences in architects and industrial designers’ preferences.

Architects and industrial designers alike differ in regards to which primary distinctive design values they deem to be essential for the creation of successful architecture and products *(Fiell, 2001: 17), (Lawson, 1997: 162).*[14] And the degree to which these values is strictly adhered to varies, with some designers sometimes utilising it very consciously and at other times rather loosely *(Lawson, 1997: 162)*. In addition, individual value sets tend to not be fixed. This is especially evident if one looks at the entire career of a given architect or industrial designer. Values held by designers tend to change to some degree over time, as designers are developing and gaining experience and are influenced by value changes that takes place in the general society *(Lawson, 1997: 162 f)*. However, not all distinctive design values change and some of these stable design values will be "defended with considerable vigour and become highly personal territory" *(Lawson, 1997: 163)* among architects and industrial designers. This is due to the fact that these values are often seen as essential to the individual architect and industrial designer practice, and the fact that these values tend to have a considerable impact on the design process, as "some designers seem to allow their guiding principles to dominate the process" *(Lawson, 1997: 163).*

Even so, there is a considerable difference among individual architects and industrial designers with regards to their level of consciousness regarding their design value sets. Some designers have a subconscious level of awareness towards their value base, whereas others have a more clearly structured relation to their value base. Yet for others, their value sets "constitute something approaching a theory of design" *(Lawson, 1997: 162).* Some architects and industrial designers have even laid out their thought behind the value base in manifestoes, articles, lectures and books.[15]

Among all the distinctive design values, which will be mapped out in this chapter, there are often conflicting interests or competing lines of thought. It is important to note that these value conflicts will not be dealt with in this chapter, but instead this will be introduced in chapter six.[16] In addition, is it worth pointing out that there is generally much more literature available within the domain of architecture than there is in the domain of industrial design, both generally and from a value perspective. The unevenness of availability literature between the two domains is reflected in the literature used as references for the different value categories found within this chapter. This might pose less of a problem than one would intuitively think, as architecture theories and thinking has been very influential within the domain of industrial design.[17]

5.1.1 Aesthetic design values

> *"A bicycle shed is a building; Lincoln Cathedral is a piece of architecture. Nearly everything that encloses space on a scale sufficient for a human being to move in is a building; the term architecture only applies to buildings with a view to aesthetic appeal" (Pevsner, 1960: 15)*

The expansion of architectural and industrial design ideas and vocabularies which took place during the last century has created a diverse aesthetic reality within these two domains.[18] This pluralistic and diverse aesthetic reality has typically been created within different architectural and industrial design movements such as: Modernism, Postmodernism, Deconstructivism, Post-structuralism, Neoclassicism, New Expressionism, Supermodernism etc. *(Krieger, 2004: 305 f), (Steer, 2004: 1279), (Flores, 2004: 1295)*. All of these aesthetic realities represent a number of divergent aesthetic values, in addition to differences in general values and theories found within these movements *(Flores, 2004: 1295)*. Some of the stylistic distinctions found in these diverse aesthetic realities reflects profound differences in design values and thinking *(Flores, 2004: 1294)*, but this is not the case for all stylistic distinctions, as some stylistic distinctions builds on similar thinking and values.

These aesthetic values and their diverse aesthetic expressions are to some degree a reflection of the development that has taken place in the art community (as introduced in chapter four).[19] In addition, more general changes have taken place in Western societies, due to technological development, new economic realities, political changes etc.[20] However, these diverse aesthetic expressions are also a reflection of individual architects and industrial designers' personal expression, based on designers' tendency to experiment with form, materials, and ornament to create new aesthetic styles and aesthetic vocabulary. Changes in aesthetic styles and expressions have been, and still are, both synchronic and diachronic, as different aesthetic styles are produced and promoted simultaneously *(Flores, 2004: 1294)*.[21]

A number of values which cannot be classified as aesthetic design values have influenced the development of the aesthetic reality, as well as contributed to the pluralistic aesthetic reality which characterises contemporary architecture and industrial design. Even so, the following sections focus on what can be described as aesthetic design values, which within this context implies values that are likely to have had a considerable impact on past and present aesthetical appearances of different buildings and products.[22]

5.1.1.1 Artistic aspects and Self-expression

> *"I am an architect. I do think that art and architecture come from the same source. They involve some of the same struggles.*
>
> *[…]*

I think pluralism is wonderful. That is the American way. Individual expression. It hasn't hurt us in painting and sculpture. It hasn't hurt us in literature. And it won't hurt us in architecture" — Frank O. Gehry (Futagawa, 1993: 173 - 178)

Architects and industrial designers have in the past, and will most likely in the future, align themselves with the values found in the different art movements. They have drawn on the developments that have taken place within the art world, both as an inspiration for their aesthetic style and for their general values, as introduced in chapter four.[23] Thus, part of the historical background of the design value of Artistic aspects and Self-expression in architecture and industrial design can be found in the art value of personal creative liberty, which is closely linked to individual self-expression and one's inner spiritual self. These art values came into prominence with the emergence of the Expressionist movement within the art world *(Morgenthaler, 2004: 425 - 427).*[24]

Inspiration from the art world contributed to the development of designers freeing themselves from the conventions of traditional construction, as well as from traditional design values such as affix of the Antique orders to facades and the "academic rules of ordonnance and symmetry in drawing plans" *(Maxwell, 2004: 6)*. The acceptance of more abstract forms and aesthetic styles within architecture and industrial design, has allowed professionals within the two design professions greater freedom to create their own self-expression through their design. On the back of this development, expressionist elements have been introduced into several architecture and design movements. This is illustrated in the fact that expressionist values can be found among prominent architects in the modernists design movement.[25]

The design value of Artistic aspects and Self-expression is even in line with a design theory which states that aesthetic form "is generated within the creative imagination" *(Gelernter, 1995: 7)*, which implies that form "originates within the inner resources or intuitions of the designer" *(Gelernter, 1995: 7)*. It is commonly asserted that architects and industrial designers have a special gift for creating forms, or using creativity to put elements "together in a new and unprecedented way, so that an original form never before seen magically blossoms in the brain and emerges from the pencil" *(Gelernter, 1995: 7).*[26]

As introduced in chapter four, a number of avant-garde art movements played a considerable part in influencing design values in general, and in particular the design value of Artistic aspects and Self-expression. It is particularly the concept of elitism and the value of being ahead of society, with its licence to be radical, controversial and not in line with consensus, in addition to often celebrating disruption, which has contributed to an acceptance of the design values of artistic aspects and self-expression within architecture and industrial design.[27] In particular, avant-garde values have been linked to part of the Modernist movement within architecture and industrial design as well as the Archigram design movement *(Fedders, 2004: 57 f), (Heynen, 2004a: 97).*[28]

Postmodernism introduced aesthetic values, which challenged the celebration of simplistic forms, found in Modernism. It also introduced a value shift among some architects and industrial designers with regards to the artistic and self-expression design value. The aesthetic values, which are commonly found in Postmodernism, did, and still do allow architects and industrial designers a great deal of freedom with regards to form and expressiveness.[29] This indicates that the design value of Artistic aspects and Self-expression is present in Postmodernism, and freedom and expressiveness is also found to some degree in other design movements like Supermodernism *(Steer, 2004: 1279).*[30] Contributors to the aesthetic style classified as Supermodernism can be found in a number of contemporary architectural firms.[31] In addition, the design value of Artistic aspects and Self-expression can be linked to the abstract forms and expressiveness that are commonly found in works by a number of contemporary architects.[32] The works by these architects are characterised by no concealment of expressive gestures *(Maxwell, 2004: 7).*

A contributing factor which allows contemporary architects and industrial designers to adhere to the design value of Artistic aspects and Self-expression can be found in technological developments which have supplied the technical means which allow designers to “build” with all the immediacy of a painter *(Maxwell, 2004: 7).*[33] The increased opportunity for artistic aspects and self-expression can also be indicated by the fact that the style battles, that occured in the 1970s and 1980s, were less prominent in the 1990s, as “architecture came increasingly to be seen as a very personal expression of the architect” *(Cruickshank, 2000: 303).* Similarly, it was often seen as “an individually tailored response to the demands of a specific project” *(Cruickshank, 2000: 303).*

The design value of Artistic aspects and Self-expression are not generally accepted within the two design professions. The following sections will indicate other competing design values that might overshadow or even dispute the design value of Artistic aspects and Self-expression.

5.1.1.2 The Spirit of the Times

> *"Simple imitation—of history or nature—was as repugnant to sensitive observers in 1850 as it was to those in 1930, and for precisely the same reasons. Copying deprived people of a style suited to their times, and it suggested a lack of originality, a quality that was more and more closely connected to all the design arts."* (Brolin, 2000: 110)

Within architecture and industrial design there exists a design value which is linked to the general concept that every age has a certain spirit "or set of shared attitudes, which pervades all of its cultural activities and sets a particular stamp on its artistic creations" *(Gelernter, 1995: 8)*. This concept also includes a notion that each generation should generate an aesthetic style that expresses a uniqueness related to the current time of a given generation. The Spirit of the Times design value implies that the source of a given architect or industrial designers' form expression can, to a considerable extent, be found in the "air" of a given time *(Gelernter, 1995: 8)*. So even though designers' work might display personal characteristics which can be accredited to his or hers individual skill and style, a given design outcome "also display overriding characteristics which readily identify it as originating" *(Gelernter, 1995: 8)* in a particular epoch such as the Renaissance, the Gothic Revival and Postmodernism.[34]

This design value has historical roots that date back to the time of August W. N. Pugin. Generally, the concept of "the Spirit of the Times", which is also commonly known as Zeitgeist[35], was first introduced by David Hume when he spoke of "the spirit of the age affects all the arts"[36] *(Hume, 1965: 50)*.[37] The Spirit of the Times denotes the intellectual and cultural climate of a particular era, which can be linked to an experience of a certain worldview, sense of taste, collective consciousness and unconsciousness. It is by some even seen as the "inevitable results of the conditions present within the subject time and place" *(Tilman, 2004: 619)*.

The link between the spirit of the age and aesthetics can be indicated when Pugin argued that architectural style should be an honest result and expression of its time and that it should reflect the current climate, customs, and religion of a country *(Brolin, 2000: 110)*.[38] Pugin, who is often credited with introducing the design value of the Spirit of the Times, famously argued that the spirit of his times demanded architecture with Gothic aesthetics qualities. This was in his eyes the proper style for England at the time, as he viewed England to be a Christian country and the Gothic style to him was Christian style *(Brolin, 2000: 110)*.[39]

The Spirit of the Time design value is also linked to what is known as Historicism[40] which in a design context understood as a "system of thought in which the past is understood as a series of periods or epochs, each distinct from each other and the present" *(Tilman, 2004: 619)*. Each period is within the context of Historicism "characterized by a number of prevailing philosophies, social structures, and technologies" *(Tilman, 2004: 619)*. It is important to note that the Spirit of the Times design value as well as the concept of Historicism is relativist in the sense that the styles and actions etc. of a given periods or epochs should not be judged by the standards of another period. This as it is "held to be superior to the past, while being at the same time the result of all that has come before" *(Tilman, 2004: 619)*.

The Spirit of the Times design value was adhered to and used by a number of architectural and industrial design reformers in 19th century. For instance, both John Ruskin and William Morris[41] insisted that imitating "past styles was an insult rather than a compliment to the builders of the past" *(Powell, 1999: 10)*. They both compiled and supported the Spirit of the Times design value as they were arguing that "every generation should build according to the needs and manners of its own age "*(Powell, 1999: 10)*.[42] This value position was also commonly found among architects and industrial designers of the 20th century, and it is still used as an important design value among contemporary architects and industrial designers. The search for an aesthetic style, which is capable of identifying a new generation of architects and industrial designers, is a continuing project among some members of nearly all new generation of architects and industrial designers. This point can be indicated by the following quotation by Frank O. Gehry:

> "You know, I got very angry when other architects started making buildings that look like Greek temples. I thought it was a denial of the present. It's a rotten thing to do to our children."
> *(Futagawa, 1993: 178)*

However, as with all design values presented in this chapter, the Spirit of the Times design value is not generally accepted among architects and industrial designers. For instance, the idea of building on the past can be found in other design values such as manifestation based on classic, traditional and vernacular forms and traditional values.[43]

5.1.1.3 Structural, Functional and Material Honesty

> *"'Form follows function' — that has been misunderstood. Form and function should be one, joined in a spiritual union." — Frank Lloyd Wright*[44]
>
> *"Nothing must be represented that is not also truly used in function" — Francesco Milizia*[45] *(Bertoni, 2004: 36)*[46]

Structural, Functional and Material Honesty are design values which as the Spirit of the Time design value have considerable tradition within architecture and industrial design *(Brolin, 2000: 111 - 124).* For instance, the design value of Functional Honesty can be traced back to the ancient history of Greek architecture *(Brolin, 2000: 116).* It can also be found in Roman times in works by the engineer and architect Vitruvius *(Brolin, 2000: 116).* The design value of Material and Functional Honesty is also commonly linked to architects like Carlo Lodoli who is know as the first prophet of functionalism and advocated for the "honest use of materials" *(Kaufmann, 1955: 95).*[47] Functional Honesty was also promoted by Pugin, which can be illustrated in the following assertion:

> "It will be readily admitted, that the great test of Architectural beauty is the fitness of the design to the purpose for which it is intended, and that the style of a building should so correspond with its use that the spectator may at once perceive the purpose for which it was erected." *(Pugin, 1837: 284)*

Generally, the design value of Functional Honesty is linked to the idea that a building or product's form is shaped by its intended function.[48]

During the 20th century, the modernistic slogan of "form follows function" was commonly associated with Modernism, which is a clear indication of the existence and importance of the design value of Functional Honesty within the Modernistic design movement *(Brolin, 2000: 116).*[49] The design value of Functional Honesty has been of considerable importance in a number of design movements, even before and after Modernism. Even so, the literal adherence to "form follows function" varies among architects and industrial designers as well as design scholars. At the literal end of the spectrum it has been proclaimed that an ideal building or product form "is already latently contained in the information about the client's needs, climatological conditions, community values, and so on" *(Gelernter, 1995: 6).* This implies that the form of a given design is only waiting to be discovered by the attentive designer. This point of view is reinforced by design scholars like Christopher Alexander[50] whom asserted that the designer must be like a scientist in order to discover the true functional aspects and it's consequent form *(Gelernter, 1995: 6).*

Structural Honesty has also considerable historical roots. For instance, August W. N. Pugin argued for the design value of Structural Honesty in his defence of Gothic architecture.[51] In much the same way, architects like Eugène E. Viollet-le-Duc[52] promoted the design value of Structural Honesty, which can be exemplified in Viollet-le-Duc following argumentation:

> "It would be so easy to spare us these repetitions ad nauseam of architectural ornaments, dictated neither by structural form nor respected tradition. What meaning have those classic symbols, those worn-out insignia on a building?" *(Viollet-le-Duc, 1959: 201)*

As the above illustrates, Viollet-le-Duc considered many of the contemporary building styles to be irrelevant because they were unrelated to the structure of a building *(Brolin, 2000: 113)*, and did not comply with the design value of Structural Honesty.

The design value of Structural Honesty has not only considerable historical roots as indicated by architects as Pugin and Viollet-le-Duc, but it is a design value which is commonly found within many design movements and among many individual architects and industrial designers. Structural Honesty is often combined with the idea of propriety and/or fitness to purpose i.e. Functional and Material Honesty *(Nesbitt, 1996: 16).*[53]

In much the same way, the design value of Material Honesty often implies that each material has its own and peculiar characteristics and properties, and that these "true" aspects of a given material define or contribute to the creation of a design form. Within the scope of Material Honesty, the characteristics and properties of a given material should therefore contribute to determine the way architects and designers use a given material *(Brolin, 2000: 120)*. Equally, there are also implications in the relationship between the Material Honesty value and the material properties and the techniques which should be used to shape it *(Brolin, 2000: 120)*. Finally, Material Honesty often implies that a given material should not be used as a substitute or imitate another material, as this subverts the materials "true" properties.

The implication of the design value of Material Honesty can be illustrated by architects like Viollet-le-Duc whom was outraged by the use of plaster ornaments to imitate or be a substitute for stone. It should be noted that his outrage was considerable even if he had to admit that there were considerable difficulties in telling the fake material from the original *(Viollet-le-Duc,* *1959: 202)*. Within the design value of Material Honesty is it the authenticity of material that is essential and not that it looks the same. Within the Modernist design movement, many designers subscribed to principles such as “truth to materials” and “integrity of surface” *(Whiteley, 1993: 91)*.

These principles have often been connected to rationalism, as well as to a supposedly morally superior approach by not “‘cheating’ spectators into thinking that the materials that met their gaze were other than they seemed” *(Whiteley, 1993: 91)*. It was commonly argued that architecture which “appeared to be in stone, but was really steel-frame with stone cladding, was beyond redemption in aesthetico-moral terms” *(Whiteley, 1993: 91)*. Equally within a industrial design context products made from plastic which simulated wood or veneers were frowned upon *(Whiteley, 1993: 91)*.[54] Material Honesty is a design value that is commonly found among contemporary architects and industrial designers, but economic and commercial pressure often prevents architects and industrial designers from adhering strictly to this value.

Even if the design values such as Structural, Functional and Material Honesty are more or less to a larger extent ingrained into the two design professions, is it maybe worth noticing that not all contemporary architects and industrial designers adhere to these design values. For instance, most Green architects and industrial designers “would find this sort of guiding principle irrelevant” *(Whiteley, 1993: 91)*, as within environmental design, values of environmental responsibility are given prominence, so material must be environmental friendly, but certainly need not be earnest *(Whiteley, 1993: 91)*. Equally, architects and designers that are driven by social values will typically object to all or some of these design values, on the basis that “good design” which applies the value of Material Honesty and to some degree Structural Honesty, is often a costly affair *(Brolin, 2000: 113, 123)*.[55]

5.1.1.4 Simplicity and Minimalism

> *“Clearly, simplicity has dimensions to it that go beyond the purely aesthetic: it can be seen as the reflection of some innate, inner quality, or the pursuit of philosophical or literary insight into the nature of harmony, reason and truth. Simplicity has a moral dimension, implying selflessness and unworldliness.“ — John Pawson[56] (Pawson, 1996: 7)*

The design value of Simplicity and Minimalism had considerable influence among many architects and industrial designers during the 20th century *(Toy,* *1999: 7)*, and it is still considered to be a dominate aesthetic design value among contemporary architects and industrial designers. Simplicity and Minimalism have roots which go beyond the 20th century as they date back to the time of John Ruskin and William Morris *(Brolin, 2000: 128 f), (Zipf, 2004: 77)*. During that time, the design value of Simplicity and Minimalism was mainly based on the idea that simple forms (i.e. aesthetics without considerable ornaments etc.) represented forms which were both truer to "real" art, and represented folk wisdom *(Brolin, 2000: 127 f)*. The design value of Simplicity and Minimalism emerged as a reaction to the dominant aesthetic at the time, which was seen as vulgar by some contemporary architects and design scholars. This vulgarness was seen as a degenerate taste of the social betters often referred to as the bourgeoisie, and the design value of Simplicity and Minimalism was seen as offering an alternative to this "vulgar bourgeoisie" taste *(Brolin, 2000: 129)*.[57] A similar line of thought can be found among architects like Adolf Loos, particularly in his book "Ornament and Crime"[58] where he argues that the cultural evolution is equal to the removal of ornament from articles of everyday use *(Toy, 1999: 7)*. Prominent architects like Le Corbusier also aligned themselves with this line of thought and took the argument one step further by arguing that the more cultivated a person becomes the more decoration disappears *(Toy, 1999: 7)*.

Simplicity and Minimalism typically involves, and is characterised by, aspects such as "introversion, simple geometry, smooth surfaces, absence of visible details and 'authenticity' of materials" *(Ruby and Ruby, 2003: 17)*, more abstract attributes include: honesty, austerity, clarity, calmness, free of clutter, purity of view, harmony between elements and void perceived as massiveness *(Silvestrin, 1999: 9)*. In addition, the idea of simplicity is often linked to the notion that simple forms will free people from the everyday clutter of life and offer spaces as well as products which contributes to tranquillity and restfulness *(Ruby and Ruby, 2003: 19), (Silvestrin, 1999: 9)*.[59] This line of thought has traditionally been strongly linked to agendas such as eradicating "the bourgeoisie's penchant for excess, extravagance and conspicuous displays of material wealth" *(Toy, 1999: 7)*. It has been argued that the bourgeoisie were represented in "eclectic, busy and ornate architecture" *(Toy, 1999: 7)*. It is therefore seen by some as ironic that the design value of simplicity has "led to an extremely expensive labour intensive, finely detailed form of architectural design" *(Toy, 1999: 7)*, and that the design outcomes that tend to be influenced by the design value of Simplicity and Minimalism are often linked to expensive and culturally advanced tastes.

Within industrial design, and to some degree architecture, the creation of an abstract from language has been seen as an essential precondition for the realisation of simplistic forms, and these simplistic forms have been seen as a precondition for realising the full potential of mass production, introduced with the industrial revolution.[60]

Generally, the early part of the 20th century was marked by the strong influence of the design value of Simplicity and Minimalism which can be found in design movements like the Modernist design movement. Among architects and industrial designers practising in accordance with theses movements, was it fashionable to strip away ornaments in order to create conspicuously austere forms of architecture *(Toy, 1999: 7).*[61] Ludwig Mies van der Rohe captured the essence of this emphasis with his famous modernist mantra *less is more*[62].[63]

The design value of Simplicity and Minimalism had become so influential during the 20th century that it contributed to the emergence of the Minimalist Design Movement[64] from the 1970s and onwards *(Melhuish, 1994: 9).* And by the beginning of the 1990s, this design movement had gathered considerable strength and it is still making its mark in contemporary architecture and industrial design *(Melhuish, 1994: 9).* There are a number of contemporary architects whom adhere to the design value of Simplicity and Minimalism, who produces both architecture and industrial designs that are known for their simplicity.[65] However, the design value of Simplicity and Minimalism has not been as prominent among the younger generation of architects in the USA as it has been in Europe *(Melhuish, 1994: 13).*[66] A possible explanation for this fact is that the design value of Simplicity and Minimalism has not found equal support in America as it has in Europe, due to the "fact that the origins of the Modern Movement in America were always imported" *(Melhuish, 1994: 13).*

As for architecture, there are a number of industrial designers that have been practising design in adherence with the design value of Simplicity and Minimalism.[67] In addition, from the 1980s onwards, there has been to some extent a link between minimalist inspired fashion and architecture and industrial design.[68]

In much the same way as the design values that have been introduced in the previous sections, the design value of Simplicity and Minimalism is not generally accepted among all architects or industrial designers. For instance, this is to some extent the case for the design value that is introduced in the following section.

5.1.1.5 Nature and Organic

> *"The straight line belongs to man, the curve belongs to god." — Antoni Gaudí [69] (Glancey, 2003: 70)*

There exists a long aesthetic tradition of letting nature inspire and be represented in human culture through the creation of form. Samples of this tradition can be found in the creation of the Egyptian Sphinx, which was created in 2500 BC. Highlights of this aesthetic tradition can be found in Ancient Greek architecture and products.

The importance of the design value of Nature can be indicated by the fact that a number of historical aesthetic theories and reasoning within architecture and industrial design have been based on the design value of Nature. An example which illustrates this old tradition can be found in the work of Leonardo da Vinci[70], particularly in his Notebooks which "explored extensively basic geometry and natural form in plants, animals, and the human body" *(Wake, 2000: 5), (Menges et al., 2004: 5).*[71] In much the same way as Leonardo da Vinci, the work of Giorgio Vasari also promoted the design value of Nature. This can be illustrated when Vasari "laid out his conceptual plan for an ideal palace on anthropomorphic[72] lines" in the 16th century *(Aldersey-Williams, 2003: 13).* Based on the design value of Nature Vasari argued that the façade should be a bilateral symmetry equal to that found in the human face. This was based on a belief that the "façade was the analogue of the human face, the courtyard the body, the stairways the limbs" *(Aldersey-Williams, 2003: 13).*[73] Design scholars like John Ruskin have also promoted the design value of Nature,[74] and along with other design scholars did he linked the design value of Nature to the Christian faith.[75] This religious link to the design value of Nature was reinforced by an assumption and argument that natural forms are inherently utilitarian *(Brolin, 2000: 130),*[76] which had an impact on "Victorian architecture, inspiring decorative natural forms and motifs" *(Pearson, 2001: 8).*

In addition, the advances in biology and zoology also had an impact on the design value of Nature. For instance, biologists and zoologists such as Ernst Haeckel[77] contributed to the focus on nature through his work "Art Forms in Nature"[78] *(Aldersey-Williams, 2003: 15), (Pearson, 2001: 48).* These and other illustrations had a noteworthy impact on aesthetic aspects found among architects and designers in the Art Nouveau[79] and Vienna Secessionist design movements *(Pearson, 2001: 8, 33).*[80] Equally, developments in contemporary philosophies, particularly theories by scientists like Fritjof Capra[81] and James Lovelock[82] with his Gaia theory[83] *(Pearson, 2001: 8),* influenced architects and industrial designers whom adhered to the design value of Nature. In general, this tradition can be found within both architecture and industrial design to a varying degree through most historical times *(Aldersey-Williams, 2003: 32 -37), (Pearson, 2001: 8 f).*

The Nature and Organic aesthetic tradition tends to contain elements of three main categories which includes: (1.) buildings and products which employ biological form for symbolic purposes, (2.) buildings and products where the "functional" programme is inspired by biological form and lastly (3.) buildings and products which "appear to the observer to possess biological qualities" *(Aldersey-Williams, 2003: 22)*. Buildings and products which are created in accordance with design value of Nature are often characterised by having free-flowing curves, asymmetrical lines and expressive forms *(Pearson, 2001: 8, 33).* This can be summed up in "form follows flow" or in "of the hill" as oppose to "on the hill"[84] *(Pearson, 2001: 8, 9, 18)*. All of these three aesthetic aspects are included in the design value of Nature in this context.[85]

Aesthetic elements in nature are the fundamental and recurring inspiration for the design value of Nature; which includes inspiration from all sorts of living organisms including humans, as well, as numerical laws of chaos theory, fractals and other advances in science and mathematics *(Menges et al., 2004: 7) (Pearson, 2001: 24).*[86] In general, its inspirations are drawn from both outward forms as well as inner structures in nature *(Pearson, 2001: 10)*.

Architects and industrial designers that adhere to the design value of Nature might express this sublimely, or it can be done with relatively literal references to elements in nature. The explicit expression of references to nature is a trend which some argues started in 1883 by Lucy the Elephant[87] *(Aldersey-Williams, 2003: 16)*. Another example can be found in the Big Duck which is "a shop in the shape of a duck selling duck decoys" *(Aldersey-Williams, 2003: 16).*[88] These are not isolated instances, but similarly buildings can be found in many theme parks etc. all over the world, and design scholars like Charles Jencks have suggested that "every forty years or so Modern architects flirt with the concept and style of 'organicism'" *(Jencks, 1995: 109).*

A number of architects and industrial designers have practised in accordance with the design value of Nature *(Pearson, 2001: 8).*[89] The American architect Frank Lloyd Wright is by some seen as the founder of Organic Architecture *(Aldersey-Williams, 2003: 16), (Pearson, 2001: 39).*[90] Industrial designers have in the same way as architects been inspired by nature.[91]

New technology has made it simpler for architects and industrial designers to design buildings and products that are based on the design value of Nature.

Particularly, the introduction of computer-aided design has had the effect of freeing up designers' expressiveness and making it possible to create shapes which takes their inspiration from nature *(Waters, 2003 - 11), (Pearson, 2001: 8 f).*

Buildings and products, which are created in accordance with the design value of Nature, are often linked to environmental values. It is not uncommon for architects and industrial designers that adhere to the design value of Nature to also appreciate environmental design values. Thus, contemporary architecture and industrial design, which is characterised by aesthetic elements connected to Nature such as "biomorphic" and "organic" design, have often a strong element of environmental values as part of its foundation.[92] But even if it is common to find that designers whom adhere to the design value of Nature also adheres to environmental design values, one should not automatically assume that the design value of Nature is always linked to environmental design values *(Aldersey-Williams, 2003: 21).*

Similarly to other aesthetic based design values introduced in this chapter, the design value of Nature is not generally accepted nor adhered to by all architects and industrial designers. An example of this can be found in what can be seen as a counter argument to the introductory quotation by Gaudí made by Le Corbusier, which states that "Man walks in a straight line because he has a goal and knows where he is going"[93] *(Le, 1929: 5).*

5.1.1.6 Classic, Traditional and Vernacular aesthetics

> *"There was an age, however, when the transition from savagery to civilization, with all its impressive outward manifestations in art and architecture, took place for the first time." James H. Breasted*[94] *(Breasted, 1928: 216)*

Within architecture, and to some degree industrial design,[95] there has existed a belief among some designers and design scholars that building and product forms can be derived "from timeless principles of form that transcend particular designers, cultures and climates" *(Gelernter, 1995: 14).* This aesthetic "theory" suggests that specific universal forms lie behind all good buildings and products, "no matter what the particular circumstances of the design problem, designer or culture" *(Gelernter, 1995: 14).* Within this line of thought there is a belief that if a design outcome is based on Classic, Traditional and Vernacular aesthetics then the forms will "ensure that everyone will appreciate its timeless beauty and that everyone will understand immediately how to use it" *(Gelernter, 1995: 15).* This line of thought will in this context be referred to as the design value of Classic, Traditional and Vernacular aesthetics. This design value has considerable history, which dates back to the early days of architecture and industrial design, even the terms i.e. Classic, Traditional and Vernacular themselves indicated historical roots.

For example, Classical design aesthetics were for many centuries linked to principles which "were thought to be embodied in the five Orders of architecture (Tuscan, Doric, Ionic, Corinthian, Composite)" *(Gelernter, 1995: 15)*. Each of these specifies specific rules for "the proportions of columns and the spaces between them, the proportions of entablatures relative to the columns" *(Gelernter, 1995: 15)* as well as "the details of embellishment and ornament for the complete ensemble" *(Gelernter, 1995: 15)*. By adhering to these and similar principles which includes aspects such as rhythm, proportion, scale, contrast, colour, and so on, it was (and still is) believed that these principles would created buildings characterised by *good design (Gelernter, 1995: 15)*.

Vernacular building traditions and traditional craftsmanship have inspired design movements like the Arts and Crafts Movement[96], which advocated a conviction that the Industrial Revolution produced substandard goods with little artistic merit *(Zipf, 2004: 75)*. In response to these substandard designs were handmade products reintroduced.[97] In addition, the Arts and Crafts architects revitalized the "medieval vernacular traditions of building in their local regions" *(Gelernter and Dubrucq, 2004: 1091)*, which they thought "fitted the local culture and climate while embodying good craftsmanship" *(Gelernter and Dubrucq, 2004: 1091)*.[98]

Traditional and vernacular aesthetics typically varies according to climate etc. For example, buildings in hot and dry climates will often be constructed of thick adobe walls, to provide a cool interior by absorbing heat during the hot days and keeping it warm at night by radiating the heat into the building *(Gelernter and Dubrucq, 2004: 1089)*. Equally, vernacular building traditions in the wet climate of Northern Europe evolved steep roofs to get rid of rain and snow *(Gelernter and Dubrucq, 2004: 1089)*. This indicates a close link between the design value of traditional and vernacular aesthetics and the design value of Regionalism.[99]

The emphasis on the design value of Classic, Traditional and Vernacular aesthetics within the two design professions has varied through history. Both Modernism and Postmodernism have in the past promoted design values which have overshadowed the design value of Classic, Traditional and Vernacular aesthetical styles and forms *(Sparke, 1987: 248 f)*, *(Sparke, 1998:*

6), (Johnson, 1994: xiii f, xv). However, contrary to popular belief, the design value of Classic, Traditional and Vernacular aesthetics has never been completely eradicated from the two design professions.[100]

A number of design scholars focused on traditional and vernacular architecture during the 1960s and 1970s, which was often seen as a reaction to the modern architecture criticised for being "paternalistic, bureaucratic, and anti-democratic character" *(Heynen, 2004b: 1048)*. The basis for a revival of the design value of Vernacular aesthetics can be found in the work of a number of scholars addressing vernacular architecture.[101] Their work inspired and provoked an interest among architects for factors such as culture, site, climate, or conventions, which had not received much attention within Modernism *(Heynen, 2004b: 1048)*. Equally, the "traditional" design values have been given a renewed prominence with the emergence of the New Urbanism movement and architects like Rob and Leon Krier[102] *(Beatley and Wheeler, 2004: 74)*. In addition, this type of design value has been famously promoted by both the HRH The Prince of Wales and the Prince Charles' Prince of Wales Institute *(Beatley and Wheeler, 2004: 74)*.

The design value of Classic, Traditional and Vernacular aesthetics has been very controversial among many contemporary architects and industrial designers. It is a value that is strongly promoted by some architects and industrial designers and equally rigorously opposed by other architects and industrial designers.

5.1.1.7 Regionalism

> *"Regionalism is not a matter of using the most available local material, or of copying some simple form of construction that our ancestors used, for want of anything better, a century or two ago. Regional forms are those which most closely meet the actual conditions of life and which most fully succeed in making a people feel at home in their environment: they do not merely utilize the soil but they reflect the current conditions of culture in the region." — Lewis Mumford[103] (Mumford, 1941: 30)*

Regionalism can be described as the "desire to shape buildings according to the particular characteristics of a specific place" *(Gelernter and Dubrucq, 2004: 1089)*. It is also often associated with an aim to achieve a visual harmony between the building and its geographical and or environmental setting, as well as attempting to achieve "continuity in a given place between past and present forms of building" *(Abel, 1997: 167)*. In addition to these aspects, regionalism is also linked to local and national identity.[104]

The design value of Regionalism builds on all these aspects, as well as the aesthetic aspects of regional differences, which tends to emerge, as the building culture of a particular place tends to respond to a set of local characteristics. These local characteristics often generates regional aesthetics like the "Southwestern[105]" or "Cape Cod"[106] style which can be found in the USA *(Gelernter and Dubrucq, 2004: 1089).*

Regionalism is often considered to be the oldest and most pervasive of all building values, and it dates back to ancient Greece *(Lefaivre and Tzonis, 2003: 11), (Gelernter and Dubrucq, 2004: 1089)*. This point can be illustrated by fact that within antiquity, Greek architectural elements used "to represent the identity of a group occupying a piece of land" *(Lefaivre and Tzonis, 2003: 11)*. Equally, the historical roots of the design value of Regionalism can be found in Marcus Vitruvius's writing, in particular his "De Re Architectura"[107] which "introduces the very concept of 'regional' to building and even discusses its political implications" *(Lefaivre and Tzonis, 2003: 11)*. Another indication can be found in the nineteenth century when regionalist ideas taken up in folklore studies aimed at delineating regional enclaves.[108] Even if the design value of Regionalism has a long tradition, the emphasis on the design value has varied throughout history in both design professions.[109]

The design value of Regionalism has been supported and developed by scholars such as Martin Heidegger[110] and Christian Norberg-Schulz *(Abel, 1997: 145)*. For instance, Norberg-Schulz argues that the relation of man to place is more than just an issue of being able to orientate oneself to one's environment. It has to do with identification, which in a Norberg-Schulz's context implies "to become 'friends' with a particular environment" *(Norberg-Schulz, 1980: 21)*.[111] Thus, human identification with a place supposes that places have "character", "attributes which distinguish one place from another and which lend to a place its unique presence" *(Abel, 1997: 147)*. On the basis of this is the essential purpose of architecture, according to Norberg-Schulz, to "understand the 'vocation' of the place" *(Norberg-Schulz, 1980: 23)*.

The emphasis on the design value of Regionalism can also be fond among prominent architects like Frank Lloyd Wright, who was inspired by the design values from the Academic Eclecticism and Arts and Crafts tradition [112]. In fact is it often argued that Wright can be considered "America's most influential spokesperson for the regionalist idea" *(Gelernter and Dubrucq,* *2004: 1091)* of his time. This point has its foundation in Wright's insistence that buildings should be harmonized with nature, and that it is of great importance to "sensitively address the local geology and site conditions" *(Gelernter and Dubrucq, 2004: 1091).*[113] The design value of Regionalism was also influential in Europe, and maybe no more so than in the Scandinavian countries, Holland, Switzerland and Italy.[114] Regionalism is a true international phenomenon, which can be found in many countries and regions which includes "North America and Europe, Japan and China, South East Asia and Latin America, the Caribbean, Africa and Turkey" *(Lefaivre and Tzonis, 2003: 53).*[115]

Like their earlier regionalist predecessors, many contemporary architects whom can be classified as new regionalists have "explored aspects of the traditional styles and vernacular forms that might provide clues to appropriate design qualities in their region" *(Gelernter and Dubrucq, 2004: 1092).* In addition, Regionalism is also expressed in more contemporary expressions of the traditional ideas which is in line with Modernist roots etc. *(Gelernter and Dubrucq, 2004: 1092).* Even Supermodernism can be argued to have elements of regional values, which can be found in it's phenomenological architecture, which is an "architecture that appeals to the experience of place rather than to ideas or symbols" *(Steer, 2004: 1278).*[116] Architects and industrial designers whom adhere to the design value of Regionalism will typically propose buildings or products which are based on experiences and knowledge which are imbedded in regional traditions.[117]

Even if the design value of Regionalism has a considerable tradition and is practised in many countries, is it as the other aesthetic design values presented in these part, not generally accepted. The next section will introduce social design values, which at times are competing and or are in conflict with many of the aesthetic design values introduced in the above sections.

5.1.2 Social design values

> *"Earth provides enough to satisfy every man's need, but not every man's greed." — Mohandas K. Gandhi[118] (Schumacher, 1974: 29)*

Many architects and industrial designers have a strong motivation to serve the public good and the needs of the user population *(Symes et al., 1995: 48 f).* Moreover, social awareness and social values within architecture and design reflect, to some degree, the emphasis these values are given in society at large.[119] The following sections will introduce social design values commonly found in architecture and industrial design.

However, it should be pointed out that social values are often linked to ethical consumer values, but this will not be given prominence within the following sections.[120] Even so, some of these social design values will occasionally be linked to the ethical consumer values, but it will not be the focus of the next section. The focus will be on design movements, which have a particular emphasis on social values; and how these societal design values manifest themselves.

It should be noted that social values can have an aesthetical impact,[121] but these aspects will not be explored as the main aesthetical impact found in design has been covered in the previous sections. However, as the following sections will suggest social design values are at times in conflict with other design values. This type of conflict can manifest itself between different design movements, but it can also be the cause of conflicts within a given design movement. It can be argued that conflicts between social values and other design values often represent the continuing debate between Rationalism[122] and Romanticism[123] commonly found within architecture and industrial design *(Johnson, 2004: 1084).*

5.1.2.1 Social change

> *"Revise the shelter and one improves the people" (Hughes, 1991: 167)*

The design value of Social change can be described as a commitment to the change of society for the "better" through architecture and industrial design. It can be seen as a pledge to achieve or contribute to a general and/or particular social change within a given local, national or global community. The design value of Social change has a considerable tradition which dates back to the time of the Arts and Crafts movement, with its emphasis on social reform *(Zipf, 2004: 77)*. The emphasis on the design value of Social change through buildings and products is also found in the early Modern Movement, which also promoted the idea that buildings and products could reform society *(Zipf, 2004: 77)*. On could go as far as arguing that during 1880 – 1930 the ideal of social transformation through architecture and functional objects was one of the driving forces behind the modernist culture *(Hughes, 1991: 165).*[124] A number of architects thought they could reform society through architecture and functional objects. This is particular evident in the teaching at the Bauhaus under the directorship of Walter Gropius *(Hughes, 1991: 192).*

The design value of Social change is often associated with political movements and subsequent building program such as the social building initiatives found in Europe between and after the World War I and World War II. In general, many architects, both in Europe and in the US, during this period displayed a particular faith in the possibility of achieving social change through new architecture. A commercial example of architecture with emphasis on the design value of social change can be found in the American suburb development called Levittown[125], which was created just after the Second World War *(Smith, 2004: 762).*[126] A similar focus on social values can be found in developments that have taken place in Brazil with the attempt to improve conditions in what is known as a Favela[127], which can be described as shantytowns and slums.[128] In addition to these examples, there exist a number of socially engaged architects, which in sum can be described as an international movement often referred to as the Social Architecture movement.[129] This movement was based on the conviction that participation is an essential element of the successful architecture which addresses people's needs *(Hatch, 1984: 7 - 9).* Architects that are committed to the design value of social change and social architecture often see their work as "an instrument for transforming both the environment and the people who live in it" *(Sanoff, 2000: x).*

In much the same way as in architecture, there are within industrial design individual designers and scholars who have put emphasis on social change through product development. Among these influential scholars advocating social change through industrial design is Victor Papanek. Typically for scholars like Papanek, is a line of thought that urges designers to dispose of design for profit type of thinking in favour of an alternative approach attempting to solve the world's problems. This typically involves "using a problem solving, compassionate and anti-consumerist approach" *(Davey et al., 2002)*[130]. In addition, several organisations have also been engaged in promoting the development of products that have the potential to contribute to social change.[131]

The commitment to the design value of Social change can often be seen as an overriding principle that is conducted and implemented at the expense of other design values. Subsequently, the design value of Social change is not generally accepted among architects and industrial designers.[132]

5.1.2.2 Consultation and participation

> *"The most basic question is not what is best but who shall decide what is best." — Thomas Sowell[133]*

The design value of Consultation and Participation is a design value that is generally connected to design methods and evaluation of existing design. Architects and industrial designers that are concerned with this design value are typically concerned with "how to make it possible for people to be involved in shaping and managing their environment" *(Sanoff, 2000: x)*. This typically involves a belief that users and communities should be participating in the design decision-making process that takes place in architecture and industrial design projects.

The recognition that "mismanagement of the physical environment is a major factor contributing to the social and economic ills of the world" *(Sanoff, 2000: ix)* has contributed to the formation of the Community design movement. This movement is a design movement that focuses on the design value of Consultation and Participation, and it is often associated with "community planning, community architecture, social architecture, community development, and community participation" *(Sanoff, 2000: ix)*. The Community design movement sees users and communities as being able to provide important contributions to the design process. It focuses on the following three points: (1.) provide users with a voice in decision making in design projects in order to improve plans, decisions, and service delivery etc.; (2.) increase users trust and confidence in the design process and organizations, "making it more likely that they will accept decisions and plans and work within the established systems when seeking solutions to problems" *(Sanoff, 2000: 9)*; and (3.) to encourage a sense of community by bringing together individuals who share common goals *(Sanoff, 2000: 10)*.

In addition are users and communities' consultation and participation often seen as having three general benefits. Firstly, participation is viewed as an important factor in meeting the social needs and increase the effectiveness and utilization of resources at the disposal of a particular community *(Sanoff, 2000: 10)*. Secondly, user participation offers the user groups an "increased sense of having influenced the design decision-making process and an increased awareness of the consequences of decisions made" *(Sanoff, 2000: 10)*. Thirdly, design professionals through user participation will be provided with more relevant and up-to-date information than what is possible without user participation. Some architects and industrial designers are even claiming that user participation makes it possible to create a methodological framework that can enable the use of rational decision-making methods without affecting the creative design process *(Sanoff, 2000: 10)*. These three points tends to be instrumental in how architects and industrial designers that adhere to the design value of Consultation and Participation conduct design projects. This can be illustrated in the fact that they often take part in a variety of partnership programs which tend to involve the public sector working together with developers and financial institutions, as well as working closely with the volunteer sector *(Sanoff, 2000: x)*.

Even if the design value of Consultation and Participation does not have a considerable history, the theoretical foundation for this value was spurred on by a number of design scholars and their publications, in a period starting in the 1960s and continuing during the 1970s and 1980s. For example, a number of design scholars argued that it is essential to base "urban design on study of how people actually experience and use urban environments" *(Beatley and Wheeler, 2004: 81)*.[134] Research conducted within this framework have included the development of methods which focuses on behaviour "observation, time-lapse photography, post-occupancy evaluation surveys, and cognitive mapping" *(Beatley and Wheeler, 2004: 81)*.

The design value of Consultation and Participation is not only connected to direct user participation and consolation, but is also closely related to the Building Performance Research where the user input is collected from already existing building in order to provide the basis for future successful design solutions.[135] The practical implication of this concept is often associated with Post-occupancy evaluation (POE), which is a process where consultation and participation is utilised in order to assess existing buildings etc. *(ebrary Inc., 2001: v)*.[136] Informal and subjective building evaluations have been conducted through-out history, but systematic POEs, as required for today's complex buildings and products, emerged during the second half of the 20th century *(Preiser et al., 1988: 8)*.[137] In short, POE is a process for evaluating a building's performance once it is occupied for some time, and it can be seen as having two major purposes: (1.) give immediate feedback for alterations which are necessary to optimize or improve a "completed" design project and (2.) develop information which future design solutions can be based on *(Zimring and Reizenstein, 1981: 52)*.[138] In other words, POE is "the practice of using systematic methods to find out exactly what makes designed environments work well for their users" *(Maple and Finlay, 1987: 5)*. POE can therefore be viewed as an indirect user consultation and participation, as individuals that take part in POE are not directly contributing to the design process of a new building *(ebrary Inc., 2001: v)*.[139]

A number of architects and industrial designers practise design in accordance with the design value of Consultation and Participation, and a number of buildings are know for this approach.[140] In addition, a number of organizations are promoting and contributing to the development of the design value of Consultation and Participation.[141] These organisations typically contribute by identifying "representative communities and examples of cutting-edge practices in community participation" *(Sanoff, 2000: x)* and distribute and share this information. Community participation is a phenomenon which is found in a number of countries, which includes countries like "Brazil, Denmark, Egypt, England, France, Germany, Greece, Hong Kong, Israel, Korea, Mexico, Poland, Slovenia, South Africa, and Turkey" *(Sanoff, 2000: xi).*

5.1.2.3 Crime prevention

> *"To build city districts that are custom made for easy crime is idiotic. Yet that is what we do" (Jacobs, 1961: 31)*

Crime prevention in architecture and industrial design has considerable historical roots. Thus, the design value of Crime prevention has a considerable history. This is indicated in numerous defensible constructions like city walls, watchtower, moat, crossbar, locks etc., which are all implemented as crime prevention (defensible) measures. Crime reduction through architecture and industrial design has received renewed attention over the last 20 years among some architects and industrial designers. This has particularly been the case within urban design and city planning, as well as among some industrial designers *(Press et al., 2001: 9)*. Parts of the foundation for this contemporary development and renewed focus can be found in the works published in the 1960s and 1970s by scholars like Elizabeth Wood, Jane B. Jacobs, Oscar Newman and Ray C. Jeffery *(Colquhoun, 2004: 38 f).*[142]

Based on this renewed focus, inspired partly by the above mentioned scholars, a number of different schools of thought related to crime prevention have been created. This includes the following three strategies: (1.) Defensible Space: which is based on the idea that "access points to an area should be restricted so that only those with a legitimate reason to be in a place would be there" *(Colquhoun, 2004: 37)*; (2.) Crime prevention through environmental design (CPTED)[143]: which is based on "the belief that the physical environment can be manipulated to influence behaviour to reduce crime" *(Colquhoun, 2004: 37)*; and (3.) Situational Crime Prevention and 2nd generation CPTED: which is based on the idea that both management and design interventions have the potential of reducing the opportunities for crime[144] *(Colquhoun, 2004: 38)*.[145] These strategies are practised in the USA and UK and have gained focus in countries like the Netherlands, France, Germany, and Australia *(Wekerle and Whitzman, 1995: 6)*.[146]

From this foundation the design value of Crime prevention has developed into a design value which can be fond among design scholars and some architects and industrial designers.[147] Efforts by architects and industrial designers as well as other professionals related to the design value of Crime prevention have not been without tangible results when it comes to crime reduction. This is evident in the fact that this effort has even been given its own term, Secured by Design (SBD). Studies shows that SBD has a real affect in combating crime levels as SBD houses have a 30% lower crime rate than what is found among non-SBD houses *(Pease, 2001: 15)*. Similarly, different urban design solutions have been linked to crime reduction though improved lighting systems, building design and other security measures *(Press et al., 2001: 2)*. Equally, industrial designers have also contributed towards producing products that have had an effect on crime rates.[148] The design value of Crime prevention is also supported and developed by a number of organisations.[149]

However, not all architects or industrial designers have a particular focus on the design value of Crime prevention. So in much the same way as the previous introduced design values, the design value of Crime prevention not generally accepted among architects and industrial designers.

5.1.2.4 "Third World"

> *"True compassion is more than flinging a coin to a beggar, it comes to see that an edifice which produces beggars needs restructuring."[150] — Martin Luther King, Jr.[151]*

Among architects and industrial designers one can find individuals who have joined forces with social activists as well as imaginative financiers to create what might be called the design of empowerment *(Serageldin, 1997: 8)*. This implies a built environment which responds to the needs of the poor and destitute within the "Third World", while attempting to respecting their humanity as well as working towards putting them in charge of their own destinies *(Serageldin, 1997: 8)*. These considerations and line of thought added up to what in this context will be described as the design value of "Third World".

In this context the term "Third World" implies a western social perspective on developments within developing countries (please see note).[152] Thus the design value of “Third World” refers mainly to western based architects and industrial designers’ intention to help the “Third World” through design project etc. The solutions presented by these architects and industrial designers often implies that social and economic circumstances found in the Third World make it necessarily to develop special solutions for “Third World”, which differs from what the same architects and industrial designers would recommend for developed countries (please see note).[153]

The design value of the “Third World” is a design value that has tradition, be it a limited one, which dates back to the beginning of the 20th century.[154] However, it was not until the 1960s and 1970s that the design value of the “Third World” became a considerable design value among some architects and industrial designers.[155] During the 1960s and onwards three main architectural related strategies were developed with regards to the design value of the “Third World” *(Strassmann, 1998: 590)*. Out of these three strategies, the first strategy was based on subsidizing of mortgages and savings-and-loan associations for new lower-middle-class for housing within the “Third World”. This strategy was based on the logic that through developing middle class houses, vacant dwellings would filter down to the poor and deprived *(Strassmann, 1998: 590)*. The second strategy was characterised by an effort to make use of prefabrication to increase the number of affordable houses within the Third World *(Strassmann, 1998: 589)*. This strategy was based on the development that had taken place within dwelling construction in countries like France, the Scandinavian countries, and Eastern Europe etc., where mass production technology had dramatically changed dwelling construction *(Strassmann, 1998: 589 f)*.[156] The third strategy was based on organized self-help, as buildings tend to be labour-intensive and labour is readily available within many “Third World” countries *(Strassmann, 1998: 590)*.[157] The focus within this strategy was on helping people to build their own houses and/or products, supplying only the blueprint for building technology and the design *(Özkan, 1997: 45)*, as well as helping economically by giving loans for land and for the materials. Professionals’ roll within this strategy would typically be to contribute by “managing the building process to ensure that dwellings were safe and that layouts would leave space for later roads, water pipes, and sewers” *(Strassmann, 1998: 590)*.[158]

On the back of the experience gained by these three strategies, the design value of “Third World” started to reflect a shift from focusing on building for the poor, and to encourage self-help and empower poor people to develop their own architecture and products *(Yunus, 1997: 7)*.[159] The design value of the “Third World” tends to encompass elements of the three strategies introduced above as well as the empowerment perspective. A number of design scholars and architects have promoted and/or designed in accordance with the design value of the "Third World".[160] Equally, the design value of "Third World" can also be found among practising industrial designers. Within industrial design the design value of the "Third World" is often linked to issues such as: (1.) contribution to solving problems associated with developing communities, (2.) utilisation of local materials, expertise and labour; (3.) reflection of local culture, (4.) utilisation of alternative energy resources, (5.) environmental impact, (6.) performance in harsh conditions, (7.) user friendliness, safety and ergonomics and (8.) innovation *(Viljoen, 2003: 5).*[161] Within industrial design, there are a number of organisations that plays a considerable roll in promoting the design value of "Third World" *(Viljoen, 2003: 4).*[162]

5.1.3 Environmental design values

> *"What's the use of a house if you haven't got a tolerable planet to put it on?" — Henry David Thoreau*

The 20th century has been marked by the re-emergence of environmental values within Western societies. Concern for the environment is not new and can be found to a varying degree throughout history, and it is rooted in a number of perspectives including the aim of managing the ecosystems for sustained resource yields (sustainable[163] development),[164] and the idea that everything in nature has an intrinsic value (nature protection and preservation).[165] Generally behind these types of thinking are the concepts of stewardship and that the present generation owes duties to generations not yet born *(Thompson, 2000a: 280), (Beatley and Wheeler, 2004: 9).*

Environmental problems and challenges found in the 19th and 20th centuries led to a development where environmental values became important in some sections of Western societies. It is therefore not surprising that these values can also be found among individual architects and industrial designers.[166] The focus on environmental values has been marked with the rediscovery and further development of many "ancient" skills and techniques.[167] In addition, new technology that approaches environmental concerns is also an important characteristic of the environmental approach found among architects and industrial designers. These rather different approaches to environmental building and product technology can be illustrated with the development of environmental high-tech architecture, and the more "traditional" environmental movement within is ecological based architecture *(Cuff, 2000: 347).*[168]

Environmental technology, along with new environmental values have affected development in cities across the world.[169] Many cities have started to formulate and introduce "eco-regulations concerning renewable resources, energy consumption, sick buildings, smart buildings, recycled materials, and sustainability" *(Cuff, 2000: 348)*. This maybe not be surprising, as about 50% of all energy consumption in Europe and 60% in the US is building-related *(Cuff, 2000: 348).*[170] However, environmental concerns are not restricted to energy consumption; environmental concerns take on a number of perspectives generally, which are reflected in the focus found among architects and industrial designers. These different perspectives will be briefly introduced in the following sections.

5.1.3.1 Green design and Sustainability

> *"We have forgotten how to be good guests, how to walk lightly on the earth as its other creatures do." — Barbara Ward*

Both Green design and Sustainability have a considerable tradition within architecture and industrial design. Traces of environmental thinking can, for example, be found in Vitruvius's writing when he outlined the benefits of designing with the local climate and indigenous materials in his book "The Ten Books on Architecture". Vitruvius's assertions implied that "on-site resources such as proper orientation, thermal mass, shading, ventilation, and local construction materials" *(McDonald, 2004: 1280)* should be used to control environmental factors etc.[171]

Environmental values were given renewed importance with the Industrial Revolution[172] as it led to urban development of cities of a million inhabitants etc.[173] Many of the industrialised cities were characterised by extensive pollution, public health issues, "sanitation, residential overcrowding, and nonexistent infrastructure" *(Beatley and Wheeler, 2004: 7).*[174] Not unexpectedly did many, including architects and industrial designers, feel that "that the balance between human beings and the natural world had been tipped too far in one direction" *(Beatley and Wheeler, 2004: 7).*[175] This and other aspects laid the foundation for a renewed interest in environmental design value among architects and industrial designers. Urban planners were especially inspired to attempt to tackle these environmental problems caused by the Industrial Revolution,[176] and were thus drawing the "public attention on the unsustainability of urban development trends at that time" *(Beatley and Wheeler, 2004: 8).* Despite these and others efforts the first part of the 20th century is not known for a major emphasis on environmental design values *(McDonald, 2004: 1280).* This is the case even when considering some of the more notable exceptions i.e. the Organic design movement and the Regional Planning movement *(McDonald, 2004: 1280).*[177]

However, the environmental revolution of the 1960s and the more pluralistic design environment found after the height of modernism paved the way for environmental based architecture to emerge in the 1960s and 1970s. The design value of Green design and Sustainability were in this period characterised by a focus on "solar energy technologies and passive solar heating of buildings (using the sun's energy to warm interior spaces)" *(Beatley and Wheeler, 2004: 181),* as well as a more general effort to improve the energy efficiency of new building construction etc.[178] All in all, a number of different technological solutions were developed, considered and utilised from a green design and sustainable perspective *(Mostaedi, 2003: 7).*[179]

Recycling, reusing and re-manufacturing have been proposed and introduced in some cities as a way to address the environmental challenges.[180] A number of individual architects, industrial designers and scholars have attempted to deal with specific areas of the environmental challenges. One of these specific areas is the disposal of wastes, where some architects[181] have designed sustainable resource systems *(Beatley and Wheeler, 2004: 133).*[182] Others have contributed to the development of a number of tools which support architects with regards to sustainable technologies, this includes qualitative recommendations tools and computer-based life-cycle assessment tools[183] *(McDonald, 2004: 1280).*

This general emphasis on environmental values led, for instance, to the formation of the Sustainability design movement which emerged in the late 1980s, which was characterised by attempting to achieve more comprehensive and integrated environmental friendly design solutions *(McDonald, 2004: 1280), (Beatley and Wheeler, 2004: 113).*[184]

On the bases of these and other developments a number of architects and industrial designers have made declarations and manifestos of environmental friendly development principles; these typically have been publicly declared through making design manifestos *(Beatley and Wheeler, 2004: 9), (McDonald, 2004: 1280).*[185] A key aspect found in these and other environmental manifestos, as well as the environmental approach, is the attention and focus given to the selection of environmental friendly material for design projects *(McDonald, 2004: 1280)*. This emphasis often implies finding materials with life cycle properties that encompasses qualities of creating none or less "environmental damage in their extraction, processing, use, waste, and disposal phases than conventional alternates" *(McDonald, 2004: 1280)*. For instance, "Green building" materials are typically selected on the bases of having long-lasting, compostable, recyclable, re-usable, and non-toxic qualities.[186] In addition, alternative building construction materials also play a significant role in sustainable architecture *(Elizabeth and Adams, 2000: 10 f)*. This tends to include material such as: straw bale *(Bainbridge et al., 1994)*, adobe, rammed earth *(Easton, 1996)*, wood, bamboo, cob, recycled tires, and fired ceramics *(Khalili, 1986) (Mostaedi, 2002: 9)*. Some architects and industrial designers even go beyond the material and technology approach and argue that designers should take a cradle to cradle, instead of cradle to grave, perspective on buildings and products *(McDonald, 2004: 1280)*. This implies considering the environmental impact throughout the entire building or product life cycle.[187] It should be noted that by the end of the 1990s and early 2000s a "wide" variety of "Green" design practices and ecological based building materials began to enter mainstream building construction *(Beatley and Wheeler, 2004: 181)*. This led to a development where relatively mainstream buildings contain "Green" features.

Environmental emphasis can also be found in the urban domain with concepts such as the "city line", which implies attempts to manage the growth brought on by the industrial revolution, cars etc.[188] Within the urban domain a number of strategies have developed which aims to limit urban sprawl in favour "of preserving open space and balancing service capacities" *(Adams, 2004: 1089)*. Some of these strategies attempt to strike a balance between "compact development and protection of natural resources" *(Adams, 2004: 1089)*. The arguments for limiting the area growth of cities are often argued from an ecological value position, as well as preserving habitat and biodiversity in landscapes in and around metropolitan areas *(Beatley and Wheeler, 2004: 116)*.[189] This has all contributed to public movements which have argued for restraint in urban growth and restoration of nature within urban areas, as well as preservation and enhancement of wildlife habitat *(Beatley and Wheeler, 2004: 116)*.

Green design and Sustainability design values can be found among a number of architects *(Cruickshank, 2000: 303)*.[190] Even prominent architects that are not known for focusing primarily on the sustainable design values have started to introduce elements of sustainability into their building designs.[191] Similarly, a number of organisations contribute to the promotion of the "Green" design values among architects and industrial designers.[192] In much the same way, a number of industrial designers adhere to the Green design and Sustainability design values.[193] In general, there has been a shift from the "throw-away aesthetic" espoused by Ravner Banham and Pop design theorists in the 1950s and 1960s, to a more durable and longer life environmental approach *(Margolin, 1995: 63)*. Industrial designers that are focusing on environmental design often attempt to minimize waste, using less energy, and reducing the amount of material etc. *(Margolin, 1995: 63)*. As for architecture, there is within the domain of industrial design also organisations which promote and distribute information about environmental friendly design.[194]

Even if Green design and Sustainability design values can be found among both architects and industrial designers, these values have not become mainstream within architectural and industrial design professions. This is the case even when considering the number of architects, industrial designers and books[195] that are promoting environmental friendly values. However, environmental building practises "are gradually spreading, and there is an increasing number of examples of built projects" *(Beatley and Wheeler, 2004: 181)*.[196]

5.1.3.2 Re-use and Modification

> *"Laws change; people die; the land remains." — Abraham Lincoln[197] (Blake, 1964)[198]*

Many buildings and a few products outlive their intended function due to their long lasting qualities and durability. These qualities often contribute to a life span where a building and/or product take on several functions. This has led to a long tradition where buildings and some products are being adapted to suit new functions *(Kalner, 2004: 12)*, which is the base for the design value of Re-use and Modification. The design value of Re-use and Modification has considerable historical roots, as a number of buildings have outlasted political, religious and economic regimes rise and fall. This can be observed in such developments as: (1.) the conversions of Greek and Roman temples and basilicas[199] to Christian churches, (2.) the conversions of Roman fortifications to part of mercantile cities, (3.) conversions of English monasteries to country houses, (4.) Russian palaces into post-Revolution museums and (5.) nineteenth-century European and American factory buildings, mills and railway stations which have been turned into shopping malls and hotels etc. *(Kalner, 2004: 12), (Powell, 1999: 9)*.

Re-use and modification have been a common strategy, and it was not until the Industrial Revolution, with its development of mechanisation of the building process and demolition capabilities, that “the practice of adapting old buildings to new uses became less the norm” *(Kalner, 2004: 12)*. This development was reinforced with the increased demolition which took place after the Second World War, which was brought on by technological advances and social upheavals which led to change in urban structure etc. *(Kalner, 2004: 12).*[200] Equally, a contributing factor can be found in that a number of well-built warehouses and industrial structures had been built on land which gradually became more valuable for other commercial proposes, such as office uses and homes etc. *(Kalner, 2004: 12)*. In addition, a number of buildings that were considered to be standing in the pathway of proposed new developments such as new highways etc., contributed to accelerating demolition rates in the 20th century.

This increased demolition in the 20th century brought on a critical response by some design scholars as well as a segment within the architectural and industrial design professions. It even developed into a design movement in its own right, which is commonly referred to as the Preservation movement *(Kalner, 2004: 13)*. But it is important to note that Re-use and Modification were and still are a different issue from authentic repair and restoration (this point will be elaborated in a subsequent section) *(Powell, 1999: 13).*[201] Thus, building and product conversion have often taken place without regard to the history or “character” of a given building or product.[202]

The design value of Re-use and Modification is often associated with two strategies. Firstly, it is linked to the preservation of existing buildings through updates which ensures continuous use i.e. more or less the same use *(Kalner, 2004: 13)*. Secondly, it is linked to re-use, where the buildings former use is freely transformed for new purposes *(Kalner, 2004: 13)*. Equally, the re-use and modification of existing buildings are often divided into two schools of thought with regards to the aesthetical aspects. One common line of thought is arguing for a “disciplined and highly refined approach to the introduction of new elements which are sublimated to an overall aesthetic” *(Powell, 1999: 18)*. Whereas the other perspective stresses the need for aesthetical contrast, dichotomy and even dissonance between the old and the new *(Powell, 1999: 18)*.

The design value of Re-use and Modification are not only connected to buildings and products, within urbanism re-use and modification are connected to re-use and the restoration of nature.[203] This often implies restoration of “brown-field” sites to their former natural habitats *(Beatley and Wheeler, 2004: 120).*[204] In general, the environmental thinking, which was brought about by the environmental revolution of the 1960s, changed some urban planers and policy-makers thinking, enabling them to become more aware and systematical with regards to integrating urban development with nature. But it was not until the 1980s and 1990s that the "efforts to restore damaged natural systems within cities gained speed" *(Beatley and Wheeler, 2004: 113),* with the development of urban environmental groups that focused on "restoring previously damaged urban ecosystems" *(Beatley and Wheeler, 2004: 120).*[205] However, re-use of the urban space has not only implied reuse of "brown-field" sites etc., it has also meant regeneration of areas of cities, like the "clean-up" of New York's Times Square area in the 1990s *(Powell, 1999: 15).*[206]

The importance of re-use and modification within the architectural profession can be indicated in that it is very common for architects to work with existing buildings. This point was highlighted by a survey of American architects which showed that 70 percent of the current workload was concerned with reuse *(Powell, 1999: 10).*[207] Generally, a number of buildings have been both re-used and modified,[208] this typically includes a number of large transportation facilities like train stations.[209] Similarly, private buildings like urban townhouses, urban palaces and castles also have been re-used.[210] One of the most common types of re-use of these buildings has been to re-use them as museums *(Kalner, 2004: 13).*[211] It has also been common to transform old industrial buildings into domestic and "leisure" facilities *(Powell, 1999: 9), (Kalner, 2004: 13).*[212] However, not all former industrial buildings have been turned into houses. Some have been converted into buildings that house new types of commercial activity.[213] This tendency has been supported by government organisations and policies.[214]

Nevertheless, as for all the other design values introduced in this chapter, the design value of Re-use and Modification is not generally accepted within the two design professions. Another approach to old buildings and products can be found in the restoration and preservation approach, which will be introduced in a later section.[215]

5.1.3.3 Health

> *"We ought to plan the ideal of our city with an eye to four considerations. The first, as being the most indispensable, is health." — Aristotle*[216] *(Aristotle et al., 1998: 275)*

The general awareness of health issues and especially the environment's impact on a person's health has increased over the last few centuries. This increased awareness has contributed to greater than before focus on health and its link to the built environment among some design scholars as well as architects and industrial designers. The backdrop for this development can be found in the period stretching from about 1820 through the end of the century with its urban change from ongoing industrialization, trade and migration *(Frank et al., 2003: 12).*[217] The growing concentration of huge populations and the pollution created by industrialisation in this period "led to some very real problems including widespread poverty and crowded, unsafe and unsanitary housing" *(Frank et al., 2003: 12 f).* These conditions exacerbated centuries-old public health problems in a number of cities.[218] Consequently, physicians started to associate diseases with the particulars of urban geography, as diseases often originated and spread most swiftly in the industrial city's poorest neighbourhoods due to their offensive, dirty and foul conditions.[219]

On the back of this, architects and others, both in the United States and Europe, started to fear the potential consequences of the sanitation conditions in dense urban centres. A number of people started to call for changes in building constructions that could combat these public health problems.[220] Partly due this pressure and partly out of fear of epidemic deceases was Public Health legislation introduced in many countries *(Benevolo, 1971: 49).*[221] It was also the backdrop for the creation of the sanitation reform movement. This movement consisted mainly of medical professionals and social activists, but it had also important links to architecture. This can be exemplified in the work of architects like Frederick Law Olmsted[222] *(Sutton and Olmsted, 1971: 36).*[223] Olmsted and similar architects linked health problems to the basic design attributes of urban spaces.[224] Their response to the health problems was to propose the more open spaces into the cities in the form of parks, wider streets and building redesign, as well as prototype suburbs found in "low-density city, consisting of wide boulevards and parks and ringed by satellite suburbs" *(Frank et al., 2003: 16).*[225] The influence of architects like Olmsted, and the shortcomings of the 19th century urban landscape, which from a health perspective could be described as "unpleasant: crowded, dirty, polluted, smelly, noisy and dangerous" *(Frank et al., 2003: 11)*, led many US based architects to idealise the horizontal city.[226] Indeed, the horizontal and decentralized city was by many architects conceptualized and promoted as the archetype of the healthy city.[227] This was incorporated into the legal tool of zoning[228] which became an interacted part of the local government strategy to improve the health, safety and welfare of urban residents of 20th century American and European cites.[229] It is important to note that health was only one of several factors and reflections that drove the change towards design of city during this period.[230]

Another indication of the link between health and design can be found in the Healthy Cities Movement and Housing Reform Movement *(Barton et al., 2000: 1),* which "made an important contribution to the idea that high concentrations of structures and people made for unhealthy living" *(Frank et al., 2003: 21)*. This reasoning was accepted as axiomatic in the minds of many of the subsequent generations of architects and public health officials.[231]

These and other developments have created the backdrop for the Health design value that can be found among architects and industrial designers. The design value of Health has influenced urban development and individual buildings, as well as products. Within the design of buildings are there four aims and principles that characterises the health design value, which are: (1.) an emphasis on climate-based understanding for construction detailing,[232] (2.) an aim of reducing toxic emissions through careful choice of building materials,[233] (3.) introducing quality control measures during the construction process with regards to health issues,[234] and (4.) providing for occupants' education to ensure an ongoing healthy environment[235] *(Baker-Laporte et al., 2001: 19 - 27)*. Equally, within this context a school of thought based on the health value has developed, which is called the Sick building syndrome *(McDonald, 2004: 1280)*. It is a term which describes the problem area connected to the health risks created by the designing of "sealed buildings", which is often characterised by having insufficient ventilation for a healthy environment, as well as being constructed and design by using "materials that cause chemicals to disperse into the indoor environment" *(McDonald, 2004: 1280).*[236]

Within this problem area there are two schools of thought, the first is linked to the elimination of as many of the indoor pollutants as possible in the building process, and then sealing it tightly towards the outdoor environment *(Baker-Laporte et al., 2001: 1)*. Clean filtered air is then mechanically pumped into the building which keeps the building "under a slightly positive pressure so that air infiltration is controlled" *(Baker-Laporte et al., 2001: 1)*. The second approach is based on constructing buildings out of non-toxic materials that "breathe". This is typically achieved by using material such as adobe (double) with natural insulation in the transitions, straw, clay and straw bale *(Baker-Laporte et al., 2001: 1)*. This second strategy indicates a link between Green design and Sustainability design value and the Health design value, which is quite natural as many of the environmental building materials "not only demonstrate superior environmental performance but also do not degrade indoor air quality" *(McDonald, 2004: 1280).*

The design value of health can also be found in industrial design and among individual industrial designers.[237] Organisation like the British Design

Council[238] has in the past promoted the design value of health through their work which focused on "design for disabled people, industrial safety, and public sector design" *(Whiteley, 1993: 117)*. Equally, Scandinavian countries, especially Sweden and Denmark, have had a strong tradition of developing products based on the design value of health.[239]

As for all the other values introduced in this chapter, the design value of health is not commonly accepted or adhered to by all architects and industrial designers.

5.1.4 Traditional design values

> *"We should not live in a bright shining new future, any more than we should hide in a comfortable pastiche of the past. We must inhabit an ever-evolving present, motivated by the possibilities of change, restricted by the baggage of memory and experience." — David Chipperfield[240] (Chipperfield, 1997: 131)*

Within both architecture and industrial design there is a long tradition of being both inspired by and re-use design elements of existing buildings and products. This is the case even if many architects and industrial designers argue that they are primarily using their creativity to create new and novel design solutions, as introduced in chapter four.[241] Some architects and industrial designers have openly led themselves be inspired by existing building and products traditions, and have even used this inspiration as the main base for their designs solutions.

This design tradition has a considerable history, which can be indicated in many of the labels associated with this tradition; this includes labels such as Classicism, Vernacular, Restoration and Preservation etc. In addition, as indicated in the previous section "Classic, Traditional and Vernacular aesthetics", an important element of this tradition is to re-use and be inspired by already existing aesthetical elements and styles.[242] However, the traditional approach also implies other aspects such as functional aspects, preserving existing building traditions as well as individual buildings and products. Thus, the following sections will introduce some of the numerous aspects connected to design based on existing traditions.

5.1.4.1 Tradition based design

> *"There is one timeless way of building. It is a thousand years old, and the same today as it has ever been. The great traditional buildings of the past, the villages and tents and temples in which man feels at home, have always been made by people who were very close to the center of this way. It is not possible to make great buildings, or great towns, beautiful places, places where you feel yourself, places where you feel alive, except by following this way. And, as you will see, this way will lead anyone who looks for it to buildings which are themselves as ancient in their form, as the trees and hills, and as our faces are." — Christopher Alexander (Alexander, 1979: 7)*

The idea of using existing buildings and products as inspiration or as a blueprint for new buildings and products is a concept that has considerable tradition within architecture and industrial design. This is the case even if the popularity of tradition-based design has varied throughout history. This is maybe not surprising as coping, mimicking and/or referencing elements of existing buildings and products has always been a part of most designers design process. However, the open embracing and reproduction of existing work has not always been embraced within the architectural or industrial design professions.

The tradition of basing a design on traditional buildings and/or products has roots in design movements such as Classicism which stretches back to the ancient Greek building traditions *(Amundson and Miller, 2004: 269)*. It has been practised throughout most periods. For instance, the traditional based design was a leading principle among many architects before the 19th century. In addition, even a few prominent architects were openly practising in accordance with traditional based design values at the height of modernism. Thus, traditional based design has never completely vanished from the architectural range of buildings produced in most decades.[243]

With the emergence of postmodernism in the 1960s, classical and traditional elements were used by prominent architects and industrial designers, but it was not until the formation of the New Urbanism[244] movement in 1980 that the Tradition based design value gained renewed momentum *(Beatley and Wheeler, 2004: 74)*.[245] The New Urbanism movement was established by a number of architects and planners whom sought ways to create neighbour-hoods "that emulated features of the traditional American small town" *(Beatley and Wheeler, 2004: 74)*. Architects within this tradition came close to arguing that it is "only a faithful reproduction of 18th-century typologies and formal idioms" *(Heynen, 2004b: 1049)* which is able of providing a "true" sense of urbanity.[246]

Architects, industrial designers and design scholars that adhere to the Tradition based design value, tend to design in accordance to three different strategies. These can be described as: (1.) the critical traditionalist/regionalist: whom examines "the building traditions of the site and interpreted these traditions while employing an abstracted modern vocabulary" *(Tilman, 2004: 621)*, (2.) the revivalists: whom employs "historical styles in their most literal form, believing that these enduring forms continue to retain their validity" *(Tilman, 2004: 621)* and (3.) the contextualists: whom uses "historical forms where the status of the project and the strong urban form of the surroundings demand it" *(Tilman, 2004: 621)*. It should be noted that this often implies that these contextual gestures are integrated into what are fundamentally modernist buildings or products.

A number of architects have practised in accordance with the Tradition based design value.[247] On the back of these and other architects work several hundred New Urbanist-inspired neighbourhoods have been created in the USA.[248] A similar development can be found in Europe,[249] where people like the HRH Prince of Wales (Prince Charles) have prompted traditional design values.[250] There also exists some organisations that are committed to the Traditional design value within architecture.[251] Traditional values are not only restricted to practising architects. A similar development can be found among industrial designers with their retro design *(Haslam, 2000: 6 - 10), (Marsh, 2002: 6 - 9), (Hodge and Armi, 2002: 59)*. Many industrial designers have designed products that take their cue from traditional form language as well as traditional functional solutions. Nevertheless, as indicated in many of the previous sections, the Tradition based design value is not generally accepted within either the architecture or the industrial design professions.

5.1.4.2 Restoration and Preservation

> *"People cannot maintain their spiritual roots and their connections to the past if the physical world they live in does not also sustain these roots." — Christopher Alexander (Alexander et al., 1977: 132)*

Restoration and preservation in the context of tradition is somewhat different from Re-use and Modification introduced in the previous environmental section.[252] Within an environmental context, Re-use and Modification is mainly thought of as approaches to preserving recourses,[253] whereas the rationale behind restoration and preservation from a traditional design perspective tends to represent restoring a building or product to its initial design etc. *(Ross, 1996: 7).*

Generally, there are three main lines of thought related to restoration and preservation. These are: (1.) an archaeological perspective, (2.) an artistic perspective and (3.) a social perspective *(Ross, 1996: 1).* The archaeological perspective is linked to preservation of something of historical interest *(Ross, 1996: 1).* At its most basic this can be seen as a desire to preserve the past as a curiosity, and it can be viewed as an archaeological factor which "is scholarly and even, on occasion, passionate in its belief that the past can yield something for the present" *(Ross, 1996: 1).* From an artistic perspective, restoration and preservation can be linked to the "desire to preserve something of beauty which has been built with the skill and care of the craftsman" *(Ross, 1996: 1).* Similarly, the social perspective tends to be linked to the uneasiness that is sometimes felt in communities with regards to the pace of change and the nature of change. Within the social perspective is there a desire to hold on to the familiar and reassuring *(Ross, 1996: 2).* The design value of Restoration and Preservation contains in this context all these perspectives, and can in short be described as a desire to preserve the best of our buildings and products.

The design value of Restoration and Preservation has a considerable history, as it in principle dates back to the first building or product that was considered worth preserving for the next generation. Even so, the design value did not emerge within scholarly works before the 16th century.[254] However, it was not until the 19th century that legislation was introduced with the aim of protecting old buildings *(Powell, 1999: 9).* France took an early lead in this development, whereas the same development was marked as a voluntary effort in, for example England, under the influence of designers like William Morris and John Ruskin. The foundation laid by the antiquarians and the relentless work of design scholars such as Morris lead to the formation of organisations such as the Society for the Protection of Ancient Buildings (SPAB) by 1877 in England *(Bronski and Gabby, 1999: 14), (Ross, 1996: 12), (Powell, 1999: 9).*[255] Generally, organisations like the SPAB have been influential in determining the philosophy and technical approach to architectural conservation within Great Britain and other countries *(Bronski and Gabby, 1999: 14).* Nonetheless, it was not well into the 20th century before American states and cities introduced legislation protecting buildings *(Powell, 1999: 9).*[256]

Design scholars, architects and industrial designers, whom have adhered to the design value of Restoration and Preservation, have been considered to be part of a design movement called the Conservation movement. This movement was generally a product of a general reaction to change, especially the change introduced by the Industrial Revolution *(Ross, 1996: 3)*.[257] Within the early days of restoration and preservation was the main focus on preserving monuments, but this steadily moved on to also include "a concern with urban form and the life it expressed" *(Powell, 1999: 19)*.

The impact of this development can be seen in some architectural schools which have given restoration and preservation their explicit attention by offering specialised courses and seminars on the subject.[258] Restoration and preservation have developed both as a science and as a "profession" in itself, particularly since the early 1970s *(Weaver and Matero, 1997: vii)*. The task of conserving historic buildings or buildings with heritage value has been and is still often considered to be a complex process which often involves "team of many professionals, specialists, trades, and craft workers" *(Weaver and Matero, 1997: 1)*.[259] Even if restoration and preservation often involves interdisciplinary teams, architects and to some degree industrial designers play a significant role in restoration and preservation of buildings and products.

The very idea of restoration and preservation implies an identification process of buildings that are worth preserving. There have been a number of surveys conducted in different countries which have aimed at identifying buildings that are considered to be worth preserving, no more so than in Great Britain *(Ross, 1996: 13)*. There have also been attempts to do this on a world scale.[260] These surveys have contributed to the concept of listings building considered worth preserving.[261] The consequences of listing a given building or product varies in different countries, but listing does not necessarily "mean that a building must necessarily be preserved in its original state for all time (although there is a presumption against change)" *(Ross, 1996: 7)*.[262] Listing does not only apply to buildings, but has also been used for products.[263]

The design value of Restoration and Preservation has influenced architecture and urban redevelopment in Europe as well as the United States through its "lasting impact on the development of the built environment, including associated landscapes" *(Tomlan, 2004: 616), (Ross, 1996: 7)*.[264] Similarly, a number of organisations have contributed to identifying, promoting and developing the foundation for restoration and preservation.[265] These and other organisations have contributed to the creation of a number of charters in support of restoration and preservation.[266] Even a number of architectural books are devoted to alteration of existing buildings.

Even if a number of organisations, legislations etc. have been introduced to ensure the restoration and preservation of buildings and products, this focus has not been adopted by architects and industrial designers generally. The opposite tends to be the case. Thus the design value of Restoration and Preservation is not generally accepted within the two design professions.

5.1.4.3 Vernacular

> *"The true basis for any serious study of the art of Architecture still lies in those indigenous, more humble buildings everywhere that are to architecture what folklore is to literature or folk song to music and with which academic architects were seldom concerned"*[267] *— Frank Lloyd Wright* (Wright, 1910)[268]

The term vernacular, within the context of architecture and industrial design, tends to refer to buildings and products that are developed within traditional, rural, regional, local, peasant, folk and indigenous context, by non-professional architects and/or industrial designers *(Oliver, 2004: 1402).* In other words, vernacular architecture is often defined as "architecture of and by, the people" *(Oliver, 2004: 1402).*[269] Vernacular architecture and products can also imply designs based conducted by trained architects or industrial designers based on architecture and products of and by, the people. This key concept often implies a number of different things in an architectural and industrial design context, which includes: (1.) reinvigorating tradition i.e. evoking the vernacular, (2.) reinventing tradition i.e. the search for new paradigms, (3.) extending tradition i.e. using the vernacular in a modified manner and (4.) reinterpreting tradition i.e. the use of contemporary idioms.

The Vernacular design value is essentially linked to vernacular buildings and/or vernacular products' traditions found in the folk tractions. Architects and industrial designers that focus on the Vernacular design value, utilise vernacular building traditions and/or vernacular product traditions as a source of inspiration and/or a justification for their work. This inspiration and/or justification is often related to the aesthetical aspects of a design project, but can also be a more general justification for the overall design solution for a given design project *(Oliver, 2004: 1402)*. It should be noted that the aesthetic aspects of vernacular design were briefly introduced in a previous section.[270]

Other aspects of the Vernacular design are related to primitivism, which is a set of ideas that came into being in Western Europe during the 18th century

(Morton, 2004b: 1061). Primitivism is associated with: (1.) a belief in the superiority of a simple life which is closely linked to nature, (2.) a belief in the superiority of non-industrial societies to that of the present *(Morton, 2004b: 1061)* and (3.) a celebration "of the art and architecture of primitive peoples or primitive creators" *(Morton, 2004b: 1061)*. Additionly, there is a tendency within primitivism to search for origins in the classical and the valorisation "of peasant, vernacular, or non-literate culture as a means for producing a more primal art or architecture" *(Morton, 2004b: 1062)*.

The Vernacular design value and its associated thinking (i.e. primitivism) can be found among a number of prominent architects practising at the beginning of the 20th century.[271] It should be noted that many of the architects that studied vernacular building traditions often had, what some will describe as a patronising view of the builders and of the non-architect whom where responsible for the vernacular architecture.[272] A number of designers and scholars focused on vernacular architecture and products during the 1960s and 1970s. This focus resulted in both exhibition and books.[273] This inspired and provoked an interest among architects and industrial designers in factors such as culture, site, climate, or conventions, which had not received much attention within architecture and industrial design conducted with emphasis on other design values *(Heynen, 2004b: 1048)*. Even if the vernacular building tradition, as an architectural tradition in its own right, was recognised among specialists during the 20th century, it was not until 1976 that the term "vernacular architecture" became widely accepted within the architectural domain *(Oliver, 2004: 1401)*.

However, this focus among some design scholars, as well as some practising architects and industrial designers, have not prevented the vernacular building traditions from declining since the beginning of the 20th century in many Western countries *(Oliver, 2004: 1402)*. Because of this decline, effort has been put into preserving some of these buildings for future generations *(Oliver, 2004: 1402)*.[274] In other continents the vernacular building tradition is still thriving.[275]

A number of architects adhere to the design value of vernacular and have endeavoured to relate their buildings to local vernacular building traditions.[276] Many of these architects "produce hybrids of modernism and indigenous forms responsive to particular local conditions" *(Morton, 2004b: 1063)*.

5.1.5 Design values based on gender

> *"Women constitute over 50 per cent of the users of our environments, yet we have had a negligible influence on the architectural forms our environments express." (Weisman, 2000: 4)*

Feminism and gender awareness have considerable roots within Western societies, and during the last two centuries, they have had a considerable impact on areas such as employment, health care and family life within Western countries. Even so, the focus on gender and feminist influences in the analysis of the fabricated environment has not been prominent within architecture and industrial design. But some scholars, architects and industrial designers have looked at design as "a form of social oppression, an expression of social power, a dimension of history, and a part of women's struggle for equality" *(Weisman, 1992: 3)*. Therefore, it can be argued that there exists gender and feminist design values within architecture and industrial design, which are strongly related to the feminist movement and theory developed within the 19th and 20th centuries.

Feminist theory within architecture typically encompasses identification of a number of gender related issues, such as the power relations found in architectural and urban development *(Morton, 2004a: 453)*. Some of these power relations can be found in everyday phrases like; *A woman's place is in the home* and *What's a nice girl like you doing in a place like this? (Hayden, 1984: 209)*. These phrases have, according to the feminist perspective, contributed to defining much of the housing policy and urban design found in the USA and other countries, and some will argue that they have there roots in the Victorian model of private and public life *(Hayden, 1984: 209)*.

Other issues that have been given prominence in feminist theory is the "critique of masculine dominance in the design professions, and creation of 'feminist' and 'feminine' architectural practices" *(Morton, 2004a: 453)*. This development has been strongly influenced by the general development which has taken place in the "feminism of philosophy, literature, cultural studies, and the social sciences" during the 20th century *(Morton, 2004a: 453)*. From a gender perspective, the area of cultural studies and gender theories have contributed to opening up the definitions of architectural and industrial design practices *(Rendell, 2000: 226)*.

Feminist theory within the domain of architecture has three main tendencies that are all addressing what is seen as the gendered power relations and the injustice of masculine domination in architecture and industrial design. Firstly, feminist theory addresses the issue of the "differences between men and women and take an overtly feminist approach to the critique and reconstruction of architectural practice and history" *(Morton, 2004a: 453)*. Secondly, the emphasis is on the "struggle for equal access to training and jobs in architecture and for recognition of women's competence in the profession" *(Morton, 2004a: 453)*. Thirdly, focus is placed on "theories of gender difference and representation in the built environment, architectural discourse, and cultural value systems" *(Morton, 2004a: 453)*.

Important issues which have contributed to the emergence of a gender design value is the environmental barriers that children, parents and the elderly experience in the built environment *(Weisman, 2000: 2 f)*. In practical terms, parents with children are often to some extent excluded from public spaces. This as parents, often a woman with "a child in a stroller, trying to get through a revolving door or a subway turnstile" *(Weisman, 2000: 2)*, will experience difficulties which are comparable with that of a disabled person.[277] Generally, it is argued from a feminist design point of view that many "public places rarely provide space where infants can be breast-fed or have their diapers changed" *(Weisman, 2000: 2)*. However, during the 1990s this did change to some degree with regards to big department stores, which occasionally offers day care to customers that bring along children.[278]

A number of books are devoted to document, describe and contribute to the awareness and development of the Gender values within design.[279] However, even if one takes into consideration all the literature and all of the practising designers that address the Gender design value, the value is far from being a dominant value within the design professions. This may not come as a surprise as there have traditionally been fewer female architects and industrial designers than there have been male architects and industrial designers.[280] A indication of the under representation of female architects and industrial designers can be found in that no women was recognized as a named partner within any of the large commercial architectural firms in the USA up to 1996, nor had any US female practising architect "ever been commissioned to design a nationally significant building" *(Agrest et al., 1996: 10)*.[281]

However, it is important to point out that being female does not imply that one adheres to the Gender design value as a base for design projects. Architecture conducted by female architects do generally fall into two categories: the group that remains gender neutral and the other that aims to make explicit their feminist and gender related intentions *(Rendell, 2000: 226)*. Zaha Hadid is an example of an architect which is not known for promoting feminist values through her architecture *(Rendell, 2000: 228)*. On the other hand, a number of architects and industrial designers have advocated or practised in accordance with the Gender design value.[282] There also exists some architectural offices that gives importance to the gender design value.[283] The design values based on Gender and feminism can also be found within industrial design.[284] Among feminist design scholars have industrial designers' approach to gender based design been questioned on the grounds that it does not really represents a feminist design alternative, but the idea of designing for a particular gender indicates a gender based design value. Equally a concept of unisex has entered product design which blurred the edges between male and female products *(Attfield, 1989: 217).*

5.2 SUMMARY

This chapter illustrates that architects and industrial designers adhere to distinctive design values, though individual designers differ as to which values they choose to "believe" and/or emphasize. This chapter demonstrates that the different design values tend to have a considerable history and can be found in numerous design movements. The influence that each design value has had on design movements and individual designers has varied throughout history. In addition, there are differences with regards to the heydays of design values' influence in the architectural and industrial design world.

The distinctive design values presented in this chapter have been organised into the five main categories: Aesthetic Design Values, Social Design Values, Environmental Design Values, Traditional Design Values and Gender-based Design Values. The first sub-category, Aesthetic Design Values, contains seven values. The first value in this category is the design value of Artistic aspects and Self-expression. It is characterised by a belief that individual self-expression—or one's inner spiritual self and creative imagination, inner resources and intuition—should be utilised and/or be the base used when designing. These sentiments are closely linked to a number of artistic values found in movements like Expressionism and the Avant-garde art. Thus, this design value is closely related to abstract forms and expression, personal creative liberty, elitism and being ahead of the rest of society.

The second value introduced in the Aesthetic Design Values category is the Spirit of the Time design value, which is based on the conception that every age has a certain spirit or set of shared attitudes that should be utilised when designing. The Spirit of the Times denotes the intellectual and cultural climate of a particular era, which can be linked to an experience of a certain worldview, sense of taste, collective consciousness and unconsciousness. Thus "form expression" which can be found, to some extent in the "air" of a given time and each generation, should generate an aesthetic style that expresses the uniqueness related to that time.

The third value presented in the same category is the design value of Structural, Functional and Material Honesty. Structural Honesty is linked to the notion that a structure shall display its “true” purpose and not be decorative etc. Functional honesty is linked to the idea that a building or product form shall be shaped on the basis of its intended function, often known as “form follows function”. Material honesty implies that materials should be used and selected on the bases of their properties, and that the characteristics of a material should influence the form it is used for. Thus, a material must not be used as a substitute for another material as this subverts the materials “true” properties and it is “cheating” the spectator.

The fourth value introduced in the aesthetic category is the design value of Simplicity and Minimalism, which is based on the idea that simple forms, i.e. aesthetics without considerable ornaments, simple geometry, smooth surfaces etc., represents forms which are both truer to “real” art and represents “folk” wisdom. This design value implies that the more cultivated a person becomes, the more decoration disappears. In addition, it is linked to the notion that simple forms will free people from the everyday clutter, thus contribute to tranquillity and restfulness.

The fifth value covered in the aesthetic category is the design value of Nature, which is based on the idea that nature (i.e. all sorts of living organisms, numerical laws etc) can provide inspiration, functional clues and aesthetic forms that architects and industrial designers should use as a basis for designs. Designs based on this value tend to be characterised by free-flowing curves, asymmetrical lines and expressive forms. This design value can be summed up in “form follows flow” or “of the hill” as oppose to “on the hill”.

The sixth value presented in the same category is the design value of Classic, Traditional and Vernacular aesthetics. This value is based on a belief that a building and product should be designed from timeless principles that transcend particular designers, cultures and climates. Implicit in this design value is the notion that if these forms are used, the public will appreciate a structure’s timeless beauty and understand immediately how to use a given building or product. This design value is also linked to regional differences i.e. varying climate etc. and folklore cultures, which creates distinctive aesthetical expressions.

The seventh value and the final value introduced in the Aesthetic Design Values category is the design value of Regionalism. It states that building—

and to some degree products—should be designed in accordance with the particular characteristics of a specific place. In addition, it is linked to the aim of achieving visual harmony between a building and its surroundings, as well as achieving continuity in a given area. In other words, it strives to create a connection between past and present forms of building. Finally, this value is also often related to preserving and creating regional and national identity.

The second sub-category of values is the Social Design Values category consisting of four design values. The first value in this category is the design value of Social change, which can be described as a commitment to the change society for the “better” through architecture and industrial design. This design value is closely connected and associated with political movements and subsequent building programs. Architects and industrial designers that are committed to the design value of social change often see their work as a tool for transforming the built environment and those who live in it.

The second value introduced in the same category is the design value of Consultation and Participation, it is based on a belief that it is beneficial to involve stakeholders in the design process. This value is connected to a belief that user involvement leads to: (1.) meeting social needs and an effective use of resources, (2.) influencing in the design process as well as awareness of the consequences etc. and (3.) providing relevant and up-to-date information for designers.

The third value presented in the Social Design Values category is the design value of Crime prevention. This design value is based on the belief that the built environment can be manipulated to reduce crime levels, which is attempted accomplished through three main strategies that are: (1.) defensible space, (2.) crime prevention through environmental design and (3.) situational crime prevention.

The fourth and last value covered in this category is the design value of “third world”, which is based on an eagerness to help developing countries through design (i.e. a response to the needs of the poor and destitute within the “Third World”). This design value implies that social and economic circumstances found in the Third World necessitate the development of special solutions, which are distinct from what the same architects and industrial designers would recommend for the developed world.

The third main sub-category of values is the Environmental Design Values category consisting of three design values. The first value in this category is the Green design and Sustainability value (i.e. the “Green” design value). This value is based on a belief that a sustainable and/or environmentally friendly building approach is beneficial to users, society and future generations. Key concepts within this design value are: energy conservation, resource management, recycling, cradle-to-cradle, toxic free materials etc.

The second value introduced in this category is the design value of Re-use and Modification, which is based on a belief that existing buildings, and to some degree products, can be continuously used through updates. Within this value there are two separate schools of thought with regards to aesthetics: one camp focuses on new elements that are sublimated to an overall aesthetic, and the other advocates for aesthetical contrast, dichotomy and even dissonance between the old and the new.

The third and final value covered in the Environmental Design Values category is the Health design value. This design value is based on the belief that the built environment can contribute to ensuring a healthy living environment. Built into this design value, are principles like: buildings should be freestanding; sites need to be distributed to maximize the amount of sunlight that reaches individual structures. Similarly, there is an emphasis on health based construction and reduction of toxic emissions through selection of appropriate materials.

The fourth main sub-category of values is the Traditional Design Values category, consisting of three distinct values. The first design value in this category is the Tradition based design value, which relies on a belief that traditional "designs" are the preferred typology and template for buildings and products, because they "create" timeless and "functional" designs. Within this design value there are three main strategies: (1.) critical traditionalist/regionalist i.e. interpreting the traditional typologies and templates and applying them in an abstracted modern vocabulary, (2.) revivalists i.e. adhering to the most literal traditional form and (3.) contextualists whom use historical forms when the surroundings "demands" it.

The second value introduced in the same category is the design value of Restoration and Preservation, which is based on a commitment to preserve the best of buildings and products for future generations. This design value tends to represent restoring a building or product to its initial design and is usually rooted in three perspectives. These are: (1.) an archaeological perspective (i.e. preserving buildings and products of historical interest), (2.) an artistic perspective i.e. a desire to preserve something of beauty and (3.) a social perspective (i.e. a desire to hold on to the familiar and reassuring).

The third and final value covered in the Traditional Design Values category is the Vernacular design value. This value is based on a belief that a simple life and its design, closely linked to nature, are superior to that of modernity. The design value of Vernacular includes key concept such as: (1.) reinvigorating tradition (i.e. evoking the vernacular), (2.) reinventing tradition i.e. the search for new paradigms, (3.) extending tradition i.e. using the vernacular in a modified manner and (4.) reinterpreting tradition i.e. the use of contemporary idioms.

The final sub-category presented in this chapter was the Gender-based Design Values, which is closely linked to the feminist movement and theory developed within the 19^{th} and 20^{th} centuries. This category has not yet been divided into sub-values. However, design values based on gender are related to three tenets found in architecture and industrial design, which are: (1.) gender differences related to critique and reconstruction of architectural practice and history, (2.) the struggle for equal access to training, jobs and recognition in architecture and industrial design and (3.) the focus on gender based theories for the built environment, the architectural discourse, and cultural value systems. Designers that adhere to the Design values based on gender typically have a focus on creating buildings that do not have the same barriers that children, parents and the elderly experience in much of the built environment. It also implies a focus on aesthetics that are deemed to be more “feminine” than the “masculine” aesthetics often created by male designers.

6 Values and design decisions

"The heart has its reasons, which reason knows nothing of."[1] *— Blaise Pascal*[2] *(Pascal et al., 1914: 169)*[3]

It is reasonable to argue that humans are dominating the planet because of their distinctive capacity for good decision-making, and not because of their physical capacities *(Hastie and Dawes, 2001: 1)*. Consequently, rational decision-making is an essential part of what characterises humans throughout history *(Lakoff and Johnson, 1999: 513)*. Decision making affects all parts of life; including architecture and industrial design. This as a typical design process of a building and/or product requires numerous decisions to be taken on different levels. These decisions and the different levels (phases and/or stages) varies greatly in architecture and industrial design, as the nature of different projects varies greatly, and as designers tend to vary their design process according to the design project at hand *(Cross, 2001a: 91), (Cuff, 1991: 84) (Blau, 1984: 10)*.

Even so, most design projects tend to consist of at least three main phases which are sometimes characterised as: (1.) schematics (the initial concept phase), (2.) design development (problem-solving phase) and (3.) work drawings (the finalising and implementation phase) *(Cuff, 1991: 91)*.[4] Each of these phases tends to have different purposes and focus, and it is not always clear when one phase ends and the next starts, but these phases must normally be "concluded" before the process of producing or building a building or product can take place *(Cuff, 1991: 91) (Cross, 2000: 3)*. It should also be noted that these three phases will to a varying degree: (1.) put different requirements on the designer, (2.) involve different contributors to the design development and (3.) engage stakeholders in the design process.[5]

The design process does not necessarily end when the production phase starts, as alteration to a proposed design during the implementing stage is common, in both architecture and industrial design. Even the starting point of a design process can vary according to which type of design process the designer practises and which design values the designer holds. For instance, while a design project normally starts out with a commission, which is not always the case, as some designers operate as entrepreneurs, within this paradigm, the designer makes their own design brief, takes responsibility for the development, and follows it through into production.[6]

Based on this variation in design process is it difficult to give a precise description of a design process, consequently, the focus in this chapter therefore will not be on describing a complete design process. Instead, the focus will be on the main stage of the design process, ranging from the initial brief to the evaluation of a finished design. However, within this range particular attention will be given to three interwoven decision-making stages. The first stage covers the initial setting[7] and brief, as well as the designers own intentions and aspirations. This all sets the backdrop for a design project and are used as a base for the initial framing of a design project. The initial frame is often referred to as the initial idea(s), metaphor(s), concept(s) and or framework *(Collins, 1971: 50).*[8] The second decision-making stage is the procedural and/or iterative part of the design process, which is often known as the problem-solving procedure or as "conversation and reflection" etc. *(Collins, 1971: 50).*[9] The third decision-making stage is connected to the fact that architects and industrial designers will often decide to reframe in the midst of the procedural or iterative design process. This reframing is often based on the insight gained through the design process or might be brought about by outside circumstances. It might even simply be brought on by designers finding the initial framing to inappropriate etc. It should be noted that for the sake of clarity, these three stages will be introduced separately, even if they undoubtedly are closely connected and often interwoven. In addition to these decision-making stages in a design process, attention will be given to evaluation and design guidelines for design projects.

Nevertheless, regardless of the varying design processes and their different phases, design decisions, like most decisions, are based on some sort of rational as well as being conducted in a context. Therefore, this chapter will start out by introducing decision-making generally and the different rationales that are used in decision-making. The lack of a knowledge foundation in architecture and industrial design, which was introduced in chapter four, will be revisited and expanded upon in this chapter, as many professional decisions in other professions are based on a knowledge foundation. There will also be an introduction to values set in a design context, which builds on what was introduced in chapter two. Equally, the challenges that are often faced by architects and designers, with regards to design projects and decision-making and its relations to a designer's value set, will be highlighted within this chapter. The chapter will be concluded by introducing the value aspect that is connected to evaluation of existing design solutions, and how architects and industrial designers use values and value sets to evaluate design, as well as how values play an essential role when design guidelines have been developed.

6.1 INTRODUCTION TO GENERAL DECISIONS MAKING

> *"A decision is the action an executive must take when he has information so incomplete that the answer does not suggest itself." — Arthur W. Radford[10] (Ransom, 1958: 6)[11]*

Decision-making is something that every person is involved with and it is an essential part of achieving goals and desirable outcomes. The types of decisions have tended to change with every generation. Previous generations faced different challenges compared to today's decision makers.[12] Nevertheless, decisions by today's generation are probably no more difficult to make than the decisions that faced pervious generations, as humans tend to "adapt to whatever decisions must be made and to their consequences" *(Hastie and Dawes, 2001: xiv)*. This adaptability can be seen as both a blessing and a curse. It is a blessing when humans are forced to adjust to cruel circumstances etc, and it is a curse in that this adaptability makes it difficult for most humans to sustain satisfaction over time.[13]

Through out history numerous scholars have philosophized and researched how decision makers[14] actually conduct their decisions and what is the best way to conduct decisions.[15] One of the outcomes of this tradition is the idea of rational decision-making that is based on general rationality.[16] Decision-making has also been linked to the concept of probability, which can be traced back to the Italy Renaissance, and in particular, to scholars such as Geronimo Cardano[17] who was the first to organize the theory of probability. His work focused on analysing decision-making within the practice of gambling *(Hastie and Dawes, 2001: 19)*. Equally, decision-making has been connected to the concept of maximization of utility, which implies an aggregation of pleasures or desirable states as utilitarians tend to speak of "summing" pleasures and "maximizing" them. This typically implies that a rational decision maker is someone which prefers alternative X to alternative Y, whenever the expected summed utility of X is greater than the summed utility of Y *(Hastie and Dawes, 2001: 251)*. It assumes that people act only on self-interested motives. This type of thinking is linked to the hedonist psychology of Jeremy Bentham[18], whom is considered to be the father of utilitarianism *(Putnam, 2002: 50 f)*. Bentham argued that everybody eventually desires only a subjective psychological quantity, referred to as “pleasure” by Bentham, and that this “quantity” is a purely subjective matter *(Putnam, 2002: 51)*. This line of though connected to maximization of utility has been developed and advocated by a number of scholars including John von Neumann[19] and Oskar Morgenstern[20] that wrote the now classic work “Theory of games and economic behaviour”.[21] This work presents a mathematical theory of economic and social organization based on a theory of games of strategy, where maximization of utility is a central concept *(Von Neumann and Morgenstern, 1944: 8 f).*[22] It should be noted that in the context of general decision-making, is it not the experiences of current pleasure and/or pain that are most important, but what one predicts will make oneself happy after the decision is taken *(Hastie and Dawes, 2001: 199)*. This is often referred to as the anticipated happiness-unhappiness decision utility by scholars such as Daniel Kahneman[23], Peter Wakker and Rakesh Savin *(Hastie and Dawes, 2001: 199)*.

But “any pleasure is qualitatively unique, being precisely the harmony of one set of conditions with its appropriate activity” *(Putnam, 2002: 51),*[24] and will therefore not necessarily lend itself to be summed. In addition, some particular “pleasures” of a given aggregation might not be distinguishable from each other, meaning that not all options presented in an aggregation will represent themselves as clear alternatives that the decision maker can easily chose between. The concept of maximization of utility tends to imply aggregation of sub-decisions which leads to a “final” decision, but the decision maker might not be able at the point of aggregation to take in all the individual decisions required in an aggregation, due to “incomparability” and “indifference” between some of the alternatives presented in aggregation “tree” *(Putnam, 2002: 81)*. Indifference in this context does not imply that one does not care in the sense that one is willing to let a coin-toss decide etc. It comes down to the difference between alternatives which the decision maker regards as perfectly substitutable alternatives and other alternatives which the decision maker regards as undistinguishable *(Putnam, 2002: 81)*. Thus can it be argued that “thinking of everything as a ‘commodity’ will necessarily blind one to the most elementary facts about the moral life” *(Putnam, 2002: 83).*

As a result, arguments and research results regarding whether decision-making should follow the concept of maximising expected utility is divided, were the difference of opinion tends to follow the lines of academic fields *(Hastie and Dawes, 2001: 21)*. Traditional economists typically adhere to the concept of maximization of utility with regards to decision-making,[25] whereas fields like psychology and behavioural economics tend to reject the concept of maximised expected utility.[26] The rejection is often based on that many decisions taken by individuals and/or social groups are blatantly irrational and violates the concept of maximising the expected utility. It can be argued that individuals and groups often fail to pursue goals consistently, as they regularly stray from what can be considered rational[27] decision-making and are irrational in a systematic way. Most people do “not exhibit the systematic kind of reasoning demanded by decision theory” *(Hastie and Dawes, 2001: 36)* which is “related to their automatic or ‘bounded’ thinking habits” etc. *(Hastie and Dawes, 2001: 22).*

This might not be considered surprising as decisions tend to be influenced by: (1.) not only the present state but also by how one arrived at the present state, (2.) the way in which one frames the possible consequences of a decision and (3.) “cognitive heuristics” like mental rules of thumb which are used to judge future likelihood etc. *(Hastie and Dawes, 2001: 18)*. Studies have shown that individuals often tend to be over optimistic and display a certainty effect, as well as loss aversion *(Kahneman and Tversky, 2000: 486)*. Many of these characteristics depart from assumptions imbedded in the concept of maximised expected utility and rational decision theories, as decision makers are assumed “to have realistic expectations, to weight outcomes by their probabilities, and to evaluate consequences as asset positions, not as gains and losses” *(Kahneman and Tversky, 2000: 486).*

A possible explanation for the limitation often found with regards to the utility-based decisions theories is that these theories imply that people in general have insight into their utilities, as well as future utility in many instances. This tends not to be the case for most peoples in many instances *(Hastie and Dawes, 2001: 251)*. Another explanation might be found in that people tend to use metaphors, framing, metonymy, and prototype-based[28] inferences to make decisions *(Lakoff and Johnson, 1999: 514)*. Equally, a possible explanation can be that decision rationality is commonly challenged by common decision-making procedures and/or influenced by habit[29], conformity[30] and religious principles or cultural mandates[31], which all have a limited link to what is commonly known as rationality *(Hastie and Dawes, 2001: 18 f).*

From the above introduction it is possible to conclude that “most people are ‘not rational,’ that is, they do not reason in everyday life in accordance with the laws of probability and the rational model” *(Lakoff and Johnson, 1999: 527)*. This view tends to be supported by second-generation cognitive scientists like Daniel Kahneman and Amos Tversky[32], whom have shown that people are irrational *(Tversky and Kahneman, 2000: 210) (Quattrone* *and Tversky, 2000: 452),*[33] as humans are often controlled by emotions and desires as well as being bounded by limitations on memory and computational capabilities, which do not fit the model of rationality *(Quattrone and Tversky, 2000: 452), (Hastie and Dawes, 2001: 237), (Nisbett and Wilson, 1977: 243 f).*[34] Instead, most people reason using metaphors, framing, metonymy, and prototype-based inferences and hence do not reason literally and "logically" *(Lakoff and Johnson, 1999: 527).*[35] It should be noted that people often can not use rational, utility and probability based reasoning even if they tried, as these forms of reasoning are not appropriate to most every day situations, and because most people reasoning is unconscious, while utility and probability "forms of reason are conscious and so have only a very limited range of real use" *(Lakoff and Johnson, 1999: 528)*.

Nevertheless, this does not render rational decision-making obsolete. It can be argued that rational-choice and/or probability theory can be used as a useful decision-making strategy when (1.) the goal is to be descriptive and not prescriptive i.e. to describe the world, not to change it, (2.) when the situation has a single form of "happiness" that can be accurately modelled by numbers and (3.) when the values of the situation are comparative, not intrinsic *(Lakoff and Johnson, 1999: 533)*.

However, as introduced above, many decision situations are not characterised by these characteristics, which is particularly the case for architecture and industrial design. Many general cases and examples found in architecture and industrial design are characterised by having (1.) intrinsic values, (2) multiple values that cannot be reduced to single numbers and (3) an outcome that will "change" the world, not just describe it *(Lakoff and Johnson, 1999: 533)*. In these cases, decision-making is dependent on values and/or value sets, and decision strategies like rationality, probability and maximization of utility tends to have limited applicability. This is particularly evident in the last of the above three characteristics as "change" to the world tend to be a moral choice rather than a "rational" (i.e., interest-maximizing) choice *(Lakoff and Johnson, 1999: 533).*[36]

In addition, value dependencies in most decision-making can be illustrated by evaluation of decisions. The dependencies on value perspective in evaluation of decisions can be illustrated in that: if one accepts that "good decisions are those that choose means available in the circumstances to achieve the decision maker's goals" *(Hastie and Dawes, 2001: 18)*, will a number of the decisions taken by Adolf Hitler[37] be seen as "rational". This is the case even if most contemporary people express disapproval of Hitler's decisions, and the fact that most of Hitler's decisions have in a historical context been considered to be extremely undesirable (to put it mildly). This illustrates that the value perspective in a strategy and/or a decision-making process is evaluated from plays a vital role.

This does not imply that facts do not play a part in evaluating decisions. This point can be demonstrated by the contest to be the first to the South Pole,[38] which involved two teams, one that was headed by the British explorer Robert F. Scott[39] and other by the Norwegian explorer Roald E. G. Amundsen[40]. Amundsen team won the contest, but unfortunately, the Scott team experienced more substantial problems than being beaten. The Scott team perished from starvation and exhaustion only 11 miles from the return supply depot *(Hastie and Dawes, 2001: 47)*. Scott described in his notebook, before he died, that his team's effort was heroic and he claimed that they where "defeated by the implacable, enigmatic natural world" *(Hastie and Dawes, 2001: 47 f)*. But this is disputed by most commentators that tend to attribute Scott's failure to repeated episodes of poor decision-making. The questionable decision-making includes issues such as: where Scott decided to locate the supply base, use of pack animals and machines and numerous other details *(Hastie and Dawes, 2001: 48)*.

The achievement by the Amundsen team, which in contrast to the failure by the Scott team, leaves little room for considering Scott's strategy i.e. decisions an equal success compared to that of the Amundsen. This example indicates that in general, all decisions cannot be looked upon equally or be considered to be equally well founded etc. This is particularly the case from a historical hindsight perspective. This illustrates that not all strategies and individual decisions can be considered to have equal claims on reality and/or on a desired outcome. Even if this is generally the case, most strategies or decisions do not allow themselves to be evaluated without passing judgments that implies a particular way of thinking or a particular value or value set.

6.2 DECISIONS MAKING IN DESIGN

> *"My way is to divide half a sheet of paper by a line into two columns; writing over the one Pro, and over the other Con; then during three or four days' consideration. I put down under the different heads short hints of the different motives, that at different times occur to me for or against the measure. When I have thus got them all together in one view, I endeavour to estimate the respective weights ... find at length where the balance lies ... And, though the weight of reasons cannot be taken with the precision of algebraic quantities, yet, when each is thus considered,*

separately and comparatively, and the whole matter lies before me, I think I can judge better, and am less liable to make a rash step; and in fact I have found great advantage for this kind of equation, in what may be called moral or prudential algebra." — Benjamin Franklin[41] *(Franklin and Bigelow, 1904: 372)*[42]

Decision-making is a concept that encompasses a wide range of activities and situations, which is reflected in that different professions refer to decision-making differently. For instance, decision-making in the context of architecture, industrial design and engineering is often referred to as "designing" *(Simon, 1977: 160)*, whereas in military affairs is it frequently referred to as "planning" and in chemistry, the term "synthesis" is often used. Other terms which imply decision-making includes: "invention", "composition" and "creation" *(Simon, 1977: 160)*. Decision-making within the architectural and industrial design professions tends to include a number of the above-mentioned aspects such as: planning, invention, composition and creation etc. Architecture and industrial design tend to be characterised by numerous amounts of different decisions as both domains covers a wide variety of aspects and issues *(Nelson and Stolterman, 2003: 105 f)*, *(Spector, 2001: 65)*.

Professional decision-making is often seen as being the skilful application of technical knowledge within ethical limitations *(Spector, 2001: 8)*.[43] This type of assertion is often made under the assumption that a profession provides highly specialised knowledge and that it administers a high degree of specialised competence (as introduced in chapter three).[44] Equally, it is often assumed that this specialised knowledge and competence contributes to professionals making "wise" decisions.[45] These assertions and qualifying assumptions are often associated with the medical and legal profession, whereas the fitness of these assertions and assumptions to both architecture and industrial design is questionable. This as both architecture and industrial design professions are known for a skilled based approach as oppose to knowledge based approach (this point was introduced in chapter four).[46] The lack of technical knowledge, specialised knowledge and general knowledge based competence has implications for the decision-making aspects within the two design professions, in the sense that both professions are not basing their decision on a specialised knowledge base in the same way as other professions like engineering, medicine and law do.[47] Another factor which contributes to differences in decisions making in the two design professions and other professions is that professional ethics tend to sets boundaries for which decisions can be taken within a given profession *(Spector, 2001: 8)*.[48] Ethical limitations within architecture and industrial design tend to be less ridged compared to those of other professions like medicine and law, giving less guidance to what is an acceptable decision within the two design professions.[49]

Even so decisions within architecture and industrial design, in the same way as all decisions, are based on some sort of decision rational (which implies everything from: thinking, rationality, cultural based judgement, value base etc.).[50] The main aspect that distinguishes the two design professions from other professions is the “fact” that there is no universal agreement on what the basis for decision-making in design should be. Instead, it tends to vary depending on the individual architect and/or industrial designers.[51] Some architects and industrial designers even vary their approach and decision rationale according to the design project at hand *(Cross, 2001a: 91), (Cuff, 1991: 84) (Blau, 1984: 10).*[52] These individual aspects of design decisions make a general discourse about architectural and industrial design judgement difficult *(Collins, 1971: 37).*[53]

However, the diverse base for decisions in design does not imply that the design decisions cannot be evaluated. But as for general decisions, the evaluation of design decision varies according to the rationale used to evaluate them (this point is elaborated in a subsequent section).[54] This makes it common for buildings and products to be considered successful or a failure, depending on the rationale that is behind the evaluation criteria.[55] Design evaluation tends to be, in the same way as design decisions, dependent on who is performing the evaluation, as different designers tend to evaluate designs from different rationales, which in this context implies different values and value sets.

In the same way as general decisions and their evaluation can be helped by clear factual result, as some medical success rates that can be measured in survival etc., decisions within the two design domains could benefit from factual information assisting the decision-making. However, generally architecture and industrial design tend not to produce similar clear-cut factual results. This lack of factual results makes architects and industrial designers more dependent on values and value sets in evaluations than other professionals.[56] It should be noted that this dependence on a given value base does not prevent designers and scholars to pass judgment which equals the severity that was passed on the previously mention failure of Scott. The difference lies in that these judgements are less fact driven and more subjective and dependent on the evaluator. This is due to the fact that there is no universal agreement on evaluation criteria of either the final design outcome or the decision process within architecture and industrial design.[57]

6.2.1 Design is generally value based as oppose to fact based

> *"Design is often a matter of compromise decisions made on the basis of inadequate information. Unfortunately for the designer such decisions often appear in concrete form for all to see and few critics are likely to excuse mistakes or failures on the grounds of insufficient information." (Lawson, 1997: 127)*

As introduced in previous chapters and in sections in this chapter, architects and industrial designers are characterised as being skill-based as opposed to knowledge-based, as well as being less specialised than many other professions.[58] This contributes to a general lack of factual knowledge and competence within architecture and industrial design, which is mainly due to the fact that there is generally little focus on empirical research within the two design domains, and the fact that there have never been any specialties developed based on the sub-knowledge domain within architecture or industrial design.[59] These circumstances have left architects and industrial designers with little or no factual knowledge that they can argue, reason and/or take decisions from.[60] Architects and industrial designers are therefore largely more dependent on a value related reasoning and argumentation than other professions.

Due to these facts, design methods and processes practised by most architects and industrial designers are not linked to a general knowledge base,[61] but instead linked to design skills which are obtained from design education and experience gained in individual design projects *(Cuff, 1991: 84)*. This point can be indicted by the typical responses which are given by architects when asked about issues such as: *How does a typical project move through the design office?*, *Who tends to works out the schematic design?*, and maybe more importantly *How do you decide when it's time to move on to design development? (Cuff, 1991: 84)*. The typical responses to these type of questions by architects and industrial designers is to assert that it all depends on the project *(Cross, 2001a: 91), (Cuff, 1991: 84), (Blau, 1984: 10)*. This notion of a customised project approach is based on the notion that every design problem is unique and that it requires a distinctive response, as general solutions can in design terms miss the complexity and refinement of detail that is sometimes needed to meet the richness of a unique design situation *(Cuff, 1991: 84), (Nelson and Stolterman, 2003: 137).*[62]

This is in line with the general observation that most architects and industrial designers tend to conduct their design process in an ad-hoc and unsystematic way *(Cross, 2001a: 91), (Cuff, 1991: 84) (Blau, 1984: 10)*,[63] and the fact that most architects and industrial designers, including design scholars, tend to site "experience" as the main way designers obtain skills and expertise. This assertion is based on the assumption that it is possible to obtain professional skills and expertise which can be generalized from one problem to the next *(Cuff, 1991: 84)*. But as designers vary their design method according to the design project, and the fact that people generally have difficulties in integrating information from non-comparable dimensions, suggests that this argumentation is problematic, at least in strict rational terms *(Hastie and Dawes, 2001: 62).*[64] It would be less problematic if training and practice made "experts superior to other people at integrating information (as opposed to knowing what information to look at)" *(Hastie and Dawes, 2001: 62)*. But there is generally no evidence that experts think differently from other people, even if experts tend to be better at knowing where to look than novices *(Hastie and Dawes, 2001: 62).*[65] To counter this argument it is often claimed that experts, unlike novices have access to thousand of examples and are thus better equipped to make decisions *(Flyvbjerg, 2004: 421)*. However, the ad-hoc and an unsystematic way that most architects and industrial designers tend to operate make this argumentation questionable in a design context.

The main factor that makes the sustained belief in intuitive judgments based on experience, commonly found among experts in most professions including the two design professions, questionable, is a general lack of available feed-back that these intuitive judgments are exposed too. Another reason can be found in that experts as well as most people tend to remember the successes of intuitive judgment selectively. In general, the lack of feedback and the selective memory contributes to situations where knowledge of experts and people's failures tends to be non-existing or at best sporadic in many instances *(Hastie and Dawes, 2001: 66)*. This point can be illustrated by two general examples. Firstly, it is common for professors, based on their expertise, to claim to have success in choosing students for a given education.[66] But professors tend to have a feedback problem as they are likely to only have access to the accepted students, which implies that if the accepted students do well this reinforces the impressions of the professor's successful expert opinion, whereas little is known of the rejected students *(Hastie and Dawes, 2001: 66)*. Based on this, it is uncommon for professors to blame their expert opinion if some students turn out not to be successful. Instead, it is common to attribute student's failing to their inability to work and their individual development etc.

Secondly, within the business domain, expert opinions are often cited as a major contributing factor to success. A well-known example of this is Ray

Kroc's[67] acquisition of McDonald. This acquisition was, according to Kroc, based on his gut feeling, which is implying an expert opinion. The strength of his "expert opinion" is highlighted by the fact that Kroc completed the acquisition of McDonald despite of a backdrop of warnings from his advisors which argued that it would be a bad investment *(Hastie and Dawes, 2001: 66)*. Even if no one disputes the success of Kroc's investment, there is no statistic available indicating all the investors that have over years followed their expert opinion, with the subsequent consequence of personal ruin. This lack of feedback related to expert opinion in the business domain can be compared to 36 people who have "an intuitive feeling that the next roll of the dice will be snake eyes and are willing to bet even odds on that hunch, on the average one will win" *(Hastie and Dawes, 2001: 66)*. In the same way as in the business world, the person which wins the dice bet will most likely "come to our attention; for one thing, the others probably won't talk about it much" *(Hastie and Dawes, 2001: 66)*.

These two examples illustrate the common feedback problem that exists in many expert domains. The lack of factual based feedback is particularly acute within the two design domains,[68] which makes the common assertion that architects and industrial designers develop their skills and knowledge from the design practice questionable. This as architects and industrial designers tend only to get experience in how well they achieve their own objectives, as the feedback is mainly only related to their own evaluation of a given design project. It should be noted that this does not imply that other architects and/or industrial designers etc. might not evaluate the work of designers. However, these evaluations are often dismissed, not considered applicable or taken to heart based on the fact that there is no universal agreed upon evaluation criteria within the two design professions.[69] Instead, the main feedback that architects and industrial designers are receiving is how well a design adheres to their own evaluation criteria, which is mainly based on their own design values as well as design values found within the professions.[70]

6.2.1.1 A science perspective

> *"Science is facts; just as houses are made of stone, so is science made of facts; but a pile of stones is not a house, and a collection of facts is not necessarily science." — Jules Henri Poincaré[71] (Poincaré and Larmor, 1952: 141)*

> *"Truth in science can be defined as the working hypothesis best suited to open the way to the next better one." — Konrad Zacharias Lorenz[72] (Reif and Larkin, 1991: 739)*

Generally architects and industrial designers base their decisions on past experience, skill, and their framework of values *(Buenaño, 1999: 84)*. This individual base leaves architects and industrial designers with what can be regarded as a personal "knowledge" base. This personal "knowledge" base makes conflicts within the two design professions generally resistant to refutation by an appeal to evidence, as there is no shared paradigm among architects and industrial designers.[73]

The importance of a common paradigm within an academic field has been introduced by scholars like Thomas Kuhn with his book "The structure of scientific revolutions". Here Kuhn argues that there exists periods of normal science in which scientists operate within a shared paradigm and with an agreement on the rules of the scientific game for settling disagreements. However, Kuhn points out, this is not always the case and that there are times where the sciences are more accurately characterised by the term "revolution". Within periods of revolution, the scientific game is not resolved by reasoned appeal to evidence, as there is no agreed-upon framework for reaching consensus. Revolutions, according to Kuhn, generally are not resolved by scientists who are able to convince others to give up their original point of view, but by individuals simply dying out and being replaced by individuals who share the "new" standpoint.

The distinction between normal and abnormal circumstances within the domain of science described by Kuhn is taken on board by Richard Rorty in his book "Philosophy and the mirror of nature", where he points out that "normal" circumstances implies that academic discourse is conducted against the background of:

> "agreed-upon set of conventions about what counts as a relevant contribution, what counts as answering a question, what counts as having a good argument for that answer or a good criticism of it." *(Rorty, 1979: 320)*

This implies that in order to settle disputes it is essential that agreed-upon rules, assumptions, conventions and beliefs exist that can be referred to. A period of "normal" circumstances implies that a dispute can be settled through reasoned discourse based on an agreed-upon criteria for reaching an accord. On the other hand, abnormal circumstances are characterised by discourse which takes place "when someone joins in the discourse who is ignorant of these conventions or who sets them aside" *(Rorty, 1979: 320)*. Generally the product of abnormal circumstances within a given discipline can be "anything from nonsense to intellectual revolution" *(Rorty, 1979: 320)*.[74] Within abnormal discourse, there is no predecided criteria for reaching an agreement, which erodes the possibility for “normal” communication among the contending actors. Within Kuhn and Rorty’s framework are “new and emerging” sciences eventually adhering to a shared paradigm, where there are agreements with regards to the rules of the scientific game.[75] When this takes place, the “new and emerging” sciences will enter a period of “normal” circumstances and shared paradigms.

The interesting point in the reasoning of Kuhn and Rorty, from a design perspective, is that within architecture and industrial design there is very seldom, if ever, a shared paradigm that can be characterised as a “normal” circumstance or shared paradigm.[76] This as there is and has not ever been a shared base with regards to a number of significant issues within architecture and industrial design. If one uses Kuhn and Rorty’s language within architecture and industrial design context, one could argue that there exists a “constant” state of revolution and abnormal circumstances within the two design professions. There is simply no agreed upon framework for settling both academic and framework disputes within the two design professions.

This abnormality is to some extent pointed out by Horst Rittel in his article “Evaluating Evaluators” when he asserts that “the greatest architect for one, is a mediocre hack for somebody else” *(Rittel, 1976: 81)*. This assertion does not imply that design professionals that share similar interests (same value set) do not arrive at similar judgments, but that there are considerable groups that disagree with regards to design judgements. To complicate matters further some design professionals share the same interests i.e. values, but still differ, as it is common to associate different importance to the different design aspects *(Rittel, 1976: 81 f)*. Thus, there is no agreed set of rules, assumptions, conventions, criteria, and beliefs etc. of how to resolve disagreements within the design domain.[77]

This lack of a shared framework and assessment criteria can also be indicated in that most architecture and industrial design schools do not share the same framework and assessment criteria.[78] Equally the lack of a common professional language with shared terminology is an indication of the nonexistence of a shared paradigm within the two design professions. For instance, architecture is renowned for its ceremonial lingo i.e. extensive use of jargon, but at the same time it is “hard to find another profession with a greater confusion of concepts” *(Rittel, 1976: 79)*. Central concepts like “Space”, “form”, “scale” etc. have no shared understanding or meaning within the architectural profession, and as long as some architects “earnestly state that ‘a building is a statement,’ it is difficult to discuss statements about buildings” *(Rittel, 1976: 79)*. Another indication can be found in that there is hardly any professional discourse in architecture which contributes to building “up a consistent system of coherent hypotheses to be argued systematically" *(Rittel, 1976: 79 f)*. Instead, the discourse within the domain of architecture and industrial design is characterised by being notoriously repetitive in the sense that it is often started from "scratch". This as practitioners and teachers of both professions tend to disregard previous results, even if published *(Rittel, 1976: 80),* which is very different from other professions' approach. Instead the discourse which takes place in the domain of architecture and industrial design tends to be characterised by evangelists, fundamentalists and gurus who preach their doctrines like "Form follows function", "Less is more" etc. *(Rittel, 1976: 80).*[79]

Subsequently, the constant revolutionary and abnormal circumstances found within design are an important factor for the value and value set dependency that characterises architecture and industrial design. The evolutionary and abnormal circumstances makes architecture and industrial design more dependent on values and value sets than other academic filed that can use evidence attributed to facts as a base for their decisions.

6.2.1.2 A political perspective

> *"Reasonable people adapt themselves to the world. Unreasonable people attempt to adapt the world to themselves. All progress, therefore, depends on unreasonable people." — George Bernard Shaw (Shaw, 1903: 221)*

It can be asserted that architecture and industrial design are to some extent political enterprises, even if this aspect is not generally given much attention within architecture and industrial design. Equally, it can be argued that the two design professions have been and are in a constant "state of denial about the political implications of the processes and products of practice" *(Till, 2005: 175),* and that both architecture and industrial design are characterised by "preferring to deal with areas which are wrongly interpreted as beyond the political (abstracted form-making or the 'neutrality' of technology)" *(Till, 2005: 175).* However, not all design scholars, architects and industrial designers deny the political aspects of architecture and industrial design. The wide range of viewpoints on design's links to politics can be indicated by the French architect Jean Renaudie when he argues that:

> "The stubborn refusal of some people to admit to the influence of politics on architecture, and the narrow assertion of others that architecture is politics and nothing else, result in the same thing: inefficiency in practice." *(Till, 2005: 180)*[80]

These diverse views described by Renaudie and the assertions above on the political aspects of architecture and industrial design is yet another indication of the previously mentioned lack of a shared paradigm within architecture and industrial design. However, if one accepts that architecture and industrial design have a considerable political component it is reasonable to assume that decision-making in politics indicates to some extent how decision-making is conducted in design. This is the basis for looking at politics in a design decision-making context.

As introduced in chapter four, economy tends to be the driving force behind the compromises and conflicts that designers have to accommodate in a design project.[81] Economy tends to have the same role in politics. Another common characteristic between design and politics can be indicated in that controversies within both domains tend not to be settled by appealing to factual information (as indicated for architecture and industrial design in previous sections). However, as for design, there is often a factual component within a number of political disputes. Depending on the nature of this factual component, some political disputes can be resolved by arguing and/or convincing with reference to this factual component. This can, for instance, be illustrated in political dispute regarding drug use among youths whom are enrolled in drug rehabilitation programs. Examining the facts of the situation, and consequently reaching an agreement or consensus by introducing evidence can determine a dispute like this. This is not as straight forward as one might expect, as the disputing parties have to agree on the definition of youth, time period, geographic location which should be considered and "what it means to be enrolled in a rehabilitation program" *(Schön and Rein, 1994: 3)*. By establishing the facts within an agreed definition of youth, time, geographic location etc., and by entering and/or appealing to rational discourse, the different parties should be able to reach an agreement. Even if further disagreement about the issue should arise, the parties will base the result on the factual component "have a good chance of settling it by searching out new information" *(Schön and Rein, 1994: 3).*

Nevertheless, in architecture and industrial design, political disputes often have a value dimension attached to them, which tends to be immune to resolution by appealing to the facts. Political issues that have this characteristic include issues such as:

> "crime, welfare, abortion, drugs, poverty, mass unemployment, the Third World, the conservation of energy, economic uncertainties, environmental destruction and resource depletion, and the threat of nuclear war." *(Schön and Rein, 1994: 4)*

Disputes relating to issues with a strong value dimension tend to be intractable and enduring, and they are seldom finally resolved by appalling to factual information.[82]

Political and design controversies have typically an important value component inherent in the issue and/or context, and these controversies tends to be stubbornly resistant to resolution by appealing to "the facts" *(Schön and Rein, 1994: 4)*.[83] This is due to the fact that the different parities in a controversy tend to differ on which facts are considered to be relevant for the controversy, which tends to be dependent on the values held by the different parties. This point can be illustrated by the controversy that exists in contemporary political debate in Western countries regarding the alleged decline of the welfare state. Within this controversy many political conservatives focus on data which is relevant to economic competitiveness, and they will often argue that the "welfare expenditures erode the comparative advantage of industrialized countries and undermine their ability to compete with" *(Schön and Rein, 1994: 4)* the emerging economies.[84] The liberal position on the other hand, often tends to dismiss the underlying argument of "can't afford" of the conservatives, as they tend to "focus on data that demonstrates either the need for income support or the inequity of income distribution" *(Schön and Rein, 1994: 4)*. Other examples can be found in that it is possible to interpret an unemployment trend as either "evidence of a decrease in opportunities for work or as a deterioration in the will to work" *(Schön and Rein, 1994: 4)*. Equally, it will within the domain of drug prevention, be possible to interpret a decline in caught drug smugglers, as a sign of the ineffectiveness of the policy and customs, or as evidence that policy strategies is functioning as an effective deterrent etc. *(Schön and Rein, 1994: 5)*.

Even if factual reasoning has limited powers within value conflicts as introduced above, it is not without any effect, as there is no convincing logical reason which "can be given for the logical irrelevance of fact to value judgments, even if we accept the positivist conception of what a 'fact' is" *(Putnam, 2002: 78)*. This argument is based on the assertion that "the activity of justifying factual claims presupposes value judgments" *(Putnam, 2002: 137)*, and that these value judgments must be regarded as being "capable of being right (as 'objective' in philosophical jargon), if we are not to fall into subjectivism with respect to the factual claims themselves" *(Putnam, 2002: 137)*.

But it can be difficult, both with the political and design domain, to know if one is dealing with a conflict where the factual component is so considerable that it can be resolved by appalling to facts, or if the conflict is of a nature which is mainly value based without a considerable factual component. A discourse that on the surface is identified as a “fact” based discourse, may in fact be masquerading as an underlying value controversy. Even straight-forward questions like: *How many?, Can we afford to?* and *What are the causes?* may not lend itself to be resolved with fact-finding missions *(Schön and Rein, 1994: 4)*. Illustrative examples of this can be found in the ever lasting and often hotly debated issues of homeless people, the affordance of the welfare state and drug dependency. All of these are supposedly issues with a considerable factual component, but even these type of issues have a tendency to rapidly slip into the quagmire of value controversy, where value sets play a central roll as opposed to factual information *(Schön and Rein, 1994: 4)*.

In order to make decisions in value conflicts, politicians and designers alike will use their value set to make decisions. Nevertheless, generally, and for architects and industrial designers in particular, a value set will not remove all value conflicts related to decision-making. In theory, a value hierarchy would appear to offer guidelines for resolving dilemmas, as a value hierarchy sets the terms for deliberating about a particular dilemma *(Billig, 1996: 245)*. But generally dilemmas are not eradicated by value sets, as objects of agre-ement still collide with unequal force *(Billig, 1996: 245)*. For example, can the virtual guidelines found in a value hierarchy:

> “assert that priority should be given to one of two values. Even so, dilemmas, and potential arguments, still remain. The guide-line will not prevent arguments about the precise extent of the priority which should be given to the favoured value, or whether there are special circumstances in which the priority should be laid aside.” *(Billig, 1996: 245)*

This point can be illustrated by the fact that commonly a liberal will be in-clined to blame society for poverty, while the value of self-help remains within the value hierarchy. There can be occasions where the value of self-help will demand to be heard, and the liberals value hierarchy will then not necessarily “provide a convenient matrix which obviates the necessity for deliberation” *(Billig, 1996: 245)*. In the same way, a value hierarchy will not prevent ethical dilemmas etc. to present themselves to politicians and designers alike. In instances as this, both politicians and designers look for alternative reasoning and justification than what their value set provides. The base for a decision will be their value set, but other elements might tip the scale as to which value should be the dominant value for a given decision.

As indicated in this section, both politics and design are generally not closely associated with factual based reasoning, nor can the main thought process which takes place in politics or design be described as rational, utility and/or probability based reasoning. Instead, reasoning within architecture and industrial design is mainly value based, in the same way, as politics tend to be mainly value based.[85]

6.2.1.3 A design problem and compromise perspective

> *"I trust the gut feeling, the intuitive hand, the intuitive feel about the project ... you can technically solve accommodation problems, you can solve problems of view and so on but which problem to solve first is a gut feeling ... you can't explain it but you feel that's right and nine times out of ten you are right." — Ken Yeang[86] (Lawson, 1994: 126)*

> *"All designs for devices are in some degree failures, either because they flout one or another of the requirements or because they are compromises, and compromise implies a degree of failure." (Pye, 1978: 70)*

As introduced in previous sections and chapters, significant design projects tend to be characterised by having a considerable amount of different factors, which in turn makes most design projects rather complex and unique *(Nelson and Stolterman, 2003: 137)*. This complexity is often linked to requirements and issues such as: form, function, manufacture, cost, promotion, distribution, consumer taste and perception etc. *(Davies-Cooper and Jones, 1995: 95)*. Design complexity can be divided into two main categories: (1.) a "general" based category, which is often linked to designers' skill and value bases (as both previous sections and chapter four indicates) and (2.) a "fact based" and/or "knowledge based" category.[87] These two categories tend to be interwoven, where the fact or knowledge based aspects of design are often closely related to sub-problems (as introduced in chapter four).[88] This as sub-problems often lend themselves to be settled with factual based decision-making, whereas the more "general" design aspects tend to be stubbornly resistant to resolution through factual based reasoning (as introduced in the previous sections) *(Schön and Rein, 1994: 3)*.

Sub-problems tend not to receive much focus in design, as architects and industrial designers are trained in creativity-led problem-solving strategy i.e. associative and visual thinking rather then fact based problem solving.[89] Instead, the focus is on the "overall" problems that are attempted to be solved by solution conjectures, rather than through problem analysis, which implies an ad-hoc design method, creativity, intuition etc. Therefore, most architects and industrial designers apply the same solution strategy i.e. solution conjectures to both overall problem and sub-problem regardless of the problem type.[90] Within a sub-problem context it can be argued that an ad-hoc design method, creativity and intuition (associative and visual thinking), systematically lead designers to make poorer judgments and choices, than what they would have been doing if they were thinking in a more factual and controlled manner about sub-problem decisions *(Hastie and Dawes, 2001: 7).*[91] It can therefore be argued that controlled thinking i.e. fact based problem solving may be an overlooked area within the architecture and industrial design.[92] The lack of fact based problem solving and emphasis on analytical skills in architecture and industrial design is linked to a number of design values introduced in chapter four, which includes the Art value in design, the "Holistic" design value and the Novel design value.[93] But it should be pointed out that controlled thinking is not always preferable to an intuitive thought process as a means to solve sub-problems within a design context *(Hastie and Dawes, 2001: 7).*

The more "general" category of design problems tends to be primarily linked to the Holistic design value. This value contributes to a situation where most architects and industrial designers attempt to take a considerable amount of different aspects into consideration when making design decisions. It is therefore not uncommon for architects and industrial designers to consider a number of issues significant at all stages in a design project. This typically includes issues such the aesthetic appearance, the social aspects of design, environmental issues, etc. This point can be illustrated by an assertion made by the architect Christopher Day when he stated that:

> "Architecture has responsibilities to minimize adverse biological effects on occupants, responsibilities to be sensitive to and act harmoniously in the surroundings, responsibilities to the human individualities who will come in contact with the building, responsibilities not only in the visual aesthetic sphere and through the outer senses but also to the intangible but perceptible 'spirit of place'." *(Day, 1990: 16)*[94]

The vast number of aspects architects and industrial designers tend to consider means that designers will have to balance the different factors. This as no matter how much designers want to satisfy all possible requirements, issues, conditions etc. they will normally find that "some of them are contradictory, unclear, or not yet fully revealed" *(Nelson and Stolterman, 2003: 30), (Spector, 2001: 65), (Lawson, 1997: 81).* So the balancing act tends to imply making compromises between different aspects and factors.[95]

As introduced in chapter four, the economy is often the driving force behind the compromises and conflicts between the different aspects and factors that architects and industrial designers tend to consider.[96] Economy plays a central role in setting the boundaries and ramifications for the production of the building and/or product. It also sets the boundaries for the time and recourse that can be allocated to the design process by the architect or industrial designer (this is often set aside by the "voluntarism" or "charrette ethos" found in design).[97] According to David Pye, a number of design conflicts are inevitable once requirements based on economy are admitted into a design project *(Pye, 1978: 70)*.[98] Generally it can be argued that the most challenging aspects of product development are to recognize, understand and manage the trade-offs which the economy imposes on product and building developments *(Ulrich and Eppinger, 2003: 6)*.[99] Nevertheless, many architects and industrial designers have and display an aversion towards economic realities (previously introduced in chapter four).

A designer's willingness to disregard the economic realities can be illustrated by the development of the Scottish Parliament Building[100]. The original budget for the building was 55 million pounds, whereas the final costs was over £431 million pounds *(Fraser, 2004: 220, 242)*.[101] A substantial part of the excessive cost was attributed to the architects, as the architects issued around 18,000 orders for changes in the design.[102] The Holyrood Inquiry"[103] by Peter Fraser[104] states that it "is difficult to see how the original budget "could have been given conscientiously or taken seriously, given the embryonic state of the designs" *(Fraser, 2004: 242)*. The final bill to the Scottish taxpayer ended up being over 8 times the original budget.

A logical process to determine the design outcome is often viewed as an impossibility due to the fact that many of the design requirements tend to be in conflict *(Pye, 1978: 70)*. This is based on the fact that it is challenging for an architect or industrial designers to use logic and/or utility as means for deciding between the conflicting design aspects (this point is elaborated in a subsequent section).[105] These difficulties can generally be attributed to the general limitation that logic and utility have when dealing with conflicting aspects, as well as the particular difficulty found in a design context with its lack of factual components to pin the logic and utility on. Another contributing factor is that maximum utility tends to be viewed very differently by different designers and/or stakeholders in a design project.[106] Instead of using logical processes, hard choices have to be made between different conflicting and often admirable aspects, based on values, as there is little chance of ever discovering the "right" answers to the question of what kind of building or product one ought to create *(Nelson and Stolterman, 2003: 30)*. The lack of one "logical" outcome of a design process is linked to the fact that the preconditions, requirements, conflicting issues etc. provide designers with more than one single correct choice. This is generally considered to be true, even if it within an historical context there has been a number of architects and designers whom have come close in claiming that they have "access to the truth—i.e., that they are able to discern what should, or should not, be regarded as an appropriate addition to our real world" *(Nelson and Stolterman, 2003: 30).*

Getting the balance right between the different requirements and issues depends on what the designers consider the appropriate design for a given project. Architects and industrial designers tend to use their value set as a crucial input when deciding the balance between the requirements and issues in a design project.[107] This is the case even if there is no consensus on what the "right" balance in a given project should be within the design professions.[108] The disagreements and differences among individual architects and industrial designers stem partly from the importance the individual designer assigns the different requirements and issues.[109]

It is not only within individual design projects that there is evidence of conflicting and/or contradicting design ideas or requirements. This can also be found in a number of design related movements and among individual designers' argumentation etc. as introduced in chapter five.[110] The potential conflicts that architects and industrial designers have to deal with can also be found in the main categories introduced in chapter five, which were: aesthetic values[111], social values[112], environmental values[113], traditional values[114] and gender values. These design values mimic a number of different requirements and issues an architect or a designer tend to attempt to balance in a given design project. Some of these values are conflicting, and at some point, a designer must decide which value should be the overriding value in order to make design decisions.[115]

Values held by individual designers will influence which emphasis and priority different aspects of a design project gets. For instance, architects and industrial designers whom are perceived to have "strong" ideals implying innovative, creative, or idealistic self-image will often focus on the overall aspects as oppose to sub-problems.[116] These architects and industrial designers will often resist being managed in any way by factual or other types of "rational" arguments *(Nelson and Stolterman, 2003: 234)*. This focus and priority makes many participants and stakeholders in design projects to consider this type of architects or industrial designers difficult to work and/or collaborated with.[117] On the other hand, architects and industrial designers that focus on sub-problems and/or the factual part of a design project are often perceived as being unselfish, objective designers, who collaborates well with other participants in a design project. But architects and industrial designers that have this focus are often perceived as producing uninteresting design solutions by many architects, industrial designers and design scholars alike *(Nelson and Stolterman, 2003: 234)*.

The fact that architecture and industrial design are mainly based on value decisions rather than logic and utility based reasoning, can be reflected in the fact that design literature have focused very little on normative design theories that specifies that decision-making should be conducted in accordance with the concept such as the maximising of expected utility and/or factual reasoning.[118] Thus, detailed utility analysis and factual reasoning is seldom conducted within the design domains.[119] Even so, there are a number of reasons why the theory of maximising expected utility and factual reasoning is not utilised as a means of improving decision-making within architecture and industrial design. These includes: (1.) no common agreement on what constitute the maximum utility or factual component,[120] (2.) the "problematic" relationship between design and economics in general (utility tends to be closely related to economy),[121] (3.) a lack of a knowledge base which characterises the architectural and industrial design professions (introduced in chapter four)[122] and (4.) utility or factual based rationality is often in conflict with the myth of the genius architects or industrial designers whom create wonderful work without the ability to rationally explain the process.[123]

As indicated in this and previous sections, architecture and industrial design are characterised as: (1.) being the result of a number of compromises between different requirements and issues, (2.) principally practised in accordance with individual design method and individual design value set[124] and (3.) "no" shared design paradigm and/or theory are generally accepted by architecture and/or industrial design. This all contributes to a situation where individual architects and/or industrial designers have different experiences and influences, and differ with regards to the issues they take into account when designing. The formation of individual value sets among design professionals contributes to the situation where a "rational" design decision from one individual value perspective might be completely irrational from another value perspective.[125]

6.2.2 Introduction to value set in a design context

> *"When your values are clear to you, making decisions becomes easier." — Roy Edward Disney*[126]

Architects and industrial designers have a number of general values, that were introduced in chapter two, three and four. These values have been instilled through design education and practice. In addition, architects and industrial designers have "personal" design values, which were introduced in chapter five.[127] Architects and industrial designers vary in their adherence to both the general design values and more personal values, and all designers do not hold all values that were pointed out in the previous chapters. Based on this, value sets that individual designers adhered to will vary substantially. This as value set varies with regards to: (1.) the actual values which makes up a given value set and (2.) the importance given to the different values in the value set (as introduced in chapter two).[128]

Individuals intuitively organize values into value hierarchies, as many values are not compatible and/or are in direct conflict, which are overcome by the creation of a value hierarchy where different values are given different importance.[129] In short, exposure to value conflicts is the prime reason why one generally "feels obliged to order values in a hierarchy" *(Perelman and Olbrechts-Tyteca, 1969: 82).* This does not imply that all values are strictly independent. Some values in a hierarchy may be linked to each other, and the changing of the preference of one value may affect the preferences given to other values within the same hierarchy *(Perelman and Olbrechts-Tyteca, 1969: 81).*[130]

The relevance of value sets was indicated in the previous sections and can be reiterated by Donald A. Schön when he argues that architecture and industrial design are situated in: "uncertainty, uniqueness, and conflict where instrumental problem solving-and certainly optimization-occupy a secondary place" *(Schön, 1987: 41).*[131] Schön sees designing in its broader sense to involve complexity and synthesis, where designers deal with "many variables and constraints, some initially known and some discovered through designing" *(Schön, 1987: 41 f).* According to Schön do architects and industrial designers:

> "juggle variables, reconcile conflicting values, and manoeuvre around constraints—a process in which, although some design products may be superior to others, there are no unique right answers." *(Schön, 1987: 42)*

This point of view is reiterated by Schön and Martin Rein in their book the "Frame reflection", where they assert that design typically "involves many different values and variables, which tend to be interdependent—some of them mutually incompatible" *(Schön and Rein, 1994: 167).*

Architects and industrial designers attempt to impose their values i.e. beliefs and intentions on the final design outcome by working with different design tools, methods and materials. But in much the same way a sculptor works with clay and/or an inventor tinkers with a mechanism, designers will often discover that the "materials" resist to some extent their intentions *(Schön and Rein, 1994: 166).* This leads to a "conversation" between the "material" and the designers whom are attempting to impose their values on the material and the final design outcome *(Schön and Rein, 1994: 166, 173).* This resistance found in the design processes will often lead to unintended effects that the "designer may see either as flaws to be corrected or as happy accidents that suggest new opportunities" *(Schön and Rein, 1994: 166).* The "conversation" between the "material" and the architect or industrial designer will therefore often lead to an incorporation of ideas and observations which have been exposed during the design process *(Schön and Rein, 1994: 167).* The decision to regard an unintended effect, idea and/or observation as an error or as an opportunity will have to be evaluated according to some rationale. And as indicated in the previous sections, most of these types of decisions will not be based on factual information, instead architects and industrial designers will use their value base to make this type of evaluation.

The "conversation" between the "material" and the architect or industrial designer will, in addition, clarify and evolve the designers' intentions through the above mentioned unintended effects and also clarify to some extent the value conflicts which are inherent in a given design project. These two factors also often lead to a re-formulation of the "original" design "problem", based on the "new discoveries" and the value conflicts that come to light during the design process. It can be argued that the more architects and industrial designers work with a particular project the more they tend to discover the complexity and the value conflicts which are inherent in the project *(Schön and Rein, 1994: 167, 173).*

As earlier argued, architecture and industrial design are conducted under conditions of uncertainty and complexity, which makes it not initially clear what the main design problem, is or what it would mean to solve it. The above mentioned "conversation" will to some degree clarify and evolve the designers intention *(Schön and Rein, 1994: 166, 173).* But it should be noted that architects and industrial designers do not arrive at a design project with a blank mind[132], which is often implied in design literature *(Lawson, 1997:*

162). This fact makes it likely that most design decisions will be taken on the basis of the value set which the designer brings to a given design project, and not on values which evolve during the design process.

The strength and the implicit nature of these preconditioned values can be indicated by Paul-Alan Johnson, when he asserts that architectural theory has the flavour of religious dogma, which according to him, is due to fact that "those who write it do so with a proselytizing agenda" *(Johnson, 1994: 5).* Johnson points out that direct theological inclinations and references as found in the writings of nineteenth-century theorists like John Ruskin and Augustus W. N. Pugin is not common in "later and recent theoretical works, even though the proselytizing remains" *(Johnson, 1994: 5).* But even so, according to Johnson, most contemporary theoretical architectural works fail to admit that they are utilising concepts that rely on faith or make sense only in a theological context, as well as not admitting that their arguments are provisional *(Johnson, 1994: 5).*

This section and the last one have indicated that architects and industrial designers use their value sets to prioritise between conflicting variables and issues within a given design project, as well as using it when evaluating which design process "accident" should be incorporated into the design outcome. In addition are values used when selecting among which alternative solutions should be proposed for a given design project. Based on this, the differences in a value set that individual architects and industrial designers adheres to accounts, in part, to the differences that exist in the design proposals which individual designers put forward *(Lera, 1980: 217).* These issues will be expanded and clarified in the following sections in this chapter.

6.3 DESIGN DECISIONS ARE BASED ON VALUES

> *"The result is that peculiar feeling of inward unrest known as indecision. Fortunately it is too familiar to need description, for to describe it would be impossible. As long as it lasts, with the various objects before the attention, we are said to deliberate; and when finally the original suggestion either prevails and makes the movement take place, or gets definitively quenched by its antagonists, we are said to decide ... in favour of one or the other course. The reinforcing and inhibiting ideas meanwhile are termed the reasons or motives by which the decision is brought about." — William James[133] (James, 1981: 1136)*

Decision-making and evaluation within architecture and industrial design is essentially a non-factual process as described in previous sections.[134] This implies that decision-making within the design domain “does not rely on a science of measurement to determine an objective or subjective outcome in its deliberation” *(Nelson and Stolterman, 2003: 189).*[135] Instead, decision-making within architecture and industrial design tends to inevitably involve subjective value judgements *(Lawson, 1997: 126)*. The basis for decision-making in design has often been attributed to designers ability to gain insight into a given design problem (or challenge) through experience and reflection *(Nelson and Stolterman, 2003: 189), (Schön, 1983: 164)*. It is commonly argued by design scholars like Donald A. Schön, Bryan Lawson, Harold G. Nelson and Erik Stolterman that this insight, experience and reflection is utilised in the decision-making processes in design projects *(Nelson and Stolterman, 2003: 189), (Schön and Rein, 1994: 172), (Schön, 1987: 42, 157).*[136] For instance, Schön has argued that it is the “conversation” and “reflection” with takes place in a design project that is the essential component of design practice. This argument has been taken one step further by Nelson and Stolterman when they write that design decisions are a “process of taking in the whole, in order to formulate a new whole” *(Nelson and Stolterman, 2003: 189)*, and that design is not based on rational anticipation. They even point out that “intellectual judgment” (what ever that might be) may possibly “lead to an understanding of a general principle, while design judgment leads to a concrete particular understanding, within a contextual setting” *(Nelson and Stolterman, 2003: 190)*.

The argumentation that will be presented in the following sections will not dispute Schön assertion that architects and industrial designers conduct a “conversation” and “reflection” within the context of developing design proposals. Neither will it be disputed that designers are attempting to take in the whole in order to formulate a new whole, as argued by Nelson and Stolterman. The emphasis will instead be on what is the basis for this “conversation”, “reflection” and the “new whole”. In line with what has been introduced in previous sections and chapters, the following sections will attempt to illustrate that it is values that are the prime basis for the “conversation”, “reflection” and the “new whole”.

In order to show this connection between decision-making and values in design, the above-mentioned authors, as well as other authors will be cited in the following sections. Many of these authors do not explicitly show the relation between design values and design decision-making, but their writings tend not to deny the link between values and decision-making within design. Instead, it is often referred to implicitly and even in some cases explicitly.

This point can be illustrated by the following assertion made by Bryan Lawson:

> "Questions about which are the most important problems, and which solutions most successfully resolve those problems are often value laden. Answers to such questions, which designers must give, are therefore frequently subjective. […] Complete objectivity demands dispassionate detachment. Designers being human beings find it hard to remain either dispassionate or detached about their work. […] designers were seen to be heavily involved in issues about which they were making subjective value judgements. […] Designers do not aim to deal with questions of what is, how and why but, rather, with what might be, could be and should be. … designers may be seen to prescribe and to create the future, and thus their process deserves not just ethical but also moral scrutiny." *(Lawson, 1997: 126 f)*[137]

The following sections will attempt to make the implicit link between values and decision-making, found in the writings of the above mentioned authors, explicit. This will be introduced in three interwoven stages that are linked to: the initial framing, the problem-solving procedures and reframing that often takes place in the midst of the procedural design process.

6.3.1 Introduction to framing

> *"We are not permitted to choose the frame of our destiny. But what we put into it is ours." — Dag H. A. C. Hammarskjöld*
>
> *"Each man should frame life so that at some future hour fact and his dreaming meet." — Victor Hugo*[138]

In the context of making decisions, most people will typically follow a particular sequence with regards to decision-making. It is common to start out by establishing what one wants and how to achieve it, and only when one has reflected over this initial stage one "decide what action to take and what choice to make" *(Hastie and Dawes, 2001: 252).* Or to put it another way, people will first establish goals, and then select the choices and actions. This is different from an analytic approach, where one first observes what is chosen and then infers what was wanted and expected *(Hastie and Dawes, 2001: 252).*[139]

In addition to establishing the goals which guide decisions, experts and lay people alike tend to rely on cognitive shortcuts and/or judgmental heuristics, to lighten the information processing burden of decision-making *(Kaufman and Smith, 1999: 166)*. These types of shortcuts are especially helpful, possibly even necessary, in dealing with complex decision-making situations. However, it should be noted that convenience tends to come at a price. This as in a complex decision-making situation it becomes progressively more difficult to scrutinize how well these shortcuts match a specific situation, which increases the likelihood of making "bad" choices, as they do so based on a poor impression of reality *(Kaufman and Smith, 1999: 166)*. This is, according to Frederic C. Bartlett[140], due to the fact that an individual tends to have an "over-mastering tendency simply to get a general impression of the whole; and, on the basis of this, … constructs the probable detail" *(Bartlett, 1932: 206)*.

Frames fall in the category of cognitive devices that help decision makers make sense of complex and challenging decision-making situations (frames and framing were briefly introduced in chapter one). A challenging decision is typically characterised by aspects such as: (1.) a number of alternatives under consideration, (2.) a possibility for substantial loss if a bad choice is made, (3.) a degree of uncertainty about the outcomes that will occur if different choices are made and (4.) the alternatives possess difficult "trade-offs that must be made on the way to selecting just one from many courses of action" *(Hastie and Dawes, 2001: 45)*. In addition, decision-making can be challenging when it involves values that are highly cherished, as these values can be threatened by the "possible" alternatives *(Hastie and Dawes, 2001: 45)*. Equally, decision-making can be challenging due to the intensity of the emotions associated with the decision process or the feelings that are induced when evaluating the possible consequences of the alternatives. Even the presence of time pressure can be challenging, and can at times feel like a straightjacket when conducting decisions *(Hastie and Dawes, 2001: 45)*.

To deal with this type of complexity and challenges, decision makers will typically frame the problem setting, as frames and framing is a diverse cognitive shortcut which individuals will use to: (1.) make sense of complex information, (2.) interpret the world, (3.) represent that world to others and (4.) organize complex phenomenon into coherent and understandable categories *(Shmueli et al., 2003)*[141]. Thus, framing is a natural part of everyday decision-making, as frame-based reasoning is one of the main cognitive mechanisms that assist humans in everyday decision-making situations (introduced in the previous sections) *(Lakoff and Johnson, 1999: 527)*.

A number of scholars have linked frames and framing to different fields and concepts, including Erving Goffman[142] who has linked frames to the "principles of organization which govern events — at least social ones — and our subjective involvement in them" *(Goffman, 1974: 10 f)*. Equally, Donald A. Schön and Martin Rein have linked frames and framing with paradigms, perspectives, underlying structures of belief, perception, and appreciations *(Schön and Rein, 1994: 23)*. The concept of frames has also been developed as a tool for analysis in various fields, including psychology and sociology *(Taylor 2000: 511 - 517), (Gonos, 1997: 854),* business management *(Watzlawick et al., 1974: 92),* artificial intelligence *(Minsky, 1975: 211 - 213),* decision-making *(Kahneman and Tversky, 1979: 271 - 273),* negotiation *(Neale and Bazerman, 1985: 34), (Gray, 1997: 171), (Pinkley, 1990: 124 f),* and environmental conflict management *(Gray, 2003: 15), (Kaufman and Smith, 1999: 173 - 175), (Vaughan and Seifert, 1992: 119)*.

Frames tend to impose a particular strategy, paradigm, point of view or condition that restricts the complexity and at the same time disregards a number of other options. Therefore, frames are in direct opposition to relativism[143] from a philosophical perspective.[144] But it should be noted that relativism holds the potential of exposing limitations connected to a given frame, even if relativism is no alternative to framing in a decision-making context *(Schön and Rein, 1994: 42)*.[145] Generally is it not possible to perceive and make sense of social reality except through frames, as the actual undertaking of "making sense of complex, information-rich situations requires an operation of selectivity and organization" *(Schön and Rein, 1994: 30)*. Framing is therefore more connected to subjectivism than pluralism and/or objectivism. The subjective nature of framing is linked to the general observation that it is common for people to disagree on how to both frame and solve a complex problem setting when people do not share the same value set.

Problems tend to vary from "chaotic" problems i.e. "wicked problems" to "ordered" problems i.e. "tame problems" as introduced in chapter four.[146] Within "ordered" problem areas rational decision-making will be applicable, whereas at the "chaos" end of the spectrum rationality will be challenged by the lack of factual information (lack of agreed upon facts), as well as agreed upon references points and goals.[147] Decision-making sets in the actual world tend not to be at either end of the spectrum, and instead are predominantly set in the middle and leaning towards "chaos" *(Schön and Rein, 1994: 181)*.[148] Thus, many everyday and professional decisions can be overwhelmingly complex without any framing that imposes boundaries and/or goals, which guide or create a reference point for the decision-making. Without some sort of framing many of these decision-making situations and/or problems are not easily resolved (with or without elements of rationality), as framing introduces means to control or reduce the number of options one allows oneself to be influenced by or considered *(Schön and Rein, 1994: 26)*.

In general, frames tend to contribute to establishing or imposing some sort of order to a problem area, and will therefore often contribute in transforming "chaos" problems into less complex problems. Thus, frames tend to help individuals cut through the intricacies etc. in a decision-making situation. This is the case even if the pervious mentioned "mismatch between frame and reality is bound to affect the quality of decision outcomes" *(Kaufman and Smith, 1999: 166)*.

The impact of frames in an uncertain decision situation is highlighted by Amos Tversky and Daniel Kahneman through studies that showed that decision, which is framed in terms of either losses or gains, gives different outcomes *(Tversky and Kahneman, 1981: 453)*. Equally Kenneth J. Dunegan has shown that such loss- or gain- frames can affect key cognitive functions including use of information and search for solutions *(Dunegan, 1993: 491)*. In addition, frames also tend to affect decisions makers "willingness to act, participate, take a stand, or join a group" *(Kaufman and Smith, 1999: 167)*, this as frames filter people's perceptions and provide them with a field of vision for a problem *(Shmueli et al., 2003)* [149].[150] Frames can even contribute to a situation where both familiar and the unfamiliar issues are seen in a new way *(Schön and Rein, 1994: 26 f)*. In short, it can be argued that framing is particularly useful in decision-making situations when factual information is difficult to ascertain or is not present. This as "frames are believed to precede conscious processing of information for decision making … and to affect subsequent individual choices" *(Kaufman and Smith, 1999: 166)*.

Many people will intuitively frame problem areas and framing has often a tacit characteristic, as well as a tendency of exerting a powerful influence on what people see and how they interpret what they see *(Schön and Rein, 1994: 34)*. This is especially the case within the political domain, where it is common to argue from tacit frames.[151] It should be noted that the tacit characteristic of many frames does not imply that framing is only rhetoric and verbal trickery. Research shows that verbal trickery loses its effectiveness once it is understood, where as framing is hard-wearing, and people tend to stand by their framing even when inconsistencies are pointed out *(Hastie and Dawes, 2001: 305 f)*.

Frames are constructed and are not created from a neutral position; instead they are based on intentions, beliefs etc. i.e. values, even if a framer is unaware of this, due to the tacit nature of some frames *(Schön and Rein, 1994: 36)*. Which frame should be used as a base for directing decision-making etc. is often controversial. The power to frame a discussion, policy, strategy project etc. allows the framer to influence most decisions that are conducted within that discussion, policy, strategy project etc. Framing and reframing are even thought of by some scholars as connected to deliberate attempts to alter someone else's frame and subsequent views on a given issue *(Kaufman and Smith, 1999: 167)*. For instance, reframing can occur during negotiations, and dependent on the reframing, can a new frame shape the course of joint decision-making *(Kaufman and Smith, 1999: 167)*.

This aspect often makes framing controversial where individual frames are disputed. Thus, different frames in a dispute can often "significantly affect the intractability of a conflict by creating mutually incompatible interpretations of events" *(Shmueli et al., 2003)*[152].[153] Different framings in a dispute tend to be the symptom of different value sets among the disputing parties, as frames tend to be based on underlying structures of values *(Shmueli et al., 2003)*[154]. Initial frames are imposed prior to the problem solving or negotiation stage of a problem setting. Thus, the link between values and frames is made probable by the fact that values tend to exist prior to conscious processing of information of a given conflict, dispute and/or decision-making situation. This accounts for the fact that disputants are separated not only by differences in the base for frames, but also in how they perceive and understand the world, both at a conscious and pre-conscious level *(Elliott et al., 2003: 410 f)*. No more so than within the political and design domain, where frames and values play an essential role.

Even if frames often are controversial, it will often be difficult to identify a given frame in a conflict or decision-making process. The difficulties in identifying a given frame stems from a number of reasons: firstly, it can be difficult to identify a frame as the rhetorical frame that shapes the public utterances of the decision maker might be different from the frame which is implicit in their patterns of action *(Schön and Rein, 1994: 35)*. The discrepancy might be due to the decision maker latching on to a dominant frame, in the hopes that this frame legitimacy can be borrowed, even if it stems from different course of action and/or is inspired by different intentions and circumstances. This is linked to the fact that frames might be used as a: (1.) strategic advantage, (2.) rationalizing self-interest, (3.) convincing broader audiences, (4.) building coalitions and/or (5.) lending preferentiality to specific outcomes *(Kaufman and Smith, 1999: 167)*.

Secondly, it can be difficult to identify a given frame due to the fact that the same course of action can be based on and consistent with quite different frames. An example of this can be found in the political domain where policies can be argued from very different frames, but at the same time the end result will be more or less the same.[155] Equally, a given frame can lead to different courses of action, which can be exemplified by liberals whom often agree on a high level frame with regards to welfare policy, but tend to disagree among themselves when entering into details regarding welfare policy etc. *(Schön and Rein, 1994: 35)*.

Thirdly, it can be difficult to identify a given frame as a frame may be transformed as it is being implemented. Transformation can lead to a situation were the original frame does not correspond with the real implementation. An example of this can be found in that street-level bureaucrats might implement a given policy frame, legislated by local or state legislators, in a way that differs from the implicit intentions and values which where present in the original frame (legislation) *(Schön and Rein, 1994: 35)*.[156]

Fourthly, it can be difficult to identify a given frame as it can be "difficult to distinguish between conflicts within a frame and conflicts that cut across frames" *(Schön and Rein, 1994: 35)*.[157] Within the political domain judgments on this score might differ depending on how one "constructs the more generic institutional action and meta-cultural frames that underlie conflicting policy positions" *(Schön and Rein, 1994: 35)*.

Fifthly, it can be difficult to identify a given frame as it can be "difficult to distinguish between real and potential shifts of frame" *(Schön and Rein, 1994: 35)*. An example of this can be found in the political domain where the introduction of a new policy or legislation may be seen as a new frame or reframing of old policies.[158]

The sum of these five points point out that it is difficult to understand and reflect over opponents framing, and it can be difficult to determine the premises that are behind a given frame. But even if it is often difficult to identify frames, frames can at times be elicited from the underlying values, discourses, speeches, decisions, laws, regulations, and routines etc. *(Schön and Rein, 1994: 34)*. The task of understanding a given frame can be helped by individuals being aware of their own frames and values, as well as their ability to understand and put oneself in the shoes of other actors in a decision-making situation or conflict.

6.3.1.1 Value set is an essential part of framing

> *"Art consists of limitation. The most beautiful part of every picture is the frame." — Gilbert K. Chesterton*[159]

> *"Science cannot resolve moral conflicts, but it can help to more accurately frame the debates about those conflicts." — Heinz R. Pagels (Pagels, 1988: 330)*

As introduced earlier in the previous sections, framing is generally an essential part of a decision-making process, but frames are generally not free floating, but are grounded in the individual or institutions that sponsor them. Equally, frames which are used in conflicts tend also to be grounded in the individuals or institutions whom sponsor the different frames *(Schön and Rein, 1994: 29)*. Thus, contentions between different frames tend to reflect differences in value sets among the individuals or institutions. In the same way, it is not as possible to adhere to two conflicting values on the same level of a value hierarchy, is it virtually impossible to adhere to two conflicting frames at the same level concurrently.[160] This point can be exemplified by urban housing developments which cannot be framed as prophylactic slum clearance and simultaneously be framed as preservation of natural communities *(Schön and Rein, 1994: 29).*[161] Another example can be found in that a planner with a proprietary right based frame might oppose an investment in a specific project that does not provide choices for those who have a limited wealth, whereas "a planner with an economic development frame might favour this investment, expecting it will benefit the whole community in the long run" *(Kaufman and Smith, 1999: 169).*

In a dispute over selection of conflicting frames it is very often not possible to appeal to evidence, as what one party regards as devastating to the opposing party's argument supporting a given frame, the opposing party may dismiss as irrelevant or innocuous *(Schön and Rein, 1994: 30)*. In addition, one party will in many instances easily repair, improve or change the argument to fit or incorporate the new evidence in order to support the original frame *(Schön and Rein, 1994: 30)*. This point can be illustrated by perusing the above urban housing development example. For instance, a possible frame for preservation of the existing urban environment can be supported by pointing out the rich networks of social interaction that characterised a given urban environment *(Gleicher and Fried, 1967: 126 129)*. Whereas a supporter of an alternative frame based on urban renewal (slum clearance) might point out that, the new development will have its own social networks of interaction. Equally, it can be argued that the potentially replaced people will be able to form new social networks (which actually happened with many of working-class people which have been moved to inner-city suburbs) *(Gleicher and Fried, 1967: 135)*.

The above example of urban housing development illustrates that most frames cannot be falsified by appealing to evidence. Or in other words, it is unlikely that one will find or produce any evidence which would conclusively disconfirm a frame in the eyes of all qualified and/or objective observers *(Schön and Rein, 1994: 30)*. This is most certainly the case within the architecture and industrial design domains, as there exits little factual information which can be the base for a given frame. The lack of factual base, which can disconfirm a given frame, indicates that frames are based on values.

The context where frames are commonly used is characterised by problems and/or challenges where not only one frame is appropriate. Thus, an individual might consider several different frames for a given problem and/or project. This implies that a problem and/or challenge, which is attempted to be solved by a team, will have the possibility of each individual in the team proposing several different frames. In both instances, i.e. the individual or the team, will the decision makers be faced with the task of choosing among different frames and will therefore be forced to make implicit or explicit frame selection criteria. This leaves the framer in the same predicament as mentioned earlier, as there is little or no factual information, which can be used to select these frame selection criteria. This point can be illustrated by some frame selection criteria proposed by James G. March[162]. March asserts that frames should be selected on truth, beauty, and justness. In this context, beauty refers to the persuasiveness with which the argument is formulated that supports a given frame (especially the prudence of its chains of inference) *(March, 1972: 423 f)*. Justice refers to an ethical evaluation of a given frame and its ability to produce better people and better worlds *(March, 1972: 413)*. This is all linked to the verifiability of the propositions implied by the premises contained in a given frame (the argument supporting a frame) *(March, 1972: 413)*. The vagueness of these criteria and the different interpretation of truth, beauty, and justness indicates that frame criteria are linked values and not factual based reasoning.

The same observation applies to Donald A. Schön and Martin Rein whom have proposed frame selection criteria based on the ones proposed by March with the addition of “coherence” and “utility, or fruitfulness” *(Schön and Rein, 1994: 44)*. Coherence in this context refers to what extent a given frame integrates “a large number of disparate values and beliefs in a single, self-consistent perspective that ‘makes sense’” *(Schön and Rein, 1994: 44)*. Utility or fruitfulness refers to what extent a given frame is likely to achieve the intended purposes, or put in another way, to what extent a given frame will have the ability to contribute to solve the problems which the frame is assigned to *(Schön and Rein, 1994: 44)*. As for March's criteria, the added criteria are not factually based, and have thus the same vagueness that has been suggested i.e. these frame criteria are linked to values and not factual based reasoning.

This is reaffirmed by the fact that it is common for sponsors of conflicting frames to differ in the way they apply the above mentioned criteria *(Schön and Rein, 1994: 44)*. For instance, many supporters of different frames agree that frames should be evaluated by, for example, coherence and beauty; but disagree about which frame comes close to exhibit these qualities *(Schön and Rein, 1994: 44)*. Equally, it is common for sponsors of conflicting frames to agree that frames should meet the criteria of truth and utility, but in the same way "disagree about what facts merit explanation and what tests are worth performing, or what constitutes a useful outcome" *(Schön and Rein, 1994: 45)*. Criteria for selecting an appropriate frame can be useful, but they do not solve the basic problem of which values should be the basis for the selection, which illustrates the close relationship that exists between framing and value sets.[163]

6.3.2 Framings' place in design

> *"People who prefer the certainty of structured well-defined problems will never appreciate the delight of being a designer!" (Cross, 2000: 25)*

Architects and industrial designers are know for solving design problems and/or challenges by making limited initial explorations, and on the basis of these initial explorations will designers start to develop a few possible solution concepts. This process continues until they find or stumble upon a solution which they deem to be satisfactory *(Lawson, 1994: 5), (Lawson, 1984: 218), (Cross, 2000: 21)*. However, designers' problem solving processes tend to be different from the process that characterises many other academic domains. This as the emphasis in academic domains is typically on understanding and investigating the underlying "rules" of a problem and/or challenge, and from this understanding creating a rational for proposing a solution for a particular problems and/or challenge *(Lawson, 1984: 218 f), (Lawson, 1997: 126 f), (Cross, 2000: 21)*. If one summaries these different strategies, it can be argued that architects and designers are solving problems and/or challenges by synthesis and solution-focused processes, whereas others professsionals like scientists use analysis and problem-focused processes to solve problems and/or challenges *(Lawson, 1984: 218 f), (Lawson, 1997: 126 f), (Cross, 2000: 21).*[164] In short, it can be asserted that architects and industrial designers do not aspire to deal with enquiries of what is, how and why, which is common in academia, but rather focuses on what might be, could be and should be *(Lawson, 1997: 126 f).*[165]

As introduced in previous sections, architects and industrial designers tend to deal with design problems and/or challenges that are characterised by uncertainty, uniqueness and conflicts, where they have to make numerous decisions *(Schön, 1987: 157)*. These decisions tend to be taken in what was introduced as ill-structured problem (wicked problems) setting in chapter four.[166] As shown in chapter four, design problems and/or challenges are characterised by: (1.) uncertainty, (2.) multiple objectives (different value framing) and (3.) multiple participants (who often adhere to different value sets).

In addition, design processes tend to have no stopping rule *(Rittel and Webber, 1973: 162)*, as the information needed to make design decisions is never complete and each constraint can be challenged. This leads to a situation were a design process is characterised by continuous discovery that can go on endlessly *(Cuff, 1991: 62)*. Equally, even if architects and industrial designers tend to peruse a single specific solution, the possibilities within design are more or less limitless *(Cuff, 1991: 62)*. Design solutions are therefore not true-or-false, but good or bad *(Rittel and Webber, 1973: 162)*. There is neither a single correct solution to a design problem, nor is there a correct test procedure for design, as there is no definite criterion for testing any proposed solution, and no mechanizable process for applying the criterion *(Simon, 1973: 183), (Rittel and Webber, 1973: 163)*. Design problems tend to be unique, as well as not having enumerable (or an exhaustively describable) set of potential solutions *(Rittel and Webber, 1973: 164)*, as the problem space is not easily defined in any meaningful way *(Simon, 1973: 187 f)*. Nor is there a well-described set of permissible operations that might be incorporated into a design solution.

These and other characteristics contribute to the situations where even a moderately complex building or product requires architects and/or industrial designers to make numerous implicit and explicit decisions *(Spector, 2001: 65)*. Many of these decisions requires the consideration of difficult trade-offs between several desirable and at times conflicting ends *(Spector, 2001: 65), (Lawson, 1997: 81).*[167] Because of the potential conflicts that exist between the irreconcilable desirable ends in design projects, will an architect or industrial designer be forced to decide which aspect that he or she considers to be: (1.) most important, (2.) which is of less importance, (3.) which can be accommodated indirectly and (4.) which need to be rejected etc. *(Spector, 2001: 65).*

Based on the numerous difficult trade-offs of desirable and/or conflicting ends, architects or industrial designers attempt to make an overall judgment of whether the implicit and explicit challenges presented in the initial state of a design project are so un-resolvable that they will conclude that the problems lie outside his or her control *(Spector, 2001: 65).* A potential decision which concludes that a problem lies outside a designer's control, is typically linked to limitations set by issues such as: budget, schedule, site, or program etc. *(Spector, 2001: 65).* But more common than to conclude that the design problem lies outside a designer's control, architects and industrial designers typically attempt to renegotiate some of the constraints that characterises the design problem and/or challenge.[168] Within this type of negotiation architects and industrial designers, as well as the clients, use a number of tactics that were introduced in chapter three.[169] From a designer's point of view this includes strategies such as: (1.) staging, limiting and manipulating both the information and the accuracy of the information contributed to clients, (2.) capitalise on clients' lack of knowledge of the design process and their lack of relevant design knowledge and (3.) ultimately, even if seldom, threaten to call an end to the participation in a project *(Cuff, 1991: 39, 75, 93).*[170] Equally, clients use a number of tactics to limit a designer's ability to change the overall constraint set in a design project. These tactics include: (1.) keeping their financial resources private, (2.) bringing the designer into the process when most of the crucial decisions is taken and (3.) threatening to call an end to the entire project *(Porter, 2000a: 26 - 28) (Cuff, 1991: 75, 93).*[171]

Architects and industrial designers typically will not abandon a design project even if little leeway is given in negotiation over the overall constraints. Instead, designers will often try to design their way out of tough and/or challenging situations. This strategy is typically chosen in the hopes that the design process will provide results which will "resolve most of the conflicts or prove so compelling that the trade-offs he or she was forced into making become invisible" *(Spector, 2001: 65).* [172] It should be noted that this attitude is particularly linked to designers ability to find a "successful" frame which reduces the complexity within a given design project.

A failure to overcome the main difficulties found in a given design project has tended to reflect badly on the architect or industrial designer conducting the project, as this type of failure has been looked upon as the designer simply did not trying hard enough, or even worse, lacking talent. This has contributed to a situation where self-doubt is a common state of mind among architecture and industrial design practitioners and students, and it is even considered to be second order of the inner debate architects and industrial designers engage in *(Spector, 2001: 66).*[173]

The assessment of the initial ramifications and the potential of subsequent negotiations, as well as the hope offered by the design process, creates the basis on which architects and industrial designers decides if a given design project is worth perusing, i.e. what the designer thinks he or she can control and handle. There is very little factual information that assists architects and industrial designers in making this decision, so it is reasonable to argue that this decision tends to be predominately experience and value based decision.[174]

Either way, when the preconditions for a design project are set, an architect and/or an industrial designer generally employs one of two main strategies to tackle the design process (it should be noted that the second is much more common than the first). The first strategy that designers may use is linked to attempts to compare the relative benefits of possible design decisions *(Spector, 2001: 66)*. A possible design decision encompasses in this context everything from the entail frame to individual design decisions. The efforts connected to comparing different potential design decisions is typically linked to the previous introduced concept of utility. For some design scholars these types of strategies hold the potential of making design decisions less intuition based and more based on rationality. Some scholars have even argued that this type of strategy can turn architecture and industrial design into more scientific disciplines *(Spector, 2001: 66), (Cross, 2000: 94), (Cross, 2001b: 49).*[175] But for a number of reasons, utility based decision procedures are difficult to apply in architecture and industrial design, this includes: (1.) the starting point of a design project is often partly uncertain, ill-defined, ill-structured, complex, and incoherent, which makes listing an analyse a challenge, (2.) the complexity found in most design projects requires designers to make numerous decisions, which makes it difficult to develop a utility analysis which cover the share range and number of decisions, (3.) the difficult trade-offs which designers have to make makes it difficult to establish an interval or ratio scale which allows the trade-offs to be compared within a utility approach, (4.) design often involves an element of visions which does on lend it self to a utility approach and (5.) aesthetic aspect of most design projects generally poses a challenge towards a utility approach, as it is difficult to asses and evaluate the aesthetical aspects of a given design project (this points is elaborated on in a subsequent section).[176]

Generally the attempt to use utility like strategies has not been very successful within architecture or industrial design, as design is characterised by the above mentioned limitation to a utility based decision-making approaches *(Spector, 2001: 67- 74), (Lawson, 1997: 81).*[177] This has made this type of strategy uncommon as an overall strategy among architects and industrial designers, even if some design scholars have advocated the strategy. It should be noted that utility based approaches can be found in sub-problems of a design project,[178] and that the approaches of comparing the relative "benefits" of possible design decisions are linked to a designers value set. This as the designer tends to employ their individual values and value sets when deciding which utility-value a given aspect should be assigned, as there tend to be very little factual based "evidence" which can assist in this process.[179]

The second strategy that architects and industrial designers employ to solve design problems and/or challenges[180] is to impose an initial frame in the form of an idea(s), metaphor(s), concept(s) and/or framework on to the design task.[181] This type of framing has the effect of reducing the "visible" complexity and limiting the possible trade-offs within a design project, as it excludes a number of possibilities that are outside of the imposed frames boundaries. In other words, architects and industrial designers impose a frame on a design project in order to reduce the variety and number of potential solutions *(Schön and Rein, 1994: 172), (Schön, 1987: 42, 157).*[182]

The process of framing tends not to comply with the view of a design process as a linear process, which has been argued by some architects, industrial designers and design scholars *(Cross, 2000: 201)*. In practice, the design process, which is used in most design projects, is of a more iterative nature where different stages get mixed and to some extent repeated *(Rowe, 1987: 34), (Cuff, 1991: 91), (Schön, 1983: 104)*. The lack of a linear design process is in line with the assertion that design problems are characterised by being poorly defined at the outset of the design process and that design challenges are of the wicked problem type.[183] Architects and industrial designers' processes of structuring and formulating the design problem are frequently identified as key features of design activity *(Cross, 2001a: 96)*,[184] which can be divided into the three previous mentioned interwoven stages where framing is an essential part.

Stage one: Most design projects start with the schematics phase, often called the concept phase *(Cuff, 1991: 91)*, which implies finding an idea, metaphor etc. which sets the agenda and limits the potential possibilities. The concept phase is often indistinguishable from the initial framing stage. The initial frame tends to be linked to idea(s), metaphor(s), concept(s) and framework (primary generators) which designers develops or brings along to the concept phase. Initial frames set the boundaries and guide the subsequent design process by providing direction and evaluation criteria for decisions making, which is conducted within a given frame. This includes influencing general design decisions, detailing and the development of specific sub-requirements and sub-solutions. In addition, the initial frame also provides a base for further insight and direction, especially with regards to further information processing *(Rowe, 1987: 37), (Darke, 1979: 38, 43)*.

Stage two is the procedural design process, known as the problem-solving procedure or the design "conversation" and "reflection" part *(Schön and Rein, 1994: 173)*. The problem-solving process is the stage which most architects and industrial designers, however gifted, tend to spend most of their time (hours, days, weeks, and even months) trying out various solutions *(Collins, 1971: 87)*. During this phase a number of potential solutions will be rejected, but some of the rejected solutions will potentially contain suggestions which contributes to the designer "finding" the appropriate path towards a desired design outcome *(Collins, 1971: 87), (Cross, 2000: 25)*.[185] On the basis of these discoveries new intentions will be formed, which are additional to the ones that are inherent in the initial frame. Thus, some intentions evolve during the progress of the design process *(Schön and Rein, 1994: 172), (Schön, 1987: 63), (Schön, 1983: 164)*.

Depending on the problem-solving process and the suggestions that come to light during the explorative solution generation, designers will typically decide to reframe in midst of the procedural design process *(Schön and Rein, 1994: 172), (Schön, 1987: 42, 63), (Darke, 1979: 38)*. During the second phase architects and industrial designers will typically be adopting a kind of double vision, which implies checking if the design development is complying with the initial frame, and if the initial frame needs to be changed i.e. reframed *(Cross, 2001a: 96) (Schön, 1983: 164)*. This double vision is often characterised as a conversation with the design situation:

> "as the designer seeks to grasp the meanings of his [or hers] moves, and of others' responses to his [or hers] moves, and to embody his interpretations in the invention of further moves."
> *(Schön and Rein, 1994: 172)*

To achieve this designers will typically try to shape proposed design solutions to fit the "original" frame, and at the same time be open for the "back-talk" which the design process itself provides *(Schön, 1983: 164)*. Or to put it in another way, the designer will try to act in accordance with the intentions he or she has adopted, but at the same time constantly recognizing that he or she can always break it open later *(Schön, 1983: 164)*.

It should be noted that the design problem-solving process which is taking place within a given frame is mainly evaluated on the basis of how well the design problem-solving process achieves the desired design outcome, and the compliance that the design developments have with the existing frame. It can also be influenced by the emerging intentions discovered through the design process. At times, the views held by other stakeholders may also play a part in the evaluation of the design development. If the problem-solving process does not achieve the intended considerations for the design outcome and/or the existing frame, this will lead the architects and/or industrial designers to reframing during the design problem-solving process *(Schön and Rein, 1994: 173)*. In addition to this evaluation, outside circumstances, or a combination of outside circumstances and the designer finding the initial framing inappropriate, may bring on reframing.[186]

Stage three reframing implies that a architect or industrial designer will redefine the initial frame to allow for solutions that were previously outside of the boundaries of what was assumed to be desirable and at times possible within the initial frame *(Cross, 2000: 25)*. Or a reframing might narrow down the scope of the initial frame to exclude solutions and refocus the design efforts on a smaller set of possibilities. Regardless of the type of reframing it does impose new constrains and set a new stage for the continuous problem-solving process. The reframing in the mist of the problem-solving process is often referred to as spiral or iterative design process *(Schön, 1987: 42), (Darke, 1979: 38)*. These means that stage two is repeated within the new framing.

The number of reframing i.e. spiral of iterations that a design process contains varies and tends to be dependent on the circumstances and on the individual architect and industrial designer. A new frame will, in much the same way as the problem-solving process, be "tested" against the appropriateness to resolving what the designers consider to be substantial design issues and problems *(Darke, 1979: 38)*. What is considered to be substantial issues and problems is evaluated primarily on the basis of the architect or industrial designer's value set, but it will also be tested against various "outside" requirements *(Darke, 1979: 38)*. The initial frame is typically developed at an early stage of a design project and is therefore based mainly on the value set of the designers, whereas later reframings are based on both the value set and on the "discoveries" reviled in the design process. In addition to the value set, a reframe is also partly based on the constraints found in the design project (requirements of the client, brief etc.) which is uncovered during the design process of a given design project *(Cross, 2001a: 95 f)*. Both elements contribute towards the basis for the reframing of a design project, but the value set tends to be the dominant factor *(Rowe, 1987: 37), (Darke, 1979: 38) , (Schön, 1987: 123 f)*. A new frame (reframe) is often summed up in a new visual concept, idea, metaphor, and or framework etc. *(Darke, 1979: 38)*.

Within the process of framing and eventual reframing, not all variables and intentions tend to be in flux. Architects and industrial designers will generally keep certain elements relatively constant throughout the process of framing (and the design process). The elements kept constant tends to be found in the initial frame and these stable elements are linked to the individual value set which a given architect or industrial designer brings to a given design project *(Lawson, 1997: 162)*. This has at times been described as an overarching design theory and an appreciative system *(Schön, 1983: 164)*.

As introduced in chapter four, architects and industrial designers tend to be reluctant to abandon their initial or developed concepts *(Lawson, 1997: 45 f), (Rowe, 1987: 36), (Porter, 2000a: 28), (Cross, 2004: 435)*,[187] as well as develop numerous alternatives *(Cross, 2004: 435)*.[188] So, as the design process progresses under a given frame, reframing will tend to become more unlikely. This, as the further into a design process a designer or design team goes, the more issues are already decided upon. In turn this will make architects and industrial designers more committed to a frame and the design proposal which has been developed under this frame *(Schön, 1983: 164)*. In summary, this implies that reframing does not take place a great number of times within the same design project, and that architects and industrial designers tend to have some reluctance towards frequent reframing.[189] This is in line with the previous argumentation that points out that: architects and industrial designers are notoriously known for clinging "to major design ideas and themes in the face of what at times might seem insurmountable odds" *(Rowe, 1987: 32)*, and they are often seen to be "distinctly defensive and possessive about their solutions" *(Lawson, 1997: 126), (Cross, 2001a: 96), (Collins, 1971: 41)*. But even if practitioners tend to become more committed to a frame as the design process progresses, does this not completely prevent practitioners from evaluating the reframing and its ability to move the design project forward *(Schön, 1983: 136)*.

Common for all these three stages, is that design projects which are not successfully framed lead to situations where the architect and/or industrial designers' experiences: (1.) analysis inhibition (closely related to escalation and regression),[190] (2.) wicked problem inhibition (which stretches the effectiveness of rational decision-making),[191] (3.) value inhibition (which is connected to value conflicts within a designer's value set or value conflicts between the different participants in a design project)[192] and (4.) holistic inhibition (i.e., attempting to be comprehensive which is connected to the "holistic" design value) *(Nelson and Stolterman, 2003: 133)*. [193]

This inhibition tends to occur when there are no means for bounding or limiting the complexity and conflicts involved in design projects. Both the complexity and conflicts commonly found within these paralyses can be greatly reduced, solved or minimized by introducing effective framing into a given design project. This as frames have the effect of reducing the options available to the designers as well as guiding the decision-making that is undertaken within a given frame in a design project.[194] Thus, in the same way most people use framing in everyday decision-making situations and/or conflicts, architects and industrial designers use framing as part of their professional decision-making process.

What is considered to be the most appropriate frame in a design project depends on the viewpoint of the framer. Different stakeholders in a design process might hold different opinions as to which frame is appropriate; it all depends on the stakeholder's value set and what and/or whom they represent in the design process. Thus, conflicts over frames and reframing are not uncommon within architecture and industrial design (this is more commonly known as conflict over design ideas or concepts). Some of these conflicts are due to the fact that it can at times be difficult to determine what will be the consequence of a given frame. But generally, is it reasonably clear what direction a given frame will move a project, and what will be the consequences for the different stakeholders *(Spector, 2001: 74)*. What is lacking is usually not an idea of the consequences of a given frame, but the lack of a common "currency against which outcomes can be measured" *(Spector, 2001: 74)*.[195] This can be illustrated by an example first introduced in chapter two, the proposed development of the military base into a national park in the Presidio area in San Francisco, which had two opposing framing alternatives.[196] On frame alternative was connected to the consequence of destroying houses in the military base in order to create a park, which has an effect on affordable housing in the area. Thus, a frame is linked to a social design value. This framing will typically recommend that the housing be kept etc. On the other hand, as these houses in the military base were considered to lack aesthetical qualities, a second frame alternative is based on an aesthetics design value that will typically recommend that the housing be destroyed. The framing of this design project from an architects point of view would therefore be radically different depending on: if the architect was focusing on preserving affordable housing (social design value), or if the architect was focusing on the aesthetics qualities of the proposed development (aesthetics design value) *(Spector, 2001: 68 f, 72)*.

In general architects and industrial designers rely on their most deeply held values i.e. their value set to select the initial frame and for the potential reframing, as design decisions are linked to subjective judgement rather than being reached by a process of logic and/or fact based analysis etc. *(Darke, 1979: 43), (Lawson, 1997: 126)*. This point has been suggested in the pervious section and will be expanded upon in the following sections.

6.3.2.1 Framing utilised by designers and its link to values

> *"During any given short period of time the architect will find himself working on a problem which, perhaps beginning in an ill-structured state, soon converts itself through evocation from memory into a well-structured problem." (Simon, 1973: 190)*

As introduced in a previous section, architects or industrial designers tend not to start a design process by listing and analysing all possible constraints that can be found in a design project, nor do they use listings and extensive analysis as a base for developing design proposals.[197] Instead, architects and industrial designers tend to use a solution-based strategy where framing is an essential part.[198] These frames tends to affect: (1.) the choice of design process selected for a given design project, (2.) the parties which the designers choose to involve in the design development, (3.) the focus and the issues which are developed thought-out the design process and (4.) the final design outcome *(Kaufman and Smith, 1999: 169)*. In addition, architects and industrial designers tend to rely on framing and reframing when they intervene in physical change conflicts *(Susskind and Ozawa, 1984: 7 - 9)*.

Frames employed by architects and industrial designers are, in the same way as for general frames, largely shaped by their values that are ascertained from their education, experience, and political and social outlook etc. *(Kaufman and Smith, 1999: 169)*. Even so, it should be noted that frames are not simply an equivalent to a general professional outlook. Rather, as introduced previously, frames tend to be consistent with a particular individual value set. Frames are often selected on the basis of some of the dominant values an individual designer is adhering to. Or they can be based on the top part of a value hierarchy which determines a small group of objectives which through a frame is imposed onto a design project *(Darke, 1979: 43)*.

Framing and reframing employed by designers tends to be subjective *(Rowe, 1987: 76)*,[199] which is indicted in an observation and reflection made by Jane Darke when she argues that:

> "any particular primary generator [i.e. frame] may be capable of justification on rational grounds, but at the point when it enters the design process it is usually more of an article of faith on the part of the architect, a designer-imposed constraint, not necessarily explicit." *(Darke, 1979: 38)* [200]

Darke's observation that frames are connected to an article of faith on the part of the architect and post rationalisation of frames indicates that the initial frame is not based on "rational" decision-making, but is instead based on design values that the architect or industrial designer bring to the project. Another indication of the this can be found in that architects and industrial designers tend to hold various objectives as the important aspects for selecting a given frame. For instance, the main objectives in a frame might be linked to a good aesthetic relationship between dwelling and surroundings, and on the other hand, the main objectives can be linked to maintaining social patterns through design *(Darke, 1979: 38)*.

Successful framing is often linked to experience within design practice, this as practising architects and industrial designers have experience in creating frames which address realistic conjecture of the issues involved in a design project and their own intentions i.e. value set *(Cross, 2001a: 96), (Schön, 1987: 157 f), (Darke, 1979: 38), (Nelson and Stolterman, 2003: 200).*[201] As students tend to lack the same experience in realistic design projects, they often are considered be more prone to make framing mistakes than their more experienced teachers and examiners etc. *(Cuff, 1991: 72), (Darke, 1979: 38).*[202] But even if the above argumentation may be close to reality, it can be considered problematic as in the same way as there is no agreed upon knowledge base for architecture and industrial design, there is no consensus on framing criteria in the two design professions, nor among design scholars and design schools. This fact makes it impossible in a strict rational sense to argue that an experienced architect or industrial designer is more successful in establishing workable frames than their equivalent students.

The fact that there are no generally accepted criteria for framing within design, in the same way as for framing in general, leads to a situation where individual designers, design scholars and design schools focus on different design frames. The question of successful framing in design is therefore dependent on the individual designer deciding the framing and the criteria that this architect or industrial designers are employing in the evaluation of the appropriateness of a given frame. This can be seen in well-known design projects where different framings have had an impact on design such as the Coventry Cathedral design by Basil Spence[203], Sydney Opera House design by Jørn Utzon and the National Theatre (London's South Bank) by Denys Lasdun *(Darke, 1979: 38)*.

Based on the above observation and the argument presented in this section that introduced values' link to framing in general it can be agued that frames within architecture and industrial design are predominately based on values and value sets. However, even if frames tend to be value based this does not prevent architects and industrial designers, in the same way as individuals in the political domain, to latch on to a dominant frame and its conventional metaphors, in an attempt to gain credibility and increased support for a given design project (as introduced in previous sections).

6.3.3 Design decisions are primarily based on value sets

> *"Design is a messy kind of business that involves making value judgements between alternatives that may each offer some advantages and disadvantages. There is unlikely to be a correct or even optimal answer in the design process, and we are not all likely to agree about the relative merits of the alternative solutions." (Lawson, 1997: 81)*

It is generally accepted within psychology's psychoanalytic and behavioural tradition that decision makers, be it individuals or groups, are not characterised by consciously weighing the consequences of various courses of action and then choosing from and among them *(Hastie and Dawes, 2001: 17)*. On the contrary, most psychologists today accept the compelling assumption that value sets i.e. ideas, beliefs etc. cause decisions to be made *(Hastie and Dawes, 2001: 17)*. Thus, it is commonly accepted that in order to understand decisions made by for example jurors, doctors etc., it is essential to find out what values they adhere to at the time the decisions were made.

The same connection is not commonly pointed out within architecture and industrial design. Instead, it has been common for design scholars to attribute design decisions to intuition, experience and tacit knowledge (as introduced in chapter four).[204] Some design scholars have been uncomfortable with the subjective nature i.e. attribution of intuition, experience and tacit knowledge etc. has had on the foundation for design. Consequently, some design scholars have developed strategies that have attempted to establish ways "of comparing the relative benefits of possible design decisions" *(Spector, 2001: 66)* and proposed this as a basis for design decisions.[205] It should be noted that the uneasiness that some design scholars have had towards the subjective nature of design decisions, which are based on intuition, experience and tacit knowledge etc., is also at times found among practising architects and industrial designers. Some architects and industrial designers will therefore at times seek out information that can assist the design decision process.[206]

However, as pointed out in previous sections, the strategy of basing decision-making within design domain on utility has not been particularly successful, nor has it been extensively adopted among architects and industrial designers.[207] Scholars who advocate the utility approach tend never to point out the difficulties that indicate why utility strategy is uncommon in architecture and industrial design out. This can be illustrated in the following argumentation by Nigel Cross:

> "different objectives may be regarded as having different values in comparison with each other, i.e. may be regarded as being more important. Therefore it usually becomes necessary to have some means of differentially weighting objectives, so that the performances of alternative designs can be assessed and compared across the whole set of objectives. The weighted objectives method provides a means of assessing and comparing alternative designs, using differentially weighted objectives. This method assigns numerical weights to objectives, and numerical scores to the performances of alternative designs measured against these objectives. However, it must be emphasized that such weighting and scoring can lead the unwary into some very dubious arithmetic. […] Arithmetical operations can only be applied to data which have been measured on an interval or ratio scale" *(Cross, 2000: 139 f)*

Generally, the nature of most design projects does not lend itself easily to a utilitarian approach, which is due to the following five reasons. Firstly, as described in previous sections, the starting point of a design projects is often partly uncertain, ill-defined, ill-structured, complex, and incoherent, which makes listing an analyse a challenge *(Cross, 2000: 25), (Schön and Rein, 1994: 172), (Schön, 1987: 42, 157).*[208]

Secondly, most design projects of moderate to extensive complexity are characterised by requiring architects and or industrial designers to make numerous decisions, which makes it difficult to develop a utility analysis which cover the share range and number of decisions.

Thirdly, many of the aspects found in a design project are of a sort which requires the designer to make difficult trade-offs between several, and at times, conflicting desirable ends *(Spector, 2001: 65), (Lawson, 1997: 81).* The trade-offs aspect complicates a utility approach, as it is difficult to establish an interval or ratio scale that allows the trade-offs to be accurately compared. Utility strategies within the two design domains tend to have the side effect of reducing all issues to a common quantitative measurement. This tends to have the effect of shifting the problem of deciding between difficult trade-offs to the problem of validating i.e. give a quantitative measurement of the same difficult trade-offs *(Lawson, 1997: 81)*.

Fourthly, design often involves an element of visions that have an element of *What ought to be?* much in the same way as moral precepts "are concerned not with what is, but with what ought to be" *(Pojman, 1997: 12)*. Consequently, vision led decision-making processes tend not to start out with the future outcome neatly defined, because visions are the trigger for transformational change which facilitates the emergence of new possibilities and realizations *(Nelson and Stolterman, 2003: 140)*. Understanding the motivation triggered by what we desire, as opposed to what we need, tends to remain undeveloped within design projects *(Nelson and Stolterman, 2003: 139)*. Thus, are desires and future needs generally not clearly defined, which makes these elements unsuited for the utility approach.

Fifthly, the aesthetic aspect of most design projects poses generally a challenge towards a utility approach. Not only are aesthetical aspects hard to quantify in itself, which is evident in comparison between different aesthetical aspects, it is also very difficult to compare aesthetical qualities with other aspects such as function, economy etc.[209] Design scholars like David Pye have indicated these difficulties arguing that within the design domain nothing can "be made without some concession, however slight and unwitting, to the requirement of appearance" *(Pye, 1978: 35)*.[210]

Because of these five characteristics, the attempt to link the overall design decisions to utility is not very successfully within architecture or industrial design. Utility based strategies such as the weighted-average system is, for instance, not "helpful in decisions where conflicting values operate because they become problematic as soon as they substitute quantitative information for qualitative" *(Spector, 2001: 79)*. The fundamental problem related to the utility decisions made in design, has been pointed out by Ruth Chang when she asserts that: it is not necessarily "'How much better?' but 'In what way better?' or 'To what extent better?'" which is the crucial aspects of a design decision *(Chang, 1997: 18 f)*. These types of questions cannot necessarily be linked to quantitative arithmetic operations.[211] In addition, utility based approaches tend to have the side effect of forcing the decision maker on sub-issues rather than the main issues in a design project *(Spector, 2001: 79)*.

Nevertheless, as pointed out in previous sections and chapters, many of the above reservations towards a utility based analysis and subsequent decision-making is not applicable for sub-problems found in a design project.[212] For example, will the comparing of solution of a fire sprinkler system as oppose to a firewall separation system lend it self to a utility based decision process, even if such issues often can be decided upon with less formal decision-making methods *(Spector, 2001: 79).*

It should be noted that the assertion that utility based decision-making is not applicable to most main design decisions, and can be seen as being in opposition to aspects introduced in the beginning of this chapter. This particularly applies to the general finding that different types of utility and statistic based approaches outperform specialist judgments of trained experts in a number of subject domains *(Hastie and Dawes, 2001: 63).*[213] For architecture and industrial design, this general assertion is most likely true and false at the same time. The above five characteristics of the inadequacies of utility-based approaches in design indicate that: expert based judgment has its rightful place within architecture and industrial design. However, there is nothing in the five characteristics that implies that the designer's expert judgment with regards to sub-solutions outperforms utility and statistic based approaches. Generally it can be argued that it is unlikely that a decision-making process can be found or developed which will relieve architects and industrial designers from the difficult task of exercising subjective judgement within the design process, and at the same time deal with the quantitative and/or rational aspects of the sub-problems i.e. sub-solutions *(Lawson, 1997: 81).*[214] This leaves architects and industrial designers with regards to sub-problems in the design projects, to some degree, in the same predicament as other professional decision makers when it comes to their overoptimistic belief in expert opinion.[215]

Decision-making in architecture and industrial design has within this chapter been linked to the concept of framing and reframing. It can be argued that the most important design decisions are taken when a given framing is established, but even within a given frame a number of decisions will still have to be undertaken in order to produce a design outcome. A frame reduces the number of difficult trade-offs without eliminating all of them, consequently architects and industrial designers will be involved in creating different solutions, selecting among different solutions, as well as deciding on sub-solutions etc., within a context which tends to be characterised by conflicting issues with irreconcilable desirable ends *(Cross, 2000: 139).*[216] This forces architects or industrial designers to decide which aspect that he or she considers to be most important, which is of less importance, that can be accommodated indirectly and that need to be rejected etc. *(Spector, 2001: 65).*[217]

To make the above mentioned design decisions, which includes frame and reframing, overall solutions within a frame, sub-solutions and/or alternative features, architects and industrial designers will need a basis that these design decisions can be based on. Having clarified: (1.) the inappropriateness of utility based decision-making for the main design problems, (2.) having shown in previous sections that there is very little factual information that can assists designers and (3.) having shown that architects and industrial designers have few rational based tools or a knowledge foundation that can assist the decision-making, it is likely that architecture and industrial design decisions are mainly value based. This assertion is in line with what is argued by contemporary psychologists i.e. psychoanalytic and the behavioural tradition with regards to decision-making generally *(Hastie and Dawes, 2001: 17)*. It is also in line with assertions such as: architects and industrial designers "rely on their most deeply held values to deal with these decisions regarding irreconcilable desirable ends which can be fond in most design projects *(Spector, 2001: 65)*. Equally, it is supported by assertions such as: design decisions are generally linked to "subjective judgement rather than being reached by a process of logic" *(Darke, 1979: 43), (Lawson, 1997: 126).* Consequently, it has been indicated in previous sections and resituated in this section that most design decisions are based on architect's and/or industrial designer's individual value sets.[218]

6.4 DESIGN EVALUATION IS BASED ON VALUE SETS

> *"Indeed, 100 flowers of wisdom ought to blossom, but not quite wild, and certainly not independent from each other."*
> *— Horst Rittel (Rittel, 1976: 89)*

When any type of evaluation[219] is conduced, it tends to be based on some implicit or explicit criteria. These criteria will in many professional evaluations be based on factual, theoretical foundations and/or experience, as well as a value base. However, what an evaluation is based on tends to differ between different professions and domains, as well to which degree these criteria are publicly declared and/or published. These differences can be indicated in that it tends to be more difficult to identify evaluation criteria within fine art, literature, or music than in more sciences based domains. For instance, when fine art, literature, or music critics evaluate a particular work tends this not to be based on factual information, or on a scientific based theories etc, but on context, person's impressions, value set etc.

Evaluations within architecture and industrial design have commonalities with the art world, in the sense that they tend not to have a factual or scientific basis as the primary foundation for evaluations. Design evaluators tend not to specify the standards that they are evaluating against and this is particularly true when aesthetic judgements are offered, as indicated by evaluators using terms like: "'the form is weak'; 'the detailing is ungainly'; 'the concept is retardataire'; etc." *(Attoe, 1993: 526)*. As for the art, it is difficult to identify the evaluation criteria utilised within architecture and industrial design, as both disciplines are characterised by having very little literature pertaining to design criticism i.e. the criteria used in an evaluation *(Attoe, 1993: 527)*. This is not to say that criticism does not exist within the architectural and industrial design domains. Books and articles containing architectural and industrial design criticism are readily available, as virtually everything written about architecture and industrial design is either descriptive, interpretative or judgemental *(Attoe, 1993: 527)*. For instance, critics will "describe buildings and the circumstances associated with their design and construction" *(Attoe, 1993: 524)*, but these descriptions tend not to be neutral, so the aspects highlighted in description will in effect often incorporate an element of evaluation for a given building. Equally, "critics will interpret buildings, advocating particular ways of understanding architecture" *(Attoe, 1993: 524)*, which at the same time passes judgement on buildings and/or products.

Identifying the most influential evaluation criteria in architecture and industrial design literature is difficult because of its implicit nature, and because the influence a book or article has on architecture and/or industrial design is not easy to establish or measure *(Attoe, 1993: 527)*. To complicate matters further, evaluation is not only played out in literature, but also takes place in classrooms, design offices, local and central building inspector's offices etc. *(Attoe, 1993: 524)*. Thus, the focus in the following sections will not be on samples of evaluation criteria, but on what forms the basis for evaluation criteria within architectural and industrial design. The following two sections will introduce the basis that is used to create, both implicit and explicit evaluation criteria within architecture and industrial design. In addition, the basis for evaluation aspects found in design guidelines and building codes will also be introduced. It should be noted that Building Performance Research and Post-occupancy evaluation, which has been previously introduced in chapter four and five, also have an element of evaluation attached, but as these methods is not commonly used or accepted within architecture, thus will this not be focused on in the following sections.

6.4.1 Evaluation in design

> *"True genius resides in the capacity for evaluation of uncertain, hazardous, and conflicting information." — Winston Churchill*

Evaluation within architecture and industrial design tends to be regarded differently from evaluation that takes place in other professions like medicine and law. These differences are often attributed to an argumentation asserting that evaluation criteria within architecture are different from "law or medicine, because legal and medical criteria are essentially far more objective" *(Collins, 1971: 142)*. This objectivity implies that evaluation conducted within medicine and law is based more on a scientific founded factual and theoretical based than architecture and industrial design. It should be noted that the "objectivity" within medicine and law does not imply that there do not exist debates and controversies within the two domains,[220] but the controversies which exist in these fields tend to be of a different nature that the "the Battle of the Styles" which has rage in architecture and industrial design *(Collins, 1971: 142).*[221] What the different professions have in common is that almost all evaluation has an element of a value basis that influences the evaluation criteria.

The lack of a factual and scientific based foundation for evaluation criteria within architecture and industrial design has led to an acceptance of individualistic,[222] and some would argue a liberal, evaluation within the two design professions. This point can be illustrated by Russell Sturgis's book "The Appreciation of Architecture" where he asserts that:

> "The reader must feel assured that there are no authorities at all in the matter of architectural appreciation: and that the only opinions, or impressions, or comparative appreciations that are worth anything to him are those which he will form gradually for himself." *(Sturgis, 1903: 11 f)*

Design scholars whom advocate an individualistic approach to design evaluation, are uncommonly found to also assert "absolute" design evaluation criteria that fall outside the plural acceptance of different design evaluations. For instance, Russell Sturgis does not strictly adhere to his own individualist evaluation concept throughout his previously mentioned book. One example of this point can be illustrated when he states that Greek temples built before

300 B.C. were “the most perfect thing that decorative art has produced” *(Sturgis, 1903: 13)*. Equally, he is stepping out of the liberal evaluation base when he asserts that architects of his own generation are concerned only with heating, lighting, ventilating and plumbing, and do not have time for design in its artistic sense *(Sturgis, 1903: 212 f)*. In fact, a number of designers and design scholars have asserted both implicitly and explicitly views on design quality and subsequent evaluations criteria that they have argued should be generally accepted, within this somewhat individualistic and liberal tradition. However, it should be noted this personal evaluation criteria tend not to be generally accepted within the two design professions.

In addition to this individualistic based approach to evaluation, some design scholars have attempted to link evaluation of architecture to an archaeological based evaluation.[223] This approach had some influence until the middle of the 20th century, but after the 1950s the archaeological approach to architectural evaluation was looked upon with growing dissatisfaction *(Collins, 1971: 107 f)*. This discontent coincided and was due to modernism becoming the dominant ideology (some will argue the undisputed “winner” of the ideological battlefield within architecture). Consequently, the base for architectural evaluation was changed to be more in line with modernism’s rejection of historical roots.[224] However, this shift should not be looked upon as a major shift, as evaluation criteria for architecture and industrial design tend to change frequently depending on the climate of opinion in the two design domains. This point is highlighted by Charles Jencks when he argues that architecture is not evaluated by universals criteria, but by architectural fashions *(Jencks, 1968: 30)*.

Another important shift can also be found in that design evaluations have historically focused on individual buildings and/or products, but increasingly within contemporary evaluation of buildings and products have these been viewed in a larger context. Implying that buildings and product should not be thought of in isolation, thus has the scope of architecture and industrial design evaluation often been extended to incorporate urban design and city planning etc. *(Attoe, 1993: 524)*.

6.4.1.1 Design evaluation involves subjective value judgement

> *“Ideally, each piece of art's its own unique object, and its evaluation's always present-tense.” — David Foster Wallace[225] (McCaffery, 1993: 133)*

Both architecture and industrial design are characterised by being potentially evaluated on a number of different “levels” simultaneously. This typically involves evaluation on an (1.) aesthetics level, (2.) functional level and (3.) user and peer level, as well as others. Not only are evaluations typically conducted on a number of different levels, but also from different perspectives such as: “(1) the design process, (2) competitive assessments, (3) control evaluations and (4) journalism” *(Collins, 1971: 146)*.[226]

Bearing in mind the different perspectives, evaluation of a design tends to imply that a given building or products is measured against a “specific” standard *(Attoe, 1993: 526)*. This standard i.e. evaluation criteria might be pre-determined, “like the minima and maxima characteristic of building codes which specify with numbers the limits within which designers must work” *(Attoe, 1993: 526)* (see next section). Or it might be a quite general evaluation criteria based on design values such as: (1.) buildings should reflect their era i.e. follow the Spirit of the Times,[227] (2.) design should follow time-honoured patterns i.e. Classic, Traditional and Vernacular aesthetics;[228] (3.) buildings should be ecologically responsible in their construction, form and disposition i.e. Green design and Sustainability[229] and (4.) “there should be no features about a building which are not necessary for convenience, construction, or propriety” *(Pugin, 1969: 1)* i.e. Structural, Functional and Material honesty *(Attoe, 1993: 526)*.[230] It should be noted that these design values might be expressed within an absolute tone, but these values i.e. design criteria do not tend to lend itself to measurement or universal agreement. Thus, a design evaluators cannot “know how close to the mark a design comes until the judgement is rendered” *(Attoe, 1993: 526)*, and the judgment is in it self debateable, which makes the absolute tone somewhat inappropriate.

Design evaluations and the notion of design quality tend to be intertwined, as soon as the question of evaluation is on the table, and the question of design quality is not far behind *(Cuff, 1991: 196)*. However, in the same way, as for evaluation criteria there is no commonly agreed upon consensuses of what constitutes design quality. Instead is it an unresolved issue whether design quality can ever be absolutely determined within the architecture and industrial design domain. To overcome this problem is it common to define and link design quality to different, more or less, objective criteria and/or phenomena.

This can be illustrated by design scholars like Dana Cuff whom links design quality to: the “phenomenological entity perceived by individuals, not as an inherent quality of the object or building” *(Cuff, 1991: 196)*. Cuff goes on to argue that that design quality is dependent upon those whom make the judgment of quality, and she points out that with regards to design quality there are three principal evaluators. These are: (1.) the consumers or the public at large, (2.) the participants in any given design process and (3.) the design professionals *(Cuff, 1991: 196)*. Design quality is, according to Cuff, found in buildings which are perceived to be excellent by all of the three groups *(Cuff, 1991: 196)*.

This definition of design quality might at first glance seem straight forward, but as Cuff herself points out it is at times hard to identify the three groups. For instance, there is no single group representing the public,[231] and it can be challenging to determine whom the real participants in the design process are.[232] Equally, it can be challenging to identify the representatives of the two design professions. Another complicating issue can be found in that there is no generally accepted set of criteria that design quality can be evaluated by. Instead, individuals tend, be it among the public at large, stakeholders in a design process and members of the two design professions, to apply and subscribe to different evaluation criteria.[233] These challenges and observations imply that the evaluation of a given building will differ according to whom, among the public, the stakeholders or the design professions, is asked to perform the evaluation. In other words, an evaluation of a design project will depend on which of the main aspects i.e. aesthetic values, social values, environmental values, traditional values and gender values that a given evaluator is giving preference to.

Cuff's definition of design quality is a challenge for the design professions, as these types of quality definitions builds on evaluations conducted by people whom are outside the architectural and/or industrial design profession. This and similar definitions imply a lack of professional evaluation criteria that can be solely conducted within the architectural and/or industrial design professions. This is problematic from a profession perspective.

Generally, design evaluation of a given design project is often disagreed upon among individuals within the two design professions, as architects and industrial designers tend to "differ in the attributes they value, and in their evaluation of the same attributes" *(Lera, 1980: 216)*. This as the "questions about which are the most important problems, and which solutions most successfully resolve those problems are often value laden" *(Lawson, 1997: 126)*. Generally, the differences that exist between designers' value systems tend to accounts for the differences in evaluations of alternative design proposals. Architects and industrial designers favour design proposals and/or implemented design solutions that reflect their own value sets and reject designs proposals and/or solutions which do not *(Lera, 1980: 218)*. In general, it tends not to be disagreements over how a design project or implementation fulfil individual attributes which determines differences in evaluation of designs, but disagreements over the relative importance given to the different attributes *(Lera, 1980: 218)*.

This point can be indicated in the fact that modernistic architecture which created aesthetic experiments have commonly been found to offer uncomfortable living, not worked as indented or promised and have tended to weather poorly *(Spector, 2001: 91)*.[234] But even with these shortcomings, there still are many modernistic buildings evaluated as architectural success stories within sections of the architectural profession. The potential evaluation conflict found in the evaluation of modernistic architecture can be accounted for as different emphasis put on functional values i.e. "user" values versus "aesthetic" values.

This conflict of values is particularly evident (and straightforwardly illustrated) in Frank Lloyd Wright's Guggenheim Museum[235]. Wright built the design of the museum on the main concept of a spiral ramp that creates the main structure for the exhibition space. This particular concept is often referred to as an elegant mechanical solution which creates a breathtaking sense of the vertical space *(Spector, 2001: 92)*. However, the functional problems with this main concept were obvious from the outset of the building, as the spiral ramp made the viewing of the art works displayed in the museum difficult. These difficulties are attributed to the notion that the art works are perceived as hung askew to the floor plane due to the spiral ramp, and that the ramp has made it difficult to arrange proper lighting of the art works *(Spector, 2001: 92)*.

It might be a fair to assert that the design decisions basing the museum around a spiral ramp concept were primarily motivated by aesthetic considerations and that the functional aspects were given lesser importance. Equally it might, from a strictly functional perspective, be fair to argue that the emphasis on aesthetic qualities had an negative impact on the central function of the museum i.e. displaying art works *(Spector, 2001: 92)*. If one accepts these assertions about the functional aspects of the museum, the evaluation of the Wright's Guggenheim museum as an architectural masterpiece is dependent on the evaluator putting emphasis on the aesthetic qualities rather than the functional aspects. In other words, in order to evaluate it as an architectural masterpiece the evaluator will to some extent have to disregard some of the functional challenges posed by the central spiral ramp concept. On the other hand, an evaluator can argue that the aesthetical qualities of the Guggenheim museum are so successful that the functional shortcomings can be justified in an art museum context.

The classic dilemma between aesthetic and functional aspects in design evaluations is generally unresolved within both design professions.[236] Thus, it can be argued that the unique degree of aesthetic success found in Wright's Guggenheim museum might justify the functional shortcomings, whereas building with a more ordinary aesthetic qualities will be evaluated differently with regards to a similar degree of functional shortcomings.

The predicament of aesthetic versus function is not the only difficult trade-off which has to be evaluated in architecture, other trade-offs can be found in issues such as: (1.) lightweight and flexible buildings tend to require increased maintenance i.e. lightweight and flexible versus maintenance, (2.) extremely tight and energy-efficient buildings tends to experience problems in maintaining acceptable air quality i.e. energy-efficiency versus health and (3.) highly contextual aware buildings tend to integrate into their context while heroic or original buildings stand out i.e. contextual awareness versus originality *(Spector, 2001: 92 f)*.

Another classic dilemma that is often evident in architecture, and maybe even more so in industrial design, is the trade-off between aesthetic aspects and commercial successes. Within the domain of industrial design, there are numerous examples of products that do not receive acclaim for design, but which still are huge commercial successes. Equally, there are examples of products which receive professional acclaim, but that are not commercial successes.[237] The aesthetical qualities valued by architects and industrial designers are often not reflected among the consumers of buildings and products. This fact often possesses the dilemma of professional appreciated aesthetical qualities versus commercial successes.

How one reconciles and/or evaluates these trade offs is highly dependent on the value set that the evaluator adheres to. This is exemplified by the number of design evaluators that admire buildings with well-known "failures" such as the New York Guggenheim museum, which may inform on as well as reflect the evaluators value set *(Spector, 2001: 93)*.

Evaluation of buildings is not only dependent on these introduced trades-offs, but is also related to specific aspects of the aesthetic qualities. Evaluators will also often vary their evaluation with regards to their appreciation of different aesthetic style with its underlying aesthetical values. These differences in appreciation will follow the same line as the aesthetic categories that were introduced in chapter five. An evaluation will be radically different depending on if the evaluator is adhering to: (1.) Artistic aspects and Self-expression, (2.) the Spirit of the Times, (3.) Structural, Functional and

Material honesty, (4.) Simplicity and Minimalism, (5.) Nature and Organic, (6.) Classic, Traditional and Vernacular aesthetics or (7.) Regionalism.[238]

These values are linked to the architectural and industrial design style debate,[239] and illustrate the divided opinion that exists with regards to what constitutes design quality. As there is no agreement over style within the two design professions, the same disagreement can be found in evaluation of the aesthetical qualities of a given building or product. This is particularly evident in the division that exists between the evaluators whom appreciate classical architecture i.e. the New Urbanism movement versus evaluators that appreciate more modernistic based architecture.[240]

Equally, differences in evaluation criteria within the two design professions reflect the different emphasis individual architects and industrial designers place on different issues such as the categories that were pointed out in chapter five i.e. aesthetic values, social design values, environmental values, traditional values and gender values. The subjective nature of evaluation and design quality found in both design professions is in line with the fact that designers are inevitably involved in making subjective value judgements *(Lawson, 1997: 126)*,[241] which is closely related to the notion that designers often see themselves as dealing with “what ought to be” as oppose to “what is” *(Lawson, 1997: 126 f)*. The evaluation of the appropriateness with which a given design solution fits a specific design challenge is often associated with issues such as applicability, appropriateness, opportunity, and real enhancement *(Rowe, 1987: 112 f)*, which to a large degree is set in “a normative terrain concerned with values and aspirations” *(Rowe, 1987: 113)*.

In addition to professional disagreement over what constitutes proper design evaluation criteria and definition of design quality, there also exists disagreements between the public’s evaluation of buildings and products and that of design professionals. This mismatch between the public and design professionals is often regarded as unproblematic by architects and to some degree industrial designers, as many designers will “console themselves with the thought that society simply has not caught up with their superior powers of reasoning” *(Spector, 2001: 19)*. The logic behind this argumentation tends to be that: if a consensus evaluation of a given building or product with the general public is out of reach, the design quality is best preserved by excluding the public all together, as the designers are more knowledgeable with regards to design issues.[242] Thus, the public’s recognition or dismay of a given building or product are for many architects and industrial designers not a sign of either successes or failure, but rather a sign of the difference between the lay person’s evaluation and that of a design professional. However, even this is not generally accepted within certain elements of the two design professions, there is, among some architects and industrial designers a willingness for both public participation and scrutiny by the public. But it should be noted that many architects and industrial designers are generally uncomfortable by the idea of public scrutiny and accountability.[243]

The varying degree of dismissal of public accountability among architects and industrial designers poses the question of how would the wisdom of the architect's and/or industrial designer's evaluation criteria ever be tested without acknowledging public scrutiny *(Spector, 2001: 19)*. Within other professional domains it is commonly acknowledged that the wisdom and good judgment is best tested through its durability in the face of open scrutiny both within and outside the professional domain *(Spector, 2001: 19)*. Within an evaluation system i.e. value system that dismisses the public opinion as that of a lay person will the issues of public accountability always tend to problematic, which in turn is problematic from a profession perspective.

In summary, as there is neither consensus on design evaluation criteria within the two design professions nor among individuals of public, it can be argued that design evaluation is a subjective activity.

6.4.1.2 Evaluation in design offices and schools

> *"Reexamine all that you have been told in school, or in church or in any book. Dismiss whatever insults your soul."*
> *— Walt Whitman*[244]

Disagreements over design quality and evaluation are not only present among different design movements and individual designers, but are also an important issue within architectural and industrial design offices (with several employees). Within a design office of some size senior designers typically evaluate the proposal brought forward by the other staff members i.e. the project designer, the draftsperson and junior designer etc. *(Cuff, 1991: 17 f)*. This evaluation tends not to be based on in-house published evaluation criteria (which if published, could represent a given design offices' definition of design quality) *(Cuff, 1991: 17 f)*. Instead it is the senior designer's individual evaluation criteria that constitutes the evaluation basis which a given design proposal is evaluated against, with its subsequent acceptance or dismissal *(Cuff, 1991: 17 f)*. This point can be illustrated by the following assertion (first quoted in chapter two)[245] made by a senior architect in an architecture office:

> "We never used to talk about design—we came to an understanding by doing it. […] we bring in lots of young people and we have to give them a sense of the way we work. […] But when people haven't worked with us for long, they don't understand. … I have to say 'We don't do things like that' and they don't know what I'm talking about, I can't spend the time to lead each person through the office philosophy. I have to take command. I'm not ashamed to say that's how the office runs now. We can have academic discussions and question the program, the design, and all that. But at some point, I'm going to say, 'We'll do it this way.' And then the argument should end and we should draw it up." *(Cuff, 1991: 17)*

As this illustrates, evaluation within a design office is often dependent on the implicit evaluation criteria adhered to by the senior architects and/or senior industrial designers. It also illustrates that junior designers have to acquaint themselves with these evaluation standards through design practice. The implicit nature of the evaluation criteria makes it difficult for junior designers to know what is expected of them and what constitutes design quality in a given design office. Difficulties and frustration will arise if junior designers are unable or unwilling to accept the senior designer's implicit evaluation criteria. Equally, frustration and problems will arise if the commissioning client does not accept the senior designer's implicit evaluation criteria.[246]

The challenge associated with implicit design evaluation and what constitutes design quality is not solely preserved for the design office. It is also a source of frustration among students and at times teachers in architecture and industrial design schools. Both teachers and students alike tend to lack the ability to make explicit and clearly state their evaluation criteria and their definition of design quality. Therefore, in much the same way as in design offices, design evaluation and design quality concepts are implicitly instilled through architecture and industrial design projects, with it subsequent evaluations and critiques. Thus, design projects in architectural and industrial design schools, in much the same way as design offices, promotes a series of self-referential and autonomous values, which is not explicitly communicated to the students *(Till, 2005: 166).*

As for most design offices, architectural and industrial design schools differs on what constitutes design quality, and design evaluation criteria tend not to be published, as design teachers tends to differ on what the criteria should be. This often leads to a situation where design schools promote diversity where design outcomes ranges from "slick" to "hairy" and from "straight" to "curvy" *(Till, 2005: 166)*. Differences in theoretical approaches are also to some extent prompted, and at times ranges “from fundamental ontology to technical determinism” *(Till, 2005: 166)*. Students are therefore forced to navigate between different teachers and projects promoting different variations of design evaluation criteria and definition of design quality.

This plurality of evaluation criteria and definitions of design quality can be a confusing experience for design students, and often affect the relationship between design teachers and design students.[247] A design student might find it challenging to learn from a teacher whom adheres to design criteria i.e. value set which does not correspond with the value set a student is adhering to. This is particularly the case with mature and self-reflecting students that tend to hold their own definition of both design evaluation criteria and design quality. When the student’s definitions differs from that of the teacher this will often led to an increased chance of dismissal of the teachers opinions and teaching recommendations *(Schön, 1987: 116)*.

The diversity found among students and teachers tend to confirm the lack of an agreed upon design quality as well as evaluation criteria within design education. Thus, evaluation conflicts between teachers and students are not about the diversity allowed in most architectural and industrial design schools, but are instead very often conflicts over the value basis that set the base for the definition of design quality with its subsequent evaluation criteria that are used in a given evaluation.

Tension created by different definitions of evaluation criteria and design quality can also be found among different architectural and industrial design schools, which is due to the different orientations among these schools *(Larson, 1993: 8)*. These differences are typically manifested in differences with regards to level and scope of what makes good architecture and industrial design *(Larson, 1993: 8)*. This is often indicated and expressed by “irritation toward the professional publications and awards that emphasize ‘design’” *(Larson, 1993: 8)* commonly found among schools, practising designers and teachers.

Based on the above observations and assertions, it might be possible to argue that evaluation conflicts in architectural and industrial design offices and schools are unavoidable. However, an explicit communication of evaluation criteria and design quality definitions would lay the foundation for a more informed discourse on the evaluation conducted by senior designers and teachers towards junior designers and design students.

As generally accepted evaluation criteria for architecture and industrial design do not exist, and as design evaluation is a value latent enterprise, it can be argued that within the context of design education could, or maybe should, students design proposals be evaluated on the basis of the students' definition of design evaluation criteria and design quality. Equally can it on the bases be argued that architectural and industrial design schools could, or maybe should develop and publish definitions of evaluation criteria and design quality. These published definitions of evaluation criteria and design quality should lay the foundation for evaluation of students'design work, rather than the individual evaluation criteria of a given design teacher or external examiner.

6.4.1.3 Building codes, zoning regulations and guidelines' link to values

> *"The laws of God require us to love our neighbour; but the laws of man only require that we do him no injury" (Collins, 1971: 163)*

The art of building, like any other human activity, tends to be subject to various statutory requirements and legal restrictions as well as recommendations *(Collins, 1971: 154)*. Thus, architecture and to some degree industrial design tend to be covered by building codes, zoning regulations and design guidelines. These codes, regulations and guidelines affect and influence what architects and industrial designers are able to design through setting boundaries for what is allowed and what is recommended *(Eisenberg and Yost, 2004: 193)*. This is typically done through codes and regulations like: (1.) general building codes, (2.) electrical codes, (3.) fire prevention and life safety codes, (4.) housing and dwelling codes, (5.) energy codes, (6.) mechanical codes, (7.) plumbing and sewage disposal codes, (8.) handicap accessibility codes and (9.) earthquakes and/or hurricanes codes *(Yatt, 1998: 38 - 40)*.

The main objective of these regulations and recommendations is to ensure the protection of individuals and to contribute to the general welfare of people, as well as hold design practitioners accountable for their work *(Eisenberg and Yost, 2004: 194)*. Codes have traditionally derived their authority from the societal expectation that the public must be protected from threats imposed by buildings and products, and have historically been "developed as a reaction to disasters and building failures" *(Eisenberg and Yost, 2004: 196)*.

The roots of building code can be traced back to as early as 1750 B.C, where the first example was part of the general Babylonian king Hammurabi's[248] Code of Laws covering a wide range of public and private matters *(Ching and Winkel, 2003: 1 f), (Eisenberg and Yost, 2004: 194)*.[249] Within this ancient law is the article 229 until 235 covering design issues.[250] For instance is article number 229 stating:

> "If a builder build a house for someone, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death." *(Ching and Winkel, 2003: 2)*

With this type of building code i.e. "performance" code in place, is it reasonably to assume that it had an impact on the quality of construction and that it had an effect in ensuring proper construction. However, a building code like this might not have been equally successful in promoting innovation etc.

Initially building codes focused "on the protection of people in and around buildings and secondarily on protection of property" *(Eisenberg and Yost, 2004: 196)*. From these early initial codes and up until today, there has been many intermediate steps. This includes the city of London's code[251] at 1189, and the Siena building laws from 1262 which provided regulations for houses *(Zucker, 1970: 87)*. Later the building codes in Siena were strengthened in 1309 and "even forbade the erection of any new buildings in the city unless previous planning permission had been received" *(Hook, 1979: 27)*, this in order to "prevent those who build from trespassing on public streets or any of the rights of the commune" *(Waley, 1969: 99)*. This building code also specified that "that brick should be used in all new houses to be built in Siena" *(Hook, 1979: 78)*. Further more, in the fourteenth century was the total population of Siena "asked to shape their windows in accordance with those of the Palazzo Pubblico[[252] (town hall)]" *(Zucker, 1970: 87)*. In these subsequent developments of building codes a number of issues have been a catalyst, which includes "fires that destroyed significant portions of major cities in the United States and Europe" *(Yatt, 1998: 37)*. America's first building code came into existence in 1875 as an aftermath of Chicago's devastating fire in 1871. Thus the prohibition of wood chimneys and thatch roofs which can be found in the early days of the Colonial period of the United States, become part of building codes *(Yatt, 1998: 37), (Ching and Winkel, 2003: 2), (Eisenberg and Yost, 2004: 195)*. During the last century the focus within design codes have "become ever more detailed and has expanded into nearly every aspect of buildings and their components and systems" *(Eisenberg and Yost, 2004: 196)*. An example of this trend can be found in the San Francisco's "Downtown Plan" of 1984 "which codified critical reaction against flat-topped 'Manhattan' type high-rise buildings" *(Attoe, 1993: 526)*. High-rise designs which is covered by this plan has to emulate high-rise types which have taper or sculptural top *(Attoe, 1993: 526)*.

Building codes, zoning regulations and design guidelines vary from country to country, and within different times. The general trend has been to develop more comprehensive and complex regulatory mechanisms compared to what existed previously *(Eisenberg and Yost, 2004: 193)*. A particular new development is to create building codes which are "based on stating what must be accomplished, rather than describing in detail what must be done and how to do it" *(Eisenberg and Yost, 2004: 195)*. This type of code has been implemented in several countries including the USA *(Eisenberg and Yost, 2004: 195)*.

The creation of building codes, zoning regulations and design guidelines is essentially a type of framing,[253] which is imposed on all design projects that are covered by given building codes or zoning regulations. Similarly to general design framing, design codes and design guidelines are based on a number of considerations and decisions, as well as a value base i.e. a particular design value set. For instance, the regulation of how tall buildings can be made tends to regulated by building codes *(Greenstreet, 1996)*[254]. However, even when bearing in mind fire regulations etc. which are of importance in high-rise buildings, have the argument against high-rise buildings often been focusing on its detrimental effect on society *(Greenstreet, 1996)*[255]. Thus, for or against high-rise buildings has tended to be linked to values related to societal development *(Greenstreet, 1996)*[256]. Equally, the shift in emphasis on environmental issues has started to be addressed through design codes, shows that values in society is often to some extent reflected in building codes. Similarly, the emergence of health values among some architects and the subsequent inclusion of health issues in building codes and zoning regulations, indicates the link between design values and the shaping of codes and regulations within architecture. An example of this can be found the introduction of the Public Health Act passed in 1847 in the UK *(Benevolo, 1971: 49)*, previously introduced in chapter four.[257] To this day, health, safety, and welfare have been the main considerations which "underpin the legal basis for zoning, and zoning remains a powerful instrument for determining land use patterns by American municipalities" *(Frank et al., 2003: 21)*.

However, building codes can also hamper the implementation of some design values. This can be illustrated by the challenges that are often faced by those following ecological design principles. Some design codes will in practice forbid many innovative design practices and materials within the domain of sustainability. This point can be illustrated the following:

> "graywater systems (collecting sink or shower water for reuse in toilets or irrigation) and alternative building materials such

> as straw bale or rammed earth have been prohibited by codes in many locations until recently. Codes also often set minimum room sizes and require unnecessarily expensive construction materials and practices. Meanwhile, zoning regulations frequently require large amounts of parking, large lot sizes, substantial building setbacks from lot lines, and low building heights." *(Eisenberg and Yost, 2004: 193)*

All of the above quoted requirements constrain what ecological architects can do. Thus, they impose a particular, and one could argue unsustainable framework, for a given building.[258] The same absence of environmental values in certain building codes can be indicated by the lack of focus that many design codes have had with regards to issues such as: "impacts that occur away from the actual building site, impacts that are cumulative or difficult to measure" *(Eisenberg and Yost, 2004: 196)*. This includes issues such as: climate impacts, health effects of indoor air quality, and toxicity of materials etc. *(Eisenberg and Yost, 2004: 196)*.

Not only do the codes themselves set boundaries for what architects and industrial designers can design. Local building officials typically have the authority, granted by provisions in local and national codes, "to approve alternative designs, materials, and methods of construction as long as they are deemed adequate to meet the intent of the building code" *(Eisenberg and Yost, 2004: 196)*. For instance, judicial control over the appearance of buildings in England was "delegated to local planning authorities by the Town and Country Planning General Development Order in 1950" *(Collins, 1971: 75)*. Thus, according to this act, these authorities have:

> "power to order the alteration of any design or external appearance which would injure the amenity of the neighbourhood; a power limited only by the proviso that the design must be (a) reasonably capable of modifications so as to conform with such amenity, or (b) of such a character that it ought to be, and could reasonably be, constructed elsewhere on the same plot of land." *(Collins, 1971: 75)*

This distinction makes the value set which the local building official's adheres to important with regards to what the individual designers can propose in a local context. There is often an extensive allowance for local interpretation in building codes, as most codes have provisions for dealing with building practices, materials, and systems which are not specifically addressed within the code it self *(Eisenberg and Yost, 2004: 196)*. And because local building officials i.e. civil servants tend not to be in "agreement as to exactly what the ideal 'public policy' (in the sense of an environmental 'common weal') really is" *(Collins, 1971: 75)*, are local implementation of building codes and zoning regulations dependent upon the value sets adhered to by the local civil servant. Thus, the evaluations of building proposals put forward by architects tend to reflect local ideas of design quality and what is interpreted into building codes.

In very much the same way that frames are sometimes reframed within a design project,[259] building codes, zoning regulations and design guidelines are also changed and amended over time. Supplements of existing codes are typically published annually and then consolidated into a new edition of the code at a given interval (for example every three years) *(Eisenberg and Yost, 2004: 196)*. However, the changing of design codes has not been without controversy, as demonstrated in the above-mentioned resistance to environmental issues. For instance, it has been argued that building "energy-efficiency is not a safety issue and therefore has no place in the building codes" *(Eisenberg and Yost, 2004: 196)*.

Building codes and design guidelines tend to reflect the current climate i.e. common value set and/or the value set of the individuals creating the specific code or guideline. Similarly to the design frames concept, there is very little factual base for many of the requirements and recommendations found in design codes and guidelines. Contrarily, they are mainly based on the design values introduced in the previous chapters.

6.5 SUMMARY

This chapter purports that most individuals are actually "non-rational" beings. In other words, people do not make everyday decisions in accordance with the laws of probability or through the use of rational models. Professional decision making often implies the skilful application of technical knowledge, suggesting that these professions require highly specialised knowledge and competencies. However, this is not true in the design world; there is a general lack of a "factual base" and/or an empirical foundation within both architecture and industrial design that often impedes the facilitation of design decisions. This deficiency has traditionally occurred due to a lack of empirical research in the design fields. Furthermore, thus far no speciality knowledge has ever developed on the basis of potential sub-disciplines within architecture and industrial design, as no sub-disciplines have emerged. In addition, the two design professions distinguish themselves from other professions by their lack of a generally accepted agreement on what the basis for decision-making in design should be. This lack of “factual” and empirical information and/or professional “code”, makes architects and industrial designers more dependent on individual values and value sets in decision-making than other professionals.

Architecture and industrial design are characterised by allowing and being based on “personal knowledge” bases rather than a generally agreed upon professional knowledge base. This makes conflicts within the two design professions generally resistant to refutation by an appeal to “evidence”, as there is no shared paradigm to settle conflicts. Thus, there exists a “constant” state of revolution and abnormal circumstances within the two design professions, because there is no established paradigm of how to resolve disagreements. As a result, the discourse within architecture and industrial design is notoriously repetitive and tends to be some what dominated by evangelists, fundamentalists and gurus. The “revolutionary” and “abnormal” circumstances at play behind the scenes of the design professions, make designers more dependent on values and value sets than other professionals (and academic filed) that can use “evidence” as a base for their decisions and knowledge development.

This chapter argues that architecture and industrial design are to some extent political enterprises; decision making in design has much in common with decision making in politics. Political decisions are generally not closely associated with factual based reasoning, rationality, utility or even probability based reasoning. Contrarily, these types of political decisions tend to be value based and immune to resolution by consideration of the facts. However, as the political link illustrates, value based decision making does not imply the removal of value conflicts related to decision making. Thus, both politicians and designers will at times seek alternative reasoning and justification for the decisions that they make. In summary, decisions are based on value sets, but other elements might tip the scale as to which value will be dominant in a given decision.

This chapter also examines the tendency of design projects to have a considerable amount of different factors at play, a situation that makes them rather complex and unique. Within this complexity, there are two main interwoven problem categories of possible problems, which are in turn linked to overall problems and sub-problems. Sub-problems are more often able to be settled with factually based decision making, whereas conflicts in aspects of “overall” design tend to be stubbornly resistant to resolution through factually based reasoning. Neither architects nor industrial designers have traditionally focused their attention on the differentiation between these two types of problems. Thus, architects and industrial designers alike attempt to solve both overall and sub-problems using the same decision making strategy. This often leads the designer to propose poor solutions to sub-problems.

Architects and industrial designers must consider a vast number of often conflicting aspects within the overall design problems. Thus, designers must prioritize and make compromises between different aspects of the design project. Architects and industrial designers receive crucial input from their value sets when attempting to strike a balance between requirements and other issues in a design project, even if there is no consensus on what the "right" balance should be within the two design professions. In summary, architecture and industrial design are (1.) the result of a number of compromises between different requirements and issues, (2.) principally practised in accordance with individual design methods and individual design value sets and (3.) exhibit "no" shared design paradigm and/or theory which is generally accepted within the field. Aside from these aforementioned commonalities, all architects and designers draw from their own unique set of experiences and influences. Thus, a "rational" design decision from one individual designer's perspective might be completely irrational from the perspective of another designer.

This chapter illustrates that framing is a key concept and cognitive device used in general decision making. Frames are used to: (1.) make sense of complex information, (2.) interpret the world, (3.) represent that world to others and (4.) organize complex phenomena into coherent and understandable categories. Thus, framing is already a natural part of everyday decision making. Frames impose a particular strategy and/or point of view in order to reduce the complexity of a given situation, and at the same time disregard a number of options; they are subjective rather than plural and/or objective. Therefore, decision makers often disagree on a given framing when they do not share the same underlying value set.

Framing is particularly useful in situations when factual information is difficult to ascertain or simply does not exist. Frames are not created from a neutral position; they are based on an individual's values, even if the framer is unaware of this tendency. Frames allow the framer to influence most decisions that are conducted within a frame. Thus, contentions between different frames tend to reflect differences in value sets among the individuals or institutions that create the frame.

Disputes over framing are not usually resolved by appealing to "facts"; what one party regards as devastating to a frame the opposing party may dismiss as irrelevant or innocuous. Similarly, a problem can be framed in many ways, which implies that individuals and/or teams might propose a number of different frames for a given a problem. Thus individuals or teams may be faced with the task of choosing among different frames, forcing them to utilize implicit or explicit frame selection criteria. Because there is little or no factual information that can be used to select frames, framing criteria can be considered value based.

This chapter also discusses the fact that a moderately complex building or product requires architects and/or industrial designers to make numerous implicit and explicit decisions. Because of potential conflicts that exist between the irreconcilable desirable ends in a design projects, an architect or industrial designer will be forced to decide which aspects of the project are: (1.) of most importance, (2.) of less importance, (3.) able to be accommodated indirectly and (4.) likely to be rejected etc. Thus, when the preconditions for a design project are set, an architect and/or industrial designer employs one of two main strategies to tackle the design process. The second strategy is the more common of the two.

The first strategy consists of comparing relative benefits of possible design decisions i.e. utility-based strategy. However, utility-based decision procedures are difficult to apply in architecture and industrial design. Therefore, this strategy is not commonly used. The second strategy employed to solve design problems is to impose a frame in the form of an idea(s), metaphor(s), concept(s) and/or framework onto the design task. This type of framing has the effect of reducing the complexity by limiting possible trade-offs, as it excludes a number of possibilities that are outside of the imposed frame.

Framing in design tends to take place in three interwoven stages. Stage one: the initial frame that a designer develops or brings along to the concept phase, sets the boundary and guides the subsequent design process i.e. the subsequent decision-making. Stage two: is the procedural design process where architects and industrial designers develop design proposals within the initial frame. During this phase, a number of potential solutions will be rejected. However, suggestions emerging from these rejected proposals will contribute to the designer “finding” the appropriate path towards a desired design outcome. This stage is evaluated based on how well the design problem-solving process achieves the desired design outcome, and if it complies with the existing frame. The goals for the final design outcome might change due to new or emerging intentions based on discoveries in the design process. Similarly, other stakeholders may play a part in the evaluation and formation of goals. Dependent on the “success” i.e. progress of the problem-solving process will architect and/or industrial designers reframe the initial frame. Stage three reframing implies that an architect or industrial designer will redefine the initial frame to allow for solutions which previously fell outside of the boundaries of the initial frame. A reframing serves to narrow down the scope of the initial frame by excluding extraneous solutions and refocusing the design efforts on a smaller set of possibilities. This type of reframing occurs in the midst of the problem-solving process and is often referred to as a spiral or iterative design process. This means that stage two is repeated within the new framing.

The initial frame tends to be developed at an early stage of a design project. Therefore, it is based on the value sets of the designer, whereas later reframing is based on both the value set as well as on the "discoveries" revealed in the design process. However, the value set tends to be the dominant factor. Even when reframing occurs, a number of elements tend to be kept constant between the new and the old frame, these elements tend to be linked to the individual designer's value. Thus, what is considered the most appropriate frame in a design project depends on the value set of the framer. Furthermore, because values set differ, conflicts over frames and reframing are not uncommon within the world of architecture and industrial design.

If a design project is not successfully framed architects and industrial designers may experience: (1.) analysis inhibition, (2.) wicked problem inhibition, (3.) value inhibition and/or (4.) holistic inhibition. This occurs because framing tends to affect: (1.) the choice of design process selected for a given design project, (2.) the parties which the designers choose to involve in the design development, (3.) the focus and the issues which are developed throughout the design process and (4.) the final design outcome.

This chapter also examines the role of values in decision making within frames. Most psychologists today accept the compelling assumption that value sets—defined as ideas and beliefs—cause most decisions to be made. This connection is often ignored by design scholars, who instead often focus on the role of intuition, experience and tacit knowledge as a base for design decisions. Some scholars have even attempted to link design decisions to utility approaches. However, this chapter demonstrates that utility-based reasoning is particularly challenging within the design context. This is due to the sheer range and number of design decisions which make listing and a subsequent utility analysis difficult. Likewise, the trade-offs and envisioned elements of design decision making do not lend themselves to the utility approach; it is difficult to establish an interval or ratio scale to address the matter in a coherent fashion. Finally, aesthetic considerations make it difficult to employ a utility approach, as it is difficult to assess and evaluate them on a factual basis. However, in this chapter has it been noted that utility-based approaches are often applicable strategies to approach design sub-problems. Thus, many of the above reservations about utility-based analysis and decision-making are not relevant to design sub-problems.

Instead of utilizing a utility approach, architects and industrial designers rely on their own value sets to prioritise between conflicting variables and issues within a given design project. They also depend on value sets when evaluating which design process "accidents" should ultimately be incorporated in the design outcome. In addition, values sets form the bases for architects or designers' selection of an appropriate alternative solution for a given design project. Thus, the differences in value sets held by individual architects and industrial designers account, in part, for the differences that exist between their individual design proposals.

In summary, having examined and clarified throughout this chapter: (1.) the inappropriateness of utility based decision making for "overall" design problems, (2.) having exposed the lack of factual information available to assist designers and (3.) having uncovered that architects and industrial designers have few rational based tools and an accepted knowledge foundation to facilitate fact-based design decision making, it is concluded that it is likely that architecture and industrial design decisions are primarily value based. Consequently, this chapter demonstrates that most design decisions are based on the architect and/or industrial designer's individual value sets.

This chapter also highlights that evaluations within architecture and industrial design have commonalities with the art world; neither relies heavily on factual or scientific foundations for evaluations. In addition, design evaluators do not usually specify the particular standard that they are evaluating against. This has led to an acceptance of individualistic, and some would argue liberal, evaluation within the fields of architecture and industrial design. However, this individualistic evaluation criteria tend not to be generally accepted within the two design professions. Currently, there is no consensus on what constitutes design quality or appropriate design evaluation criteria. This is, in part, a reflection of the classical dilemma between aesthetics and functionality, a dilemma that has remained largely unresolved. Other predicaments in design evaluation include issues such as: (1.) flexibility versus maintenance, (2.) energy-efficiency versus health, (3.) contextual awareness versus originality and (4.) aesthetics versus commercial success.

Evaluation within architecture and industrial design is often related to specific aspects of the aesthetic qualities. Thus, a design evaluation depends on the evaluator's aesthetic values. Similarly, a design evaluation may also be dependent on other design values that an evaluator is adhering to, such as social design values, environmental values, traditional values and gender values. Thus, design evaluation is a subjective activity, and the differences that exist between a designer's value systems tend to account for their differences in evaluations of alternative design proposals. In summary, architects and industrial designers favour design proposals and/or implemented design solutions that reflect their own value sets and subsequently reject designs proposals and/or solutions that do not.

This subjectivity plays out in design offices and design schools; both arenas are characterised by their lack of explicit criteria for evaluations and overall design quality. Students and employees are therefore forced to navigate between different design evaluation criteria and definitions of design quality. This plurality can be a confusing experience and often affects the relationship between senior designers i.e. design teachers and junior designers i.e. design students. Thus, conflicts between "teachers" and "students" are often about conflicts over the values. A more explicit definition of evaluation criteria and design quality would lay the foundation for a more informed discourse on evaluation of design projects within these two arenas.

Elements of design evaluation can be found in building codes, zoning regulations and design guidelines. The creation of building codes etc. is essentially a type of framing, which is imposed on all design projects that are covered by given building codes. Building codes etc. are based on a number of technical considerations and a value base, as there is very little factual information behind many of the requirements and recommendations found in design codes. Instead, building codes etc. usually reflect the value sets of the individuals or organisation that is charged with creating them. Thus, building codes etc. can be said to be mainly based on the design values introduced in the previous chapters.

It is important to note that it is not only the codes themselves that set boundaries for what architects and industrial designers can design. Local building officials typically have evaluation authority granted by provisions in local and national codes. And because building officials don't usually agree on the ideal "public policy" will the design values that they adhere to be of particular importance in their design evaluations. Thus, a building official's value set influences what the architects (and to a lesser degree industrial designers) can propose in a local context.

7 Conclusions and reflections

> *“Life is the art of drawing sufficient conclusions from insufficient premises.“ — Samuel Butler (Butler, 1968: 3)*
>
> *“Nothing is worth doing unless the consequences may be serious.” — George Bernard Shaw (Shaw, 1914b: 57)*

The previous chapters have demonstrated that values play a central role in architecture and industrial design. It has been argued that a number of design values have contributed to a situation where both architecture and industrial design are to a large extent distinct from other professions. This occurs, in part because the two design professions do not have a clear “territory” of competency from which to claim professional competence, exclusive of other adjacent professions. Furthermore, this text has presented and discussed the presumption that a number of design values have contributed to the classification of architecture and industrial design as “weak” or “minor” professions.

At times, certain design values also contribute to “difficult” relationships between designers and their clients. From a value perspective, there exists a gap between clients’ needs and the service provided by either architects or industrial designers. Some will even argue that this gap is widening as many clients are becoming more informed and professional with regards to acquisition of design services. A number of design values have been proposed as one of the main contributing factors to these developments.

This thesis points out a number of design values in both the external and internal realms of architecture and industrial design. These design values contribute to the specificities and characteristics that make the two professions what they are. Furthermore, it has been argued that some of these values influence how designers cooperate with other “team” members as well as how they solve design problems. Values are also one of the main substitutes for a comprehensive knowledge base within architecture and industrial design, and values affect how that knowledge base that do exist in the two design professions is developed.

Additionally, individual designers have a number of professionally based values which are more or less "common" among designers; designers also have "distinctive individual" design values. These "distinctive individual" design values are thought to be one of the primary explanatory models as to why architects and industrial designers often conduct design differently, recommend different design proposals and conduct various design evaluations, even when starting from similar circumstances and preconditions.

Finally, as illustrated in this thesis, design values are one of the main contributing factors to design decisions. More specifically, architects and industrial designers use design values as a determining factor in making main and subsequent design decisions, as well as in design evaluation.

In summary, it has been demonstrated throughout this work that values play a central role in architecture and industrial design, though current design education is not accommodating this phenomenon. Similarly, design scholars have not given design values a central role in their work.

These indications and assertions have a number of implications. For instance, if one accepts this value perspective for architecture and industrial design, it follows that design is to some extent linked to the political domain. From this perspective one could argue that architecture and industrial design are more closely linked to politics than to a general concept of profession. Similarly, if one accepts that the two professions are mostly value based, as opposed to knowledge based, questions are raised as to the two professions' claim of specialised competency. Based on the same accepted belief, questions can be raised as to the two design professions' legitimacy to propose solutions that are objected to by large segments of a democratic society. These questions have their ground in that there tends to be a lack of "factual" information to settle discrepancies between conflicting values sets.

Having described the value aspects found in the two design professions, it should not be forgotten that the two professions are distinctive in their focus on the aesthetic aspects of buildings and products. Thus, this thesis does not attempt to proclaim that the two professions are in any way obsolete or redundant. On the contrary, there is without a doubt a need for this type of profession, with its' value foundation. Moreover, it is not necessarily problematic that both architecture and industrial design are to a large extent value based. However, it has been suggested that the two professions might benefit from a more explicit awareness and reflective relationship to their value base.

The intent of this thesis has been to present the sheer number of design values and to discern how they influence architecture and industrial design at different levels and stages in the design process. Thus, this thesis does not contribute to design research by indicating each design value, but rather by attempting to describe the “totality” of values as well as their place in and impact on architecture and industrial design. This “totality” can be summarised in the claim that design values are the most important factor in the two design professions and that other aspects play a secondary role. It is this first attempt, to the best of my knowledge, at identifying and describing the “totality” which make this research able to say something insightful about the reality that it is attempting to describe. Thus, as indicated in chapter one, it is not necessarily whether research is of empirical nature that is easily testable, but more whether the research is able to say something insightful about the reality which it is attempting to describe, which should be the evaluation criteria for this type of research.

Throughout this work values have been designated in both architecture and industrial design, illustrating that the main value foundations in these two professions are very similar. As argued in chapter one, both professions are in the midst of the design profession spectrum. This makes it natural to speculate as to whether many of the adjacent design professions have adopted the value foundation that is common in architecture and industrial design. This thesis does not in any way answer these questions: however, as architecture is often seen as the mother of all design professions, is it natural to wonder if many of the values indicated in this thesis also apply to other design professions.

Within this thesis, it has been illustrated that the value foundation embedded in architecture and industrial design has implications for how they function and conduct themselves in cross-professional teams. It has also been asserted that architecture and industrial design are more value dependent than other professions, suggesting that values plays a particularly important role in these two professions. It is indicated in this thesis that designers have values that are at times opposed by other members of cross-professional teams. Thus, it is plausible to argue that cross-professional teams would benefit from value awareness and value based conflict management when architects and/or industrial designers are involved.

It is important to note that this work has only attempted to introduce the above mentioned issues. The thesis is based on numerous studies and discourse including empirical based studies, normative work, practising architects and industrial designers’ assertions etc. Thus, this work can rightly be criticised on the grounds that several generalised claims are substantiated only by single references or by a “weak” foundation. Many of the claims and assertions presented in this work would have benefited from a more extensive substantiation. The main reason for this lack of substantiation occurs because design research is often untested i.e. validated by repeated studies. Similarly, the alloted time frame has made it impossible to review all available research that could have substantiated all the different claims and assertions made throughout this work. Thus, as for medical research, there should be repeat as well as adjacent studies of this thesis, which investigate its' claims and assertions as well as conclusions. Equally, the authority of this work would be improved by an in-depth study of most of the avenues introduced in this thesis. Thus, the "totality" of this work and more or less all sections can be viewed as a starting point for further research and in particular more in-depth studies.

Out of all the aspects in the thesis, chapter five would particularly benefit from further research, as it has been left at a "patch stage" without a complete overview or high level of detail on the distinctive design values presented. Thus, the issues indicated in this chapter would benefit from further research in order to create a more complete overview and bring the values presented to a higher level of detail. Some of the existing values encompass the potential for being split into several values as they at their current stage are covering what could be argued to substantiate several separate issues i.e. values.

8 Appendix

8.1 ETHICS IN DESIGN

> *“Architecture is grounded in human intention and purpose. It is, therefore, subject, as are other human affairs, to judgment with respect to its intentions: who and what purposes are served by those intentions, and how well those intentions are met. These are not only practical or utilitarian judgments, but also ethical ones.” (Wasserman et al., 2000: 1)*

This thesis examines the values present in the architectural and industrial design professions—some of these values are closely related to design ethics. Though this intimate link between certain design values and design ethics is acknowledged here, it is outside the scope of this thesis and thus, is not explored on a deeper level. The following section provides a very brief explanation of the relationship between ethics and design values as well as an indication of some of the general ethical aspects found in design.

Architects and industrial designers tend to be concerned with the future state of the built environment and its ability to suit human purposes. This concern causes them to consider issues such as *What ought to be made?, How should we make it?* and in *In which place should it be made? (Wasserman et al., 2000: 32)*. Proposing what buildings and products “ought to be” has the potential to contribute to explicitly framing a way of life, a way of experiencing life and a way of improving life. Thus, it can be asserted that both architecture and industrial design are to some degree inherently ethical activities *(Wasserman et al., 2000: 32, 34)*. This point is illustrated by the following assertion:

> “Architecture’s creative and constructive processes, the built environment that results from them, and architectural reflection are all intrinsically ethical, whether or not the architectural method and presentation explicitly utilize ethical discourse.” *(Wasserman et al., 2000: 35)*

This line of thought indicates that from an ethical standpoint the question is not whether design has ethical dimensions *(Wasserman et al., 2000: 46)*, but rather which ethics should be the basis for a given design project. The moral implications of a design project are not difficult to identify, and some are perhaps even obvious, “given the road map of the existing applied and pure ethics literature” *(Fisher, 2000: 179)* found within the two design domains. The problem is not in identifying the ethical aspects, but how to best cope with and resolve the ethical dimensions of design which are yet unresolved by design theorists *(Spector, 2001: 60)*.

The lack of agreement on how to cope with and resolve the ethical dimensions within architecture and industrial design can be exemplified by the aesthetic verses ethics discourse found within these two domains. A number of scholars have been occupied with this and similar ethical dimensions. This includes Karsten Harries who argues against aesthetics as the foundation for architecture’s ethical function. Similarly, David Watkin has written extensively on the discourse of aesthetics versus ethics. Watkin points out the weaknesses that exist in the writings of many nineteenth and twentieth-century architects, as these design scholars and art historians have attached fixed truth and moral qualities to architecture of different aesthetic styles and forms. Scholars like Lucien Krukowski and David Bell have also concerned themselves with these and similar issues.

The ethics versus aesthetics discourse is found both among design scholars and practising designers, even if it is seldom as explicit in the latter. Many designers have an implicit relationship to the ethical discourse; they often show their support for a particular aesthetic solution by making implicit and explicit references to an ethical argumentation. A possible explanatory model for this behaviour is that aesthetic qualities are often considered to be of a subjective nature. Thus, to avoid criticism many architects and industrial designers fail to utilize a strictly aesthetic argumentation to justify the aesthetic appearance of a given project *(Thompson, 2000b: 39)*.

It is common—in both a contemporary and historical context—for some prominent designers to link a particular style of aesthetics to an ethical argumentation. However, these positions are always difficult to maintain, as a diversity of aesthetic styles have always been represented by other leading designers. The challenge in establishing a common ground on the issues of aesthetic and its link to ethics is illustrated by Saul Fisher’s assertion in his article “How to think about the ethics of architecture”, when he argues:

> “It is harder to spell out the relevant competing claims and supporting arguments with proper attention to architectural

concerns, because there is no literature in analytic ethics that addresses issues in architecture.” *(Fisher, 2000: 179)*

However, the ethical challenges facing architects and industrial designers go beyond the ethical versus aesthetic discourse. Historically, different design ideologies have proposed different ethical approach to design. In addition legal frameworks in some countries impose certain ethical considerations onto the two design professions.[1] In addition the different design professions developed their own ethical code of conduct which regulate a number of issues, and, to some extent limit design even more than the legal legislation requires *(Wasserman et al., 2000: 167 - 177)*. A number of issues relating to these aforementioned categories can be found in most ethical codes of conduct, as pointed out in the following two tables:

Societal		
General Practice	**Contractual**	**Preliminary Design**
Social Responsibility/ Public Policy Issues	Contract	Process Issues
Community Involvement	Negotiations	Involving Community Interaction
	Client Education	Who's the Client?
	Client Understanding	Political Issues
	Decision Making	
Contract Documents/ Bidding	**Administration/ Construction**	**Follow-Up/ Post Occupancy**
Approvals	Public Interest	Findings/Issues
Code Issues	Life Safety	
Specifications		

Table 1 *(Wasserman et al., 2000: 167)*

Professional		
General Practice	**Contractual**	**Preliminary Design**
Personal Responsibilities as a Professional	Contract	Architectural Programming
Job Seeking/Marketing	Negotiations	Codes and Regulations
Advertising	Liability	Design Issues
	Work Scope/Process	Budget Issues
	Client	Management Issues
	Responsibilities/Rights	
Contract Documents/ Bidding	**Administration/ Construction**	**Follow-Up/ Post Occupancy**
Approvals	Observation/Inspection	Performance Issues
Clear Definition of Required Product or Service	Administration/ Change Orders	Representation Issues
Bid Issues		Reporting Issues
Proprietary Issues		Mitigation Issues
Document Review		

Table 2 *(Wasserman et al., 2000: 167)*

Even if most design projects inherently involve many of the afore mentioned ethical issues, these issues are often downplayed by architects and industrial designers alike. This attitude can be attributed to the fact that many architects and industrial designers consider themselves to be artists, not public servants.[2] Also, there is a general perception that considering the architect or industrial designer as necessarily ethical, will result in undesirable constraints being imposed on the design process and design outcome *(Spector, 2001: 30)*. This general downplaying of the ethical dimension in architecture and industrial design has an obvious downside from a professional point of view, as ethical responsibility and conduct is one of the main characteristics of any respected profession.[3]

Thus, the differences between the ethical constraints within the framework of a profession and those that exist in society in general, can create an inner conflict among professionals.[4] These conflicts may arise because some of the justifying considerations that professionals appeal to, are part of the general morality found in a society; at the same time, these considerations may be somewhat than the justifying considerations found in a given profession *(Williams, 1995: 195)*. Inner conflict may influence a professional to attempt to reduce the potential discrepancies between ethical constraint found in a profession compared to that found in the general society *(Spector, 2001: 8)*.[5] The degree of uneasiness or strength of inner conflict an architect or industrial designer experiences is dependent on the potential discrepancy between the ethical professional considerations and the ethical considerations held by the general society. It is also dependent on architects' and industrial designers' values towards society in general. For instance, if the architect or industrial designer is not concerned with the evaluation and acceptance of the general public[6], this will play less of a role in their decision making process, compared to for instance an architect and/or industrial designer that values public participation in the design process.[7]

8.2 COMPANY SIZE IN DESIGN

Research conducted in the early nineties indicated that about half of the 25,000 architectural firms operating in the US were a one-person establishment *(Cuff, 1991: 155)*. The other half (which had more than one employee) consisted of firms where 50 percent had fewer than five employees, and fewer than 10 percent had more than 20 employees. Only 250 out of the 25,000 US based architecture firms employed more than 50 persons *(Cuff, 1991: 155)*. Similar studies have indicated that the situation in United Kingdom was similar in virtually the same time period: there were 32,000 registered architects operating in beginning of the 1990s *(Jackson, 1992: 4)*. The number of private architectural firms in the UK was about 6,500 in 1991, where 70% of these firms had 1 to 5 employees; 15% employed 6 to 10; and 15% employed 11 or more *(Jackson, 1992: 4)*. It is worth nothing that the structure of employment in architecture firms in the UK has been reasonably stable over a number of decades *(Symes et al., 1995: 92)*. Studies that are more recent[8] show that architectural practices in the US did not change much during the 1990s with regards to employees etc. This as architectural practices at the end of the 1990s was dominated by sole proprietorships which made up 33% of all firms; another 26% was “made up of two - to four-person firms, half of which have only one licensed architect” *(Cuff, 2000: 353)*. This was still the case at the end of the 1990’s: fewer than 20% of firms employed more than ten people, and only 3% had more than fifty employees *(Cuff, 2000: 353)*.

There exists a similar company structure in contemporary industrial design in the United Kingdom, which “has been heralded as the strongest in the world in terms of numbers of companies” *(Bruce and Morris, 1998a: 263).* According to studies, there are about 76,000 employees working in the UK design consultancy industry.[9] The UK industrial design profession consists of about 4000 design consultancy firms. Out of which 73 percent of these design consultancy firms employ 20 or fewer staff, and about a third of the 4000 design consultancies have five or fewer employees.

As these studies indicate, small firms employing only a few architects or industrial designers dominate both architecture and industrial design, it is the norm. This do not deny the existence of bigger architectural and industrial firms, which can be considered “an American invention dating from the late nineteenth century” *(Larson, 1993: 7)*. Big international firms in both architectural and industrial design are predominantly based in the US.[10]

Bibliographical References

ABBOTT, A. (1988) *The system of professions: an essay on the division of expert labor.* Chicago, University of Chicago Press.

ABEL, C. (1997) *Architecture and identity: towards a global eco-culture.* Oxford, Arhitectural Press.

ADAMS, H. (1918) *The education of Henry Adams: an autobiography.* Boston, Hougton Mifflin company.

ADAMS, R. (2004) Regional Planning. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

AGREST, D. I., CONWAY, P. & WEISMAN, L. K. (1996) *The Sex of architecture.* New York, Abrams.

AKIN, Ö. & AKIN, C. (1996) Frames of reference in architectural design: analysing the hyperacclamation (A-h-a-!). *Design studies,* 17**,** p. 341 - 361.

ALDERSEY-WILLIAMS, H. (2003) *Zoomorphic: new animal architecture.* London, Laurence King Publ.

ALEXANDER, C. (1979) *The timeless way of building.* New York, Oxford University Press.

ALEXANDER, C., ISHIKAWA, S. & SILVERSTEIN, M. (1977) *A pattern language towns, buildings, construction.* New York, Oxford University Press.

ALVESSON, M. & SKÖLDBERG, K. (2000) *Reflexive methodology: new vistas for qualitative research.* London, Sage publications.

AMUNDSON, J. A. & MILLER, C. C. (2004) Classicism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

ARISTOTLE, BARKER, E. & STALLEY, R. F. (1998) *Politics.* New York, Oxford University Press.

ATTFIELD, J. (1989) Form/female follows function/male: Feminist critiques of design. In WALKER, J. A. & ATTFIELD, J. (Eds.) *Design history and the history of design.* London, Pluto.

ATTOE, W. (1993) The role of the critic. In FARMER, B. & LOUW, H. (Eds.) *Companion to contemporary architectural thought.* London, Routledge.

BACON, F. (1969) *The elements of the common lawes of England.* Amsterdam, Da Capo Press.

BAINBRIDGE, D. A., STEEN, A. S. & STEEN, B. (1994) *The straw bale house.* White River Junction, Vt., Chelsea Green Publ. Co.
BAKER-LAPORTE, P., ELLIOTT, E. & BANTA, J. (2001) *Prescriptions for a healthy house: a practical guide for architects, builders, and homeowners.* Santa Fe, InWord Press.
BALL-ROKEACH, S., ROKEACH, M. & GRUBE, J. W. (1984) *The great american values test: influencing behavior and belief through television.* New York; London, Free Press; Collier Macmillan.
BANHAM, R. (Ed.) (1974) *The aspen papers: twenty years of design theory from the International design conference in aspen,* London, Pall Mall.
BANHAM, R. (1990) A black box; the secret profession of architecture. *New statesman & society***,** p. 22 - 25.
BANNISTER, T. C. (1954) *The architect at mid-century: report.* New York, Reinhold.
BARROWS, H. S. & TAMBLYN, R. M. (1980) *Problem-based learning: an approach to medical education.* New York, Springer.
BARTLETT, F. C. (1932) *Remembering: a study in experimental and social psychology.* Cambridge, Cambridge University Press.
BARTLEY, W. W. (1990) *Unfathomed knowledge, unmeasured wealth: on universities and the wealth of nations.* La Salle, Ill., Open Court.
BARTON, H., TSOUROU, C. & WORLD HEALTH ORGANIZATION. REGIONAL OFFICE FOR, E. (2000) *Healthy urban planning: a WHO guide to planning for people.* London, Published on behalf of the World Health Organization Regional.
BAYAZIT, N. (2004) Investigating design: a review of forty years of design research. *Design Issues,* 20**,** p. 16 - 29.
BAZJANAC, V. (1974) Architectural design theory: models of the design process. In SPILLERS, W. R. (Ed.) *Basic questions of design theory.* Amsterdam, North-Holland.
BEATLEY, T. & WHEELER, S. M. (2004) *The sustainable urban development reader.* London, Routledge.
BECKER, G. S. (1976) *The economic approach to human behavior.* Chicago, University of Chicago Press.
BECKER, H. S. (1982) *Art worlds.* Berkeley, University of California Press.
BECKMAN, S. (1990) Professionalization: borderline authority and autonomy in work. In BURRAGE, M. & TORSTENDAHL, R. (Eds.) *Professions in theory and history: rethinking the study of the professions.* London, Sage.
BELLAH, R. N. (1985) *Habits of the heart: individualism and commitment in American life.* Berkeley, Calif., University of California Press.
BENEVOLO, L. (1971) *History of modern architecture.* London, Routledge & Kegan Paul.
BERTONI, F. (2002) *Minimalist architecture.* Basel, Birkhäuser.
BERTONI, F. (2004) *Minimalist design.* Basel, Birkhäuser.

BEVERIDGE, W. I. B. (1950) *The art of scientific investigation.* Melbourne, William Heinemann.

BILLIG, M. (1996) *Arguing and thinking: a rhetorical approach to social psychology.* Cambridge, Cambridge University Press.

BIRKELAND, J. (2002) *Design for sustainability: a sourcebook of integrated eco-logical solutions.* London, Earthscan.

BLAKE, P. (1964) *God's own junkyard: the planned deterioration of America's landscape.* New York, Holt, Rinehart and Winston.

BLANKENSHIP, R. L. (1977) *Colleagues in organization: the social construction of professional work.* London ,.

BLAU, J. R. (1984) *Architects and firms: a sociological perspective on architectural practice.* Cambridge, Mass., MIT Press.

BONTA, J. (1980) Notes for a theory of meaning in design. In BUNT, R., JENCKS, C. & BROADBENT, G. (Eds.) *Signs, symbols and architecture.* Chichester, Wiley.

BOYER, E. L. (1990) *Scholarship reconsidered: priorities of the professoriate: a special report.* Princeton, N.J., Carnegie Foundation.

BOYER, E. L. & MITGANG, L. D. (1996) *Building community: a new future for architecture education and practice: a special report.* Princeton, N.J., Carnegie Foundation for the Advancement of Teaching.

BOYER, E. L. W., G. H. VON (19901971) *Scholarship reconsidered: priorities of the professoriate: a special reportExplanation and understanding.* Princeton, N.J.London, Carnegie Foundation-Routledge.

BOYLE, B. M. (2004) Brutalism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

BREASTED, J. H. (1928) The new crusade. *The American historical review,* 34**,** p. 215 - 236.

BRIGGS, M. S. (1974) *The architect in history.* New York ,.

BROADBENT, G. (1980) The deep structures of architecture. In BUNT, R., JENCKS, C. & BROADBENT, G. (Eds.) *Signs, symbols and architecture.* Chichester, Wiley.

BROLIN, B. C. (2000) *Architectural ornament: banishment and return.* New York, Norton.

BRONSKI, M. B. & GABBY, B. A. (1999) A comparison of principles in several architectural conservation standards. In SICKELS-TAVES, L. B. (Ed.) *The Use of and need for preservation standards in architectural conservation.* West Conshohocken, Pa., ASTM.

BROOKS, H. (1967) Dilemmas of engineering education. *IEEE spectrum***,** p. 89.

BROWN, G. & GELERNTER, M. (1998) Education: veering from practice. *Progressive architecture.* Cleveland, Ohio, Reinhold.

BRUCE, M. & MORRIS, B. (1998a) A comparative study of design professionals. In BRUCE, M. & JEVNAKER, B. H. (Eds.)

Management of design alliances sustaining competitive advantage. Chichester, Wiley.

BRUCE, M. & MORRIS, B. (1998b) In-house, outsourced or a mixed approach to design. In BRUCE, M. & JEVNAKER, B. H. (Eds.) *Management of design alliances sustaining competitive advantage.* Chichester, Wiley.

BRUMFIELD, W. C. (2004) Constructivism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

BUCCIARELLI, L. L. (1994) *Designing engineers.* Cambridge, Mass., MIT Press.

BUCHANAN, R. (1995a) Branzi's dilemma: design in contemporary culture. In VIHMA, S. & TAHKOKALLIO, P. (Eds.) *Design - pleasure or responsibility?: selected and edited articles from the International Conference on Design at the University of Art and Design Helsinki UIAH 21-23 June 1994.* Helsinki, University of Art and Design Helsinki UIAH.

BUCHANAN, R. (1995b) Wicked problems in design thinking. In MARGOLIN, V. & BUCHANAN, R. (Eds.) *The Idea of design.* Cambridge, Mass., MIT Press.

BUECHLER, S. M. (2000) *Social movements in advanced capitalism: the political economy and cultural construction of social activism.* New York, Oxford University Press.

BUENAÑO, G. (1999) The becoming of problems in design: knowledge in action to frame wicked problems. *Department of Architecture.* Berkley, University of California, Berkeley.

BURCHARD, J. & BUSH-BROWN, A. (1961) *The architecture of America: a social and cultural history.* Boston, Little, Brown and Comp.

BÜRDEK, B. E. (2005) *Design: history, theory and practice of product design.* Basel, Birkhäuser.

BUTLER, S. (1968) *The note-books of Samuel Butler.* New York, AMS Press.

CANNON, C. (2001) *Does moral education increase moral development?: A reexamination of the moral reasoning abilities of working adult learners.* [S.l.], Nova Southeastern University.

CATHÁIN, C. Ó. (2003) Designer denial - the dark side of architectural practice. In AOKI, H. (Ed.) *Journal of the Asian Design International Conference.* University of Tsukuba, Institute of Art and Design, University of Tsukuba.

CHANG, R. (1997) *Incommensurability, incomparability, and practical reason.* Cambridge, Mass., Harvard University Press.

CHING, F. D. K. & WINKEL, S. R. (2003) *Building codes illustrated: a guide to understanding the 2000 International building code.* Hoboken, N.J., Wiley.

CHIPPERFIELD, D. (1997) *David Chipperfield: obra reciente*. Barcelona, Gustavo Gili.

CHRISTIAANS, H. H. C. M. & DORST, K. (1993) Cognitive models in industrial design engineering: a protocol study. In TAYLOR, D. L. & STAUER, D. A. (Eds.) *Design Theory and Methodology - DTM92 4th International Conference on Design Theory and Methodology. Held: Scottsdale, AZ, USA, Sept. 13-16, 1992.* New York, American Society of Mechanical Engineers.

CHURCHILL, W. S. & JAMES, R. R. (1974) *Winston S. Churchill: his complete speeches, 1897-1963.* New York, Chelsea House Publishers.

COBB, H. N. (1992) Ethics and architecture. In HAMILTON, A. (Ed.) *The Harvard architecture review 8.* New York, Rizzoli.

COLLINS, P. (1965) *Changing ideals in modern architecture: 1750-1950.* London, Faber and Faber.

COLLINS, P. (1971) *Architectural judgement.* London, Faber & Faber.

COLQUHOUN, I. (2004) *Design out crime: creating safe and sustainable communities.* Amsterdam, Elsevier.

COLVIN, H. (1999) *Essays in english architectural history.* New Haven, Conn., Yale University Press.

CONRADS, U. (1970) *Programs and manifestoes on 20th-century architecture.* Cambridge, Mass., MIT Press.

COOK, J. W. & KLOTZ, H. (1973) *Conversations with architects: Philip Johnson, Kevin Roche, Paul Rudolph, Bertrand Goldberg, Morris Lapidus, Louis Kahn, Charles Moore, Robert Venturi & Denise Scott Brown.* London, Lund Humphries.

COOLEY, M. (1988) From Brunelleschi to CAD-CAM. In THACKARA, J. (Ed.) *Design after modernism: beyond the object.* London, Thames and Hudson.

COOPER, R. (2003) Research Insights. *The Design journal: an international refereed journal for all aspects of design*, 6**,** p. 1 - 2.

CORMIER, L. H. (2004a) International Style. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

CORMIER, L. H. (2004b) Urban Planning. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

COWAN, R. S. (1985) How the refrigerator got its hum. *The Social shaping of technology how the refrigerator got its hum.* Milton Keynes, Open University Press.

CRAIG, D. L. (2001) Stalking homo faber: a comparison of research strategies for studying design behavior. In EASTMAN, C. M., NEWSTETTER, W. C. & MCCRACKEN, W. M. (Eds.) *Design knowing and learning: cognition in design education.* Amsterdam, Elsevier.

CRAIG, R. M. (2004) Art deco. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

CROSS, N. (1997) Creativity in design: analyzing and modeling the creative leap. *LEONARDO,* 30**,** p. 311 - 317.

CROSS, N. (1999) Natural intelligence in design. *Design studies*, 20**,** p. 25 - 39.

CROSS, N. (2000) *Engineering design methods: strategies for product design.* Chichester, Wiley.

CROSS, N. (2001a) Design Cognition: Results From Protocol And Other Empirical Studies Of Design Activity. In EASTMAN, C. M., NEWSTETTER, W. C. & MCCRACKEN, W. M. (Eds.) *Design knowing and learning: cognition in design education.* Amsterdam, Elsevier.

CROSS, N. (2001b) Designerly ways of knowing: design discipline versus design science. *Design issues: history, theory, criticism,* 17**,** p. 49 - 55.

CROSS, N. (2004) Expertise in design: an overview. *Design Studies,* 25**,** p. 427 - 441.

CROSS, N., CHRISTIAANS, H. H. C. M. & DORST, K. (1994) Design expertise amongst student designers. *Journal of art & design education elektronisk ressurs,* 13**,** p. 39 - 56.

CROSS, N. & CROSS, A. C. (1998) Expertise in engineering design. *Research in engineering design: theory, applications, and concurrent engineering,* 10**,** p. 141 - 149.

CRUICKSHANK, D. (2000) *Architecture: the critics' choice: 150 masterpieces of western architecture.* London, Aurum.

CRYSLER, C. G. (2003) *Writing spaces: discourses of architecture, urbanism and the built environment, 1960-2000.* New York, Routledge.

CSIKSZENTMIHALYI, M. (1996) *Creativity: flow and the psychology of discovery and invention.* New York, HarperCollins.

CUFF, D. (1991) *Architecture: the story of practice.* Cambridge, Mass., MIT Press.

CUFF, D. (2000) Epilogue. In KOSTOF, S. (Ed.) *The Architect: chapters in the history of the profession.* Berkeley, Calif., University of California Press.

DARKE, J. (1978) The primary generator and the design process. In ROGERS, W. E. & ITTELSON, W. H. (Eds.) *New directions in environmental design research edra9 (environmental design research association).* Tucson, Arizona, Printed at the University of Arizona, April 1978.

DARKE, J. (1979) The primary generator and the design process. *Design studies,* 1**,** p. 36 - 44.

DAVEY, C. L., COOPER, R., PRESS, M., WOOTTON, A. B. & OLSON, E. (2002) Design against crime design: leadership in the development

of emotional values. *Design Management Institute.* Boston, www.designagainstcrime.org.
DAVIES-COOPER, R. & JONES, T. (1995) The interfaces between design and other key functions in product development. In BRUCE, M. & BIEMANS, W. G. (Eds.) *Product development: meeting the challenge of the design-marketing interface.* Chichester, Wiley.
DAVIS, R. D. & BRAUN, E. M. (1997) *The gift of dyslexia: why some of the brightest people can't read and how they can learn.* London, Souvenir.
DAY, C. (1990) *Places of the soul: architecture and environmental design as a healing art.* Wellingborough, Aquarian Press.
DESCARTES, R. & SPINOZA, B. D. (1952) *Rules for the direction of the mind; discourse on the method; meditations on first philosophy; objections against the meditations and replies; the geometry.*
DIAMONSTEIN, B. (1980) *American architecture now: [interviews] with I. M. Pei ...* New York, Rizolli.
DODSON, M. & PALMER, J. (1996) *Design and aesthetics: a reader.* London, Routledge.
DORST, K. (1997) *Describing design: a comparison of paradigms.* Rotterdam, Vormgeving Rotterdam.
DRAPER, J. (1977) The ecole des beaux-arts and the architectural profession in the united states: the case of john galen howard. In KOSTOF, S. (Ed.) *The Architect: chapters in the history of the profession.* New York, Oxford University Press.
DUFFY, F. & HUTTON, L. (1998) *Architectural knowledge: the idea of a profession.* London, E & FN Spon.
DUNEGAN, K. J. (1993) Framing, cognitive modes, and image theory: toward an understanding of a glass half full. *Journal of applied psychology,* 78**,** p. 491 - 503.
DWECK, C. S. (2002) Beliefs that make smart people dumb. In STERNBERG, R. J. (Ed.) *Why smart people can be so stupid.* New Haven, Yale University Press.
EASTON, D. (1996) *The rammed earth house.* White River Junction, Vt., Chelsea Green.
EBERHARD, J. P. (1970) We ought to know the difference. In MOORE, G. T. (Ed.) *Emerging methods in environmental design and planning: proceedings of The 1. Design Methods Group International Conference, Cambridge, Mass., 1968.* Cambridge, Mass., MIT Press.
EBRARY INC. (2001) Learning from our buildings: a state-of-the-practice summary of post-occupancy evaluation. Washington, D.C., National Academy Press.
EDGERTON, R. B. (2000) Traditional beliefs and practices are some better than others? In HARRISON, L. E. & HUNTINGTON, S. P. (Eds.)

Culture matters: how values shape human progress. New York, Basic Books.
EDITORS, T. (2001) Theory and practice. *arq: Architectural research quarterly (Cambridge University Press via SwetsWise),* 5**,** p. 291.
EDWARDS, B. (2001) Design challenge of sustainability. In CASTLE, H. (Ed.) *Green architecture.* London, Wiley-Academy.
EDWARDS, E. H. (1999) *The architect in the building process: pragmatic reflection, concrete experience.* Stockholm, Royal Institute of Technology School of Architecture Surveying and Civil Engineeting.
EISENBERG, D. & YOST, P. (2004) Sustainability and building codes. In BEATLEY, T. & WHEELER, S. M. (Eds.) *The Sustainable urban development reader.* London, Routledge.
ELIZABETH, L. & ADAMS, C. (2000) *Alternative construction: contemporary natural building methods.* New York, Wiley.
ELLIOTT, M., GRAY, B. & LEWICKI, R. J. (2003) Lessons learned about the framing and refraining of Intractable environmental conflicts. In LEWICKI, R. J., GRAY, B. & ELLIOTT, M. (Eds.) *Making sense of intractable environmental conflicts: frames and cases.* Washington, DC, Island Press.
FEDDERS, K. (2004) Archigram. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.
FESTINGER, L. (1962) *A theory of cognitive dissonance.* Stanford, Calif., Stanford University Press.
FIELL, C. F., PETER (2001) *Designing the 21st century = design des 21. jahrhunderts = le design du 21e siècle.* Köln, Taschen.
FINE, G. A. & DEEGAN, J. G. (1996) Three principles of Serendip: insight, chance, and discovery in qualitative research. *International journal of qualitative studies in education,* 9**,** p. 434 - 447.
FISHER, S. (2000) How to think about the ethics of architecture. In FOX, W. (Ed.) *Ethics and the built environment.* London, Routledge.
FLORES, C. A. H. (2004) Symbolism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.
FLYVBJERG, B. (2004) Five misunderstandings about case-study research. In SEALE, C., GOBO, G., GUBRIUM, J. F. & SILVERMAN, D. (Eds.) *Qualitative research practice.* London, Sage.
FOGARTY, M. P., ALLEN, I., WALTERS, P. & POLICY STUDIES INSTITUTE (1981) *Women in top jobs 1968-1979.* London, Heinemann.
FRANK, L. D., ENGELKE, P. O. & SCHMID, T. L. (2003) *Health and community design: the impact of the built environment on physical activity.* Washington, DC, Island Press.
FRANKLIN, B. & BIGELOW, J. (1904) *The works of Benjamin Franklin: including the private as well as the official and scientific correspondence: together with the unmutilated and correct version of the autobiography.* New York, Putnam's sons.

FRASER, P. (2004) The Holyrood Inquiry. *Scottish Parliamentary Corporate Body*. Edinburgh.

FRAYLING, C. (1993) Research in art and design. *Royal College of Art Research Papers,* 1**,** p. 1 - 5.

FRAYLING, C. (2001) Research in art and design. *Lecture given at the National College of Art and Design in Oslo.* Oslo.

FREIDSON, E. (1971) *The professions and their prospects.* Beverly Hills, Calif.

FRIEDMANN, A., ZIMRING, C. & ZUBE, E. H. (1978) *Environmental design evaluation.* New York, Academic Press.

FRY, S. (1993) *Paperweight.* London, Mandarin, 1993.

FUTAGAWA, Y. (1993) American center: interview with frank o. gehry. *GA architect,* 10**,** p. 172 - 178.

GALE, D. E. (2004) City beautiful movement. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

GEDENRYD, H. (1998) *How designers work.* Lund, Lund University.

GELERNTER, M. (1995) *Sources of architectural form: a critical history of Western design theory.* Manchester, Manchester University Press.

GELERNTER, M. & DUBRUCQ, V. (2004) Regionalism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

GEMSER, G. & LEENDERS, M. A. A. M. (2001) How integrating industrial design in the product development process impacts on company performance. *The Journal of product innovation management,* 18**,** p. 28 - 38.

GEMSER, G. & WIJNBERG, N. (2002) The economic significance of industrial design awards: A conceptual framework. *Design Management Journal Academic Review,* 2**,** p. 61 - 71.

GEMSER, G. & WIJNBERG, N. M. (2000) Adding Value to Innovation: Impressionism and the Transformation of the Selection System in Visual Arts. *Organization science,* 11**,** p. 323-329.

GERO, J. S. (1994) Computational models of creative design processes. In DARTNALL, T. (Ed.) *Artificial intelligence and creativity: an interdisciplinary approach.* Dordrecht, Kluwer Academic.

GIBBERD, V. (1997) *Architecture source book.* London, Grange Books.

GIBBONS, M. (1994) *The New production of knowledge: the dynamics of science and research in contemporary societies.* London, Sage.

GIEDION, S. (1971) *Architecture and the phenomena of transition: the three space conceptions in architecture.* Cambridge, Mass., Harvard Univ. Press.

GILBERT, M. (1991) *Churchill: a life.* New York, Holt.

GILES, J. (2005) Internet encyclopaedias go head to head. *Nature: international weekly journal of science,* 438**,** p. 900 - 901.

GLANCEY, J. (2003) *C 20th architecture: the structures that shaped the twentieth century.* London, Carlton Books.

GLAZER, N. (1974) The schools of the minor professions. *Minerva,* 12**,** p. 346 - 364.

GLAZER, N. (2000) Disaggregating culture. In HARRISON, L. E. & HUNTINGTON, S. P. (Eds.) *Culture matters: how values shape human progress.* New York, Basic Books.

GLEICHER, P. & FRIED, M. (1967) Some sources of residential dissatisfaction in an urban slum. In BELLUSH, J. & HAUSKNECHT, M. (Eds.) *Urban renewal: people, politics, and planning.* 1st ed. Garden City, N.Y., Anchor Books.

GOFFMAN, E. (1974) *Frame analysis: an essay on the organization of experience.* Cambridge, Mass., Harvard University Press.

GOLDSCHMIDT, G. (1994) On visual design thinking: the vis kids of architecture. *Design studies,* 15**,** p. 158 - 174.

GONOS, G. (1997) "Situation" versus "frame": the "interactionist" and the "structualist" analyses of everyday life. *American sociological review: official journal of the American Sociological Association,* 42**,** p. 854 - 867.

GORMAN, C. (2003) *The industrial design reader.* New York, Allworth Press [with the] Design Management Institute.

GRANT, D. P. (1979) Design methodology and design methods. *Design Methods Group - Design Research Society journal: design research and methods,* 13**,** p. 46-47.

GRAY, B. (1997) Framing and reframing of Intractable environmental disputes. In LEWICKI, R. J., BIES, R. J. & SHEPPARD, B. H. (Eds.) *Research on negotiation in organizations.* Greenwich, Conn, JAI Press.

GRAY, B. (2003) Framing of environmental disputes. In LEWICKI, R. J., GRAY, B. & ELLIOTT, M. (Eds.) *Making sense of intractable environmental conflicts: frames and cases.* Washington, DC, Island Press.

GREENSTREET, R. C. (1996) Impact of building codes and legislation on the development of tall buildings. *Architronic,* 5.

GROAT, L. & WANG, D. (2002) *Architectural research methods.* New York, Wiley.

GUZOWSKI, M. (2000) *Daylighting for sustainable design.* New York, McGraw-Hill.

HAECKEL, E., BREIDBACH, O. & EIBL-EIBESFELDT, I. (1998) *Art forms in nature: the prints of ernst haeckel; one hundred color plates with contributions by olaf breidbach and irenäus eibl-eibesfeldt and a preface by richard hartmann.* Munich; New York, Prestel.

HARRIES, K. (1997) *The ethical function of architecture.* Cambridge, Mass., MIT Press.

HARRISON, L. E. (2000) Promoting progressive cultural change. In HARRISON, L. E. & HUNTINGTON, S. P. (Eds.) *Culture matters: how values shape human progress.* New York, Basic Books.
HARRISON, L. E. & HUNTINGTON, S. P. (2000) *Culture matters: how values shape human progress.* New York, Basic Books.
HASKELL, T. L. (1984) *The Authority of experts: studies in history and theory.* Bloomington, Indiana University Press.
HASLAM, M. (2000) *Retro style: the 50s look for today's home.* London, Cassell.
HASTIE, R. & DAWES, R. M. (2001) *Rational choice in an uncertain world: the psychology of judgement and decision making.* Thousand Oaks, Calif., Sage Publications.
HATCH, C. R. (1984) *The scope of social architecture.* New York, Van Nostrand Reinhold.
HAYDEN, D. (1984) *Redesigning the american dream: the future of housing, work, and family life.* New York, W. W. Norton.
HEUFLER, G. (2004) *Design basics: from ideas to products.* Sulgen, Niggli.
HEYER, P. (1966) *Architects on architecture: new directions in america.* New York, Walker and Company.
HEYLIGHEN, A. (2000) In case of architectural design: critique and praise of case-based design in architecture. *Architecture.* Leuven, Katholieke Universiteit Leuven.
HEYNEN, H. (2004a) Avant-garde. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.
HEYNEN, H. (2004b) Postmodernism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.
HODGE, B. & ARMI, E. C. (2002) *Retrofuturism: the car designs of j mays.* Universe.
HOOK, J. (1979) *Siena: a city and its history.* London, Hamish Hamilton.
HUGHES, E. C. (1959) The study of occupations. In BROOM, L., MERTON, R. K. & COTTRELL, L. S. (Eds.) *Sociology today: problems and prospects.* New York, Basic.
HUGHES, R. (1991) *The shock of the new art and the century of change.* London, Thames and Hudson.
HUME, D. (1965) *Of the standard of taste: and other essays.* Indianapolis, The Bobbs-Merrill Company.
HURSTON, Z. N. (1984) *Dust tracks on a road: an autobiography.* Urbana and Chicago, University og Illinoies press.
INGLEHART, R., BASANEZ, M. & MENÉNDEZ MORENO, A. (1998) *Human values and beliefs: a cross-cultural sourcebook: political, religious, sexual, and economic norms in 43 societies: findings from the 1990-1993 World values survey.* Ann Arbor, Mich., University of Michigan Press.
JACKSON, J. A. (1970) *Professions and professionalization.* Cambridge, Cambridge University Press.

JACKSON, L. (Ed.) (1992) *Strategic study of the profession: phase 1: strategic overview,* London, Royal Institute of British Architects.

JACKSON, L. (Ed.) (1993) *Strategic study of the profession: phase 2 - clients and architects*, Royal Institute of British Architects.

JACOBS, J. (1961) *The death and life of great American cities.* New York, Random House.

JAMES, W. (1981) *The principles of psychology*. Cambridge, Mass., Harvard University Press.

JANSON, U. (1998) *Vägen till verket: studier i arkitekt jan gezelius arbetsprocess.* Göteborg, Chalmers.

JENCKS, C. (1968) Adhocism on the south bank. *The Architectural review,* 143**,** p. 27 - 30.

JENCKS, C. (1987) *Post-modernism the new classicism in art and architecture*. London, Academy Editions.

JENCKS, C. (1995) *The architecture of the jumping universe: a polemic: how complexity science is changing architecture and culture.* London, Academy Editions.

JENKINS, F. (1961) *Architect and patron: a survey of professional relations and practice in england from the sixteenth century to the present day.* London, Oxford University Press.

JEVNAKER, B. H. (1998) Building up organizational capabilities in design. In BRUCE, M. & JEVNAKER, B. H. (Eds.) *Management of design alliances sustaining competitive advantage.* Chichester, Wiley.

JEVNAKER, B. H. (2001) Strategic integration of design and innovation: dilemmas of design expertise and its management. *International Journal of New Product Development & Innovation Management,* 3**,** p. 129-151.

JOAS, H. (2000) *The genesis of values.* Chicago, University of Chicago Press.

JOHNSON, D. L. (2004) Rationalism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

JOHNSON, P.-A. (1994) *The theory of architecture: concepts, themes & practices.* New York, Van Nostrand Reinhold.

JOHNSTON, L. (1995) Structure and methodology in architectural education. In LUSCOMBE, D. & KING, S. (Eds.) *Aspects of Quality in Australian Architectural Education.* Sydney, RAIA.

JONES, C. (1961) *Architecture today and tomorrow.* New York, McGraw-Hill.

JOWITT, E. & WALSH, C. (1959) *The dictionary of english law.* London, Sweet & Maxwell.

KAHNEMAN, D. & TVERSKY, A. (1979) Prospect theory: an analysis of decision under risk. *Econometrica: journal of the Econometric Society,* 47**,** p. 263 - 289.

KAHNEMAN, D. & TVERSKY, A. (2000) Conflict resolution a cognitive perspective. In TVERSKY, A. & KAHNEMAN, D. (Eds.) *Choices, values, and frames.* Cambrigde, Cambridge University Press.

KALNER, S. (2004) Adaptwe re-use. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

KAUFMAN, S. & SMITH, J. (1999) Framing and reframing in land use change conflicts. *Journal of Architectural and Planning Research,* 16**,** p. 164 - 180.

KAUFMANN, E. (1955) *Architecture in the age of reason; baroque and postbaroque in england, italy, and france.* Cambridge, Harvard University Press.

KHALILI, N. (1986) *Ceramic houses: how to build your own.* San Francisco, Harper & Row.

KOSNIK, T. J. (1991) Designing and building a corporate reputation? *Design management journal,* 2**,** p. 10 -16.

KRIEGER, P. (2004) Contextualism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

KRIPPENDORFF, K. (1995) Redesigning design: an invitation to a responsible future. In VIHMA, S. & TAHKOKALLIO, P. (Eds.) *Design - pleasure or responsibility?: selected and edited articles from the International Conference on Design at the University of Art and Design Helsinki UIAH 21-23 June 1994.* Helsinki, University of Art and Design Helsinki UIAH.

KRIPPENDORFF, K. (2000) Propositions of human-centeredness: a philosophy for design. In FRIEDMAN, K. & DURLING, D. (Eds.) *Proceedings of the conference Doctoral Education in Design: Foundations for the Future: held 8-12 July 2000, La Clusaz, France.* Stoke-on-Trent, Staffordshire University Press.

KRISTENSEN, T. (1998) The contribution of design to business: a competence-based perspective. In BRUCE, M. & JEVNAKER, B. H. (Eds.) *Management of design alliances sustaining competitive advantage.* Chichester, Wiley.

KROPF, K. & JENCKS, C. (1997) *Theories and manifestoes of contemporary architecture.* Chichester, Academy Editions.

KRUGER, C. & CROSS, N. (2001) Modelling cognitive strategies in creative design. In GERO, S. J. & MAHER, L. M. (Eds.) *Computational and Cognitive Models of Creative Design V.* Sydney, Key Centre of Design Computing and Cognition, University of Sydney.

KVAN, T. & THILAKARATNE, R. (2003) The role of accreditation. *BUILDING THE LINK 2003 - Integrating Teaching with Research and Practice in the Built Environment.* Conference held at Wadham College Oxford, UK, 8-10 September 2003.

LAKOFF, G. & JOHNSON, M. (1999) *Philosophy in the flesh: the embodied mind and its challenge to Western thought.* New York, Basic Books.

LANGER, S. (1966) The social influence of design. In HOLLAND, L. B. (Ed.) *Who designs America?: The American Civilization Conference at Princeton.* New York, Anchor Books.

LARSON, M. S. (1977) *The rise of professionalism: a sociological analysis.* Berkeley, Calif., University of California Press.

LARSON, M. S. (1993) *Behind the postmodern facade: architectural change in late twentieth-century America.* Berkeley, University of California Press.

LAUGIER, M.-A. (1975) *An essay on architecture.* Los Angeles, Hennessey & Ingalls.

LAWSON, B. (1979) Cognitive strategies in architectural design. *Ergonomics,* 22**,** p. 59 - 68.

LAWSON, B. (1994) *Design in mind.* Oxford, Butterworth Architecture.

LAWSON, B. (1997) *How designers think: the design process demystified.* Oxford, Architectural Press.

LAWSON, B. (2002) The subject that won't go away: but perhaps we are ahead of the game. *arq: architectural research quarterly,* 6**,** p. 109-114.

LAWSON, B. R. (1984) Cognitive strategies in architectural design. In CROSS, N. (Ed.) *Developments in design methodology.* Chichester, Wiley.

LE, C. (1929) *The city of to-morrow: and its planning.* New York, Payson & Clarke.

LEFAIVRE, L. & TZONIS, A. (2003) *Critical regionalism: architecture and identity in a globalized world.* Munich, Prestel.

LEONARDO DA, V. & RICHTER, J. P. (1970) *The notebooks of leonardo da vinci.* New York, Dover Publications.

LERA, S. G. (1980) Designers' values and evaluation of designs. *Department of design research.* London, Royal College of Art.

LÉVI-STRAUSS, C. (1994) *The raw and the cooked: introduction to a science of mythology.* London, Pimlico.

LEWIS, R. & MAUDE, A. (1952) *Professional people.* London, Phoenix.

LLOYD, P. & SCOTT, P. (1994) Discovering the design problem. *Design studies,* 15**,** p. 125 - 140.

LOFLAND, J. & LOFLAND, L. H. (1984) *Analyzing social settings: a guide to qualitative observation and analysis.* Belmont, Calif., Wadsworth.

MACINTYRE, A. (1985) *After virtue: a study in moral theory.* London, Duckworth.

MACKINNON, D. W. (1965) Personality and the realization of creative potential. *American psychologist: journal of the American Psychological Association, Inc,* 20**,** p. 273 - 281.

MAPLE, T. L. & FINLAY, T. W. (1987) Post-occupancy evaluation in the zoo. *Applied Animal Behavior Science,* 18**,** p. 5 - 18.

MARCH, J. G. (1972) Model bias in social action. *Review of educational research: a quarterly publication of the American Educational Research Association,* 42**,** p. 413 - 429.

MARGOLIN, V. (1989) *Design discourse: history, theory, criticism.* Chicago, University of Chicago Press.

MARGOLIN, V. (1995) The experience of products. In VIHMA, S. & TAHKOKALLIO, P. (Eds.) *Design - pleasure or responsibility?: selected and edited articles from the International Conference on Design at the University of Art and Design Helsinki UIAH 21-23 June 1994.* Helsinki, University of Art and Design Helsinki UIAH.

MARSH, M. (2002) *Modern retro tabletop: living with mid-century tableware.* London, Ryland Peters & Small.

MARTIN, L. (1958) Conference on Architectural Education. *Journal of the Royal Institute of British Architects***,** p. 279 - 282.

MAXWELL, R. (2004) Abstraction. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

MCCAFFERY, L. (1993) An Interview with David Foster Wallace. *The Review of contemporary fiction,* 13.

MCDONALD, M. K. (2004) Sustainability and sustainable architecture. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

MEEHL, P. E. (1954) *Clinical versus statistical prediction: a theoretical analysis and a review of the evidence.* Minneapolis, University of Minnesota Press.

MEEHL, P. E. (1986) Causes and effects of my disturbing little book. *Journal of personality assessment: [official organ of the Society for Personality Assessment],* 50**,** p. 370 - 375.

MELHUISH, C. (1994) On minimalism in architecture. In TOY, M. (Ed.) *Aspects of minimal architecture.* London, Academy.

MENGES, A., HENSEL, M. & WEINSTOCK, M. (2004) *Emergence: morphogenetic design strategies.* Chichester, Wiley-Academy.

MESTHENE, E. G. (1997) The role of technology in society. In WESTRA, L. & SHRADER-FRECHETTE, K. S. (Eds.) *Technology and values.* Lanham, Md., Rowman & Littlefield Publishers.

MINSKY, M. (1975) A Framework for Representing Knowledge. In WINSTON, P. H. (Ed.) *The psychology of computer vision.* New York, McGraw-Hill.

MITCHAM, C. (1995) Ethics into Design. In BUCHANAN, R. & MARGOLIN, V. (Eds.) *Discovering design: explorations in design studies.* Chicago, University of Chicago Press.

MITCHAM, C. (1997) Engineering design research and social responsibility. In WESTRA, L. & SHRADER-FRECHETTE, K. S. (Eds.) *Technology and values.* Lanham, Md., Rowman & Littlefield Publishers.

MOORE, W. E. (1970) *The professions: roles and rules.* New York, Russell Sage Foundation.

MORGENTHALER, H. (2004) Expressionism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.
MORO, P. (1968) Queen Elizabeth Hall: an appraisal. *Journal of the Royal Institute of British Architects,* 75**,** p. 252 - 255.
MORTON, P. (2004a) Feminist Theory. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.
MORTON, P. (2004b) Primitivism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.
MOSTAEDI, A. (2002) *Sustainable architecture: low tech houses.* Barcelona, Carles Broto i Comerma.
MOSTAEDI, A. (2003) *Sustainable architecture: high tech housing.* Barcelona, Carles Broto i Comerma.
MOYNIHAN, D. P. (1996) *Miles to go: a personal history of social policy.* Cambridge, Mass., Harvard University Press.
MUMFORD, L. (1941) *The south in architecture: the dancy lectures, Alabama college 1941*. New York, Harcourt, Brace & co.
MURRAY, P. (1999) Royal Academy and AD International Forum, Something or Nothing: Minimalism in Art and Architecture 8. In TOY, M. (Ed.) *Aspects of minimal architecture II.* London, Academy Editions.
N.N (1967) Performance Design. *Progressive architecture,* 48**,** p. 104 - 106.
NEALE, M. A. & BAZERMAN, M. H. (1985) The effects of framing and negotiator overconfidence on bargaining behaviors and outcomes. *Academy of Management journal,* 28**,** p. 34 - 49.
NELSON, H. G. & STOLTERMAN, E. (2003) *The design way: intentional change in an unpredictable world: foundations and fundamentals of design competence.* Englewood Cliffs, N.J., Educational Technology Publications.
NESBITT, K. (1996) *Theorizing a new agenda for architecture: an anthology of architectural theory 1965-1995.* New York, Princeton Architectural Press.
NEWMAN, O. (1972) *Defensible space: crime prevention through urban design.* New York, Macmillan.
NGUBANE, B. (2003) Opening Address. In VILJOEN, A. (Ed.) *ICSID AFRICA regional meeting 3 - 5 March 2003.* Cape Town South Africa, Design Institute South Africa, a division of the South African Bureau of Standards.
NISBETT, R. & WILSON, T. (1977) Telling more than we can know: Verbal reports on mental processes. *Psychological review***,** p. 231 - 259.
NOFFSINGER, J. P. (1955) *The influence of the Ecole des Beaux-Arts on the Architects of the United States.* Washington, Catholic University of America Press.
NORBERG-SCHULZ, C. (1965) *Intentions in architecture.* Cambridge, Mass., MIT press.

NORBERG-SCHULZ, C. (1980) *Genius loci: towards a phenomenology of architecture*. London, Academy Editions.

NORMAN, D. A. (1990) *The design of everyday things.* New York, Doubleday/Currency.

O'CONNOR, J. & MCDERMOTT, I. (1997) *The art of systems thinking: essential skills for creativity and problem solving.* London, Thorsons.

ODUM, E. P. (1964) The new ecology. *BioScience*, 14**,** p. 14-16.

OLIVER, P. (2004) Vernacular Architecture. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

ÖZKAN, S. (1997) Architecture to change the world? In SERAGELDIN, I. (Ed.) *The Architecture of empowerment: people, shelter and livable cities.* London, Academy Editions.

PAGELS, H. R. (1988) *The dreams of reason the computer and the rise of sciences of complexity*. New York, Simon and Schuster.

PASCAL, B., FAGUET, É. & BRUNSCHVICG, L. (1914) *Pensées.* Paris ,.

PATTERSON, O. (2000) Taking culture seriously: a framework and an afro-american illustration. In HARRISON, L. E. & HUNTINGTON, S. P. (Eds.) *Culture matters: how values shape human progress.* New York, Basic Books.

PAWSON, J. (1996) *Minimum.* London, Phaidon.

PEARSON, D. (2001) *New organic architecture: the breaking wave.* Berkeley, University of California Press.

PEASE, K. (2001) Cracking crime through design. London, Design Council.

PERELMAN, C. & OLBRECHTS-TYTECA, L. (1969) *The new rhetoric: a treatise on argumentation.* London, University of Notre Dame Press.

PEVSNER, N. (1960) *An outline of European architecture.* Baltimore,, Penguin Books.

PHILLIPS, D. C. (1987) *Philosophy, science, and social inquiry: contemporary methodological controversies in social science and related applied fields of research.* Oxford, Pergamon Press.

PINKLEY, R. L. (1990) Dimensions of conflict frame: disputant Interpretations of conflict. *Journal of applied psychology,* 75**,** p. 117 - 126.

POINCARÉ, H. & LARMOR, J. (1952) *Science and hypothesis.* New York, Dover.

POJMAN, L. P. (1997) What Is moral philosophy? In WESTRA, L. & SHRADER-FRECHETTE, K. S. (Eds.) *Technology and values.* Lanham, Md., Rowman & Littlefield Publishers.

POLANYI, M. (1967) *The tacit dimension.* Garden City, N. Y., Doubleday.

PORTER, D. (2000a) Why do architects wear black? thinking beyond the trap. In TOFT, A. E. (Ed.) *Ethics in architecture: architectural education in the epoch of virtuality.* [Leuven], European Association for Architectural Education.

PORTER, M. E. (2000b) Attitudes, values, beliefs, and the microeconomics of prosperity. In HARRISON, L. E. & HUNTINGTON, S. P. (Eds.) *Culture matters: how values shape human progress.* New York, Basic Books.

POWELL, K. (1999) *Architecture reborn: the conversion and reconstruction of old buildings.* London, Laurence King.

POYNER, B. & WEBB, B. (1991) *Crime free housing.* Oxford, Butterworth-Architecture.

PREECE, R. A. (1994) *Starting research: an introduction to academic research and dissertation writing.* London, Pinter Publishers.

PREISER, W. F. E., WHITE, E. T. & RABINOWITZ, H. Z. (1988) *Post-occupancy evaluation.* New York, Van Nostrand Reinhold.

PRESS, M., COOPER, R. & EROL, R. (2001) Design as a tool for social policy: the case of 'design against crime'. *The Fourth European Academy of Design Conference.* Aveiro Portugal.

PUGIN, A. (1969) *The true principles of pointed or Christian architecture: set forth in two lectures delivered at St. Marie's, Oscott.* Oxford, St. Barnabas P.; distributed by Basil Blackwell.

PUGIN, A. W. N. (1837) Contrasts or, a parallel between the architecture of the fifteenth and nineteenth centuries. *The Gentleman's magazine,* VII**,** p. 283 - 285.

PUTNAM, H. (1978) *Meaning and the moral sciences.* London, Routledge & Kegan Paul.

PUTNAM, H. (2002) *The collapse of the fact/value dichotomy and other essays.* Cambridge, Mass., Harvard University Press.

PYE, D. (1978) *The nature and aesthetics of design.* London, Barrie & Jenkins.

QUATTRONE, G. A. & TVERSKY, A. (2000) Contrasting rational and psychological analyses of political choice. In TVERSKY, A. & KAHNEMAN, D. (Eds.) *Choices, values, and frames.* Cambrigde, Cambridge University Press.

RAND, A. (1994) *The fountainhead.* New York, Plume.

RANSOM, H. H. (1958) *Central intelligence and national security.* Cambridge, Harvard University Press.

REIF, F. & LARKIN, J. H. (1991) Cognition in scientific and everyday domains: comparison and learning Implications. *Journal of research in science teaching,* 28**,** p. 733 - 760.

REMEN, R. N. (1996) In the Service of Life. *Noetic sciences review,* 37**,** p. 24-25.

REMER THEODORE, G. (Ed.) (1965) *Serendipity and the three princes. From the Peregrinaggio of 1557,* Norman, University of Oklahoma Press.

RENDELL, J. (2000) Introduction: 'Gender, Space Architecture'. In BORDEN, I., RENDELL, J. & PENNER, B. (Eds.) *Gender space architecture: an interdisciplinary introduction.* London, Routledge.

REST, J. R. & NARVÁEZ, D. (1994) *Moral development in the professions: psychology and applied ethics.* Hillsdale, N.J., L. Erlbaum.

RICHARDS, J. M., RASTORFER, D. & SERAGELDIN, I. (1985) *Hassan Fathy.* Singapore, Concept Media.

RICHARDSON, J. M. (Ed.) (1982) *Making it happen: A positive guide to the future*, Washington, DC, US Association for Club of Rome.

RITTEL, H. (1976) Evaluating Evaluators. *Accreditation Evaluation Conference of the National Architectural Accrediting Board***,** p. 77 - 91.

RITTEL, H. W. J. & WEBBER, M. M. (1973) Dilemmas in a General Theory of Planning. *Policy Sciences,* 4**,** p. 155 - 169.

ROBBINS, E. (1994) *Why architects draw.* Cambridge, Mass., MIT Press.

ROKEACH, M. (1979) *Understanding human values: individual and societal.* New York, Free Press.

RORTY, R. (1979) *Philosophy and the mirror of nature.* Princeton, Princeton University Press.

ROSA, J. (2003) *Next generation architecture contemporary digital experimentation + the radical avant-garde.* London, Thames & Hudson.

ROSENMAN, M. A. & GERO, J. S. (1993) Creativity in design using a design prototype approach. In GERO, J. S. & MAHER, M. L. (Eds.) *Modeling creativity and knowledge-based creative design.* Hillsdale, N.J., Lawrence Erlbaum associates.

ROSS, M. (1996) *Planning and the heritage: policy and procedures.* London, E & FN Spon.

ROWE, P. G. (1987) *Design thinking.* Cambridge, Mass., MIT Press.

RUBY, I. & RUBY, A. (2003) Essential, Meta-, Trans-. The Chimeras of Minimalist Architecture. In RUBY, I. (Ed.) *Minimal architecture.* Munich, Prestel.

RUDOFSKY, B. (1964) *Architecture without architects: a short introduction to non-pedigree architecture.* New York, Doubleday.

RUSKIN, J. (1925) *The seven lamps of architecture.* London, Allen & Unwin.

RUSKIN, J. & LINKS, J. G. (1960) *The stones of Venice.* London, Collins.

RYLE, G. (1949) *The concept of mind.* London, Hutchinson.

SALAMAN, G. (1974) *Community and occupation: an exploration of work/leisure relationships.* London, Cambridge University Press.

SALLYBANKS, J. & BROWN, R. (1999) Vehicle Crime Reduction: Turning the corner. In HOME OFFICE, L. (Ed.), Policing and Reducing Crime Unit.

SANOFF, H. (2000) *Community participation methods in design and planning.* New York, Wiley.

SCHÖN, D. A. (1983) *The reflective practitioner: how professionals think in action.* New York, Basic Books.

SCHÖN, D. A. (1987) *Educating the reflective practitioner.* San Francisco, Jossey-Bass.
SCHÖN, D. A. & REIN, M. (1994) *Frame reflection: toward the resolution of intractable policy controversies.* N.Y., Basic Books.
SCHÖN, D. A. & WIGGINS, G. (1994) Kinds of seeing and their functions in designing. *Design studies,* 13**,** p. 135 -156.
SCHUMACHER, E. F. (1974) *Small is beautiful a study of economics as if people mattered.* London, ABACUS.
SCRUTON, R. (1979) *The aesthetics of architecture.* London, Methuen.
SCULLY, V. (1962) *Louis I. Kahn.* London, Prentice-Hall Intern.
SEGRE, R. (2004) Favela. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.
SELANDER, S. (1990) Associative strategies in the process of professionalization: professional strategies and cientification of occupations. In BURRAGE, M. & TORSTENDAHL, R. (Eds.) *Professions in theory and history: rethinking the study of the professions.* London, Sage.
SENOSIAIN, J. (2003) *Bio-architecture.* Amsterdam, Architectural Press.
SERAGELDIN, I. (1997) The architecture of empowerment a survey. In SERAGELDIN, I. (Ed.) *The Architecture of empowerment: people, shelter and livable cities.* London, Academy Editions.
SHAFIR, E., SIMONSON, I. & TVERSKY, A. (2000) Reason-Based Choice. In TVERSKY, A. & KAHNEMAN, D. (Eds.) *Choices, values, and frames.* Cambrigde, Cambridge University Press.
SHAW, B. (1903) *Man and superman: a comedy and a philosophy.* London, Constable.
SHAW, B. (1914a) *The doctor's dilemma, and The Dark Lady of the Sonnets.* Leipzig, Bernhard Tauchnitz.
SHAW, B. (1914b) *Misalliance; the dark lady of the sonnets; and fanny's first play; with a treatise on parents and children.* London, Constable and company.
SHAW, R. N. & JACKSON, T. G. (1892) *Architecture a profession or an art: Thirteen Short essays on the qualifications and training of architects.* London, John Murray, Albemarle Street.
SHILS, E. A. & PARSONS, T. (1951) *Toward a general theory of action.* Cambridge, Mass., Harvard University Press.
SHMUELI, D., KAUFMAN, S. & ELLIOTT, M. (2003) Frames, framing and reframing. In BURGESS, H. & BURGESS, G. (Eds.) *Intractable Conflict Knowledge Base Project Conflict Research Consortium University of Colorado* Colorado, Intractable Conflict Knowledge Base Project Conflict Research Consortium University of Colorado
SHRADER-FRECHETTE, K. & WESTRA, L. (1997) Overview: ethical studies about technology. In WESTRA, L. & SHRADER-

FRECHETTE, K. S. (Eds.) *Technology and values.* Lanham, Md., Rowman & Littlefield Publishers.

SIEGRIST, H. (1990) Professionalization as a process: patterns, progression and discontinuity. In BURRAGE, M. & TORSTENDAHL, R. (Eds.) *Professions in theory and history: rethinking the study of the professions.* London, Sage.

SILVESTRIN, C. (1999) Royal Academy and AD International Forum, Something or Nothing: Minimalism in Art and Architecture 8. In TOY, M. (Ed.) *Aspects of minimal architecture II.* London, Academy Editions.

SIM, S. (2001) *Lyotard and the inhuman.* Duxford, Icon.

SIMON, H. A. (1969) *The sciences of the artificial.* Cambridge, Mass. ,, M.I.T.

SIMON, H. A. (1973) The Structure of Ill-structured Problems. *Artificial intelligence: an international journal,* 4**,** p. 181 - 200.

SIMON, H. A. (1977) *Models of discovery: and other topics in the methods of science.* Dordrecht, Reidel.

SIMPSON, W. (1883) *Architecture in the Himalayas.* New York, Susil Gupta.

SMITH, C. D. (2004) Levittown. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

SPARKE, P. (1987) *Design in context.* London, Bloomsbury.

SPARKE, P. (1998) *A Century of design: design pioneers of the 20th century.* London, Mitchell Beazley.

SPECTOR, T. (2001) *The ethical architect: the dilemma of contemporary practice.* New York, Princeton Architectural Press.

STEER, L. M. (2004) Supermodernism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

STERNBERG, R. J. (2002) Smart people are not stupid, but they sure can be foolish. In STERNBERG, R. J. (Ed.) *Why smart people can be so stupid.* New Haven, Yale University Press.

STRASSMANN, P. W. (1998) Third world housing. In VAN VLIET, W. (Ed.) *The Encyclopedia of housing.* Thousand Oaks, Calif, Sage Publications.

STRATTON, M. (2000) Reviving industrial buildings: an overview of conservation and commercial interests. In STRATTON, M. (Ed.) *Industrial buildings: conservation and regeneration.* London, E & FN Spon.

STURGIS, R. (1903) *The appreciation of architecture: how to judge architecture.* New York, The Baker & Taylor Co.

SUSSKIND, L. & OZAWA, C. (1984) The planner as mediator. *Journal of planning education and research,* 4**,** p. 5 -15.

SUTCLIFFE, A. (1981) *Towards the planned city: Germany, Britain the United States and France 1780-1914.* Oxford, Blackwell.

SUTTON, S. B. & OLMSTED, F. L. (1971) *Civilizing American cities: a selection of Frederick Law Olmsted's writings on city landscapes.* Cambridge, Mass., MIT.

SUWA, M., GERO, J. & PURCELL, T. (2000) Unexpected discoveries and S-invention of design requirements: important vehicles for a design process. *Design studies.* Guildford, IPC Science and Technology Press.

SYMES, M., ELEY, J. & SEIDEL, A. D. (1995) *Architects and their practices: a changing profession.* Oxford, Butterworth Architecture.

SZASZ, T. (1974) *The second sin.* London, Routledge & Kegan Paul.

TANNEN, D. (1979) What's in a frame? Surface evidence of underlying expectations. In FREEDLE, R. O. (Ed.) *New directions in discourse processing.* Norwood, Ablex.

TAYLOR , D. E. (2000) The rise of the environmental justice paradigm. Injustice framing and the social construction of environmental discourses. *The American behavioral scientist,* 43**,** p. 508 - 580.

TAYLOR, N. (2000) Ethical arguments about the aesthetics of architecture. In FOX, W. (Ed.) *Ethics and the built environment.* London, Routledge.

THOMAS, J. C. & CARROLL, J. M. (1979) The psychological study of design. *Design studies,* 1**,** p. 5 - 11.

THOMAS, L. (1977) Biomedical science and human health: the long-range prospect. *Daedalus,* 10**,** p. 163 - 171.

THOMPSON, I. H. (2000a) Aesthetic, social and ecological values in landscape architecture: a discourse analysis. *Ethics, place and environment*, 3**,** p. 269-287.

THOMPSON, I. H. (2000b) *Ecology, community and delight: sources of values in landscape architecture.* London, E & FN Spon.

THOREAU, H. D. (2002) *Title wild apples and other natural history essays.* Boston, University of Georgia Press.

TILL, J. (2005) Lost judgement. In HARDER, E. (Ed.) *Writings in architectural education.* Leuven, European Association for Architectural Education.

TILMAN, J. T. (2004) Historicism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

TOMLAN, M. A. (2004) Historic preservation. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

TOULMIN, S. (1958) *The uses of argument.* London, Cambridge University Press.

TOURNIKIOTIS, P. (2004) Neo-Rationlism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

TOY, M. (1999) EDITORIAL. In TOY, M. (Ed.) *Aspects of minimal architecture II.* London, Academy Editions.

TROLLOPE, A. (1883) *An autobiography.* Edinburgh & London, William Blackwood and Sons.

TSUI, E. (1999) *Evolutionary architecture: nature as a basis for design.* New York, Wiley.

TVERSKY, A. (1972) Elimination by aspects: A theory of choice. *Psychological review,* 79**,** p. 281 - 299.

TVERSKY, A. & KAHNEMAN, D. (1981) The framing of decisions and the psychology of choice. *Science,* 211**,** p. 453 - 458.

TVERSKY, A. & KAHNEMAN, D. (2000) Rational choice and the framing of decisions. In TVERSKY, A. & KAHNEMAN, D. (Eds.) *Choices, values, and frames.* Cambrigde, Cambridge University Press.

TVERSKY, A. & THALER, R. (1990) Anomalies: preference reversals. *The Journal of economic perspectives,* 4**,** p. 201 - 211.

ULRICH, K. T. & EPPINGER, S. D. (2003) *Product design and development.* Boston, McGraw-Hill.

ULRICH, W. (2001) Critically systemic discourse, A discursive approach to reflective practice in ISD. *Journal of Information Technology Theory and Application,* Volume 3, No. 3 - 2001.

UNITED NATIONS (1998a) The Universal Declaration of Human Rights: Adopted and proclaimed by the General Assembly of the United Nations on 10 December 1948. In SYMONIDES, J. (Ed.) *International social science journal: Human rights: 50th anniversary of the Universal Declaration.* Oxford, Blackwell for UNESCO.

UNITED NATIONS (1998b) The Universal Declaration of Human Rights: Adopted and proclaimed by the General Assembly of the United Nations on 10 December 1948. In SYMONIDES, J. (Ed.) *International social science journal: Human rights: 50th anniversary of the Universal Declaration.* Oxford, Blackwell for UNESCO.

VASARI, G. (1979) *Lives of the most eminent painters, sculptors, and architects.* New York, Abrams.

VAUGHAN, E. & SEIFERT, M. (1992) Variability in the framing of risk issues. *Journal of social issues,* 48**,** p. 119 - 135.

VILJOEN, A. (2003) A Landmark occasion. In VILJOEN, A. (Ed.) *ICSID AFRICA regional meeting 3 - 5 March 2003.* Cape Town South Africa, Design Institute South Africa, a division of the South African Bureau of Standards.

VIOLLET-LE-DUC, E.-E. (1959) *Discourses on architecture.* New York,, Grove Press.

VITRUVIUS POLLIO, M. (1960) *The ten books on architecture.* New York, Dover.

VON GLASERSFELD, E. (1991) Knowing without metaphysics: aspects of the radical constructivist position. In STEIER, F. (Ed.) *Research and reflexivity.* London, Sage.

VON NEUMANN, J. & MORGENSTERN, O. (1944) *Theory of games and economic behavior*. Princeton, Princeton University Press.

WAGNER, R. K. (2002) Smart people doing dumb things. In STERNBERG, R. J. (Ed.) *Why smart people can be so stupid.* New Haven, Yale University Press.

WAKE, W. K. (2000) *Design paradigms: a sourcebook for creative visualization.* New York, Wiley.

WALEY, D. (1969) *The Italian city-republics.* London, Weidenfeld and Nicolson.

WALKER BRYAN, C. & SINGH, J. (1996) *Allergy problems in buildings.* Dinton, Quay Books.

WALKER, J. A. & ATTFIELD, J. (1989) *Design history and the history of design.* London, Pluto.

WALTERS, D. (2004) New urbanism. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

WASSERMAN, B., PALERMO, G. & SULLIVAN, P. (2000) *Ethics and the practice of architecture.* New York, Wiley.

WATERS, J. K. (2003) *Blobitecture: waveform architecture and digital design.* Gloucester, Mass., Rockport Publishers.

WATKIN, D. (1977) *Morality and architecture: the development of a theme in architectural history and theory from the Gothic revival to the modern movement.* Oxford, Clarendon Press.

WATKIN, D. (2001) *Morality and architecture revisited.* London, John Murray.

WATZLAWICK, P., FISCH, R. & WEAKLAND, J. H. (1974) *Change: principles of problem formation and problem resolution.* New York, Norton.

WEATHERHEAD, A. C. (1941) *The history of collegiate education in architecture in the United States.* Los Angeles, Calif, Columbia university.

WEAVER, M. E. & MATERO, F. G. (1997) *Conserving buildings: guide to techniques and materials.* New York, Wiley.

WEISMAN, L. K. (1992) *Discrimination by design: a feminist critique of the man-made environment.* Urbana, University of Illinois Press.

WEISMAN, L. K. (2000) Prologue: 'women's environmental rights: a manifesto'. In BORDEN, I., RENDELL, J. & PENNER, B. (Eds.) *Gender space architecture: an interdisciplinary introduction.* London, Routledge.

WEKERLE, G. R. & WHITZMAN, C. (1995) *Safe cities: guidelines for planning, design, and management.* New York ; London, Van Nostrand Reinhold.

WELDON, T. D. (1953) *The vocabulary of politics.* London, Penguin Books.

WESTON, A. (2000) *A 21st century ethical toolbox.* New York, Oxford University Press.

WHEELIS, A. (1973) *The moralist.* Baltimore.
WHELTON, M. & BALLARD, G. (2002) Project definition and wicked problems. *Proceedings IGLC-10* p. 375 - 387.
WHITELEY, N. (1993) *Design for society*. London, Reaktion Books.
WHITELEY, N. (1995) Design criticism and ethical consuming. In VIHMA, S. & TAHKOKALLIO, P. (Eds.) *Design - pleasure or responsibility?: selected and edited articles from the International Conference on Design at the University of Art and Design Helsinki UIAH 21-23 June 1994.* Helsinki, University of Art and Design Helsinki Uiah.
WIJNBERG, N. M. (1995) Selection processes and appropriability in art, science and technology. *Journal of cultural economics,* 19**,** p. 221 - 235.
WILL, C. M. (1971) Relativistic gravity in the solar system, II: anisotrophy in the newtonian gravitational constant *The Astrophysical journal,* 169**,** p. 141 - 155.
WILLIAMS, B. (1995) Professional morality and Its dispositions. In WILLIAMS, B. (Ed.) *Making sense of humanity: and other philosophical papers, 1982-1993.* Cambridge, Cambridge University Press.
WILLIAMS, G. (1989) Coming up for air. *Design week***,** p. 16.
WILSON, M. A. (1996) The socialization of architectural preference. *Journal of environmental psychology,* 16**,** p. 33 - 44.
WILTON-ELY, J. (1977) The rise of the professional architect in england. In KOSTOF, S. (Ed.) *The Architect chapters in the history of the profession.* New York, Oxford University Press.
WINES, J. & JODIDIO, P. (2000) *Green architecture.* Köln, Taschen.
WINNER, L. (1997) Technologies as forms of life. In WESTRA, L. & SHRADER-FRECHETTE, K. S. (Eds.) *Technology and values.* Lanham, Md., Rowman & Littlefield Publishers.
WOLFE, T. (1981) *From bauhaus to our house.* London, Picador.
WOLFF, J. (1993) *Aesthetics and the sociology of art.* Basingstoke, Macmillan.
WOOD, E. (1961) *Housing design, a social theory.* New York, Citizens' Housing and Planning Counsel of New York.
WOODHAM, J. M. (1997) *Twentieth century design.* Oxford, Oxford University Press.
WOODHAM, J. M. (2004) *A dictionary of modern design.* Oxford, Oxford University Press.
WORLD, D. F. T. (2002) Design for the World: Annual Report 2002. Barcelona - Spain.
WRIGHT, F. L. (1910) *The Sovereignty of the Individual, In the Cause of Architecture.* Wasmuth Berlin.
WRIGHT, F. L. (1953) *The future of architecture.* New York, Horizon Press.
WRIGHT, F. L. & GUTHEIM, F. (1941) *On architecture: selected writings 1894-1940.* New York, Duell, Sloane and Pearce.

WRIGHT, G. H. V. (1971) *Explanation and understanding.* London, Routledge.

YATT, B. D. (1998) *Cracking the codes: an architect's guide to building regulations.* New York, Wiley.

YUNUS, M. (1997) Foreword. In SERAGELDIN, I. (Ed.) *The Architecture of empowerment: people, shelter and livable cities.* London, Academy Editions.

ZIMRING, C. & CRAIG, D. L. (2001) Defining design between domains: an argument for design research á la carte. In EASTMAN, C. M., NEWSTETTER, W. C. & MCCRACKEN, W. M. (Eds.) *Design knowing and learning: cognition in design education.* Amsterdam, Elsevier.

ZIMRING, C. M. & REIZENSTEIN, J. E. (1981) A Primer on post-occupancy evaluation: uses and techniques of an increasingly valued tool. *Architecture (AIA Journal),* 70**,** p. 52 - 54.

ZIPF, C. W. (2004) Arts and crafts movement. In SENNOTT, R. S. (Ed.) *Encyclopedia of 20th-century architecture.* New York, Fitzroy Dearborn.

ZUCKER, P. (1970) *Town and square: from the Agora to the village green.* Cambridge, Mass., MIT Press.

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Notes

P R E F A C E

[1] “The Right Honourable Sir Winston Leonard Spencer-Churchill, KG, OM, CH, TD, FRS (30 November 1874 – 24 January 1965) was a British statesman, best known as Prime Minister of the United Kingdom during the Second World War. At various times a soldier, journalist, author, and politician, Churchill is generally regarded as one of the most important leaders in British and world history. He won the 1953 Nobel Prize in Literature. In a poll conducted by the BBC in 2002 to identify the "100 Greatest Britons", participants voted Churchill to be history's "greatest" Briton.” Source: www.wikipedia.org 05.01.2006.

[2] Winston Churchill's comment made at Britain’s National Book Exhibition in 1949 while talking about the writing process of his World War II memoirs.

[3] “Pierre-Jules Renard or Jules Renard (February 22, 1864- May 22, 1910) was a French author and member of the Académie Goncourt, most famous for the works Poil de Carotte (Carrot hair) (1894) and Les Histoires Naturelles (Natural Histories) (1896). Among his other works are Le Plaisir de rompre (The Pleasure of Breaking) (1898) and Huit jours à la campagne (Eight Days in the Countryside) (1906).” Source: www.wikipedia.org 01.01.2006.

[4] Values within the context of this thesis have a scope defined as: attitudes, beliefs, orientations, and underlying assumptions. The broad definition of design values which is the cornerstone of this thesis, is sometimes referred to as design culture. A similarly broad definition of general values is referred to as culture outside the design domain. Current academic literature concerned with general values (culture) argues that values “play an unquestioned role in human behavior and progress” *(Porter, 2000b: 14)*. The potential link that exists between values (culture) and human progress has been explored by a large quantity of literature outside the design domain *(Porter, 2000b: 14)*, and this literature is used as a resource and inspiration within the thesis to investigate if there is a similar potential link between design values and design progress. For more deliberation see (1.2.2 Field of study and clarification).

[5] “Sir Karl Raimund Popper (July 28, 1902 – September 17, 1994), was an Austrian-born, British philosopher of science. He is counted among the most influential philosophers of science of the 20th century, and also wrote extensively on social and political philosophy.” Source: www.wikipedia.org 05.06.2005

[6] The encyclopaedias Wikipedia.org has been extensively used to give easy access to details considering names and concepts, which for most readers are well-known facts. However as this thesis covers two professions and encircles a board domain might there occasionally be details that for some readers are not familiar. Instead of trying to assume what all potential readers might know or should know have efforts gone into making details readily available. Thus, have a number of names and concepts been given notes which gives some additional basic information. This is only intend as a help for those who are not familiar with all the details and persons mentioned, and should be disregard by those who knows all the mentioned details.

Notes are only introduced the first time a name or concept is introduced in the thesis. If one for some reasons wants to find details later in the text can the index be used to allocate the first instance that contains the note. It should also be noted that not all names and concepts have notes, as not all names and concepts are covered by Wikipedia.org and other sources used.

The use of Wikipedia.org as a source can be questioned as it is free and public editable encyclopaedias. However, test of Wikipedia.org versus more authorized encyclopaedias such as Britannica shows that Wikipedia.org has more or less the same quality (except for political controversial subjects) *(Giles, 2005: 900 f)*. The advantage of it being free and web based has been instrumental in choosing to use Wikipedia.org compared to other encyclopaedias.

C H A P T E R   O N E

[1] “Margaret Mead (December 16, 1901 – November 15, 1978) was an American cultural anthropologist.” Source: www.wikipedia.org 08.11.2005.

[2] Unable to find the page, but a number of internet pages attribute this book as the score for this quotation.

[3] “Samuel Langhorne Clemens (November 30, 1835 – April 21, 1910), better known by his pen name Mark Twain, was a famous and popular American humorist, novelist, writer and lecturer.” Source: www.wikipedia.org 01.01.2006.

[4] “Claude Lévi-Strauss (born November 28, 1908) is a French anthropologist who became one of the twentieth century's greatest intellectuals by developing structuralism as a method of understanding human society and culture.” Source: www.wikipedia.org 18.07.2005.

[5] “The Central Saint Martins College of Art and Design, (or Central Saint Martins) is one of the leading colleges of art and design in England. It is part of the University of the Arts London which was given university status in 2004.” Source: www.wikipedia.org 18.07.2005.

[6] “Imperial College London is a college of the University of London which focuses on science and technology, and is located in the South Kensington district of London. […] As a specialist science college, Imperial is often seen to enjoy a similar reputation in the United Kingdom as the

Massachusetts Institute of Technology has in the United States." Source: www.wikipedia.org 18.07.2005.

[7] "Telenor is the largest telecommunications operator in Norway. The headquarter is located at Fornebu, close to Oslo. It has operations in over 12 other countries." Source: www.wikipedia.org 18.07.2005.

[8] For instance, anecdotal evidence indicates that there is a trend within western societies of reducing the number of "natural" physical meeting points and simultaneously developing a number of new virtual meeting points. Reflection over the anecdotal evidence, posed some difficult questions such as: do we as a society want to reduce the number of physical meeting points and replace them with virtual meeting points? And, who is making the decisions?

[9] "Henry David Thoreau (July 12, 1817 – May 6, 1862; born David Henry Thoreau) was an American author, naturalist, transcendentalist, pacifist, tax resister and philosopher who is famous for Walden (available at wikisource), on simple living amongst nature, and Civil Disobedience (available at wikisource), on resistance to civil government and among 22 other books that Thoreau published. He was a lifelong abolitionist, delivering lectures that attacked the Fugitive Slave Law while praising the writings of Wendell Phillips and defending the abolitionist John Brown. Among his lasting contributions were his writings on natural history and philosophy, where he anticipated the methods and findings of ecology and environmental history, two sources of modern day environmentalism." Source: www.wikipedia.org 05.02.2006.

[10] "Dr. Thomas Stephen Szasz (born April 15, 1920 in Budapest, Hungary) is Professor Emeritus in Psychiatry at the State University of New York Health Science Center in Syracuse, New York. Szasz is a critic of the moral and scientific foundations of psychiatry." Source: www.wikipedia.org 05.02.2006.

[11] To put in another way, what are the values that designers hold and what are the underlying justifications and assumptions for such values. Ultimately, how do these values influence design decisions?

[12] The spectrum of design professions often includes: architecture (includes urban design), interior design, industrial design (includes interaction design), engineering design, graphic design, and fashion design.

[13] Art historians (design historians) point out that there were exceptions to this rule with some of the early industrial designers being "trained as craftspeople, graphic designers or fine artists" *(Sparke, 1998: 6)*.

[14] For instance, all of the design professions tend to have clients that pay for their work, they all go through a creative process in order to make their design proposal, and they all have a concept phase where most of the important design decisions are taken etc.

[15] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[16] The role of architects towards mass-production has not been straightforward, for example Reyner Banhams criticises the 'out-dated' architectural profession as he in the 1950's sees the industrial designer as much more up-dated, a modern architect.

[17] This is not always a peaceful situation and there are, at times, struggles between the different design professions with regards to the boundaries between the disciplines. An example of this is the occasional skirmishing that exist between the interior design profession and the architecture profession *(Spector, 2001: 29).*

[18] Throughout this thesis a number of key words and concepts are used which vary in meaning, depending in which context and domain they are used. These disparities in meaning tend to generate confusion in everyday life (among the general public) as well as within the design professions. These potential misunderstandings call for clarification of terms such as, design, architecture, architectural profession, industrial design, values and framing which are all central concepts within the thesis.

[19] It can be argued that humans did not stumble over the wheel in a stroke of good luck—they designed it. "The habit of labelling significant human achievements as `discoveries', rather than `designs', discloses a critical bias in our Western tradition." *(Nelson and Stolterman, 2003: 9).*

[20] It should be noted that this does not:

> "suggest that designing was a new activity, rather that it was being separated out from wider productive activity and recognized as a function in its own right. This recognition can be said to constitute a separation of hand and brain, of manual and intellectual work; and the separation of the conceptual part of work from the labour process. Above all, the term indicated that designing was to be separated from doing." *(Cooley, 1988: 197)*

[21] The conventional everyday meaning of the term "design" is used both as noun and verb. Design as a verb has its origin in the Latin designare and to designate which means to specify and point out what to do. Design as a noun has its origin in the Latin signum (is not so much in the modern sense of the root "sign" (as in symbol, mark; semantics, semiotics, etc.) as is sometimes claimed) which has the meaning of something that you follow, in the sense of the specifications passed on from architect to builder *(Gedenryd, 1998: 42).*

[22] "How is it that we can still use the word `design' to describe such different processes as the creation of motor cars, architecture or advertisements? … such situations differ only in the degree of importance attached to various aspects of the problem." *(Lawson, 1997: 109)*

[23] Design is understood in everyday language. Design is a word which is used in different contexts in contemporary everyday language, as illustrated by the contemporary definition of design found communally used dictionaries such as the Compact Oxford English Dictionary where design is defined as: (1) A plan or drawing produced to show the look and function or workings of something before it is built or made. (2) The art or action of producing such a plan or drawing. (3) Underlying purpose or planning: the appearance of design in the universe. (4) A decorative pattern. Source: Compact Oxford English Dictionary online 16.02.2004.

[24] An internet search conducted to investigate the common definition of design related words revealed that there were 33 different dictionaries defining design and there where 42 dictionaries defining Architecture. During the same search where there only three dictionaries defining industrial design, which is in stark contrast to graphic design which were found in seven dictionaries, interior design which were found in 10 dictionaries, landscape architecture which were found in 12 dictionaries and fashion which were found in 27 dictionaries. Source: OneLook® Dictionary Search online .02.2004.

[25] Design has been associated with terms like: designer labels, designer clothes, designer water, designer drugs and designer stubble, which has began to render the word design less meaningful *(Woodham, 2004: xiii)*.

[26] This is a division of the design field which is based for the most part on a separation of artistically oriented ways of designing as well as those connected to a technological base *(Margolin, 1989: 4)*.

[27] "Indeed, the variety of research reported in conference papers, journal articles, and books suggests that design continues to expand in its meanings and connections, revealing unexpected dimensions in practice as well as understanding. This follows the trend of design thinking in the twentieth century, for we have seen design grow from a trade activity to a segmented profession to a field for technical research and to what now should be recognized as a new liberal art of technological culture

[…]

We have been slow to recognize the peculiar indeterminacy of subject matter in design and its impact on the nature of design thinking. As a consequence, each of the sciences that have come into contact with design has tended to regard design as an 'applied' version of its own knowledge, methods, and principles. They see in design an instance of their own subject matter and treat design as a practical demonstration of the scientific principles of that subject matter. Thus, we have the odd, recurring situation in which design is alternately regarded as 'applied' natural science, 'applied' social science, or 'applied' fine art. No wonder designers and members of the scientific community often have difficulty communicating." *(Buchanan, 1995b: 3, 18)*

[28] This includes building Architecture, system Architecture, computer Architecture and the architect behind a political proposal etc. The wide use of the term architecture can be highlighted by a definition of architecture found in the Compact Oxford English Dictionary, which defines architecture as: (1) the art or practice of designing and constructing buildings, (2) the style in which a building is designed and constructed and (3) the complex structure of something. Source: Compact Oxford English Dictionary online 16.02.2004.

[29] For further details see 3.1 (The concept of profession), 3.2 (The design profession specificity) and 3.3 (The design profession from a society perspective).

[30] "The last decades of the eighteenth century saw various attempts to distinguish between the designer as such and the other traditional roles embraced by architects since the sixteenth century. The historic association between the surveyor and the architect was partially qualified by

the setting up of the Surveyors' Club in 1792 … However, in Dr. Johnson's celebrated Dictionary of 1755, ‘surveyor’ and ‘architect’ were virtually synonymous terms, ... The two roles continued to be associated, however, until the foundation of the Surveyors' Institute in 1869, and even then the final break was not made until the 1930S.

The same was true with engineering; despite the foundation of the Society of Civil Engineers in 1771, the Smcatonian Society of 1793, and, ultimately, the Institution of Civil Engineers in 1818, the historic bond between the disciplines survived well into the nineteenth century. Architects like Robert Mylne and Thomas Harrison made important contributions to engineering, especially in bridge construction, during the late eighteenth century. Other designers such as John Smcaton, Thomas Telford, and John Rennie operated with national distinction in both fields during the opening decades of the new century, and as late as 1854, Thomas Hardwick, member of the Institution of Civil Engineers, received the Institute of British Architects' Gold Medal for Architecture.” *(Wilton-Ely, 1977: 192)*

[31] Architecture was slower than other professions like law and medicine to find its way to the European universities *(Cuff, 1991: 26)*.

[32] “There is, in fact, much disagreement about what the task of a designer is. Victor Papanek, for example, criticized the designer's role in the production of consumer goods, and posed the challenge to industrial designers of solving problems related to education, the handicapped, and Third World countries.' Buckminster Fuller confronted designers with the prospect of a ‘comprehensive design science’ but, despite the fact that he was personally able to transcend conventional boundaries between engineering, industrial design, and architecture, he had no strategy for moving the design professions in this direction. While much has been written about design, particularly in the postwar period (as my essay on postwar design literature in this anthology indicates), this writing has been fragmented, not integrated within the context of a coherent definition of what designing is.” *(Margolin, 1989: 4)*

[33] If art historians were to focus on the problem solving activity of design the selection of key figures in the design domain would differ from the selection made by Penny Sparke in the “A Century of design: design pioneers of the 20th century”. The fact that there is no consensus on what constitutes industrial design among practitioners and academic scholars is only to a small degree discussed by contemporary art historians.

[34] A not all-inclusive list of different perspectives on industrial design, based on the different perspectives of industrial design emphasised both academics and practitioners, amounts to the following: (1) Industrial design relates to aesthetics, (2) Industrial design is concerned with ergonomics, ease of manufacture, efficient use of materials, and product performance, (3) Industrial design is a strategic tool enabling marketers to match customer requirements to a product's performance, quality, durability, appearance and price, (4) Industrial design is the creation of pleasing product shapes and styles, the industrial design’s role in product

development can be viewed as a communicator of the firm's quality image and product integrity *(Gemser and Leenders, 2001:29)*.

[35] These different perspectives are also to some degree reflected in the wide scope of industrial design courses where the category of industrial design encompasses courses like product design, transport design or interaction design.

[36] For further details see 3.1 (The concept of profession), 3.2 (The design profession's specificity) and 3.3 (The design profession from a society perspective).

[37] "Industrial designers were initially cast as specialists who were needed to `give form' to products that had already gone through technical development. Such industrial designers are being trained in art schools all over the world." *(Dorst, 1997: 16)*

[38] Even after the emergence of a specific profession dedicated to designing products, some architects and other design professionals continue to create products produced by industry which compete with the role of the industrial designer.

[39] "In marketing, the value of a product is the consumer's expectation of product quality in relation to the actual amount paid for it." Source: www.wikipedia.org 05.08.2005.

[40] "In general, the value of something is how much a product or service is worth to someone relative to other things (often measured in money)" Source: www.wikipedia.org 05.08.2005.

[41] "In computer science, a value may be a number, literal string, array and anything else that can be represented by a finite sequence of symbols. The exact definition of a value varies across programming languages." Source: www.wikipedia.org 05.08.2005.

[42] "In mathematics, a value is a quantitative value - a constant (number), or a variable" Source: www.wikipedia.org 05.08.2005.

[43] "Each individual has a core of underlying values that contribute to our system of beliefs, ideas and/or opinions (see value in semiotics). Integrity in the application of a 'value' ensures its continuity and this continuity separates a value from beliefs, opinion and ideas. In this context a 'value' (e.g. Truth or Equality or Greed) is the core from which we operate or react from. Societies have values that are shared between many of the participants in that culture." Source: www.wikipedia.org 05.08.2005.

[44] Aesthetics i.e. beautiful, ugly, unbalanced, and pleasing.

[45] Doctrine i.e. political, ideological, religious or social beliefs.

[46] "The term 'culture,' of course, has had multiple meanings in different disciplines and different contexts. It is often used to refer to the intellectual, musical, artistic, and literary products of a society, its 'high culture.' Anthropologists, perhaps most notably Clifford Geertz, have emphasized culture as 'thick description' and used it to refer to the entire way of life of a society: its values, practices, symbols, institutions, and human relationships. In this book, however, we are interested in how culture affects societal development; if culture includes everything, it explains nothing. Hence we define culture in purely subjective terms as the values, attitudes, beliefs, orientations, and underlying assumptions prevalent among people in a society." *(Harrison and Huntington, 2000: xv)*

[47] "By the term "human progress" in the subtitle of this book we mean movement toward economic development and material well-being, social-economic equity, and political democracy." *(Harrison and Huntington, 2000: xv)*

[48] "Imagine two young brothers tumbling in the family playroom. They tussle back and forth giggling as they wrestle each other to the ground. Although they are rambunctious, they do not hurt each other. They are roughhousing—playing. Next, imagine that one of the boys cuffs his brother rather sharply on the ear and the second boy stops cold. Suddenly, they are no longer playing. The fists fly fast and furiously as both boys start to hurt each other and try to win the fight that has emerged.

Why did their interaction shift from playing to fighting? To answer that question, think about their perceptions. At first, they saw their tussle as play; then they saw it as fighting. The shift occurred because they viewed their interaction in a new light. What was considered play initially was reframed as fight when the play became too rough. Their perspective about their interaction changed, or, to use our terminology, they framed their interaction as playing and then they framed it as fighting. […] This idea was originally presented in Bateson (1975, 177-93)." *(Gray, 2003: 11)*

[49] "For example, we can frame our favorite hockey player as a "hero" when she scores the winning goal, and as a "bum" when she misses the open net; our parents as "loving" when they pay our tuition, and as "demanding" when they tell us to get a summer job; and ourselves as "studious" when we prepare diligently for an exam, and as "clever" when we pass the exam without reading the textbook." *(Gray, 2003: 12)*

[50] For further details see 6.3.1 (Introduction to framing), 6.3.1.1 (Value set is an essential part of framing), 6.3.2 (Framings' place in design) and 6.3.2.1 (Framing utilised by designers and its link to values).

[51] For further details see 6.3.1 (Introduction to framing), 6.3.1.1 (Value set is an essential part of framing), 6.3.2 (Framings' place in design) and 6.3.2.1 (Framing utilised by designers and its link to values).

[52] Remark made in the speech "A Sense Of Crowd And Urgency" in the House of Commons, October 28, 1943.

[53] Remark made in the speech "Architecture" at the Architectural Association Prize-Giving, London July 25, 1924.

[54] "The House of Commons is the lower house of the Parliament of the United Kingdom. Parliament also includes the Sovereign and the upper house, the House of Lords. The House of Commons is a democratically elected body, consisting of 646 members, who are known as "Members of Parliament" or "MPs."" Source: www.wikipedia.org 01.08.2005.

[55] Remarks made in the speech "A Sense Of Crowd And Urgency" in the House of Commons, October 28, 1943.

[56] Winston Churchill reiterates his points when he is arguing why the House of Commons should continue to be “not be big enough to contain all its Members at once without over-crowding” *(Churchill and James, 1974: 6870),* as well as arguing that “there should be no question of every Member having a separate seat reserved for him” *(Churchill and James, 1974: 6870)*. This is different from many other parliaments and has caused some puzzlement among outsiders and new members of Parliament. Churchill makes his argument from a practical point of view where he points out that:

> “If the House is big enough to contain all its Members, nine-tenths of its Debates will be conducted in the depressing atmosphere of an almost empty or half-empty Chamber. The essence of good House of Commons speaking is the conversational style, the facility for quick, informal interruptions and interchanges. Harangues from a rostrum would be a bad substitute for the conversational style in which so much of our business is done. But the conversational style requires a fairly small space, and there should be on great occasions a sense of crowd and urgency. There should be a sense of the importance of much that is said, and a sense that great matters are being decided, there and then, by the House.” *(Churchill and James, 1974: 6870)*

[57] American urban planner, architect, and teacher.

[58] “Konrad Adenauer (January 5, 1876 – April 19, 1967) was a conservative German statesman. Although his political career spanned 60 years, beginning as early as 1906, he is most noted for his role as West Germany's first chancellor from 1949-1963 and chairman of the Christian Democratic Union from 1950 to 1966.” Source: www.wikipedia.org 21.01.2005.

[59] One could argue that this multidisciplinary nature of architecture and industrial design increases the challenge of limiting the scope compared to thesis project found in most academic disciplines. All in all, is it a considerable challenge to limiting any research project within the domain of design. For further deliberation see 3.2.5 (The design profession’s peculiarities and abnormalities).

[60] The article “The Primary Generator and the Design Process” by Jane Darke was originally published in New Directions in Environmental Design Research Edited *(Darke, 1978: 325 - 337)*.

[61] This point will be touch upon in 4.3.3.2 (Philosophy based knowledge).

[62] “Knowledge is accumulating so rapidly, that, even given a whole lifetime, it would not be possible to master more than a small and specialized field. It has long been recognized that the days of the universal genius are over” *(Phillips, 1987: 122)*.

[63] ”Designer and educator Victor Papanek (1927-1999) was a strong advocate of the socially and ecologically responsible design of products and tools. He disapproved of manufactured products that were unsafe, showy, maladapted, or essentially useless. His products, writings, and lectures

were considered an example and spur by many designers, and he was an untiring eloquent promoter of social and ecological design." Source: www.wikipedia.org 21.01.2005.

[64] On the contrary, the aim of this thesis is to show the broad spectre of design values that exist within the domain of architecture and industrial design, and how these are utilised by the two professions.

[65] See 8.1 (Ethics in design).

[66] Within both architecture and industrial design, designers practice a wide variety of different design processes, and the type of process chosen by a designer is often connected to the design values which they practice by.

[67] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[68] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[69] Ernest L. Boyer indicates in his book "Scholarship reconsidered" that scholarship in the full scope of academic work includes the scholarship of discovery; the scholarship of integration; the scholarship of application; and the scholarship of teaching *(Boyer, 1990: 16)*.

[70] Excellent examples of this research tradition can be found the substantial work by prominent design scholars such as Dana Cuff, Donald A. Schön and Bryan Lawson etc.

[71] Quotation made by former US President John F. Kennedy, the commencement was made at an address at Yale University on June 11, 1962.

[72] Precedent is a:

> "judgement or decision of a court of law cited as an authority for deciding a similar state of facts in the same manner, or on the same principle by analogy. The rules of common law and equity are contained in precedents established by courts, that is, they have to be arrived at by ascertaining the principle on which those cases were decided." *(Jowitt and Walsh, 1959: 1385)*

[73] For further deliberation, see 1.3.1.3 (Research challenges within the domain of design).

[74] This can be viewed as standing on the shoulders of other academic scholars or using other academic scholars' work as a basis for the development of new knowledge.

[75] For further deliberation see 4.3 (Knowledge foundation from a values perspective).

[76] Such as DNA proof etc which is common in contemporary criminal court cases.

[77] See 1.3.2.1 (Research challenges within the domain of values), 1.3.2.2 (Research challenges within the domain of design) and 1.3.2.3 (Reflection over practical limitations and opportunities).

[78] For further deliberation, see 1.3.2 (Framework and Logical Argumentation).

[79] "Researchers in cognitive psychology, for example, have looked at design both because it represents a core aspect of human creativity and because of the challenge it poses in applying what is already known about cognition to more complex domains." *(Craig, 2001: 13)*.

[80] "Researchers in fields like engineering, computer science and architecture, on the other hand, have looked at design because of a larger interest in improving what designers do through the use of design aids and better teaching methods. At the same time, design has been the subject of study in a host of other fields, by researchers pursuing their own discipline-specific goals, ranging from the sociological to the anthropological to the historical." *(Craig, 2001: 13)*
[81] The literature that forms the foundation for this thesis is not generally written with values in mind, so the value aspect has to a lager degree been extracted from the different texts. These extractions have subsequently been combined to create a description and logical argumentation which is presented in this thesis.
[82] This challenge can be exemplified by the controversy of moral development which surrounds Lawrence Kohlberg that Denis C. Phillips uses as an example in his book "Philosophy, science, and social inquiry" where he argues:

> "In light of the available evidence, there is good reason to believe that the hard core of the Kohlbergian research program is implausible. There are no clear stages of moral development-at best they are arbitrary fictions (or "ideal types" by Kohlberg's new admission) having little or no verisimilitude; even if it is assumed that there is something there, the order in which individuals move through these (fictitious/ideal) stages is far from invariant, and the sequence of the stages (if indeed they exist) is certainly not logically necessary." *(Phillips, 1987: 198)*

If one accepts Phillips arguments with regards to Kohlberg work with any academic work which relies on Kohlberg's theory equally will be questionable. This illustrates that it is essential for academic scholars to be careful when selecting which work one chooses to refer to or uses a basis, and which work one chooses to treat differently.
[83] See 1.3.2.2 (Research challenges within the domain of design) and 4.3.3 (Skill based as opposed to knowledge based).
[84] These difficulties do not make it less important, but they it tend to make it more difficult to choose exactly what should be included and drawn upon.
[85] There is a considerable amount of literature that is describing and theorising these two subject areas. An extensive literature search revealed that there exist several design discourses which unravels values positions and how values are utilised within design. This is the case even when one takes into consideration that there only exist a very limited specific value discourse within design. Based on this observations have the strategy for this thesis been to rely on literature as the main sources for providing incite into values in design. A number of articles and books have been investigated with the purpose of mining it for, both explicit and implicit, value strategies, statements, and assumptions etc.

[86] The geographical limitation will at times be overturned in order to include developments which affect architecture and industrial design in West-Europe and the USA.
[87] This will hopefully prevent the essential works from other languages from being ignored.
[88] The claims and assertions made within the thesis are from a strictly methodological point of view restricted to analysing and describing what is found in literature which is describing design, and not in design itself.
[89] Even if many of the authors behind the literature utilised in this thesis are rarely involved in practical design in terms of writing public policy, designing buildings or products, planning regions and engaging in historic preservation projects, is their work influential because it is used by others to inform design policy *(Crysler, 2003: 9)*. This is demonstrated in the following extract:

> "Academic discourse does not exist on the head of a pin. It is a result of the interaction between speakers and their audiences in specific settings. There are many 'sites' of discourse in higher education: these extend from the seminar classroom and the academic conference hall, to the many books and articles that are published annually. Moreover, these sites are connected through pedagogical practice: class lectures and discussions are informed by written texts, and syllabi are organized around readings from books and journals. Scholars communicate with each through verbal and written representations which are often informed by (or later become) books or journal articles." *(Crysler, 2003: 10)*

All this influences designs students and practising architects and industrial designers which in turn transform some of the ideas which are present in the design literature into practical design. This indicates that it is likely to be some relationship between the ideas and theory presented by design scholars and what is actually taking place in the design world. This relationship is not necessarily always one-to-one, but it is possible to argue that the two domains influence each other to a substantial degree. All in all have design scholars a potential to influence on design practice through trade journals, newspaper articles, and other media as will as through "the curricula they draw up, the lectures they give, the scholarly articles and books they publish" *(Crysler, 2003: 9)*.
[90] But the lack of knowledge of these domains has made the selection process particularly difficult, and the selection of work cited might reflect to some extent the lack of specific knowledge of these general domains.
[91] "Dr. Charles Jules Henry Nicolle (September 21, 1866 - February 28, 1936) was a bacteriologist who earned the 1928 Nobel Prize in Medicine for his identification of lice as the transmitter of epidemic typhus." Source: www.wikipedia.org 14.11.2004.

[92] Quotation taken from a speech he made at the age of thirty-one when he was installed as Professor and Dean of a newly created Faculty of Sciences at Lille.
[93] "Louis Pasteur (December 27, 1822 – September 28, 1895) was a French microbiologist, chemist and humanist. He is most famous for his demonstrations supporting the germ theory of disease and his vaccinations, most notably the first vaccine against rabies. However, he also made many discoveries in the field of chemistry, most notably the assymetry of crystals." Source: www.wikipedia.org 12.01.2006.
[94] Serendipity is a concept first formulated by Horace Walpole in 1754 (January 28) while writing to a British diplomat called Sir Horace Mann *(Fine and Deegan, 1996: 434)*. The term is based on the following exotic tale of princes named Serendip:

> "Three goodly young princes were travelling the world in hopes of being educated to take their proper position upon their return. On their journey they happened upon a camel driver who inquired if they had seen his missing camel. As sport, they claimed to have seen the camel, reporting correctly that the camel was blind in one eye, missing a tooth, and lame. From these accurate details, the owner assumed that the three had surely stolen the camel, and they were subsequently thrown into jail. Soon the wayward camel was discovered, and the princes brought to the perplexed Emperor of the land, who inquired of them how they had learned these facts. That the grass was eaten on one side of the road suggested that camel had one eye, the cods of grass on the ground indicated a tooth gap, and the traces of a dragged hoof revealed the camel's lameness." *(Fine and Deegan, 1996: 343)*

According to Leo A. Goodman, Serendip is a corruption of the Hindustani name for Ceylon, Saradip, meaning "Golden Isle", where according to legend a city of gold was built. Walpole term Serendipity which was inspired by the above exotic tale, and Walpole was referring to the combination of accident and sagacity in recognizing the significance of a discovery when he used the term serendipity *(Remer Theodore, 1965: 6 f)*.
[95] The concept of serendipity has since Walpole's day become a recognised scientific concept, and prominent scholars like William Ian Beardmore Beveridge have pointed out the importance of serendipity by claiming that:

> "Probably the majority of discoveries in biology and medicine have been come upon unexpectedly, or at least had an element of chance in them, especially the most important and revolutionary ones. It is scarcely possible to foresee a discovery that breaks really new ground, because it is often not in accord with current beliefs." *(Beveridge, 1950: 31)*

[96] This point is emphasised by John and Lyn H. Lofland in their book "Analyzing social settings" when they highlights the following:

> "Because all social analysis plays off what is ordinarily believed or felt to be known, an analysis is interesting only in so far as it departs from what is already "obvious." And because what is seen as obvious is itself changing, what is or will be regarded as interesting is also changing." *(Lofland and Lofland, 1984: 127)*

[97] Kuhn's perception of scientific development is not undisputed in contemporary philosophy of science, as illustrated by the tendency of ethnographers to disregard natural science's rhetoric of discovery of the "new and better", as represented by Kuhn's Structure of Scientific Revolutions. Ethnographers tends to have a different perspective where they see themselves engaged in providing a "deeper understandings of things many people are already pretty much aware of" *(Becker, 1982: x)*.

[98] According to Kuhn, scientific breakthroughs depend on critical, unexpected insight which leads to a "better" way of understanding empirical relations, and this new understanding often constitutes a new paradigm. Kuhn's view of discovery and scientific breakthrough ties in and depends on the concept of serendipity as it underlines the recognition that scientific work is a "messy" process and that critical, unexpected insight is a precondition for a "better" understanding, "it also asserts that an approximation to truth is possible" *(Fine and Deegan, 1996: 435)*.

[99] The history of scientific discovery shows that serendipity is not a completely unusual happening, and it is a mistake to treat serendipity as purely a matter of fluke. Serendipity should instead be viewed as a "unique and contingent mix of insight coupled with chance" *(Fine and Deegan, 1996: 436)*.

[100] There are a number of well documented and recorded incidences of serendipity in significant scientific discoveries, including the classic example of Sir Alexander Fleming's discovery and naming of penicillin. Fleming named the penicillin fungus that got into his staphylococcus culture and destroyed the bacteria *(Fine and Deegan, 1996: 435)*. Equally:

> "Newton's discovery of gravity from an apple falling on his head while he rested beneath a tree is more than a bump in the annals of scientific discovery. This account of Newton's experience privileges chance observation. Whether, however, the story of the discovery of Newton's Second Law is apocryphal, others, including Bequerel's discovery of radioactivity arising from his unwitting tossing of uranium salts into a drawer with photographic materials (Badash, 1965), Tombaugh's discovery of Pluto on the basis of Lowell's flawed calculations (Tombaugh & Moore, 1980), and Penzias and Wilson's (1965) Nobel-winning identification of 'cosmic microwave radiation' are accounts

> grounded on actual happenings. In addition, Kirk and Miller (1986) provide many examples of new discoveries in the biomedical sciences 'that occur only in consequence of some kind of mistake," *(Fine and Deegan, 1996: 435)*

[101] For instance, some ethnographers asserts that: "It is not that they accidently stumble on truth, but that they can find accounts that others find useful in making sense of the world" *(Fine and Deegan, 1996: 435)*.

[102] Researchers that actively seeks out and remain open to these new sources expose themselves to the potential of serendipity, and this increases the likelihood of enabling oneself to creating new theoretical models *(Fine and Deegan, 1996: 442)*.

[103] The importance of the social relationship is illustrated by the English novelist Anthony Trollope's reflection on a lifetime of writing, where he wonders if he owed more to the unfailingly old groom that brought him a cup of coffee at 5:30 a.m. every morning and helped him begin his daily writing routine, than any one else *(Trollope, 1883: 103)*.

[104] "Charles Bernard Renouvier (January 1, 1815 - September 1, 1903) was a French philosopher." Source: www.wikipedia.org 28.04.2005.

[105] No page number available. The quote is taken from the page before the content page.

[106] This can be illustrated by a man who owned a company in a small town which was considering extensive automation of the production. The owner received an economic report which outlined the potential of increased profit which would potentially follow the automation of the production line. A substantial number of peoples in the small town where employed at the company and the owner felt uneasy implementing the automation, but he was unable to explain to himself or others why he felt uneasy. The owner solution to this problem was to hire an applied decision analyst consultant which after questioning the business owner at length concluded that:

> "the owner's real utilities in running the business had very little to do with the profit he made. Instead, the owner derived great satisfaction from providing employment to so many people in the town; doing so provided him with status and a feeling of doing something important for the community." *(Hastie and Dawes, 2001: 284)*

The owner's prime value was not to make a substantial profit, the primary values was instead connected to providing employment. Having been made aware of these values which explained his initial reaction to automation, the decision became much clearer, and he decided not to automate the production even if this meant that he would not receive the potentially increased profit *(Hastie and Dawes, 2001: 284)*.

[107] All in all "doubts about the validity of introspective reports have led many students of decision making to focus exclusively on observed choices" *(Shafir et al., 2000: 599)*.

[108] For example sceptic might question the validity of value research and ask what good is this type of research for, as it has limited predictive powers *(Hastie and Dawes, 2001: 195 f)*. A possible critique from a dedicated behaviourist (if any still exist) might be as there is no strictly controllable phenomenon will the descriptions of these phenomenon and its mechanisms be of no scientific value *(Hastie and Dawes, 2001: 195 f)*. For more details, see 2.1.4 (Values' link to behaviour and decision).

[109] It is possible to argue that genuine scientists should not investigate such vague phenomenon, which design theory, practice and values can be categorised as. But if this arguments where accepted generally would this exclude considerable research areas such as "meteorology, agricultural science, computer science, and many other useful applied sciences" *(Hastie and Dawes, 2001: 196)*.

[110] The challenges faced by a researcher attempting to extract individual designer's values will be considerable and will require that one familiarise oneself with the existing value literature and research methods which are available to tackle these challenges.

[111] "Zora Neale Hurston (January 7, 1891–January 28, 1960) was an African-American folklorist and author." Source: www.wikipedia.org 21.01.2005.

[112] "Mikołaj Kopernik (February 19, 1473 – May 24, 1543), more commonly known by the Latin form Nicolaus Copernicus, was a Polish[1] astrologer, astronomer, mathematician, administrator and economist. He is mainly remembered for developing a scientifically-useful heliocentric (Sun-centered) theory of the solar system." Source: www.wikipedia.org 21.01.2005.

[113] For more details see 4.3.3 (Skill based as opposed to knowledge based).

[114] Most of the theories found within architecture and industrial design have not been developed within a strict system of observation or experiments etc. On the contrary are many "design theory", methods and practices riddled with and characterised by values. This is not necessarily a weakness as design is a profession concerned with contributing to change in the environment and has the potential of significantly changing and altering the build environment. See 4.3.3 (Skill based as opposed to knowledge based).

[115] "Designers do not start with a full and explicit list of factors to be considered, with performance limits predetermined where possible. Rather they have to find a way of reducing the variety of potential solutions to the as yet imperfectly-understood problem, to a small class of solutions that is cognitively manageable To do this, they fix on a particular objective or small group of objectives, usually strongly valued and self-imposed, for reasons that rest on their subjective judgement rather than being reached by a process of logic" *(Darke, 1979: 43)*.

[116] "This simple dichotomization had many variants, involving elaboration of the main stages and often involving feedback loops; see for example Archer … and Mauer … In many cases these models were derived from the design processes of designers in other fields, eg engineering or industrial design." *(Darke, 1979: 37)*

[117] For more details, see 6.3 (Design decisions is based on values).

[118] "One of the shortcomings of the early phase of design methods research was that it concentrated on design morphology, a sequence of boxes bearing particular labels, rather than the way particular designers filled the boxes with concepts, and the source of the designers' concepts." *(Darke, 1979: 43)*

[119] "The result is often an experimental task that mimics design in some regard but that reduces its complexity to allow for the controlled manipulation of independent variables." *(Craig, 2001: 26).*

[120] "Experimental settings seldom include a persistent social network … as one might expect to find in a design office or educational setting. A typical office includes, among other things, coworkers with whom a designer has already developed social relations." *(Craig, 2001: 29).*

[121] "Subjects may use concepts in experimental settings that depend on their everyday work environments for meaning. When removed from their everyday settings, these concepts may loose meaning." *(Craig, 2001: 29)*

[122] "The 'think-aloud' version assumes that some mapping may be required between verbalization and internal representations, whereas the 'talk-aloud' version assumes that internal representations are already in verbalization form. 'Thinking aloud' is thus more general

[…]

Think-aloud protocols have been employed in design studies for more than thirty years." *(Craig, 2001: 15 - 18)*

[123] "A variation on verbal analysis that has been used to study knowledge representations involves analyzing drawings produced by subjects rather than verbal responses. By looking at resulting designs, for example, some researchers have attempted to infer both the kinds of knowledge and the structure of the knowledge used to solve design problems." *(Craig, 2001: 25)*

[124] It is generally argued that for the interviewing process to produce meaningful results within architecture and industrial design, is it significant that the researchers have considerable knowledge of design generally and of the particular designer's work in particular *(Lawson, 1997: 307).*

[125] Controversial claims have also been validated by running them by fellow research staff at the Oslo School of Architecture and Design and other institutions. Especially Professor Dr. Halina Dunin-Woyseth, my main supervisors Professor Dr. Rolf Johansson and Dr. Trygve Ask has been helpful in this regard. Even so, the full responsibility for the claims is solely mine.

[126] I contacted and visited a number of design firms in London in order to arrange for the possibilities of conducting in-depth interviews (at the end of July and beginning of August 2003). This was unsuccessful as the firms did not have the time or interest in taking part in a potential study. But, the general literature search undertaken in the project and the preparation for the pilot testing (investigating the existing literature in order to prepare for investigating cases and/or questions etc.) revealed that it was possible to get considerable insight by only focusing on the literature. Consequently did the literature search and the studying of the existing discourse emerged as a research strategy in its own right.

[127] The literature available was surprisingly rich as the research tradition is fairly young within architecture and industrial design.

[128] "Henry Brooks Adams (February 16, 1838 – March 27, 1918) was an American historian, journalist and novelist." Source: www.wikipedia.org 01.01.2006.

[129] "A MAN who makes an assertion puts forward a claim—a claim on our attention and to our belief. Unlike one who speaks frivolously, jokingly or only hypothetically (under the rubric `let us suppose'), one who plays a part or talks solely for effect, or one who composes lapidary inscriptions (in which, as Dr Johnson remarks, `a man is not upon oath'), a man who asserts something intends his statement to be taken seriously: and, if his statement is understood as an assertion, it will be so taken." *(Toulmin, 1958: 11)*

[130] "We can, that is, demand an argument; and a claim need be conceded only if the argument which can be produced in its support proves to be up to standard" *(Toulmin, 1958: 11 f)*.

[131] "Of course we may not get the challenger even to agree about the correctness of these facts, and in that case we have to clear his objection out of the way by a preliminary argument: only when this prior issue or `lemma', as geometers would call it, has been dealt with, are we in a position to return to the original argument." *(Toulmin, 1958: 97)*

[132] This new avenue of research will ultimately create the possibilities for new PhD projects which will be characterised by the subject narrowness, as the subject field is further developed and the knowledge in the field is further developed.

[133] "Since we are unable to prevent life from posing us problems of all these different kinds, there is one sense in which the differences between different fields of argument are of course irreducible—something with which we must just come to terms." *(Toulmin, 1958: 167)*

[134] "Socrates (June 4, 470 - 399 BC) (Greek Σωκράτης Sōkrátēs) was a Greek (Athenian) philosopher and one of the most important icons of the Western philosophical tradition." Source: www.wikipedia.org 14.11.2004.

[135] Linda Groat and David Wang have introduced the term Logical argumentation within the context of architectural research in their book "Architectural research methods".

[136] The tradition of work produced within Logical argumentation can be found in both architectural literature and to some degree industrial design literature.

[137] "John Ruskin (February 8, 1819 – January 20, 1900) was an English author, poet and artist, although more famous for his work as art critic and social critic. His Modern Painters series were responsible for the early popularity of the artist Joseph Mallord William Turner and the pre-Raphaelite movement." Source: www.wikipedia.org 14.11.2004.

[138] "Marcus Vitruvius Pollio was a Roman writer, architect and engineer, active in the 1st century BC. He was the author of De Architectura, known today as The Ten Books of Architecture, a treatise in Latin on architecture, and perhaps the first work about this discipline." Source: www.wikipedia.org 14.11.2004.

[139] "Leone Battista Alberti (February 14, 1404 – 25th April 1472), Italian painter, poet, linguist, philosopher, cryptographer, musician, architect, and general Renaissance polymath . His life was

described in Giorgio Vasari's Vite. In Italy, his first name is usually spelled Leon.” Source: www.wikipedia.org 14.01.2006.

[140] Abbé Marc-Antoine Laugier (1711–1769), author of the influential Essai sur l'architecture (1755), argued for purity of form in building.

[141] “August Welby Northmore Pugin (1812–1852) was an English-born architect, designer and theorist of design now best remembered for his work on churches and on the Houses of Parliament.” Source: www.wikipedia.org 14.11.2004.

[142] “Adolf Loos (December 10, 1870 in Brno, Moravia–August 8, 1933 in Vienna, Austria) was an early-20th century Viennese modernist architect who is associated with the International Style.” Source: www.wikipedia.org 14.01.2006.

[143] “Frank Lloyd Wright (June 8, 1867 – April 9, 1959) was one of the most prominent and influential architects of the first half of the 20th century. To this day he is easily America's most famous architect (topping Philip Johnson, Paul Laszlo, Richard Neutra, and Louis Kahn) and still extremely well-known in the public eye.” Source: www.wikipedia.org 14.01.2006.

[144] “Robert Charles Venturi (June 25, 1925 -) is a Philadelphia-based architect who worked under Eero Saarinen and Louis Kahn before forming his own firm with John Rauch. As a faculty member at the University of Pennsylvania, Venturi met his future wife, the architect and planner Denise Scott Brown, who joined the firm in 1967. After Rauch's resignation in 1989, the firm took its current form and was named Venturi, Scott Brown and Associates, Inc.. Robert Venturi won the Pritzker Prize in 1991.” Source: www.wikipedia.org 14.01.2006.

[145] Christian Norberg-Schulz’s PhD thesis submitted at the University of Trondheim (Norges tekniske høyskole) called “Intentions in Architecture” is an example of this tradition.

[146] Anne Marit Vagstein has submitted a PhD thesis called “Stedet det stemte rom” at Oslo School of Architecture and Design which is an example of this tradition.

[147] “Wolfgang Amadeus Mozart (January 27, 1756 - December 5, 1791) was one of the most significant and influential of all composers of Western classical music. His works are loved by many and are frequently performed.” Source: www.wikipedia.org 14.12.2004.

[148] “Relativism is the view that the meaning and value of human beliefs and behaviors have no absolute reference. Relativists claim that humans understand and evaluate beliefs and behaviors only in terms of, for example, their historical and cultural context. Philosophers identify many different kinds of relativism depending upon which classes of beliefs allegedly depend upon what.” Source: www.wikipedia.org 13.08.2005.

[149] “Hilary Whitehall Putnam (born July 31, 1926) is a key figure in the philosophy of mind during the 20th century. After receiving his BA at the University of Pennsylvania (where he was an undergraduate with Noam Chomsky) and PhD at UCLA (under Hans Reichenbach), he taught at Princeton, MIT, and Harvard, where he is now Cogan University Professor emeritus.” Source: www.wikipedia.org 14.11.2004.

[150] Objections to this research model has been asserted within the domain of “hermeneuticians, critical theorists, poststructuralists, linguistic philosophers, discourse analysts, feminists, constructivists, reflectivists” *(Alvesson and Sköldberg, 2000: 3)* etc.

[151] A number of philosophical traditions have raised objections to a positivist view of testability which insists on empiricism (defined research based on “pure data” or uninterpreted “facts”) as the solid cornerstone of research *(Alvesson and Sköldberg, 2000: 3)*. However, attempts have been made to bridge the space between these traditions, in order to allow the use of methods from different research traditions within a given research project to create new knowledge. This bridge building can be exemplified by Mats Alvesson, and Kaj Sköldberg book the “Reflexive methodology”. Alvesson, and Sköldberg argues in the introduction of their book:

> “We are not convinced that the opposite pole to methodological textbook wisdom — where it is claimed in a spirit of postmodernism or post-structuralism, for instance, that empirical reality can be ignored altogether — is in any way preferable. Nor is the phobia of empirical matters that characterizes much hermeneutic and critical theory to be recommended. It is our experience that the study of a confusing and contradictory but often surprising and inspiring empirical material has much to offer.” *(Alvesson and Sköldberg, 2000: 3)*

[152] Ernst von Glasersfeld was a philosopher and a proponent of radical constructivism.

[153] “Jean-François Lyotard (1924-1998) was a French philosopher and literary theorist well-known for his embracing postmodernism after the late 1970s. Before that, he was a member of the group Socialisme ou Barbarie (‘Socialism or Barbarism’), a group of left-wing French intellectuals formed in the wake of the 1956 Hungarian Uprising in opposition to the Stalinism of Soviet communism. Later he became a founding member of the European Graduate School.” Source: www.wikipedia.org 14.11.2004.

[154] Within a body of research (scientific contexts) is it the researcher's colleagues or peers which in practice will make the first evaluation of a “theory” developed or normative recommendation within the research have explainable powers and/or if it has probable pragmatic value *(Alvesson and Sköldberg, 2000: 272)*.

[155] “Albert Einstein (March 14, 1879 – April 18, 1955) was a German born American theoretical physicist who is widely regarded as the greatest scientist of the 20th century.” Source: www.wikipedia.org 12.08.2005.

[156] ” Alfred North Whitehead (February 15, 1861, Ramsgate, Kent, UK – December 30, 1947, Cambridge, MA) was a British-American philosopher, physicist and mathematician who worked in logic, mathematics, philosophy of science and metaphysics.” Source: www.wikipedia.org 12.08.2005.

[157] The refutation of Whitehead's theory was the work of Clifford M. Will *(Will, 1971)*.

[158] "Jacob Bronowski (January 18, 1908, Lódź, Poland - August 22, 1974, East Hampton, New York, USA) was the presenter of the BBC television documentary series, The Ascent of Man which inspired Carl Sagan's Cosmos series. Bronowski wrote a Ph.D. in algebraic geometry, and was a poet" Source: www.wikipedia.org 12.08.2005.

[159] "It is also worth pointing out that Popper repeatedly claims that the famous eclipse experiment was an experimentum crucis, and thus illustrates the superior "falsifiability" of Einstein's general relativity. In fact, the experiment produced four sets of results; depending on which of the (poor quality) photographs one trusted, one got Einsteinian deviation, Newtonian deviation, and even double Einsteinian deviation! Really solid experimental confirmation of general relativity came only in the 1960s. For an account of this confirmation, see Charles W. Misner, Kip S. Thorne, and John Archibald Wheeler, Gravitation (San Francisco: Freeman, 1973), Part IX. That general relativity was accepted before there were decisive experiments in its favor of course contradicts completely the whole Popperian account, which can be characterized as mythological." *(Putnam, 2002: 180)*

C H A P T E R T W O

[1] Quote taken from the masquerade "This week Men At Work talks to Sir Jeremy Creep, Principal of the London College of Architects in Rohan Point, Putney" *(Fry, 1993: 12)* by Stephen Fry.

[2] "Stephen John Fry (born 24 August, 1957) is an English comedian, author, actor and director." Source: www.wikipedia.org 08.01.2006.

[3] In contemporary everyday language values typically mean the regard to which something is held to or deserve, or its importance and/or worth. Furthermore, values describe material and/or monetary worth; the term can refer to principles and/or standards of behaviour in an everyday context. It is even used in mathematics where a value typically refers to a numerical amount (denoted by an algebraic term), a magnitude, quantity or a number. Even within the musical domain value is a common term which describes the relative duration of a sound (signified by a note). Source: Compact Oxford English Dictionary online 16.02.2004.

[4] For more details see 1.2.1 (Field of study and clarification).

[5] These demands are placed on individuals to fulfill wishes, needs and desires which stem from demands within a given family, as well as society on a whole, and they becomes standards that are applied to oneself and others *(Ball-Rokeach et al., 1984: 24 f)*. Demands are communicated through modelling of positive and negative reinforcement by parents and others agents of society, which contribute to instil and convey "shared" values found in a given society, that ultimately become internalized as the standards for judging members of a society's competence or

morality *(Ball-Rokeach et al., 1984: 25)*. Generally a society demands values (competence and morality) because:

> "it is good for society to have individuals who are competent and moral and such demands are generally accepted by individuals because it is good for the individual; that is, meeting these demands satisfies individual needs for competence and morality.
> […]
> Thus, values develop and are learned by each person to serve a dual purpose: they are the cognitive representations of societal demands, on the one hand, and of individual needs for competence and morality, on the other." *(Ball-Rokeach et al., 1984: 24 f)*

This process typically starts at childhood, and these values constitute elements of what is seen as commonsense and which truths or desirability are taken for granted within a given society *(Billig, 1996: 240)*. This can be exemplified in that these values are so firmly imprinted that:

> "it would provoke a scandal if someone were to show disrespect for the common-sense of decency by explicitly, and seriously, championing the values of cruelty, avarice and greed." *(Billig, 1996: 240)*

[6] "One appeals to values in order to induce the hearer to make certain choices rather than others and, most of all, to justify those choices so that they may be accepted and approved by others." *(Perelman and Olbrechts-Tyteca, 1969: 75)*

[7] "As Michele Moody-Adams argued in an important book about cultural relativism, if we give up the very idea of a 'rationally irresolvable' ethical dispute, we are not thereby committing ourselves to the prospect of actually re-solving all our ethical disagreements, but we are committing our-selves to the idea that there is always the possibility of further discussion and further examination of any disputed issue" *(Putnam, 2002: 44)*.

[8] There is no inherent aspect of physical science that justifies the focus on coherence, simplicity, etc.

[9] "Apparently any fantasy—the fantasy of doing science using only deductive logic (Popper), the fantasy of vindicating induction deductively (Reichenbach), the fantasy of reducing science to a simple sampling algorithm (Carnap), the fantasy of selecting theories given a mysteriously available set of "true observation conditionals," or, alternatively, "settling for psychology" (both Quine)—is regarded as preferable to rethinking the whole dogma" *(Putnam, 2002: 145)*.

[10] Many anthropologists have in the past and present argued that: "culture is, by definition, harmonious and adaptive and that conflict and suffering are the consequence of external intrusions" *(Harrison and Huntington, 2000: xxv)*. In short cultural relativism has dominated

these disciplines in this and the last century *(Harrison and Huntington, 2000: xxv)*. This is based on a line of thought which can be summarized as follows:

> "Culture is a symbolic system to be interpreted, understood, discussed, delineated, respected, and celebrated as the distinctive product of a particular group of people, of equal worth with all other such products. But it should never be used to explain anything about the people who produced it. In humanistic terms, culture is often likened to a text to be read and interpreted. Although explanations of the text are permitted, no claims of objectivity can be made for such explanations. The understanding of culture is wholly subjective and reflects as much about the interpreter as the interpreted." *(Patterson, 2000: 202 f)*

[11] "Commonsense realism about the views of my cultural peers coupled with anti-realism about everything else makes no sense. If, as [Richard] Rorty likes to claim, the notion of an objective world makes no sense, then the notion of 'our culture' cannot be more than Rorty's private fantasy, and if there is no such thing as objective justification—not even of claims about what other people believe—then Rorty's talk of 'solidarity' with the views of 'our culture' is mere rhetoric." *(Putnam, 2002: 143)*.

[12] Race and genetic characteristics have played a crucial role as an explanation in much of the first half of the past century, and the ensuing consequences can only be described as evil, where Nazism formed the ultimate low point. Due to these dreadful consequences, race and genetic background have been predominantly disregarded as an explanatory model for the differences that exist in economic progress or cultural attitudes etc. *(Glazer, 2000:220 f)*.

[13] "One reason is that we are chary of intervening in a culture to change its characteristics, assuming we knew how. At a time when we think of all cultures as worthy of equal respect, what justification would we have to intervene—whether that intervention is public or private—and change a cultural feature that we think limits economic development? What is our mandate for intervention?" *(Glazer, 2000:222)*.

[14] Some anthropologists view progress as an idea the West is trying to impose on other cultures. *(Harrison and Huntington, 2000: xxvi)*. Many anthropologists and social scientists argue that each culture should define its own goals and ethics (i.e. values) and cannot be evaluated against the goals and ethics of other cultures (i.e. values) a view which taken to its ultimate logic endorses inhumane practices, such as:

> "female genital mutilation, suttee (the Hindu practice of widows joining their dead husbands on the funeral pyre, whether they want to or not), or even slavery." *(Harrison and Huntington, 2000: xxvi)*

[15] "The United Nations, or UN, is an international organization established in 1945 and now made up of 191 states." Source: www.wikipedia.org 16.08.2005.

[16] "(3.) Everyone has the right to life, liberty and security of person […] (7.) All are equal before the law and are entitled without any discrimination to equal protection of the law […] (19.) Everyone has the right to freedom of opinion and expression […] (21.) Everyone has the right to take part in the government of his country, directly or through freely chosen representatives […] (25.) Everyone has the right to a standard of living adequate for the health and well being of himself and of his family, including food, clothing, housing and medical care and necessary social services […] (26.) Everyone has the right to education[16]" *(United Nations, 1998b: 472 - 474).*

[17] Adopted and proclaimed by General Assembly resolution 217 A (III) of 10 December 1948.

[18] It is worth noting that the declaration was not endorsed by the Executive Board of the American Anthropological Association on the grounds that it was an ethnocentric document *(Harrison and Huntington, 2000: xxvi)*. However, it is possible to question whether their position of arguing that the declaration is ethnocentric document will withstand the test of time, as the vast majority of the planet's people are likely to agree on the following:

> "Life is better than death.
> Health is better than sickness.
> Liberty is better than slavery.
> Prosperity is better than poverty.
> Education is better than ignorance.
> Justice is better than injustice." *(Harrison and Huntington, 2000: xxvi f)*

The cultural relativism expressed by anthropologists and social scientists still (to some degree) exists today (Harrison and Huntington, 2000xxvii).

[19] This development is taking place even with considerable opposition from many anthropologists and social scientists and economists *(Harrison and Huntington, 2000: xxiv)*.

[20] For instance, the explanatory power of racism and discrimination have been questioned as a rationalization for minorities' underachievement in the USA *(Harrison and Huntington, 2000: xxi)*. In addition, the inadequacy of economists' assertions such as the "appropriate economic policy effectively implemented will produce the same results without reference to culture" *(Harrison and Huntington, 2000: xxiv)* has been a contributing factor. These are being questioned, as this is not the case in multicultural countries. It is not seen as an adequate assertion in the light of economic development. For example:

> "Chinese minorities in Thailand, Malaysia, Indonesia, the Philippines, and the United States; the Japanese minorities in Brazil and the United States; the

> Basques in Spain and Latin America;' and the Jews wherever they have migrated.” *(Harrison and Huntington, 2000: xxiv)*

Even the well-respected Federal Reserve Board chairman Alan Greenspan has in the past been an advocate for the assertion that appropriate economic policy effectively implemented will produce the same results without reference to culture. For example, he argued that in connection with the post-Soviet experience of Russia: humans are natural capitalists and that communism's collapse would automatically establish a free-market entrepreneurial system. Greenspan has in the light of the Russian economic disaster reached a different conclusion, asserting that the development of a capitalist system as we know it in the USA is not nature at all, but dependent on culture *(Harrison and Huntington, 2000: xxiv f)*.

[21] This can be exemplified by the prosperous economic development that has taken place in Singapore, Hong Kong, Barbados, and Costa Rica which are all situated in tropical climates, compared to many other tropical countries *(Harrison and Huntington, 2000: xxi)*. Equally, this can also be illustrated by the economic development of Ghana and South Korea. In the 1960’s, both countries had compatible levels of per capita Gross National Product as well as “similar divisions of their economy among primary products, manufacturing, and services; and overwhelmingly primary product exports” *(Harrison and Huntington, 2000: xiii)*. Thirty years later, there are no such similarities; South Korea has become the fourth largest economy in the world whereas Ghana has not experienced similar economic development. The consideration of values as an explanatory model has been spurred on by the above mentioned deficiency in the more “traditional” models and is now “gradually filling the explanatory vacuum left by the collapse of dependency theory” *(Harrison, 2000: 296)*.

[22] Possible explanations for this development can be linked to the values i.e. belief that “successful economic development is acceptance that prosperity depends on productivity, not on control of resources” *(Porter, 2000b: 21)*, as well as that the a productivity paradigm is beneficial and good for society *(Porter, 2000b: 21)*. Equally, the value i.e. belief “that the potential for wealth is limitless because it is based on ideas and insights, not fixed because of scarce resources” *(Porter, 2000b: 21)* can be considered important, as this “supports productivity-enhancing steps in all parts of society that will expand the pie” *(Porter, 2000b: 21)*. Values that can account for hampering development and prosperity are often linked to concepts of rent seeking and monopoly seeking structures, as this incorporates a notion that wealth is fixed and not related to effort. This tends to lead to a development where the focus is on distribution of the pie rather than increasing the pie *(Porter, 2000b: 21 f)*. “This zero-sum worldview is central to the theory of a universal peasant culture” *(Porter, 2000b: 21 f)*.

[23] It has its intellectual heritage in work conducted by prominent academic scholars like:

> “Alexis de Tocqueville, who concluded that what made the American political system work was a culture congenial to democracy; Max Weber, who ex-

> plained the rise of capitalism as essentially a cultural phenomenon rooted in religion; and Edward Banfield, who illuminated the cultural roots of poverty and authoritarianism in southern Italy, a case with universal applications." *(Harrison and Huntington, 2000: xxi)*

[24] But very few interventions or aid programs have been designed to promote cultural change; it has been a taboo to promote cultural change along side economic assistance. Equally has it been taboo to point out the "cultural explanations for ethnic group underachievement" *(Harrison and Huntington, 2000: xxx)*. But this renewed interest in values is exemplified by an initiative, by the Harvard Academy for International and Area Studies, to organise a symposium named Cultural Values and Human Progress in 1999.

[25] It is clearly asserted that values (culture) play an important role in economic progress, but at the same time is it acknowledged that it is challenging to isolate values' contribution to economic development, from other independent influences which also contributes to the economic development *(Harrison and Huntington, 2000: xiii f)*.

[26] This is illustrated by the following:

> "Treatments of the role of culture in economic prosperity tend to focus on generic cultural attributes that are deemed desirable, such as hard work, initiative, belief in the value of education, as well as factors drawn from macroeconomics, such as a propensity to save and invest. These are surely relevant to prosperity, but none of these generic attributes is unambiguously correlated with economic progress. Hard work is important, but just as important is what guides and directs the type of work done. Initiative is important, but not all initiative is productive. Education is crucial, but so is the type of education sought and what the education is used to accomplish. Saving is good, but only if the savings are deployed in productive ways" *(Porter, 2000b: 14 f)*

[27] Originally asserted in Ulrich Wickert book "Der Ehrliche ist der Dumme" published in 1994 on page 40 *(Joas, 2000: 187)*.

[28] For example, every day statements like: "He values freedom" are easily stated as: "He went to work yesterday", this is the case even if many intuitive beliefs based on personal values are of dubious validity *(Hastie and Dawes, 2001: 253)*.

[29] This can be exemplified again by the statement: "He values freedom", which typically refers to a general set of dispositions, actions, and beliefs *(Hastie and Dawes, 2001: 253)*.

[30] Values and value hierarchies are the most central of all components which determine belief systems, and they "guide the formation of countless … attitudes toward others encountered directly or vicariously" *(Ball-Rokeach et al., 1984: 26)*.

[31] People often simultaneously pursue values that are incompatible and this dilemma obligates individuals and societies to make choices. This can be exemplified by one of the most basic problems confronting scientists that are undertaking content analysis: content analysis is the challenge of striking an appropriate balance between reliability (trustworthiness) and significance (importance). Reliability within content analysis is typically achieved by counting the frequencies of words appearing in their text, but the frequencies of appearing may be of very trivial importance. Thus is it possible to achieve a completely reliable (trustworthiness) result of frequency of occurrence of any selected word in any given text, but this frequency of occurrence may be of very trivial significance (importance) *(Perelman and Olbrechts-Tyteca, 1969: 82 f).*

[32] Values that make up value hierarchies and are intuitively organized by individuals as different values are not always compatible and value conflicts face individuals and societies constantly.

[33] Such as the late Milton Rokeach, Sandra Ball-Rokeach, and Joel W Grube.

[34] These assertions correspond with the observation that "conservatives and liberals differ in their readiness to blame the poor or the inequalities of society for the existence of poverty" *(Billig, 1996: 244 - 245).*

[35] This pitfall from the point of view of the individual making an argument can be avoided by not exposing the preferences giving to the different values within the argument i.e. avoiding the exposure of the value hierarchy. This strategy will not always work, as in most cases the values are adhered to with different degrees of intensity by the audience, and the audience will mostly "admits principles by which the values can be graded" *(Perelman and Olbrechts-Tyteca, 1969: 81).* This can be exemplified by the constant (reoccurring) debate on whether poverty is primarily the fault of the poor and can be blamed on the personal characteristics of the poor, or can first and foremost be blamed on circumstances which apply to the poor. The argument for blaming the poor for their plight is often based on the assertion that there are things that the poor themselves can do to improve their situation. References to success stories of the self-made person emerging from poverty to wealth by hard work and a dedicated character are often used as a justification for this assertion. The counterargument is based on the assertion that economic unfairness and structural inequality can clearly not be blamed upon the poor. A audience will typically feel that there is some reasonableness in the arguments of both sides, but depending on the value hierarchy of the audience, one side appear more reasonable than the other *(Billig, 1996: 244).* Generally have philosophers dealing with values have failed to draw attention to this point *(Perelman and Olbrechts-Tyteca, 1969: 81).*

[36] Value change can be encouraged "even when there are no preselected target values and even when no interpretations of the data are offered" *(Ball-Rokeach et al., 1984: 47).*

[37] The reflection that is typically needed to stimulate value change is characteristically made by other individuals and/or an argument, an everyday situation or by researchers and experiments. But the self- reflection does not have to be brought on by these circumstances, as illustrated by an experiment conducted using a computer program for a feedback procedure attempting to instill self-reflection. The computer affected the experimentee's values, indicating that self-

reflection is the crucial factor for potential value change *(Ball-Rokeach et al., 1984: 47)*. Not all individual values are reflected upon and have subsequently become explicit values. Research and experiments suggest that values can be changed by feedback, which provides an important opportunity for self-knowledge and self-reflection. But for this type of value change to take place, individuals have to be informed and challenged with regards to their currently held values *(Ball-Rokeach et al., 1984: 48 f)*.

[38] A number of studies suggest that a specific state of self-dissatisfaction must be awakened in order for value change to take place *(Ball-Rokeach et al., 1984: 47)*.

[39] The aforementioned dissatisfaction is connected to maintaining or enhancing one's self-esteem. Likewise these studies suggest that change is unlikely if value shifts do not ultimately influence the self-esteem. The proposed explanation for these observations is that "self-knowledge about, and evaluation with pride or shame of, one's values is especially compelling in producing effects" *(Ball-Rokeach et al., 1984: 63, 48 - 51)*.

[40] A controversial value in one society may not be controversial in another society, and the values which are under pressure to be changed will therefore differ among different societies *(Billig, 1996: 206 f, 246 f)*.

[41] An example that illustrates this can be found in the controversy surrounding the theory, which attempts to explain humans' origin. At one point in time it was considered to be commonsense that humans and apes have different origins. This changed in the mid-19 century as a result of Charles Robert Darwin theory of evolution. The origin of humans suddenly became a hotly debated and controversial issue. The controversy slowly subsided and the evolution theory became commonsense in large parts of Western society. Recently, however, the theory of evolution has come under renewed attack from creationists, whom are arguing that Darwin's evolution theory is questionable and amounts to a value, not a fact *(Billig, 1996: 207)*.

[42] What constitutes controversial issues is not stable in a given society. Political, moral, religious and commercial issues typically generate debate and argument that is necessary to achieve values change, but what is hotly debated within a given society changes. Values which were previously under pressure for change, at a given point in time, will subside from the public debate, and other issues which where uncontroversial will enter the debate as controversial issues. The changing status of environmental values held in Western society during the last century is an example of this process of changing the status of a given value *(Billig, 1996: 246 f)*.

[43] Equally the subject matter of "race" has undergone a dramatic change. A hundred years ago race was talked of in terms like "pure blood" and the "threat of inferior stocks" in both scientific discourse and in everyday language, without embarrassment *(Billig, 1996: 246 f)*. Whereas, today it is impossible to express these types of race values within a western society without receiving public condemnation, as illustrated in the following:

> "One might summarize these changes by saying that the old racial values, which were once unquestioned and desirable end-states, have become taboo.

> […] A whole collection of images, terms, and beliefs has become forbidden. Those who break the taboo are liable to find themselves ostracized, just like those who transgress sexual and lavatorial proprieties in polite company." *(Billig, 1996: 247)*

But even under the threat of public condemnation, these types of values continue to exist, and they have not disappeared entirely from Western society. They may have been removed more or less successfully from the public debate and argumentative context, "but privately they can continue to feed the obsessions of individual imaginations" *(Billig, 1996: 247)*. The creation of new taboos has not prevented racism to still linger on at the fringes of the public debate and argumentative context in Western society, *(Billig, 1996: 247)* and as racisms is detached from its old value it is possible that "some racist images, beliefs, and even feelings may now travel under the protection of acceptable, and formerly contrary, values" *(Billig, 1996: 246 f)*.

[44] This is asserted in the work of Milton Rokeach, Sandra Ball-Rokeach, and Joel W Grube as published in the book "The great American values test". The findings and analysis in their work demonstrates that experimental changes of values and value hierarchies lead to changes in behaviour and attitudes. This is exemplified by experiments that have led to the reductions in value-related racist attitudes toward blacks and to value-related changes in behaviour among participants. Some of these changes were not only significant but also long term changes, as changes were observed many weeks and months later, even as long as 21 months after the initial experiment *(Ball-Rokeach et al., 1984: 44)*.

[45] "Daniel Patrick "Pat" Moynihan (March 16, 1927 – March 26, 2003) was a U.S. Senator, ambassador, and academic. He was first elected to the United States Senate for New York in 1976, and re-elected three times, in 1982, 1988, and 1994. He declined to run for re-election in 2000. Prior to his years in the Senate, Moynihan was a member of four successive presidential administrations, beginning with the administration of John F. Kennedy, and continuing through the administrations of Lyndon B. Johnson, Richard Nixon, and Gerald Ford." Source: www.wikipedia.org 17.01.2006.

[46] Comment made to a question during the Godkin Lecture at Harvard in 1986 by the late US Senator Daniel P. Moynihan.

[47] These discrepancies between expressed attitudes and actions taken by individual have led some social psychologists to recommend that attitude researchers should avoid focusing on general attitudes and instead focus on attitudes regarding specific actions, as:

> "The results from the studies linking attitudes to actions reveal that most people can be criticized on the grounds that their general statements often appear to be inconsistent with their actions, and also with other beliefs which they might espouse." *(Billig, 1996: 211)*

[48] For further details see 2.1.3 (Value hierarchies).

[49] The challenge of putting the messy particulars of the world into general attitude categories is a considerable challenge to the researcher attempting to establish the connection between values and behaviour.

[50] Likewise, other studies have examined the effect of ethics courses given to business students. Results indicate a weak link between moral development and change in behaviour *(Cannon, 2001)*. The conclusion of this research is that these types of courses have had very little effect on students' business ethics, as exemplified by the following:

> "no significance for either intervention treatment or moral development was found for the working adults examined. Implications from the study's results, therefore, do not support current trends for ethics training in academia and business." *(Cannon, 2001: Abstract)* No page number available, quote taken from the abstract.

One can therefore conclude that there is a persistent, statistically significant link between moral judgement and behaviour, albeit one of a modest level.

[51] This is typically indicated by both the commercial sector and government's willingness to put money into campaigns and service ads. Governments will typically attempt to instil values through these public campaigns, often related to unhealthy, destructive behaviours like smoking, overeating, and drug abuse, or to encourage participation in physical fitness programs and adoption of healthier eating habits *(Ball-Rokeach et al., 1984: 171)*. The desired result of these campaigns and ads is to create or change health related values among the citizens to more health promoting values. The expected consequence is a change in citizens' behaviour. It is expected that this will create a discrepancy between values and behaviour.

[52] Sandra Ball-Rokeach, Milton Rokeach and Joel W. Grube found through their research published in the "The great American values test: influencing behavior and belief through television" determined that the effect of public and private campaigns conducted through mass media and its ability to change values and through this change behaviour, was so great, that the they where considering not to publish the findings. They fear that the findings could be miss used by organisations and individuals for "evil or ignoble or antidemocratic or self-serving purposes" *(Ball-Rokeach et al., 1984: 171)*.

[53] "Leon Festinger (born May 8, 1919) was a social psychologist from New York City who became famous for his Theory of Cognitive Dissonance." Source: www.wikipedia.org 14.11.2004.

[54] Within this theory does Festinger argues:

> "(1.) There may exist dissonant or 'nonfitting' relations among cognitive elements. (2.) The existence of dissonance gives rise to pressures to reduce the

> dissonance and to avoid increases in dissonance. (3.) Manifestations of the operation of these pressures include behavior changes, changes of cognition, and circumspect exposure to new information and new opinions." *(Festinger, 1962: 31)*

Which implies that individuals find the cognitive dissonance so unpleasant that they jerk their attitudes into line with their actions and shuffle about their "beliefs, until they all point in the same consistent direction" *(Billig, 1996: 190)*.

[55] Yet another indication of the link between value and behaviour is evident in an experiment that attempted to improve a teacher's performance. The experiment showed an increased quality of teaching among student teachers that underwent a value change. A statistically significant performance increase was found in the experimental participants, but not in control participants *(Ball-Rokeach et al., 1984: 50 f)*. "Teacher performance was independently assessed by supervisors, who were unaware of participants' status vis-à-vis the experimental and control groups" *(Ball-Rokeach et al., 1984: 50 f)*.

[56] For further deliberation see 2.1.1 (The anthropologists, social scientists and economic perspective).

[57] This line of thought has led to the publications of works like Lawrence Harrison book "Underdevelopment Is a State of Mind" and Samuel P. Huntington's book "The clash of civilizations and the remaking of world order".

[58] The probability aspects and the tendencies for values to play a part where facts are difficult to establish have been illustrated by Rene Descartes maxims provisional code of morals, which states:

> "And thus since often enough in the actions of life no delay is permissible, it is very certain that, when it is beyond our power to discern the opinions which carry most truth, we should follow the most probable; and even although we notice no greater probability in the one opinion than in the other, we at least should make up our minds to follow a particular one and afterwards consider it as no longer doubtful in its relationship to practice, but as very true and very certain, inasmuch as the reason which caused us to determine upon it is known to be so." *(Descartes and Spinoza, 1952:49)*

[59] This can be illustrated by David Pye's following assertion:

> "All cynicism apart, it is obviously questionable whether a higher standard of living entails more happiness, but it is not questionable that a higher standard of living gives better opportunities for avoiding unhappiness. Utility has a strangely negative character. We speak of the secret of happiness, for its causes

> are elusive; but there is no secret about the causes of unhappiness: thirst, hunger, want of sleep, exhaustion, pain, constraint of movement and too great heat and cold, are evils which can effectively prevent happiness. Utility has a negative character, because useful devices are adopted in the main for the sake ultimately of avoiding such evils." *(Pye, 1978: 67)*

Pye subsequent argument touches upon productivity and its relation to society and design. The similarities between the discussion, considering that it is conducted within different domains and traditions, indicates that designers and design scholars are influenced by general values found in the society.

[60] The late Peter Collins was professor of architecture at McGill University from 1956 to 1981 and is the author of Changing Ideals in Modern Architecture, 1750-1950.

[61] In addition, many designers find themselves working in multi-disciplinary teams, where it is difficult to determine individual/discipline responsibility. This can raise questions like:

> "As a designer, am I fully responsible and accountable for my designs and to whom? Can I be relieved of responsibility in some way? If not, how can I prepare for this responsibility and assume the liability of being fully accountable for my design judgments and actions?" *(Nelson and Stolterman, 2003: 239)*

[62] For further deliberation see 2.2.2 (Contemporary value discourse).

[63] The complexity of determining the consequences of design have led to design scholars asserting statements like the following:

> "The only thing we know for sure is that it is impossible to predict with certainty whether a realized design will result in the betterment of human life. We can hope for this, but nothing is absolute before it is realized. Also, we can never know what the unintended consequences of a design will be and whom they will affect" *(Nelson and Stolterman, 2003: 239 f)*

[64] Architects and industrial designers tend to have a reasonably good idea of who will benefit and who will suffer as a result of a given design decision. They also know what those benefits and disutilities will be *(Spector, 2001: 74)*.

[65] For further deliberation see 6.4 (Design evaluation is based on value sets).

[66] The area had commonly been described as "one of the most beautiful spots in the world" (Spector, 2001: 67).

[67] One could argue that the design was poorly detailed made from cheap-looking materials *(Spector, 2001: 67)*.

[68] "the thought of destroying Wherry … was anathema to the many citizens who struggled daily to help house those in need. [...] That mere aesthetics would cause the destruction of hundreds of housing units—buildings that could be brought up to code for a fraction of the cost of building from ground up—was considered outrageous by many. Yet not even the proponents of the measure were bold enough to suggest that these buildings could ever be made to grace their location. Wherry Housing could only be placed back into service for the benefit of its lucky residents at the expense of the greater public's enjoyment of the Presidio National Park." *(Spector, 2001: 68 f)*

[69] This general observation is not limited to the design domain. The fact that the conflicting values represent different aspects of good intentions or moral conflicts between different aspects known as being good, it is not limited to the field of design, this is a general value problem indicated by:

> "'Only dogmatism,' wrote the philosopher John Dewey, can suppose that serious moral conflict is between something clearly bad and something known to be good, and that uncertainty lies wholly in the will of the one choosing. Most conflicts of importance are conflicts between things which are or have been satisfying, not between good and evil. Again, they are choices between one good thing and another. Not 'right versus wrong' but 'right versus right.' We need to start by honoring that fact." *(Weston, 2000: 118)*

[70] For further details see 3.2 (The design profession's specificity).

[71] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[72] For further details see 4.3.3 (Skill based as opposed to knowledge based).

[73] For further deliberation see 6.4 (Design evaluation is based on value sets).

[74] For further details see 2.1.2 (Contemporary value discourse).

[75] "Positivism is the name for (at least) two philosophical directions. They have in common the idea of a science without theology or metaphysics, based only on facts about the physical/-material world. The older positivism is based on the philosophical thinking of Auguste Comte in the 19th century. The newer logical positivism was founded in 1920s by the Vienna Circle." Source: www.wikipedia.org 15.11.2004.

[76] It was not until the 1980s and 1990s that postmodernism became an intellectual buzzword within architectural and industrial design circles. The precise content of the term has to some degree been elusive, especially as it became fashionable. In the context of design postmodernism has generally been understood to refer to a formal aesthetical language "that could clearly be distinguished from its modernist predecessor because of its free use of historical, vernacular, or populist references" *(Heynen, 2004b: 1047)*.

[77] Postmodernism in architecture and design corresponds in some degree to the French philosopher Jean-Francois Lyotard's interpretation of postmodernism which he writes about in

his book the “La condition postmoderne ” (“The postmodern condition”). Lyotard asserts that the main aspect of the post-modern condition is that grand narratives found in literature, history, art, and philosophy have come under scrutiny, and as a result of this scrutiny has the legitimacy of institutions and values found in society lost their self-evident character, “hence, there is a general loss of shared ideals that can act as guidance for decisions about future developments in our society” *(Heynen, 2004b: 1049).*

[78] Postmodernism has been viewed as a common denominator which characterises the “cultural climate of the last decades of the 20th century” *(Heynen, 2004b: 1047).* The development of post-modern philosophy and thinking had its starting point outside the design domain and can be traced to literary theory where:

> “Postmodernism was used to refer to new modes of fiction characterized by self-reflexivity, linguistic play, and the use of referential frames within frames (the "Russian doll" effect)” *(Heynen, 2004b: 1047)*

[79] “Postmodern values have brought a shift in the political agenda throughout advanced industrial society, moving it away from an emphasis on economic growth at any price, towards an increasing concern for its environmental costs […] Today, economic conflicts are increasingly sharing the stage with new issues that were almost invisible a generation ago: in advanced industrial societies, environmental protection, abortion, ethnic conflicts, women's issues, and gay and lesbian emancipation are heated issues today—while the classic Marxist prescription-nationalization of industry, is virtually a forgotten cause. As a result, a new dimension of political conflict has become increasingly salient. It reflects a polarization between modern and postmodern issue preferences.” *(Inglehart et al., 1998: 13)*

[80] The critique intensified during the 1950s, 1960s and 1970s and Modernism was seriously criticized during the late 1960s and early 1970s, as it emerged that architecture created under the modernistic ideology “showed serious flaws in their fabric, their environment, their performance, and their appeal” *(Johnson, 1994: xiii).*

[81] “This position was most forcibly presented by the radical French Group at the 1970 International Design Conference, held annually in Aspen, Colorado. The Group lambasted designers for their hollow concerns, and tried to expose the way that designers ignored the political nature and implications of design” *(Whiteley, 1993: 94 f)*

[82] The negotiations which take place between intentions and realisation are due to the fact that design is, and has always has been, set in the real world and in the real world one tends to make compromises to achieve realisation *(Simon, 1969: 68, 75).*

[83] The fundamental issue of compromise in an historical context has to a large extent been based on design values (philosophical texts) which have guided designers approach to design, in addition, to practical manuals which have implicit values *(Cruickshank, 2000: 78).*

[84] Which has it origins in the Latin words; firmitas, utilitas, and venustas *(Spector, 2001: 35, 213)*.
[85] For further deliberation 3 (Values in the design profession).
[86] This was typically the driving incentives in John Ruskin and August Welby Northmore Pugin design work and writings *(Whiteley, 1993: vii)*.
[87] The connection between design and social, political and economic values, is also argued by Christian Norberg-Schulz when he writes:

> "Any closer scrutiny of the last hundred years, however, shows that the new architecture is not a result of the wish for l´Art pour l'Art, but has sprung from the strivings of idealistic individuals to make man's environment better." *(Norberg-Schulz, 1965: 19)*

[88] Modernism and post-modernism are two dominant ideologies (design value sets) that have influenced designers greatly during the last century and these ideologies have a strong influence in contemporary design. Through architecture and industrial design schools and the design establishment, these ideologies have influenced generations of architects and designers with regards to their design values (design thinking).
[89] Nigel Whiteley is Professor of Visual Arts in the Art Department at the School of Creative Arts, Lancaster University, UK and has written the book "Design for Society" published in 1993.
[90] Whiteley points out the strengths and weaknesses of this tradition when he writes:

> "The strength of the tradition is that design is firmly grounded in a relationship to society rather than being presented as an area of study which feeds only on itself; its weakness has been that, in both the nineteenth and twentieth centuries, design reform writing has been on occasions little more than a cover for professional middle-class taste masquerading as ethically superior -'good'-design." *(Whiteley, 1993: vii)*

[91] Modernism can be divided into two main strains/trends: Conservative Modernism and Progressive Modernism. These are both characterised by rationality, lack of sentimentality, functionality, lack of historical context and seriousness *(Sparke, 1998: 86)*.
[92] "'Less is more' is a quote often attributed to the architect Ludwig Mies van der Rohe, and sometimes to Buckminster Fuller. The quotation actually comes from the poem 'Andrea del Sarto', by Robert Browning." Source: www.wikipedia.org 10.12.2004.
[93] "Ludwig Mies van der Rohe (born Maria Ludwig Michael Mies) (March 27, 1886 – August 19, 1969) was the leading architect of the modernist style." Source: www.wikipedia.org 15.02.2006.
[94] For further deliberation 5.1.1.4 (Simplicity and Minimalism).

[95] "Functionalism is the principle that architects should direct their efforts towards the function of buildings, and even define architectural beauty as a product of a functional solution." Source: www.wikipedia.org 14.11.2004.

[96] For further details see 5.1.1.3 (Structural, Functional and Material Honesty).

[97] Within this modernistic value set architects and industrial designers have attempted (through modernistic architects and product) to influence how people should live as opposed to utilising the way people do live as basis for the design *(Whiteley, 1993: 11)*.

[98] For further details see 5.1.2.2 (Consultation and participation).

[99] "Ayn Rand (Ayn rhymes with 'mine'), born Alissa (Alice) Zinovievna Rosenbaum (February 2, 1905–March 6, 1982), was a controversial American novelist and philosopher, most famous for her philosophy of Objectivism, and her novels The Fountainhead and Atlas Shrugged." Source: www.wikipedia.org 14.11.2004.

[100] "Henrik Johan Ibsen (March 20, 1828–May 23, 1906) was an extremely influential Norwegian playwright who was largely responsible for the rise of the modern realistic drama." Source: www.wikipedia.org 21.08.2005.

[101] Modernism had its heydays during the height of positivism, and consequently the challenge of modernism coincided with the growing challenge and criticism of the positivistic ideology, as the fundamental belief in progress through technological development cam into questioning. This criticism of positivism fuelled the emerging criticism of modernistic design ideology (design values) *(Sparke, 1998: 192)*.

[102] The critique intensified during the 1950s, 1960s and 1970s and modernism ideology came in for serious criticisms during the late 1960s and early 1970s, as it emerge that architecture created under the modernistic ideology "showed serious flaws in their fabric, their environment, their performance, and their appeal" *(Johnson, 1994: xiii)*.

[103] The criticism of Modernism is an enterprise which has been undertaken by many different academic scholars including post-modernist designers, various academic disciplines representing different subject areas, urban and social critics, including Jane Butzner Jacobs' criticism in the influential book "The Death and Life of Great American Cities", Robert Charles Venturi's criticism in his book the "Complexity and Contradiction" and Charles Jencks' criticism in his widely influential book "The language of post-modern architecture" which "unleashed a thoroughgoing repudiation of the movement's moral pretensions" *(Spector, 2001: viii)*. It has been agued that the moral mission of architecture reached the rock bottom of its decline at the height of this criticism which took place in the 1970s *(Spector, 2001: viii)*.

[104] "Jane Butzner Jacobs (born May 4, 1916) is a writer and activist born in the United States, but now residing in Canada. She is best known for The Death and Life of Great American Cities (1961), a powerful critique of the urban renewal policies of the 1950s in America." Source: www.wikipedia.org 22.08.2005.

[105] "Aldo Rossi, (1932-1997 Milan, Italy) was an Italian architect. For the Venice Biennale in 1979 he designed a floating Teatro del Mondo that seated 250 that was towed out to sea. He also

designed the National Opera House in Genoa. He won the prestigious Pritzker Prize for architecture in 1990." Source: www.wikipedia.org 14.11.2004.

[106] "Form follows function is a slogan and principle of Modern architecture, including specifically" Source: www.wikipedia.org 10.12.2004.

[107] According to Rossi do the persistence of the historical forms allow for the emergence of new functions *(Heynen, 2004b: 1047)*.

[108] For further details see 5.2.4.2 (Vernacular).

[109] This criticism was put forward by Sibyl Moholy-Nagy in her book the "Native Genius in Anonymous Architecture" published in 1957.

[110] Bernard Rudofsky makes these types claims in his book the "Architecture without architects" published in 1964.

[111] Amos Rapoport put forth such types of assertions in his book the "House, Form and Culture" published in 1969.

[112] This criticism was especially directed towards areas of public housing. Some of the triumph principles of modernism (rationality, lack of sentimentality, lack of historical context and functionality) were questioned on the basis of public houses. It was argued that practical application of these principals had failed to deliver. Studies and reviews of modernistic architecture compared to the argumentation which accompanied this architecture indicates that the social agenda of modernism did not materialise in practises *(Johnson, 1994: xiii)*.

[113] The impact of modernism in design was reduced following this extensive criticism, and has since been given a mythical ending moment attributed to the blowing up of the 14-story slab blocks which together formed Pruitt-Igoe housing complex. Pruitt-Igoe housing complex was a prize-winning social housing scheme designed by Minoru Yamasaki , built in St Louis, Missouri, in 1952 *(Heynen, 2004b: 1047)*. Charles Jencks is the source of this mythical ending of modernism which he has even given a fictional date and time (15 July 1972, 13.32 p.m.) which is the time of demolition of the ultra modernist Pruitt-Igoe housing complex *(Jencks, 1987: 27 - 29)*.

The Pruitt-Igoe housing complex was seen as a major failure of modernism, as demolition became unavoidable despite millions of dollars that had been spent in an attempt to keep it alive and repaired. This failure and its consequent demolition were due to recurring damage and heavy vandalism by its residents which turned it into a slum. Pruitt-Igoe housing complex did not cater to the taste of it residence (residence's design values), as it had been build according to modernistic design values which were not shared by the residents as indicated by the following:

> "the purist principles of functionalism, with `streets in the air', `sun, space, and greenery', and according to a hospital metaphor which was supposed to infuse the inhabitants with cleanliness and health - but was not very well adjusted to

> their comfort. The naive rationalism thus had led to irrationalism." *(Alvesson and Sköldberg, 2000: 149)*

The fate of the Pruitt-Igoe housing complex illustrates some of the challenges that face modernistic design values when implemented in buildings occupied by users that have not accepted the modernistic design education and the modernistic design values.

[114] It was challenging for many modernistic architects and designers to accept that "people actually disliked much of the work in which architects had made such psychical investment" *(Johnson, 1994: xiv)*.

[115] These accusations were made towards modernistic architecture regardless of whether it was dwelling units line-to-ground, skyscrapers etc. which were described as "human filing cabinets" or towards modernistic office buildings accused of tedious aesthetic *(Johnson, 1994: xiv)*.

[116] The post-modern critique of modernism is often misunderstood as being the only basis of Postmodernism (Postmodernism in design terms), it is a common belief that the postmodernistic design movement is an anti modernism movement and a reaction to the modernistic design values, but the postmodern design movement is a movement in its own right with its own design values which is not all reactionary.

[117] The introduction of Postmodernism and the decline of modernism as the driving force within design have created a new design environment where the acceptance of different theory and aesthetic styles lived less uncomfortable side-by-side than often was the case during modernism. There is less striving towards reaching a general consensus of what constitutes "proper" design values within Postmodernism compared to Modernism. This have in turn given rise to a more pluralistic design values where different aesthetic styles and consumer choice is seen as an asset and not as a problem or challenge *(Sparke, 1998: 228)*.

[118] Eclecticism is reflected in that Postmodern architects and designers are free to make use of elements from: the contemporary context, "from the past, from classicism, from popular culture, and from the architectural language and concepts of modernism" *(Heynen, 2004b: 1049)*.

[119] The following is a summary of main points which characterises Postmodernism:

- Postmodernism is characterised by "meaningful" architecture which attempts to be sensitive to its urban context.
- Postmodernist architecture attempts to communicate on several levels at the same time.
    - It attempts to convey a specific meaning to a minority public of experts (other architects, art historians, and the like), who recognize formal references to historical styles, innovations, or ironic gestures.
    - Equally are postmodern designs attempting to communicate to the larger public, this by invoking images that satisfy feelings of nostalgia and continuity.

- Postmodern architecture and design tends to embraces the input of mass culture and allow for representation, poetics, and metaphor.
- Postmodern urbanism proposes a “collage city” which allows for fragmentations within the city structure, which attempts to opening up the city for choice and freedom, as well as multiplicity and ambiguity *(Heynen, 2004b: 1047 f)*.

This can at times make it difficult to distinguish between postmodernism and contemporary modernist tradition, exemplified by the fact that:

> “ work of architects such as Richard Meier or Rem Koolhaas has been labeled Postmodernist, although it clearly continues a modernist tradition (be it with ironic or even cynical overtones).” *(Heynen, 2004b: 1049)*

[120] “Jürgen Habermas (born June 18, 1929 in Düsseldorf, Germany) is a philosopher and social theorist in the tradition of critical theory. His work has been called Neo-Marxist, and focuses on the foundations of social theory and epistemology, the analysis of advanced capitalist industrial society and of democracy and the rule of law in a critical social-evolutionary context, and contemporary (especially German) politics.” Source: www.wikipedia.org 24.08.2005.

[121] “Fredric Jameson (b. April 14, 1934) is a Marxist political and literary critic and theorist. He is best known for the analysis of contemporary cultural trends; he described postmodernism as the claudication of culture under the pressure of organized capitalism. Jameson's best-known books include Postmodernism: The Cultural Logic of Late Capitalism, The Political Unconscious, and Marxism and Form.” Source: www.wikipedia.org 20.08.2005.

[122] For further details see 3.2.3 (Designer’s unsettled relation towards society) and 3.3 (The design profession from a society perspective).

[123] This took place where civil groups and academics where arguing that the profession seemed to be little more than a self-serving business adventure. *(Spector, 2001: viii)*.

[124] The link between the value discourses within design is often related to political issues concerning the wider society as pointed out by Whiteley. This has historical roots, exemplified by William Morris linking of design with political reform. This relationship between politics and design tend to be ignored or glossed over by the contemporary design discourse and it is usually largely ignored by practising designers *(Whiteley, 1993: 167)*.

[125] As argued within this thesis is that values are an inherit quality of design, but they have not been a dominant factor within design literature, where the focus have traditionally been on the aesthetics and functional qualities of design, in addition to design methodology.

[126] For further details see 6 (Values; a design compass).

[127] Academia is characterized as book learning and formal rules, without much focus on knowledge or experience of practical matters. In short, academics are primarily concerned with theories rather than practical matters (abstract, speculative, theoretic, theoretical matters).

[128] For further deliberation 4.3 (Knowledge foundation from a values perspective).

[129] Design values are or not something that designers are born with, on the contrary, they are required and developed through an education and socialisation.

[130] Different design schools have different sets of design values that they will attempt to pass on their design students.

[131] Even if most schools have, to a large degree the same educational teaching methods, different schools represent competing design value sets. The controversy that exist between design schools is not limited to disagreement with regards to the best way of solving specific design problems “but about what problems are worth solving and what role the practitioner should play in their solution” *(Schön, 1983: 129 f)*.

[132] Crit is critique of a student’s design work given by one or more teachers, often with companying remarks from fellow students.

[133] “Most of us can remember crits that finished with the pronouncement, ‘Sorry... It's very clever/beautiful/sensitive, but it isn't architecture, you know!’” *(Banham, 1990: 23)*.

[134] For further deliberation 4.1.3 (Participants in the creation of design).

[135] Examples of this design value can be found among some well-known architects who have proposed concepts that could only be realised when a large number of apparently countervailing conditions were surmounted (This includes Jorn Utzon’s Sydney Opera House and Renzo Piano, Richard Rogers and Gianfranco Franchini’s Centre Pompidou).

[136] “Some schools of architecture over the past twenty years have reduced the technological aspects of their curricula. It has been said that students come to architecture school to enter a profession that permits them to be an artist, shunning the technological subjects. If such motivations and aspirations on the part of students is true, these principals would emphatically not agree. In fact, in view of the supreme ranking given by the principals to building technology, these students might be well warned to seek employment elsewhere. Lastly, it is possible that the principals are giving a warning that unless architecture students are well prepared in building technologies, we may see aspects of the building process now performed by architects being performed by non-architects, accelerating the diminution of the role of the architect in the building process.” *(Symes et al., 1995: 46 f)*

[137] The practice in design schools of excluding the structural conditions by which designs operate, has obscured the complexity often found in design. It gives the students a sense of control and domination that often goes beyond the control a professional architect or industrial designer has over decisions in a real design project. It also has the affect of hiding many of the value conflicts that are found in real design projects.

[138] For further deliberation 6.4 (Design evaluation is based on value sets).

[1] A short introductory example of these general professional value aspects can be indicated in an anecdote from Jeremy Till where, having been knocked off his bicycle, he suffered a rare and painful form of fracture and dislocation. This incident landed Till in a teaching hospital where he was subjected to the probing and prodding of doctors and students, and on one occasion the following conversation took place:

Till: “This could be you, one day”.
Chief tutor (doctor): “No, I would never be so stupid to ride a bicycle”
Till: “No, what I meant was one day you could be a patient”
Chief tutor (doctor): “If you don't want us to help you, we won’t”

This short exchange illustrates the way in which members of particular professions tend to “define themselves by setting themselves apart, both epistemologically and socially” *(Till, 2005: 171)*. It also exemplifies that doctors themselves are potential patients, where the distance between the profession and the rest of society is a fragile social construction *(Till, 2005: 171)*. This social construction holds a number of value related aspects, such as the fact that doctors are expected to use their knowledge not just in an instrumental way; they are also expected to perform within a specific value system (modern version of Hippocratic Oath) and to take value-related decisions that can influence life or death.

Just as doctors sometimes forget that they too are potential patients, the professions of architecture and industrial design are “prone to deny their experience as users, to forget that they too are embodied citizens” *(Till, 2005: 171)*. Acknowledging this could potentially threaten the very thing that sets them apart as a profession. This is particularly apparent in the reluctance that exists among architects and industrial designers in dealing with the everyday or domestic and/or using normal language *(Till, 2005: 171 f)*. Designers’ fear of being seen as “normal” is not without its foundation, as the knowledge base within architecture and industrial design is not as widely respected, robust or defined as that of other professions such as law and medicine.
[2] Authority in this context is defined

> “as that property of instructions – for action, belief, valuation and being – given by individuals, organizations or by systems of rules (such as laws, institutions, roles and customs), to other individuals, which explains why the latter voluntarily comply with these instructions.” *(Beckman, 1990: 126 f)*

[3] “This somewhat complicates the situation as it admits of cases where an institutional rule has authority in the formal sense, while it lacks authority in the sense defined. People are formally

obliged to follow it, but actually they do not. The empirical criterion of authority is thus a compliant attitude in the minds of those whose actions and so on are instructed by it." *(Beckman, 1990: 126 f)*

[4] In this context clergy, medicine and law are considered to be the older, more established, professions.

[5] The term occupation often serves the purpose of upholding the distinction between what is considered professionals and others who for their living are dependent on their work.

[6] "A guild is an association of people of the same trade or pursuits, formed to protect mutual interests and maintain standards of morality or conduct. Historically they were benefit societies or small business associations, since each crafter was a self-employed individual artisan or part of a small craft shop or co-operative." Source: www.wikipedia.org 27.08.2005.

[7] "Ronald Wilson Reagan (February 6, 1911 – June 5, 2004) was the 40th President of the United States (1981–1989) and the 33rd Governor of California (1967–1975). Before entering politics, Reagan was also a broadcaster, a film actor, and head of the Screen Actors Guild." Source: www.wikipedia.org 19.02.2006.

[8] This third tradition "falls some-where between terminological conventions focusing on the professions and conventions focusing on occupation in general" *(Beckman, 1990: 116)*.

[9] This special status is usually accompanied by a certain service and trust obligations between the society that is granting the privileges and the professions which in return serve the society. The status and privileges granted a given profession often depends on the profession administering a "complex knowledge and expertise which without professional would not be accessible in the society" *(Wasserman et al., 2000: 71)*.

[10] This is often linked to technological aspects where professions have parched as the technological foundation disappeared. Professions which has parched includes: railroad professions, proto professions and itinerant entertainers *(Abbott, 1988: 28 f)*.

[11] ""Freidson is one of the most interesting and best known medical sociologists and his thinking continues to have applicability to current and impending issues."--David Mechanic, Rutgers University" Source: http://yalepress.yale.edu 23.11.2004.

[12] Without this economic protection few would make the initial investment required to become a professional. In addition to offer economic protection for the initial investment credentials also supply consumers and employers with crucial information about expected skills and knowledge, which otherwise would be unavailable to both consumers and employers. Freidson goes on to assert that autonomy is a means of reducing alienation in the workplace and/or resisting pressure for the excessive standardisation of goods and services *(Haskell, 1984: xxii)*.

[13] It is worth nothing that Moore sees professionalism as a scale rather than a cluster of attributes *(Moore, 1970: 5)*.

[14] "The occupation of journalist is an old occupation which has developed its specific competence within the market sector for more than a century. The counsellor's occupation is a new one, shaped and developed within the state sector, and has developed over four decades, with

different aims and directions. Journalists have managed to enclose a field of knowledge, something which counsellors have not been able to do. This is mirrored in their education: the education for journalists consists of 80 weeks of education (one term being 20 weeks), of which 40 weeks include `journalism'; that is, 50 per cent of their total education.18 The education for counsellors takes 120 weeks, in which the specific field of knowledge — choice of career and guidance — comprises 23 weeks: that is, 17.5 per cent of their total education. If we include here also public administration and the organization of counselling (4 weeks) and a continuation course (4 weeks), we will still only reach 25.8 per cent of their total education. Thus the evidence indicates that counsellors have not yet found their specific competence, their own specific field of knowledge." *(Selander, 1990: 148 f)*

[15] It is this incompetence of the society or client etc. which rightly makes trust central to professional status, where the credentials of a given profession is instituted to inspire trust *(Beckman, 1990: 128)*.

[16] For instance, the legal profession is regulated through a bar association and restrict membership through licensing and accreditation of law schools.

[17] This legal protection insures exclusivity for a given profession, which in practical terms tends to prohibit a layperson from practice within the domain of a given profession. A classical example of the legal protection can be found in the medical professions where people are generally prohibited by law from practicing medicine without a license.

[18] Another example is the public defender system that gives everybody access to legal representation at a public trail.

[19] By combining the main criteria of "Specialised knowledge" i.e. amount of formal training required with "Legal sanction credentialism and autonomy" i.e. degree of autonomous and heteronomous conditions, can an illustrative comparison between the concept of profession and other occupational concept such as vocational, skilled labour and proletarian be made *(Beckman, 1990: 120)*. This is shown by the following table:

	Little or no formal training required	Substantial formal training required
Heteronomous work	"Proletarian" work[19]	"Skilled labour" work[19]
Autonomous work	"Vocational" work[19]	"Professional" work[19]

Table 1. Four types of work *(Beckman, 1990: 120)*

As the table indicates is there a difference between "Proletarian", "Skilled labour", "Vocational" and "Professional" work.

[20] This as "the function of producing half-truths and bogus scientific terminology to sell products (how-ever 'ethical' they may be) cannot be professional" *(Lewis and Maude, 1952: 69)*.

[21] "On the other hand it consists of academically trained experts entering public service and party offices on a professional basis, while eventually turning into politicians, in the sense of acquiring a mandate from parties or corresponding political community bodies. In trade unions and popular movement organizations, similar patterns can be found." *(Beckman, 1990: 123)*

[22] "Nathan Glazer is an American commentator. He is a domestic policy neoconservative, editor of 'the Public Interest' magazine and formerly a frequent contributor to The New Republic. Known for his writings on ethnicity and race, such as 'Beyond the Melting Pot' co-written with Daniel Patrick Moynihan, he was an early sceptic of Great Society programs such as expanded welfare and affirmative action." Source: www.wikipedia.org 23.11.2004.

[23] "On the one hand against the wholly institutionalized, role-bound authority of the bureaucratic position, on the other against the wholly person-based authority of `free expertise', which is not institutionally boosted by credentials and authorization." *(Beckman, 1990: 131 f)*

[24] It is not uncommon to shift between stressing the merits of institutionally secured authority often used "against agents on the `free market' of expertise" *(Beckman, 1990: 132)*, and stressing "the merits of personal quality and institutional independence" *(Beckman, 1990: 132)*. This type of argument is often directed towards bureaucratic structures. It is this ambiguous standpoint "between the authority of formal positions and the market-evaluated authority of personal skills" *(Beckman, 1990: 132)* which is considered to be essential to professional authority.

[25] These privileges can be described as parts of an informal social contract between society and the different professions in return for bearing certain responsibilities *(Cuff, 1991: 23)*.

[26] Professions that have parched includes: railroad professions, proto professions and itinerant entertainers *(Abbott, 1988: 28 f)*.

[27] The fascination with successful professions can at times prevent an acknowledgement that knowledge based occupations and professions have disappeared *(Abbott, 1988: 28 f)*.

[28] "It is with abstraction that law and accounting fought frontally over tax advice, the one because it writes the laws, the other because it defines what the prescribed numbers mean. It is with abstractions that psychiatry stole the neurotics from neurology, the abstractions of its fancy new Freudianism." *(Abbott, 1988: 30)*

[29] "Francis Bacon, 1st Viscount St Albans (January 22, 1561 – April 9, 1626) was an English philosopher, statesman, spy and essayist." Source: www.wikipedia.org 30.04.2005.

[30] Page number not available, but the quote can be found at the very first page of the preface.

[31] This difficulty can be illustrated with that it has often been up to the courts to make the distinction between a profession and an occupations. For instance, within the British legal system it has been argued by Lord Justice Scrutton that:

> "it is impossible to lay down any strict legal definition of what is a profession, because persons carry on such infinite varieties of trades and businesses that it

> is a question of degree in nearly every case whether the form of business is, or is not, a profession ... To determine whether an artist is a professional man again depends, in my view, on the degree of artistic work that he is doing ... If I were invited to define exhaustively what a profession was, I should find the utmost difficulty in doing so ... But I myself am disposed to attach some importance in findings as to whether a profession is exercised or not to the fact that the particular man is a member of an organized professional body with a recognized standard of ability enforced before he can enter it and a recognized standard of conduct enforced while he is practicing it." *(Collins, 1971: 128 f)*

[32] Even if some professions derive from medieval, or in some cases, ancient roots, it was not until last century that the first systematic attempts where made to study professions. This reflects in part the rise of the social sciences, as well as great change in the professions themselves *(Abbott, 1988: 3)*.

[33] A name change can assist in creating a distance to the old ways of the occupation, assist in asserting a professional monopoly, and give a label capable of legislative restriction *(Abbott, 1988: 11)*.

[34] "The colleges of Italian legal consultants, the Inns of Court of the English banisters, and the guilds of physicians and surgeons which existed in parts of Europe before 1800 are all examples of professional corporate guilds." *(Siegrist, 1990: 194)*

[35] This included occupations "employed by the state; members of older and virtually independent professions such as physicians and advocates were also involved" *(Siegrist, 1990: 193)* Guilds tended to:

> "defined allowances, the type of function and income, and they regulated admission policies and internal order. In reality these guilds were a group of occupational classes that endowed their members with particular political, legal and social rights within the system of estates and graduated privileges. A few aristocratic professions even co-opted their members by virtue of the privileges granted them by birth." *(Siegrist, 1990: 194)*

[36] This created in part of the foundation for the independent liberal profession and an autonomous profession development as it is know today *(Siegrist, 1990: 193)*.

[37] "There is a tendency in modern society that occupations to an ever-increasing extent begin to use a scientific language, that they strive to build up their own research facilities and that the education is transposed to a university level. In Sweden it has been said (since 1977) that university education should `rest upon a scientific ground'. This acknowledges that more occupations now are getting an abstract basis of knowledge but also that they very actively work

to build up their own research competence and thus themselves are able to produce occupationally relevant theoretical and empirical knowledge." *(Selander, 1990: 141 f)*

[38] The research contribution of universities is particularly evident in the medical profession *(Boyer, 1990: 18)*. Physician and medical writer Lewis Thomas points this out when he observes that "the development of immunizations for diphtheria, tetanus, lobar pneumonia, and other bacterial infections" *(Boyer, 1990: 18)* all based on painstaking research:

> "was basic science of a very high order, storing up a great mass of interesting knowledge for its own sake, creating, so to speak, a bank of information, ready for drawing on when the time for intelligent use arrived." *(Thomas, 1977: 165)*

[39] This type of assertion often includes the emergence of surgeons, physicians, and apothecaries as well as "the rise of the lower branch of the legal profession, and the appearance of the surveyors, architects, and accountants" *(Abbott, 1988: 3)*. In short continental Europe was "marked by a visible professionalization process which proceeded from top to bottom" *(Siegrist, 1990: 195)*. This can be exemplified in that:

> "Access to professions was defined and enforced by state regulations, and the practice of a learned profession was confined to those who were either appointed to a state office or who belonged to the select group holding authorized credentials." *(Siegrist, 1990: 195)*

[40] "Because the professions were concerned with central values and issues, particular moral, social and political prerequisites continued to play a leading role in the lives of professionals. A larger stratum of professionals now met these demands. Particular birthrights and the practice of purchasing appointments to official positions were done away with. A pattern of semi-autonomous office professions dominated in academic professions that were caught between the sphere of state and bureaucracy on the one hand, and society in general on the other. From the viewpoint of the absolutist state which enforced its own policies of public welfare on all levels of society, these professions were a type of occupational residue which could not be totally integrated into the state apparatus." *(Siegrist, 1990: 195)*

[41] This can be exemplified by the development of medical departments in the prestigious universities of Harvard and Yale, where it was not only the scientific advances that created the foundation for the medical schools. Instead, it was an:

> "alliance with powerful religious and political groups that enabled Connecticut and Massachusetts doctors to achieve by 1830 a legal monopoly for regular practitioners, university-affiliated medical schools" *(Haskell, 1984: xxv f)*.

This development caused much fury, as whilst some practitioners of medicine stood to gain from this academic affiliation and others stood to lose. The legalisation of an expert's authority and the affiliation with an academic institution introduced social, political and economic consequences for the old medical occupation *(Haskell, 1984: xxvi)*.

[42] The political development came from an advancement, where the state took on a new role that was positioned somewhere between that of the unions and organized capitalism, where the state allowed an administrative mixture that embodied principles of state control and self-regulation *(Siegrist, 1990: 193), (Siegrist, 1990: 197)*. These trends were already generally noticeable in the nineteenth century and were commonly intensified for most western countries in the last decades of the twentieth century *(Siegrist, 1990: 193 f)*.

[43] "At the onset of the 1790s, the French Revolution abolished the operational monopolies of advocates and physicians.51 The de-regulatory movement soon swept the French-dominated regions of Italy and Switzerland. Services that had previously been the exclusive domain of professionals were opened up in order to allow laymen and mature, responsible citizens to perform the respective operations and tasks. Laymen were thereby allowed to represent themselves in legal proceedings or to choose to whom their representation was to be entrusted. Persons who regarded themselves as competent, and as morally, socially and politically reliable, were allowed to earn their livelihood as medical practitioners or as legal advisers; laymen in legal fields were even permitted to become judges. A mature citizen's common sense was as highly esteemed as the professional's specialized scholastic expertise which depended primarily on general trust." *(Siegrist, 1990: 196)*

[44] "The boundaries between the state/legislative bodies and participant social partners vary, which is the reason why interest groups and associations of professionals were delegated supervisory powers which had previously been a function of the state." *(Siegrist, 1990: 197)*

[45] Generally it can be argued that it is not uncommon for most occupational group to at least unofficially aspire to professional rank and status, and as there is no standard definitions of a profession will often claims of professionalism be undisputed.

[46] "The professions, and in particular the Anglo-American variety, were therefore a great puzzle for social theorists" *(Abbott, 1988: 4)*.

[47] An examples of this can be found in the medical profession where the history of nursing is characterised by "a longstanding tension between a definition of their work as 'a calling' and the ambition to get it accepted as an ordinary skilled job" *(Beckman, 1990: 122)*. In particular:

> "the negative consequences for collective bargaining strength have made Swedish nurses (for example) keen to get rid of the 'vocational' label. Collectively organized pride in nursing has shifted from the ethical and honorary status of community work to the pride in particular skills of qualified labour."
> *(Beckman, 1990: 122)*

[48] "George Bernard Shaw (July 26, 1856-November 2, 1950) was an Irish playwright and winner of the Nobel Prize for Literature 1925." Source: www.wikipedia.org 24.11.2004.

[49] This criticism can be exemplified by the criticism that was directed towards the urban renewal programmes in the early Sixties, where critics argued that the urban renewal programme destroyed neighbourhoods. The unexpected consequences pointed out by critics like William Alonso led to the weakening of the underlying theory of the urban renewal programmes, which had an effect on fields as diverse as "housing, criminal justice, social services, welfare, and transportation" *(Schön, 1983: 10)*.

[50] "The Medicaid program in the United States, created on July 30, 1965 provides health insurance for the poor." Source: www.wikipedia.org 23.11.2004.

[51] "The Watergate scandal (or just 'Watergate') was an American political scandal and constitutional crisis of the 1970s, which eventually led to the resignation of President Richard Nixon. The affair was named after the hotel where the burglary that led to a series of investigations occurred." Source: www.wikipedia.org 23.11.2004.

[52] This can be exemplified by the disastrous effect expert opinions had on the financial development introduced by the Yeltsin administration in Russia, the Mobutu administration in Zaire, or the Abacha administration in Nigeria had on this countries economic development. These expert opinions had the effect of sending whole countries into soaring debt and near ruin *(Sternberg, 2002: 241)*. Equally, expert advice which has come under intense scrutiny and criticism is the "Vietnam War, the Bay of Pigs, the nuclear accident at Three Mile Island, the near-bankruptcy of New York City" *(Schön, 1983: 11)*.

[53] A dispute between a cognitive rebel and the professional establishment tends to favour the established experts, who have the backing of the whole of the professional institution in their quest to handle the burden of proof *(Haskell, 1984: xxxiii)*.

[54] This point of view which is argued among others by Jürgen Habermas when he claims that people's ability to take an independent ethical and political stand has been undermined by professional expertise and social engineering, which have been supported by a narrow positivist view of science *(Alvesson and Sköldberg, 2000: 115 f)*.

[55] This has led to politics becoming "more and more a matter of administering the social apparatus" *(Alvesson and Sköldberg, 2000: 116)*. Jürgen Habermas points out that science and technology have come to function much as "ideology" in western societies.

[56] Even in the light of criticism directed towards professions (as indicated in the previous section), the general public's trust and confidence in professions and occupations is often substantial. This is reflected in the publics trust in professionals such as lawyers, medical doctors, university professors, and even architects *(Wasserman et al., 2000: 105)*.

[57] Even with the development of ethical guidelines and standards which professionals are expected to adhere to, do conflicts emerge between different individuals within a profession and between professionals and client and or society. Professional institutions and professional societies tend to attempt to resolve these conflicts within the profession, where the ethical

guidelines and standards play a vital role in achieving this objective. If the ethical codes have been ignored or broken will professional institution enforce the code by bringing the “weight of their promotional and disciplinary powers to bear on adherence to the code” *(Fisher, 2000: 172)*.

[58] “I will apply dietetic measures for the benefit of the sick according to my ability and judgement; I will keep them from harm and injustice. I will neither give a deadly drug to anybody if asked for it, nor will I make a suggestion to this effect. Similarly, I will not give a woman an abortive remedy. In purity and holiness I will guard my life and my art. I will not use the knife ... but will withdraw in favour of such men as are engaged in this work. Whatever houses I may visit, I will come for the benefit of the sick, remaining free of all intentional injustice, of all mischief, and in particular of sexual relations with both female and male persons, be they free or slaves. What I may see or hear in the course of the treatment ... which on no account one must spread abroad, I will keep to myself” *(Weston, 2000: 300)*

[59] “Hippocrates of Cos (c. 460 BC–380 BC) was an Ancient Greek physician, commonly regarded as one of the most outstanding figures in medicine of all time; he has been called the father of medicine. He was a physician from the so-called medical school of Kos. Writings attributed to him (Corpus Hippocraticum, or ‘Hippocratic writings’) rejected the superstition and magic of primitive "medicine" and laid the foundations of medicine as a branch of science.” Source: www.wikipedia.org 23.11.2004.

[60] The Hippocratic Oath regulates the conduct of medical professionals, and it has been changed and amended over the years to reflect contemporary considerations, as is common for most ethical codes, guidelines and standards.

[61] This development can be exemplified in the development of the American Nurses association’s ethical guidelines which used to specify that nurses should:

> “always followed doctors orders, whereas more recent versions stress responsibility to patients and sometimes may even require nurses to become "patient advocates" against doctors” *(Weston, 2000: 302)*

[62] Nevertheless, ethical codes etc. can be an obstacle or be a pretext for avoiding personal reflections over the ethical implications. Ethical guidelines and standards are essential to developing coherence and specify minimum standards for professional conduct, but it cannot and should not substitute the individual ethical and value reflection, this as reflection “is essential to the process by which individuals function as agents of significant organizational learning” *(Schön, 1983: 338)*. It can be argued that ethical code etc. can have some ethical side affects. For instance, it can be argued that ethical guidelines and standards force professionals to do the right thing for the wrong reason, potentially limiting the individual professional ethical reflection and willingness to take personal responsibility *(Fisher, 2000: 172)*. Equally, ethical codes etc. can be criticised for the fact that they tend to be developed from a given professions’ point of view, where other stakeholders’ appear less prominently. The effect of this perspective is that ethical

codes etc. often prescribe what is morally correct from a single profession's point of view, whereas the point of view of other stakeholders tends to be neglected *(Fisher, 2000: 172)*. These points are inducted in the following:

> "All of this is built upon careful thinking about ethics, yet the finished product cannot qualify as ethical reasoning per se. Though these codes are perfectly suitable as professional statements, they are codes after all; hence ethics by stipulation […] What is striking about professional codes of ethics, as compared with philosophical or even theological ethics, is that the moral thinking so structured is inappropriately rigid. […] Further, such codes present the content of moral claims without the benefit of the supporting reasoning. It is a mistake, then, to take this fixed moral pronouncement as completing one's duties towards thinking about right and wrong. Surely such thinking needs to be an ongoing professional activity, and the best evidence of this need lies in the serious failings of such codes as they currently stand." *(Fisher, 2000: 172 f)*

Ethical codes etc. do not exempt professionals from individually reflecting over value issues concerning their professional conduct, and the value implications that are generated from their professional recommendations and decisions. The continuous development of ethical codes etc. do not resolve all ethical questions which face professionals as argued by Anthony Weston in his book the "A 21st century ethical toolbox" where he points out:

> "In the first place, most codes tend to be general. They lay out basic values and large ideals. Applying them to specific cases is still tricky. […] Codes can also come into conflict with each other, or even themselves […] there is debate about certain aspects of some professions' codes of ethics, especially requirements that seem to set lower or different ethical standards for professionals than for ordinary people." *(Weston, 2000: 302)*

[63] "The Renaissance was an influential cultural movement which brought about a period of scientific revolution and artistic transformation, at the dawn of modern European history. It marks the transitional period between the end of the Middle Ages and the start of the Modern Age. The Renaissance is usually considered to have begun in the 14th century in Italy and the 16th century in northern Europe. It is also known as "Rinascimento" (in Italian)." Source: www.wikipedia.org 08.09.2005.

[64] For further deliberation see 1.2.1 (Field of study and clarification).

[65] These architectural schools were Massachusetts Institute of Technology, Cornell, Illinois, Columbia, Syracuse, Pennsylvania, George Washington, Armour Institute and Harvard. And out of the 508 students where 384 regular and 124 special students *(Weatherhead, 1941: 63)*.

[66] “Thus a talented and honest architect could not guarantee the competency or scrupulousness of colleagues” *(Draper, 1977: 215)*.

[67] It is worth nothing that in the 1970s was there a reaction to this division of labour which “led younger designers in particular to attempt to undertake design, production, and marketing as a unified whole” *(Bürdek, 2005: 19)*.

[68] For further deliberation see 1.2.1 (Field of study and clarification).

[69] “Industrial designers were initially cast as specialists who were needed to `give form' to products that had already gone through technical development. Such industrial designers are being trained in art schools all over the world” *(Dorst, 1997: 16)*

[70] “Minoru Yamasaki (December 1, 1912–February 6, 1986) was a Japanese American architect, born in Seattle, Washington, a second-generation Japanese-American. A prolific architect, he is best known for his design of the World Trade Center, which was destroyed in the September 11, 2001 attacks” Sources www.wikipedia.org 09.09.2005.

[71] For more in depth discussions see 4.3 (Knowledge foundation from a values perspective).

[72] “Most important, buildings are commendatory or not in terms of standards of beauty, aesthetic pleasure, and expression. It is no wonder that architects profess to be artists

[]

Architects' view of their profession largely relates to the mystique of artistic creativity, and it resonates with the opinions of the top-ranking designers” *(Blau, 1984: 46, 49)*

[73] “École des Beaux Arts refers to several art schools in France. The most famous one is located in Paris, in the 6th arrondissement. Until 1897 women were barred from studying there. The Paris school is known as namesake and founding location of the Beaux Arts architectural movement of the early twentieth century.” Source: www.wikipedia.org 20.05.2005.

[74] It was not until 1940 that the France government:

> “deemed it necessary to restrict the practice of architecture exclusively to those holding diplomas (clients having hitherto been considered adequately protected against technical incompetence and malpractice by Article 1792 of the Napoleonic Code)” *(Collins, 1971: 121)*

[75] The first three States to pass such laws were Illinois (1897), Arkansas (1901) and California (1901) *(Bannister, 1954: 357)*.

[76] Within the Charlotte and Peter Fiell’s book is there mentioned a number of industrial designers which has no or little formal design training.

[77] “Le Corbusier (October 6, 1887–August 27, 1965) was the pseudonym of Charles Edouard Jeanneret-Gris. He was an architect famous for what is now called the International style, along with Ludwig Mies van der Rohe, Walter Gropius, and Theo van Doesburg.” Source: www.wikipedia.org 23.11.2004.

[78] “Roscoe Pound (1870 - 1964) was a distinguished American legal scholar and educator.” Source: www.wikipedia.org 16.09.2005.
[79] Wolff summarizes the main argument by arguing that:

> “emphasis on specificity takes up the ... question of the independence of art in relation to social or economic factors. Here the concepts of ‘specificity’ and ‘relative autonomy’ are more or less interchangeable. This line of argument ... maintains that although art is a social product (which is, however, thanks to the historical separation of the aesthetic as a distinct sphere, regarded and experienced as remote from its social determinants) it is also the case that it is not simply a reflection of its social origins. [...] The relative autonomy of art and culture consists in the specific codes and conventions of artistic representation, which mediate and (re)produce ideology in aesthetic form.” *(Wolff, 1993: 88)*

[80] “The contradictions that ensue when a master value is not accompanied by wide-ranging opportunities to work in terms of that value are bound to create the conditions for great disillusionment (or apostasy)” *(Blau, 1984: 59)*
[81] It can also be indicated by two disillusioned design graduates who argued that industrial design if it were a person would “be a `whining and insecure adolescent ... or perhaps a boastful drunk in a pub” *(Whiteley, 1993: 42)*.
[82] Some designers are at times undoubtedly inspired by artists in their quest for artistic freedom, and some designers even compare themselves with famous artists, as observed and argued by Nigel Whiteley:

> “Occasionally, the profession sees its own creativity in grandiose terms. In his company's heyday, Michael Peters remembers, `I was in Venice, looking at paintings in churches, and I thought to myself, "I am no different from those blokes: if I lie on my back and paint this I am exactly the same." Peter’s point was that Michelangelo was fulfilling a commission for a client, and therefore felt an obligation to that client. Given the profession's own hype about its value and special skills, it does not take an ungenerous mind to read this comment as implying that designers are on a par with artists such as Michelangelo because of their mutual creativity.” *(Whiteley, 1993: 42)*

[83] “Michelangelo di Lodovico Buonarroti Simoni (March 6, 1475 - March 18, 1564*) was a Renaissance painter, sculptor, poet and architect. He is famous for creating the fresco ceiling of the Sistine Chapel, one of the most stupendous works in all of Western art, as well as the Last Judgment over the altar, and "The Martyrdom of St. Peter" and "The Conversion of St. Paul" in

the Vatican's Cappella Paolina; among his many sculptures are those of the Pieta and David, again, sublime masterpieces of their field, as well as the Virgin, Bacchus, Moses, Rachel, Leah, and members of the Medici family (see article for more information on them); he also designed the dome of St. Peter's Basilica." Source: www.wikipedia.org 23.11.2004.

[84] "the achievements of most of the famous architects in history were due almost entirely to their own ability, ambition, and perseverance. No other profession in the past has offered a more open road to fame, for architecture is at least as much of an art as a profession." *(Briggs, 1974: 383)*

[85] For further deliberation see 2.2.3 (Design education from a value perspective) and 4.1.3 (Participants in the creation of design).

[86] "Medieval records indicate that responsibility for a building's final form has long been distributed among a number of individuals" *(Cuff, 1991: 73)*. For further deliberation see 4.1.3 (Participants in the creation of design).

[87] Especially within industrial design has the "star" designer's signature become an important asset that the public, clients and companies are willing to pay extra for.

[88] For further deliberation see 2.2.2 (Contemporary value discourse).

[89] "The absence in architecture of many equally valued roles helps to explain why there is such a discrepancy between what architects expect from their careers and what they experience." *(Blau, 1984: 59)*

[90] Looking from an historical perspective is there aesthetic style and ideology pluralism within architecture and industrial design, which has been well documented by a number of art and design historians such as: Penny Sparke, Jonathan M. Woodham, R. Stephen Sennott, Dan Cruickshank, Vernon Gibberd etc.

[91] This type of classification and thinking can be found in shifts classified by art and design historians such as: the change from Neoclassicism to The Machine Age leading to the Fin de Siècle and then to Modernism etc. *(Cruickshank, 2000)*.

[92] "Conservative Modernism … strong commitment to the idea of an egalitarian society within which modern design, allied with mass production industry, could help provide an opportunity for everybody to improve the material conditions of their lives. […] highlighted the importance of combining craft traditions with industrial manufacture and social reform" *(Sparke, 1998: 42)*

[93] "Progressive Modernism … The dominant metaphor for modern design in the first half of this century was … the machine. Perceived as a powerful symbol and perpetrator of progress, democracy and control over the unruly world of nature, […] innovations made possible by mass production … with the stylistic innovations … based on the principles of simplification and geometric abstraction […] a movement … essentially idealistic in nature and … based on the need for change and renewal. […] rooted in the principles of mass production and of geometric simplification, held that an object's outer appearance should be defined by its inner structure. … emphasized the belief in "truth to materials" and the importance of function." *(Sparke, 1998: 86)*

[94] For further deliberation see 2.2.1 (Design values as indicated by design history).

[95] Pluralist sets of design values are not only found in epoch of Modernism, but can also be exemplified by design diversity found in the coarse grouping called Fin de Siècle which predates Modernism etc. *(Cruickshank, 2000: 206 f)*.

[96] For more details see 5.1.1.3 (Structural, Functional and Material Honesty).

[97] For more details see 5.1.1.3 (Structural, Functional and Material Honesty).

[98] It can be argued that "postmodernism is not a singular style, but more a sensibility of inclusion in a period of pluralism" *(Nesbitt, 1996: 16 f)*.

[99] The diagram is based on the following sources: *(Nesbitt, 1996), (Sparke, 1998), (Woodham, 1997), (Craig, 2004), (Zipf, 2004), (Boyle, 2004), (Gale, 2004), (Amundson and Miller, 2004), (Brumfield, 2004), (Krieger, 2004), (Cormier, 2004a), (Tournikiotis, 2004), (Walters, 2004), (Steer, 2004), (McDonald, 2004), www.brunel.ac.uk 11.01.2005*.

[100] In cross-profession design teams is it important to determine the different roles and contributions between the professionals. For further deliberation see 4.1.3 (Participants in the creation of design).

[101] As introduced in 3.1.1 (Defining the concept profession) and 3.1.2 (The emergence of professions).

[102] For further deliberation see 6.3.2 (Framings place in design).

[103] The distinction between judges and advocates is clearly defined in the same way as the interests of the public and those of individual patients seldom collide *(Collins, 1971: 125)*.

[104] Architects can "in fact it cannot even lay exclusive claims on building, except on its design or artistic value inasmuch as most building is done with-out any architects" *(Blau, 1984: 135)*.

[105] It "is certainly far more controversial as regards its specific application" *(Collins, 1971: 125)*.

[106] For further deliberation see 3.1.4 (Ethical guidelines and standards).

[107] In comparison to the medical professions oath and its commitment to society is the conventional relationship between the design professions and society more diverse and sometimes questionable from a stakeholder and or society perspective.

[108] Architecture's and industrial design's impact on stakeholders and society through built environment is debatable. A number of scholars and design historians have argued that architecture and industrial design have a considerable impact on stakeholders and society, some have even pointed out that:

> "objects created by designers in previous decades are often regarded as the symbols and instruments of oppression, serving the purposes and pleasures of an elite while quietly excluding other voices" *(Buchanan, 1995a: 17)*

But it is possible to argue against the assertion that architects and industrial designers have considerable impact on society on the grounds that: designers have lost to clients and society more often than they have won when attempting to influence their clients and the society.

[109] The views generated from this uneasiness typically ranges from: it is a job and we need a job so we will do it, we will except to job and tried to reduce the downside through our expertise, we will not accept the job *(Thompson, 2000b: 47 - 51), (Collins, 1971: 205)*.

[110] "Kevin Roche (b. June 14, 1922 in Dublin, Ireland) is a late-twentieth-century corporate architect famous for his creative work with glass." Source: www.wikipedia.org 12.09.2005.

[111] Called Lake Shore Drive in Chicago situated at waterfront.

[112] Not all architects and industrial designers exclude consultation and participation; see section 5.1.2.2 (Consultation and participation).

[113] This might sounds contradictory as architects and industrial designers should have specialist knowledge, but are not familiar with bringing in user research into their design process. Chapter four will indicate that architects and industrial designers have a limited knowledge base and that they do not tend to bringing in much user research into their design process. For further deliberation see 4.3 (Knowledge foundation from a values perspective).

[114] Should stakeholders opinions or experience be subordinated that of the designers? And will the skill bases of architects and industrial designers make them ideally suited to determine stockholder's "real" and subconscious preferences? *(Spector, 2001: 72)*.

[115] For further deliberation see 6.3.2 (Framings' place in design).

[116] This can be exemplified by the assertion that as an architect would one most likely value beauty; as a homeless advocate would one would value housing as exemplified in 2.2 (Introduction to values in design).

[117] One could argue design research is not about asking people or stakeholders what they want, but is, or should be, a trained approach which identifies latent needs, which allows architects and industrial designers to designs with them in mind. Design research should not simply about asking people what they want, nor do they like this or that. These type of questions do not get the results one need, just opinions which might be accurate or simply because you asked them. The problem with this argumentation is that architects and industrial designers are not trained in this type of research, nor is it common within design schools. The more fundamental problem lies in the presumption that it is possible to identify latent needs within a terrain characterised by numerous tradeoffs.

[118] It has been argued:

> "Does `society as a whole' really expect anything from designers as a profession? Do they even know who we are, or give a damn anyway? Wouldn't `society' prefer to see our industry as an integral part of a healthy economy, striving to create opportunity and employment, rather than an elitist profession which ... must surely go the way of the dinosaur?" *(Whiteley, 1993: 160)*

[119] The business model viewpoint can be contrasted with another industrial designer's heartfelt comment which is questioning the business point of view:

> "If industrial design is to set itself up as a profession, it must work out whether or not it is a servant of industry and whether or not it is a profession which faces up to moral issues ... What is important, however, is that the designer should never become the tool of the marketing profession - a clown, prostitute or stylist." *(Whiteley, 1993: 160)*

[120] With design values as diverse as these two positions indicates, is it possible to conclude that industrial design have a unsettled relationship towards society, where designers are unsure of their potential impact and responsibilities towards society.

[121] Within the boundaries of a general contract between professional-client relationships are there large areas of optional freedom for both parties, as illustrated in the following:

> "The client may show more or less deference, more or less compliance with the professional's advice, may present a greater or lesser challenge to the professional's opinions. In turn, the professional may show more or less sympathy with the client's problems, evince more or less effort at understanding his situation, reveal more or less of the special knowledge available to him, all of which may depend on the professional's perception of the client's status, his ability to pay, or on prior relations of friendship or obligation." *(Schön, 1983: 292 f)*

[122] If a serious dispute arises over the performance within the professional-client relationship, both sides have the opportunity of testing the accountability through the legal system. This most notably takes place in the medical professions with their sometimes very public medical malpractice lawsuits etc. *(Schön, 1983: 293)*.

[123] Michelangelo's comment was made in response to cardinals arguing that the lighting in the proposed design for St. Peter's Cathedral would be inadequate. Michelangelo made the assertion in order to reassert his authority as the responsible designer, and draw a line between himself as an architect and the influence allowed to the Church as a patron of the design *(Vasari, 1979: 1898)*.

[124] For further deliberation see 3.2.1 (The artist that lives inside the professional designer).

[125] The initial condition in the early periods with the church and landowners as patrons has not been used to develop genuine autonomy within architecture, which have left architects and to some degree industrial designers tied to their patrons *(Cuff, 1991: 33)*.

[126] The difference between helping and serving is a crucial one in design, as it addresses the balance between the designer and the client, which is indicated in the following:

> "Serving is different from helping. Helping is based on inequality; it is not a relationship between equals […] Service is a relationship between equals.

> Helping incurs debt. When you help someone they owe you one. But serving, like healing is mutual. There is no debt." *(Remen, 1996: 24)*

[127] Clients who have no confidence in architects or industrial designers would properly not hire them in the firsts place.

[128] Few want a boring or poor building or product, but many clients can not accept that architects and or industrial designers cannot deliver the best possible building or product within their stated constraints on time and budget *(Jackson, 1993: 15)*.

[129] For further details see 4.2.2 (The emphasis on novel design solutions) and 2.2.3 (Design education from a value perspective).

[130] For further details see 4.2.2 (The emphasis on novel design solutions) and 2.2.3 (Design education from a value perspective).

[131] This typically includes client's lack of "technical knowledge … materials, codes, and building systems, as well as the significant but ambiguous knowledge based on 'experience'" *(Cuff, 1991: 39)*.

[132] Architects and industrial designers will therefore, from their positions of expert authority, often attempt to open and close lines of inquiry with regards to the design process. Through this will they attempt to "dominate clients who are not familiar enough with the design process to recognize its potential flexibility" *(Cuff, 1991: 93)*. It is not uncommon for architects and industrial designers to attempt to use "technical knowledge" and experience to offer themselves protective shelters where clients' challenges can be repulsed, as well as a protection for designers decision-making authority *(Cuff, 1991: 39)*.

[133] Beyond limits like these, architects and industrial designers will vary in terms of what they consider to be negotiable constraints. For example, some architects will accept at face value a proposed program for a given building, whereas others will se as their responsibility to evaluate and reconsider the client's program.

[134] This strategy for acquiring clients is typical for young innovative design offices characterised by "numerous outstanding projects and awards but no capital, pursuing aesthetic goals that outweigh business interests" *(Cuff, 1991: 105)*.

[135] "Several elite designers report difficulties in relating to a sometimes timid, sometimes arrogant intermediary who must be treated as an expert but cannot be treated as a colleague." *(Larson, 1993: 120)*

[136] Designer as artist is characterised by the designer having:

> "complete influence over the process and the client has little to none. The designer is not interested in the desires or needs of the client. Instead, he or she creates a design based on his or her own judgments concerning the requirements for a satisfactory design solution. We often see this type of designer being glorified as a `prima donna', or celebrity designer. Clients who desire

> prestige, or status, by being identified with high profile designs, often seek out this type of design relationship." *(Nelson and Stolterman, 2003: 57 f)*

[137] Designer as a facilitator is characterised by designer which:

> "simply `obeys' any and all requests coming from the client. In this situation, it is accepted that the client knows precisely what he or she wants or needs, and knows specifically what should be done as a consequence-without any input from the designer. The client is, in this case, the sole creative agent in the design process. The designer becomes merely a facilitator." *(Nelson and Stolterman, 2003: 58)*

[138] Designer as technician is characterised by:

> "designers acting simply as technicians; by that we mean they don't contribute intentionally, or creatively, to any part of the design process. Instead, they answer questions, or respond to wishes from an intentional client, acting as an instrumental agent only." *(Nelson and Stolterman, 2003: 58)*

[139] Designer as expert which is characterised by clients being:

> "called to respond to initiatives taken by the designer. The designer enters the design process as an expert, with predetermined insights and outcomes in hand, dismissing the necessity of customized interactions with the client. As an expert, the designer determines which generalized solution, or solutions, will be adapted to the particular situation of the client." *(Nelson and Stolterman, 2003: 58 f)*

[140] Designer as entrepreneur is characterised by: the designer designs the object, takes responsibility for the developed and follows it through into production. The design then takes a responsibility for the sales of the product. In short the architect and the industrial designer build what he or she draws *(Edwards, 1999: 33)*.

[141] For further deliberation, see 3.2.2 (Pluralism tendency within design profession).

[142] For further deliberation on this point see 3.2.2 (Pluralism tendency within design profession).

[143] Generally can it be argued that the role of the design professions is under pressure from other professions, even if the increased wealth and visually discriminating society found in contemporary Western society's favours, at least in theory, what architects and industrial designers have to offer *(Cruickshank, 2000: 337)*. Dan Cruickshank forecast in his book the "Architecture: the critics' choice" that the trend is bound to continue:

"As architecture becomes more complex and all-embracing – including issues of engineering, cost control, planning, communications technology, sustainability and the design of specialized interiors and exteriors — it is likely that the architect's role will reduce dramatically. The architect will become just one member of a large team, probably responsible only for the external appearance of the building, with structural engineers, planners, quantity surveyors, energy consultants, interior designers and other specialists being responsible for their areas of expertise. […] the architect's diminishing responsibility is not only an accurate reflection of the true state of affairs — for some years it has been generally acknowledged that structural engineers have played an increasing role in the creation of particularly demanding structures such a Piano and Rogers' Centre Pompidou in Paris." *(Cruickshank, 2000: 337)*

[144] For further discussion see 4.1.2 (Economy in design).

[145] The change in architect-client relationship is illustrated in the following table:

Aspect	1960's and 1970's	1990's
Clients	Relatively unsophisticated Public sector influential Less informed purchasers	Different client types Large private sector influence More informed purchasers
Clients' objectives	Emphasis on one feature of time or cost or quality Less awareness of management	Time, cost and quality requirements balanced Greater awareness of industry's shortcomings
Procurement process	Standardized Few contract types	Many more contract types Growth of design and building Growth of project management
Professional team	Architect as project manager Roles clearly defined and consistent across projects Not much fee competition	Separate project manager Flexible roles Integrated team Careful selection
Architects' role	Defined by plan of work Head of the building team	Negotiated — can vary for each project

(Jackson, 1992: 21)

This is often seen as a worrying signal for most design professions as the status and the role enjoyed by architects is especially important for most design professions. This is due to the fact that architects have traditionally been seen as the most established profession among the design professions, thus, is the status of architecture and the architectural professions' designer-client relationship important to other design professions *(Sparke, 1998: 10)*.

[146] These aspects "have grown up and been tolerated over the years within the architectural profession and which have contaminated our collective offering to clients" *(Jackson, 1993: 3)*.

[147] Clients tends not "accept that architects cannot deliver the best possible building within their stated constraints on time and budget" *(Jackson, 1993: 15)*. But at the same time do many architectural and industrial design practices:

> "welcomed the involvement of good project managers in a client team, and some practices seem to have become reliant on other professionals — project managers, quantity surveyors and contractors — to manage the cost and time elements of the project." *(Jackson, 1993: 16)*

[148] "Small clients making changes to their homes seem especially to show a high level of emotion and vulnerability, particularly if they are inexperienced in using architects" *(Jackson, 1993)*

[149] This might not be considered surprising as some architects call it a duty to deceive *(Larson, 1993: 14)*.

[150] For further deliberation see 3.3 (The design profession from a society perspective).

[151] See 3.1.1 (Defining the concept of profession).

[152] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[153] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[154] Further details see 4.3.1 (Design generalist versus specialisation).

[155] This aspect is has been touch upon in 3.1.1 (Defining the concept of profession).

[156] Further details of the generalist design value can be found in 4.3.1 (Design generalist versus specialisation).

[157] For further deliberation, see 4.3.1 (Design generalist versus specialisation).

[158] "Are they artists who express themselves through the medium of "space"? Are they providers of real estate, social engineers, environmental controllers, coordinators of the numerous interests and experts, which are involved nowadays in the "complex" activity of building? Etc., etc." *(Rittel, 1976: 80)*

[159] This tends to have the subsequent effect of acquiring clients' dependence, social status and concrete economic and social privileges *(Blau, 1984: 8)*.

[160] These professions have undercut the capability of architectural occupation "of attaining a monopoly, and hence have reduced the likelihood of achieving the social status and income comparable to those of, say, medicine" *(Blau, 1984: 8)*.

[161] "Research on industrial design in general and on the relationship between industrial design and company performance in particular, is extremely light ... At best, the few studies that have been conducted in this area identify possible contributions of industrial design and/or offer

anecdotal evidence on the positive effect of industrial design on company performance." *(Gemser and Leenders, 2001:28 f)*

[162] "Not all members of the profession are equally affected by this process of re-evaluation and change in theory, but its consequences for practice are far-reaching." *(Blau, 1984: 135)*

[163] Further details see 4.2.1 (Design verses art), 4.2.2 (The emphasis on novel design solutions) and 4.2.2.1 (Creativity in design).

[164] Further deliberation can be found in 4.2.3 (The "holistic" approach).

[165] Further deliberation can be found in 4.3.1 (Design generalist versus specialisation).

[166] Further deliberation, see 3.2.1 (The artist that lives inside the professional designer) and 4.2.1 (Design verses art).

[167] For further deliberation see 4 (Values in design practise) and 5 (Designers' distinctive design values).

[168] Professional society for architects and industrial designers include organisations such as the: the Royal Institute of British Architects (RIBA), Architects Registration Board (ARB), European Association for Architectural Educations (EAAE), American Institute of Architects (AIA), International Council of Societies of Industrial Design (ICSID).

[169] Quote taken from the masquerade "This week Men At Work talks to Sir Jeremy Creep, Principal of the London College of Architects in Rohan Point, Putney" *(Fry, 1993)* Page 12.

[170] The idea of a contract between society and professions has its foundation in the seventeenth century and the writings of the English philosopher Thomas Hobbes where he in the Leviathan outlines the concept of the social contract *(Spector, 2001: 10)*. The idea of the contract relationship between society and professions is not restricted to the philosophical perspective, but can also be found in sociology represented by the late pioneering sociologist of the professions Everett Hughes. He argues that society has struck a bargain with the different professions that can be categorised as a contract between society and the professions.

[171] These aspects have been introduced in 3.1.1 (Defining the concept of profession).

[172] This point was deliberated on in 3.1.1 (Defining the concept of profession).

[173] For further details, see 3.1.4 (Ethical guidelines and standards).

[174] This is the case even if there often exist a clear notion within part of the two professions that design engages in and ethically significant contract with society *(Spector, 2001: 11)*.

[175] It is worth noting that Larson's point of view effectively denies the relevance of any moral aspects of society versus professionalism; professional ethics would with Larson line of thought be limited to a self-serving rhetoric. *(Spector, 2001: 10 - 12)*.

[176] See the beginning of the chapter (3.1 (The concept of profession)).

[177] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[178] Counterprofessionals and advocates of public interest groups questioning of the legitimacy of professional expertise is not only limited to the professions, but has also lead to a questioning the professional education, which is seen as the basis for the profession's expertise. This is high-lighted in:

> "The crisis of confidence in professional knowledge corresponds to a similar crisis in professional education. If professions are blamed for ineffectiveness and impropriety, their schools are blamed for failing to teach the rudiments of effective and ethical practice." *(Schön, 1987: 8)*

[179] The public scrutiny and challenge of professional knowledge and consequently its educational establishment, is not limited to the design profession, but is also found in business schools which its M.B.A.'s which are criticised for having failed to exercise responsible stewardship. Equally are the schools of engineering discredited as they are seen as "producing narrowly trained technicians deficient in capacity for design and wisdom to deal with dilemmas of technological development" *(Schön, 1987: 8)*.

[180] For further details, see 6.4 (Design evaluation is based on value sets).

[181] For further details, see 3.2.3 (Designer's unsettled relation towards society).

[182] This as the scope of professional expertise is then limited by the particular situation of uncertainty, instability and uniqueness *(Schön, 1983: 345)*.

[183] Within Larson's perspective would professionals which has a desire to do morally good towards society, experience an inner conflict between the desire to serve society and the desire to promote one's own profession and one's own professional authority *(Spector, 2001: 12)*.

[184] Designers inner conflict is instead often focused on how to promote:

> "the beauty of the built environment in the face of the an-aesthetic values of capitalism, or how to represent the interests of groups that are not present during design, or how to bring meaning to desultory suburban landscapes." *(Spector, 2001: 12 f)*

Designers are not troubled by or are in a dilemma about how to reconcile their moral feelings with their struggle to achieve a monopoly over a segment of the building and product producing industry. This lack of reflection over the moral dilemma is may be due to the "weak" nature of design professions *(Spector, 2001: 13)*.

[185] For further details, see 3.1.3 (Critique and challenges linked to professions).

[186] "His Royal Highness The Prince Charles, Prince of Wales (Charles Philip Arthur George Mountbatten-Windsor, formerly Windsor), styled HRH The Prince Charles, Duke of Rothesay in Scotland and HRH The Prince of Wales elsewhere (born 14 November 1948) is the eldest son of Queen Elizabeth II and Prince Philip, Duke of Edinburgh. He is heir-apparent to the throne of the British Monarchy and as a result first in line to become King of the United Kingdom and over a dozen Commonwealth Realms." Source: www.wikipedia.org 08.02.2005.

[187] Public pressure groups have through counterprofessionals, militant minorities and citizens' groups been able to make special interest politics the order of the day *(Schön, 1983: 341)*.

[188] "In turn, this has extended the time frame of every project in an office, so that firms must now carry more projects in order to maintain the same work load." *(Cuff, 2000: 354 f)*
[189] This is the case even if they generally acknowledge that the public interest and support are crucial for the accomplishment of some design projects *(Edwards, 1999: 124)*.
[190] Typically conducted in "conferences and journals, and as it materializes in academic curricula" *(Rittel, 1976: 82)*.
[191] Organised consumer boycotts or radical consumer actions tend to appear when ordinary political pressure other forms of public pressure seems to be failing *(Whiteley, 1993: 131)*.
[192] Further indication can be found in chapter 5, particularly in 5.1.2 (Social design values).
[193] This can be indicated in statements like the following:

> "Further, it will be suggested that architecture is related to the democratic community, and that good architecture is seen to be the result of a democratic process. In contemporary life, identification is being sought by individuals and by communities, and architecture is potentially one of its foremost manifestations." *(Edwards, 1999: 53)*

[194] This can be illustrated in the changes which has taken place in the engineering profession, were:

> "opposition to nuclear weapons in the 1950s and 1960s, together with the consumer and environmental movements of the 1960s and 1970s, provoked some engineers to challenge both national and business directions. In conjunction with a renewed concern for democratic values-especially as a result of the civil-rights movement-this challenge led to new ideas about engineering ethics." *(Mitcham, 1997: 263)*

[195] Which has gone from stating in 1947 that: engineers should be committed to interest himself or herself in the public welfare, to: engineers are to use their knowledge and skill for the enhancement of human welfare *(Mitcham, 1997: 263)*.

C H A P T E R   F O U R

[1] The changing premise for architecture and design which emerged as a consequence of new technology in the 19th and the 20th-century led to a questioning of the fundamental principles behind design, and a number of new approaches to design were developed in response to these new possibilities, during the 19th and 20th-century *(Cruickshank, 2000: 175)*.

[2] Among many contributing factors to this extraordinary development that has taken place in Western society through the last centuries, technological development has been a main contributor.

[3] At the same time technological advances have not offered a solution to the substantial imbalances that exist between nations and global regions, “with respect to economics, health-care, education, food, and material and natural resources” *(Wasserman et al., 2000: 13)*.

[4] “It was against the backcloth of this reactionary climate that modern design was born” *(Sparke, 1998: 10)*. It can be argued that it was architects that show the way in this new-found climate of technological development, though their new architecture has transformed the built environment beyond recognition of what had previously been built.

[5] The technological advances that have been taking place in the 20th and the 21st century have created the foundation for many new and complex products, which were unfamiliar to previous generations. For further deliberation see 2.2.1 (Design values as indicated by design history).

[6] “The rifle wiped out the buffalo, but nuclear weapons can wipe out man. Dust storms lay whole regions waste, but too much radioactivity in the atmosphere could make the planet uninhabitable. The domestication of animals and the invention of the wheel literally lifted the burden from man's back, but computers could free him from all need to labor.” *(Mesthene, 1997: 74)*

[7] Society and individuals are “therefore devoting significant effort to the search for ways to measure the full range of its effects rather than only those bearing principally on the economy” *(Mesthene, 1997: 74)*.

[8] The types and speed of change has come under scrutiny from academic scholars and philosophers, who have been researching and questioning the validity of such technology development. The value related implication of technological advances can for instance be illustrated by Jean-François Lyotard critique of technological advancements, where he introduces the concept of inhumanism and “calls for a reassessment of the significance of the human, and a realignment of our relationship to technology” *(Sim, 2001: 15)*. Jean-François Lyotard’s argumentation is based on the changes that have occurred in the relationship between humans and machines. This relationship has been altered dramatically in recent decades and there is no indication that this trend of changes will end soon. The relationship between humans and machines used to be one where the humans where firmly in control, whereas the contemporary relation between humans and machines is more questionable. Lyotard argues that it has become more of a relationship of corporation and even domination from the machine side. This is especially the case if one includes the advanced forms of artificial intelligence in the humans and machines relationship. The continuous tendency of change regarding the relationship between humans and machines, gives rise to the reflection over how far we are willing to allow this phenomenon to continue developing. This type of moral dilemma poses possibly one of the most important moral dilemmas of our age, which concerns the whole society including architects and designers alike. *(Sim, 2001: 16)*.

Equally, the value related aspects of technological development can be indicated by the resistance it has been met by some moral thinkers such as Allen Wheelis, whom suggests that the harvest i.e. results of technological development has been cruel and meagre *(Wheelis, 1973: 22)*. It has been pointed out that society ought not to turn the technical development over "to technicians who will never ask is it right or wrong but only will it work" *(Wheelis, 1973: 22)*. This as technology-based judgements can at times be made on too narrow grounds where the focus is only on whether a new "device serves a particular need, performs more efficiently than its predecessor, makes a profit, or provides a convenient service" *(Winner, 1997: 61)*. Such narrow perspectives might overlook the undesirable side effects or secondary consequences as these tend to only become clear later. However, it should be noted that not all technological innovation embodies choices or side effect of great significance, some developments are more-or-less trivial, innocuous, incremental and only crate trivial modifications to already existing artefacts *(Winner, 1997: 68)*.

[9] There is a lacking sense of broad and devoted awareness of what changes might be generated, and what these changes means for the society as a whole. Or put in another way; society with regards to the technical realm repeatedly enters into a series of social contracts where the terms of technological development is revealed only after the signing *(Winner, 1997: 61)*.

[10] "Langdon Winner is Professor of Political Science in the Departement of Science and Technology studies at the Rensselaer Polytechnic Institute, Troy, New York since 1990. [...] Winner is known for his articles and books on science, technology, and society." Source: www.wikipedia.org 30.11.2004

[11] Winner argues that social scientists have attempted to address the sleepwalker by developing methods of technology assessment, which brings to light phenomenon that were previously overlooked or disregarded *(Winner, 1997: 61)*.

[12] Winner argues that the shortcomings of social science is its tendency to view technology assessment from a perspective which sees technological development and change as a "cause" and everything that follows as an "effect" or "impact". This perspective leads the researcher to identify, observe, and explain the "effect" or "impact" and at the same time assumes that the causes have already take place or are bound to do so in the ordinary course of events. Winner describes this as entering the research scene (stage) to study the "consequences" of the technological changes, and uses the following metaphor to describe the shortcomings: "after the bulldozer has rolled over us, we can pick ourselves up and carefully measure the treadmarks" *(Winner, 1997: 61)*. Emmanuel G. Mesthene argues that there exists a good deal of research that is aimed at discerning the particular effects of technological change on industry, government, or education. But Mesthene asserts that research that is aimed at systematic inquiry focused on determining the effect of technological development, its impact and implication for the contemporary society as a whole, is "relatively recent and does not enjoy the strong methodology and richness of theory and data that mark more established fields of scholarship" *(Mesthene, 1997: 72)*.

[13] For some indication of this see 5.1.1 (Aesthetic design values), 5.1.4 (Traditional design values) and 5.1.2 (Social design values).

[14] "Technology is seen as the motor of all progress, as holding the solution to most of our social problems, as helping to liberate the individual from the clutches of a complex and highly organized society, and as the source of permanent prosperity; in short, as the promise of utopia in our time. This view has its modern origins in the social philosophies of such 19th-century thinkers as Saint-Simon, Karl Marx, and Auguste Comte. It tends to be held by many scientists and engineers, by many military leaders and aerospace industrialists, by people who believe that man is fully in command of his tools and his destiny, and by many of the devotees of modern techniques of 'scientific management'." *(Mesthene, 1997: 72)*

[15] "Technology is said to rob people of their jobs, their privacy, their participation in democratic government, and even, in the end, their dignity as human beings. It is seen as autonomous and uncontrollable, as fostering materialistic values and as destructive of religion, as bringing about a technocratic society and bureaucratic state in which the individual is increasingly submerged, and as threatening, ultimately, to poison nature and blow up the world. This view akin to historical "back-to-nature" attitudes toward the world and is propounded mainly by artists, literary commentators, popular social critics, and ex-istentialist philosophers. It is becoming increasingly attractive to many of our youth, and it tends to be held, understandably enough, by segments of the population that have suffered dislocation as a result of technological change." *(Mesthene, 1997: 72 f)*

[16] "It argues that technology as such is not worthy of special notice, because it has been well recognized as a factor in social change at least since the Industrial Revolution, because it is unlikely that the social effects of computers will be nearly so traumatic as the introduction of the factory system in 18th-century England, because research has shown that technology has done little to accelerate the rate of economic productivity since the 1880s, because there has been no significant change in recent decades in the time periods between invention and widespread adoption of new technology, and because improved communications and higher levels of education make people much more adaptable than heretofore to new ideas and to new social reforms required by technology." *(Mesthene, 1997: 73)*

[17] Each of these points of view tend to be supported by empirical based research, as they contain, to some degree, a measure of truth and tends to reflect a real aspect of the relationship of technology and society, but all of these views have shortcomings, as they tend to disregard or ignore altogether a number of "social, cultural, psychological, and political effects of technological change" *(Mesthene, 1997: 73)*.

[18] All three have a narrow focus which do not produce realizations about the "actual mechanism by which technology leads to social change or significant insight into its implications for the future" *(Mesthene, 1997: 73)*.

[19] Questions worth considering are such as: are the current developments of technology contributing to the “growth in human freedom, sociability, intelligence, creativity, and self-government? Or are we headed in an altogether different direction?” *(Winner, 1997: 68)*.

[20] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[21] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[22] Architects and industrial designers might differ as to when the ongoing expansion of technology, materials and building systems became unmanageable, but most will agree that expansion is without a doubt continuing. *(Cuff, 2000: 348)*.

[23] These changes started to occure in the 1950s and have continued to develop at an extraordinary pace until today (and still continuing). This can be illustrated by the design of the aluminum Gyrotron exhibited at Montreal's Expo in 1967 by Boyd Auger, which then consisted of a large single space frame which it took two hours of computer time to calculate. Two hours of computer time was at that time the equivalent of 30,000 lifetimes of hand calculation. Today hand calculations are irrelevant, as there exists computers which perform three trillion calculations per second *(Cuff, 2000: 346 f)*.

[24] The old way of zipping drawings back and forth in mailing tubes and its successors of slicing drawings into strips to be fed through fax machines, is replaced by computer drawings which can be shared instantly *(Cuff, 2000: 349)*.

[25] Within architecture the building “materials and systems as well as labor pools … [is] internationally accessible; only the building site remains geographically fixed” *(Cuff, 2000: 349)*.

[26] “Expertise in the current developments of computer capabilities is held by the most recent graduates of schools of architecture, thus unraveling the relationship between experience and wisdom.” *(Cuff, 2000: 347)*

[27] This point can be illustrated by Frank O. Gehry's well-known use of Catia which is software developed first for warplane design *(Till, 2005: 169)*.

[28] Within this development became complex technological issues the order of the day for architects “ranging from comfort levels to global warming became linked through building technology” *(Cuff, 2000: 347)*.

[29] For further deliberation, see 5.1.3 (Environmental design values).

[30] Consequently, it is possible to assert that new technology and materials set new possibilities (i.e. considerable premises) for architecture and industrial design, and that this development has put designers face to face with an accelerated technological innovations never experienced before *(Margolin, 1995: 61)*. This development has allowed for new types of products and buildings to emerge and have caused dramatic changes to already existing products and buildings. The general advances in science, technology and communication, which have enhanced the living standards in the western society, have created the opportunity to “be almost anywhere, anytime, with almost any self-created self-image, experiencing virtual worlds” *(Wasserman et al., 2000: 13)*. This can be illustrated by the fact that more complex products than ever before are being introduced in to society *(Margolin, 1995: 61)*.

[31] In their view it is this failure which has led to the rise of competing and infringing professional specializations *(Symes et al., 1995: 16)*.

[32] This is the case even if many architects and industrial designers tend to argue that the two design professions have a great potential for contributing to technological development. For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[33] For further deliberation, see 4.1.3 (Participants in the creation of design).

[34] For further deliberation, see 4.2.3 (The "holistic" approach).

[35] The expectations directed towards the design professions from society have to some extent their origin in the technological development, this through the expectations and demands that the constant technology development itself generates within the society. The design professions as well as other professions must bear the burden of responsibility for generating and managing this change. This places a burden and a requirement for adaptability on professions which is unprecedented in modern times *(Brooks, 1967: 89)*.

[36] For further deliberation, see 3.2.4 (Designer's unsettled designer-client relationship) and 3.2.5 (The design profession's peculiarities and abnormalities).

[37] For further deliberation, see 4.3.1 (Design generalist versus specialisation).

[38] For further deliberation see 4.2.3 (The "holistic" approach), 4.3.1 (Design generalist versus specialisation) and 4.3.3 (Skill based as opposed to knowledge based).

[39] This leaves consumers with the choice among what is produced within economic realities, rather than what they would like to have.

[40] "Profits are partly compounded out of sales - but only partly. Profits are also compounded out of how much staff time has to be spent, whether a marketing arrangement is already in place, how easily manufacturing facilities can be converted, how reliably an item can be mass-produced - and similar considerations." *(Cowan, 1985: 215)*

[41] For instance architects must "command building economics in order to give sound advice to clients and to use the construction process for the clients' benefit" *(Jackson, 1992: 9)*.

[42] For further deliberation see 6.2.1 (Design is generally value based as oppose to fact based).

[43] "The Royal Institute of British Architects (RIBA) is a professional body for architects in the United Kingdom. It was awarded a Royal Charter in 1837. The RIBA is a member organisation, with 30,000 members. It is based in central London and in a dozen regional offices. It runs many awards including the Stirling Prize." Source: www.wikipedia.org 03.12.2004.

[44] The difficulties of combining the art aspects of design with the business side of design are not addressed by most design schools.

[45] For futher deliberation see 6.4 (Design evaluation is based on value sets).

[46] This includes "subordination of employees to managers, rationalization of the firm's activities and of its internal division of responsibility, and administrative control over the means by which work is produced" *(Blau, 1984: 44)*.

[47] For more details on company size see appendix 8.2 (Company size in design).

[48] For more details see appendix 8.2 (Company size in design).

[49] The fact that most architects and industrial design firms tend to be small companies limits what clients are requesting from design offices, as for instant big corporations will find it hard to rely solely on small one man companies which characterises both architecture and industrial design.

[50] For more details see 4.3.1 (Design generalist versus specialisation).

[51] "Paul Marvin Rudolph (October 23, 1918 in Elkton, Kentucky – August 8, 1997 in New York City, New York) was an American architect and the Dean of the Yale School of Architecture for six years. His most famous work is the Art and Architecture (A&A) Building on the Yale campus, a spatially complex Brutalist concrete structure." Source: www.wikipedia.org 29.09.2005.

[52] For more details on company size see 8.2 (Company size in design).

[53] As introduced in 3.2.1 (The artist that lives inside the professional designer).

[54] There is not a great deal of correspondence when it comes to participations between real life design projects and what is often taught in architectural and industrial design schools. But the general reluctance to focus on all the participants in design projects in design education etc., have tended not interfered with the realisation and acknowledgement that architecture and design is a complex tasks which involves a number of different subjects, skills and knowledge.

[55] For more detail see 4.3.1 (Design generalist versus specialisation).

[56] For further deliberation see 4.1.1 (Technological determinism, possibilities and challenges).

[57] Due to holism, designers tend to see themselves as the sole representative of the holistic overview in the design outcome. For mere details see 4.2.3 (The "holistic" approach).

[58] For more deliberations on this point see 6.3.2 (Framings place in design).

[59] For more details on framing see 6.3.2 (Framings place in design).

[60] "Upstream the political, social and economic strategies are still fluid, the process is still open and innovation is on the cards" *(Porter, 2000a: 28)*.

[61] For more details see 2.2.3 (Design education from a value perspective).

[62] More detail can be found in 4.1.2 (Economy in design).

[63] For more deliberations see 4.1.2 (Economy in design).

[64] Corporate reputation refers in this section to "the position a company holds in the minds of its customers, employees, investors, and other stakeholders" *(Kosnik, 1991)*.

[65] "MacCormac, R Design is...(Interview with N. Cross), BBC/Open University TV broadcast (1976)" *(Cross, 1999: 29)*.

[66] Sir Richard MacCormac architect and chairman of MacCormac Jamieson Prichard established in 1972 and incorporated in 2002. Richard has taught and lectured widely, and published articles on urban design and architectural theory.

[67] "The concept of "wicked problems" was originally proposed by H. J. Rittel (a pioneering theorist of design and planning, and late professor at the University of California, Berkeley) and M. Webber (1) in a seminal treatise for social planning." Source: www.wikipedia.org 06.12.2004.

[68] “Rittel expounded on the nature of ill-defined design and planning problems which he termed "wicked" to contrast against the relatively "tame" problems of mathematics, chess, or puzzle solving.” Source: www.wikipedia.org 06.12.2004

[69] Even if tame problem solving is the main problem solving area taught in most schools is very few every day problems strictly within the category of “tame problems”. This fact has lead to criticism of the school system as well as IQ testing (intelligence quotients test) which represent ability to solve tame problems. IQ tests are commonly criticised on the ground that it is not applicable towards everyday life problems and this critique is often connected to concept of wicked problems and tame problems.

[70] Donald A. Schön looks at problems from a practice point of view and argues that “the situations of practice are not problems to be solved but problematic situations characterized by uncertainty, disorder, and indeterminacy” *(Schön, 1983: 15 f)*.

[71] “John Dewey (October 20, 1859 - June 1, 1952) was an American philosopher, psychologist, and educational reformer, whose thought has been greatly influential in the United States and around the world.” Source: www.wikipedia.org 02.04.2005.

[72] “Herbert Simon (June 15, 1916 - February 9, 2001) was a researcher in the fields of cognitive psychology, computer science, economics and philosophy (sometimes described as a polymath). He was awarded the ACM's A.M. Turing Award along with Allen Newell in 1975 for making ‘basic contributions to artificial intelligence, the psychology of human cognition, and list processing.’ In 1978 he was awarded The Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel ‘ [The Bank of Sweden Prize in Economic Sciences often inaccurately called The Nobel Prize in Economics] for his pioneering research into the decision-making process within economic organizations’. He invented the terms bounded rationality and satisficing.” Source: www.wikipedia.org 07.12.2004.

[73] “A mathematician, designer, and former teacher at the Hochschule für Gestaltung (HfG) Ulm” *(Buchanan, 1995b: 13 f)*.

[74] For further deliberation see 6.2.1.3 (A design problem and compromise perspective), 6.3.2 (Framings place in design) and 6.3.3 (Design decisions are primarily based on value sets).

[75] Definition of a “problem” within the design domain implies that something has to be done about the problem. This clarification is of importance as in some cases (other domains) are problem “seen as an entity in itself amenable to study or contemplation and analysis, but without intent to do something about it” *(Buenaño, 1999: 14)*.

[76] “The first published report of Rittel's concept of wicked problems was presented by C. West Churchman, "Wicked Problems," Management Science, vol. 4, no. 14 (December 1967), B-141—42. His editorial is particularly interesting for its discussion of the moral problems of design and planning that can occur when individuals mistakenly believe that they have effectively taken the "wickedness" out of design problems” *(Buchanan, 1995b: 13 f)*.

[77] Rittel has developed the concept of wicked problems over the years and has received much acclaim for the seminal article “Dilemmas in a General Theory of Planning” which he co-wrote with Webber.

[78] “Of course this is only true if the architect is trying to be `creative'—if he does not begin the task by taking off his shelf one of a set of standard house designs that he keeps there.” *(Simon, 1973: 187)*

[79] For more details see 6.2 (Decisions making in design).

[80] For further deliberation see 6.3.2 (Framings’ place in design) and 6.3.2.1 (Framing utilised by designers and its link to values).

[81] For further deliberation see 6.3.1.1 (Value set is an essential part of framing), 6.3.2 (Framings place in design), 6.3.2.1 (Framing utilised by designers and its link to values) and 6.3.3 (Design decisions are primarily based on value sets).

[82] For further deliberation see 5.1.1.3 (Structural, Functional and Material Honesty).

[83] For further deliberation see 5.1.1.1 (Artistic aspects and Self-expression), 5.1.1.3 (Structural, Functional and Material Honesty), 5.1.2.2 (Consultation and participation), and 5.1.3.1 (Green design and Sustainability).

[84] For further deliberation see 6.3.2 (Framings’ place in design) and 6.3.2.1 (Framing utilised by designers and its link to values).

[85] For further deliberation see 6.3.2 (Framings’ place in design) and 6.3.2.1 (Framing utilised by designers and its link to values).

[86] “Sketches incorporate not only drawings of tentative solution concepts but also numbers, symbols and text, as the designer relates what he knows of the design problem to what is emerging as a solution” *(Cross, 2000: 25)*.

[87] Generally sketching is:

> “tied-in very closely with features of design cognition such as the generation and exploration of tentative solution concepts, the identification of what needs to be known about the developing concept, and especially the recognition of emergent features and properties.” *(Cross, 2001a: 97)*

[88] Building typically holds surprises that different participants in a design project are unable to predict from sketching and simulations, this is the case even with the aid of sketching, computer modelling, physical models, logical argumentation etc. *(Cuff, 1991: 96)*.

[89] Successful as well as outstanding designers *(Cross, 2001a: 96)*.

[90] Study based on several observational and protocol studies of a variety of creative problem solving tasks *(Cross, 2001a: 82)*.

[91] For further deliberation see 6.3.2.1 (Framing utilised by designers and its link to values).

[92] For further deliberation see 4.2.3 (The “holistic” approach).

[93] For further deliberation see 4.2.3 (The “holistic” approach) and 4.3 (Knowledge foundation from a values perspective).

[94] Apart from what individual designer scholars as well as individual designers conceives it to be *(Buchanan, 1995b: 15)*. For further deliberation see 4.3.1 (Design generalist versus specialisation), 4.3.3 (Skill based as opposed to knowledge based) and 6.2.1 (Design is generally value based as oppose to fact based).

[95] For further deliberation see 2.2.2 (Contemporary value discourse) and 5 (Designers’ distinctive design values).

[96] For further deliberation see 4.3.1 (Design generalist versus specialisation), 4.3.3 (Skill based as opposed to knowledge based) and 6.2.1 (Design is generally value based as oppose to fact based).

[97] This can be exemplified by the assertion made by Buchanan when he argues that the subject matter of design is the fundamental reason why design problems are indeterminate and therefore wicked *(Buchanan, 1995b: 15)*.

[98] If one accepts that designs projects mainly consist of wicked problems (with well-defined sub problems) is it of interest how designers tackles these wicked problems. As earlier indicted will designers tend to tackle all design problems as ill-defined problems *(Cross, 2001a: 82)*.

[99] For further deliberation see 6.3.2 (Framings place in design) and 6.3.2.1 (Framing utilised by designers and its link to values).

[100] Some design implementations leave traces which cannot easily be undone *(Rittel and Webber, 1973: 163)*.

[101] For further details, see 6.4 (Design evaluation is based on value sets).

[102] Generally can it be argued that:

> “People choose those explanations which are most plausible to them. Somewhat but not much exaggerated, you might say that everybody picks that explanation of a discrepancy which fits his intentions best and which conforms to the action-prospects that are available to him. [as]
> […]
> the aim is not to find the truth, but to improve some characteristics of the world where people live.” *(Rittel and Webber, 1973: 166 f)*

[103] There are usually a number of participants dealing with a given design problem, and these participants usually holds many different objectives, and, thus, different preferences *(Buenaño, 1999: 37)*.

[104] For further deliberation see 5.1.2.2 (Consultation and participation).

[105] For further deliberation see 4.1.3 (Participants in the creation of design).

[106] For further details, see 6.4 (Design evaluation is based on value sets).

[107] The emergence of engineering into a profession in its own right and its active contribution in most architectural and design projects has eroded designers the possibility of sole ownership to problem solving and the technical aspects of building and products *(Cuff, 1991: 31), (Edwards, 1999: 73)*.

[108] The late Professor David Pye was an internationally known architect, industrial designer, instructor, and craftsman.

[109] See 3.2.5 (The design profession's peculiarities and abnormalities).

[110] For more details see 3.2.1 (The artist that lives inside the professional designer).

[111] This was introduced in 3.2.1 (The artist that lives inside the professional designer).

[112] "Sir Thomas Graham Jackson RA (1835-1924) was one of the most distinguished architects of his generation. He is best remembered for his work at Oxford, including the Bridge of Sighs over New College Lane, and for the college chapel at the University of Wales, Lampeter." Source: www.wikipedia.org 04.10.2005.

[113] Many design historians will probably still accept Nikolaus Pevsner assertion that "what distinguishes architecture from painting and sculpture is its spatial quality" *(Pevsner, 1960: 15)*.

[114] "This is necessarily so because all objects have a function of some sort by virtue of occupying some place in human society (this might include the function of being rejected as `worthless' or `foul', which reinforces the evaluative boundary of usefulness and worthiness), and all objects have to be created according to some imaginative process where the creator imagines them in their completed state before the completion occurs in actuality." *(Dodson and Palmer, 1996: 3)*

[115] Some architects, industrial designers and design scholars have even argued that design is and should be the bridge between art and engineering *(Pye, 1978: 104 - 107)*.

[116] "De Stijl (in English generally pronounced duh-STILE; from the Dutch for 'the style' – Dutch pronunciation: IPA /də stɛil/) was an artistic movement in the 1920s. The movement is also known as neoplasticism — the new plastic art (or Nieuwe Beelding in Dutch)." Source: www.wikipedia.org 16.10.2005.

[117] "In art and architecture, constructivism was an artistic movement in Russia from 1914 onward, which dismissed 'pure' art in favour of art used as an instrument for social purposes (namedly, the construction of the socialist system). Its designs were influenced by, and used materials from, industry. It was founded by Vladimir Tatlin, with later prominent constructivists including Antoine Pevsner and Naum Gabo. Kazimir Malevich also made pieces that could be called constructivist, though he is better known for his earlier suprematism. The movement was an important influence on new graphic design techniques championed by El Lissitzky." Source: www.wikipedia.org 16.10.2005.

[118] "Expressionism is the tendency of an artist to distort reality for emotional effect. Expressionism is exhibited in many art forms, including painting, literature, film, and architecture." Source: www.wikipedia.org 07.01.2005.

[119] "The November Group (German: Novembergruppe) was a group of German expressionist artists. Formed on 3 December 1918, they took their name from the month of the Weimar

Revolution. The group was led by Max Pechstein and César Klein. Linked less by their styles of art than by shared socialist values, the group campaigned for radical artists to have a greater say in such issues as the organisation of art schools, and new laws around the arts. The group was active until the early 1930s." Source: www.wikipedia.org 07.01.2005.

[120] These movements where inspired by an "intensive exchange between visual arts and architecture and a new social reality that was based on a new, artistic outlook on the world" *(Heynen, 2004a: 97)*.

[121] "Cubism was an avant-garde art movement that revolutionised European painting and sculpture in the early 20th century. The essence of cubism is that instead of viewing subjects from a single, fixed angle, the artist breaks them up into a multiplicity of facets, so that several different aspects/faces of the subject can be seen simultaneously." Source: www.wikipedia.org 13.12.2004.

[122] "Born at Amersfoort in The Netherlands, Pieter Cornelis Mondriaan (March 7, 1872 - February 1, 1944), was a Dutch painter and an important contributor of the De Stijl art movement, which was founded by Theo van Doesburg. After 1911 he also signed his work as Mondrian." Source: www.wikipedia.org 13.12.2004.

[123] "Kazimir Severinovich Malevich (Казимир Северинович Малевич, Polish Malewicz, Ukrainian transliteration Malevych, German Kasimir Malewitsch), (February 12, 1878 – May 15, 1935) was a painter and art theoretician, pioneer of geometric abstract art and one of the most important members of the so-called Russian avantgarde." Source: www.wikipedia.org 13.12.2004.

[124] This freedom made it possible for architecture to create its own myth, that of functionalism *(Maxwell, 2004: 6)*.

[125] "Richard Meier is a late twentieth century American architect known for his use of the color white. He achieved a Bachelor of Architecture degree from Cornell University in 1957. In 1984 he was awarded the Pritzker Prize." Source: www.wikipedia.org 13.12.2004.

[126] "Rem Koolhaas (born November 17, 1944 in Rotterdam, Netherlands) is a Dutch architect, former journalist and screenwriter educated in architecture at the Architectural Association in London." Source: www.wikipedia.org 13.12.2004.

[127] This is the case even if there is some disagreement as to when exactly this occurred. For example, Manfredo Tafuri traces this reconceptualization of architecture to the Bauhaus to be the decantation chamber of the avant-garde, this is supported by Michael Kirby which also "views the Bauhaus as particularly critical for the avant-garde because of the intense interaction among diverse types of artists" *(Blau, 1984: 47)*. Other scholars like Sigfried Giedion link the avant-garde with architecture when it became defined as sculpture and credits le Corbusier's 1933 Swiss Pavilion as the main point of departure for this link *(Giedion, 1971: 5 f, 266)*.

[128] For further details see 5.1.1.4 (Simplicity and Minimalism).

[129] This was reinforced by a belief that "only through standardization could the building's economy be fully realized" *(Maxwell, 2004: 6)*.

[130] “The Salon des Refusés (Salon of the Rejected) was an art exhibition in Paris. In the 1860s, artists of the nascent realist and impressionist movements submitted works to the Salon de Paris, the official exhibition sponsored by the Académie des beaux-arts, selection committee only to be rejected. The resultant complaints of bias led French emperor Napoleon III to allow the rejected works to be displayed in a separate exhibition. The first Salon des Refusés in 1863 invited art-works rejected for display at the Salon de Paris. Most were poor quality, leading to ridicule in the press. However, the exhibition included several important paintings including Édouard Manet's Le déjeuner sur l'herbe (The Luncheon on the Grass) and James McNeill Whistler's The White Girl. Other artists who showed at the Salon des Refusés include Henri Fantin-Latour, Paul Cézanne, Armand Guillaumin, Johan Jongkind, and Camille Pissarro.” Source: www.wikipedia.org 04.10.2005.

[131] For more details, see 4.2.2 (The emphasis on novel design solutions) and 4.2.2.1 (Creativity in design).

[132] This freedom often granted artist has historically been affirmed by rationalists like Immanuel Kant in “The Critique of Judgement”, systematic philosophers, such as Stephen D. Ross, “A Theory of Art”, metaphysicians, including Alfred N. Whitehead “Process and Reality*”*, and even by neo-Marxists, such as Herbert Marcuse “The Aesthetic Dimension” and Louis P. Althusser “Lenin and Philosophy and Other Essays” *(Blau, 1984: 28)*.

[133] “"Art for art's sake" is the usual English rendition of a French slogan, "l'art pour l'art", which is credited to Théophile Gautier (1811–1872). Gautier was not the first to write those words — they appear in the works of Benjamin Constant — but he was the first to adopt them as a slogan. "Art for art's sake" was a bohemian creed in the nineteenth century, a slogan raised in defiance of those who — from John Ruskin to the much later Communist advocates of socialist realism — thought that the value of art was to serve some moral or didactic purpose. Art for art's sake affirmed that art was valuable as art, that artistic pursuits were their own justification, and that art did not need moral justification — and indeed, was allowed to be morally subversive.” Source: www.wikipedia.org 04.10.2005.

[134] This is done in much the same way as architecture is not mere building, but:

> “has its place in religious imagery … , in every centre of power … , in war … and in literature … Most important, buildings are commendatory or not in terms of standards of beauty, aesthetic pleasure, and expression.” *(Blau, 1984: 46)*

[135] “Edward Durrell Stone (1902 Fayetteville, Arkansas - 1978 New York City), American modernist twentieth century architect.” Source: www.wikipedia.org 06.10.2005.

[136] “Formal qualities such as symmetry, order, balance and proportion play an important role. This approach elevates culture above nature. Grand gestures certainly found their place within

the Classical tradition, but it is also possible to think of Modernist gestures or Postmodern gestures." *(Thompson, 2000b: 71)*

[137] "An opposing view would regard skill alone as indicative of craftsmanship rather than truly artistic achievement. […] What seems to be admirable here is the artifice and the skill employed to achieve a natural effect. […] Many would feel, however, that without greater symbolic content this achievement remains technical rather than artistic." *(Thompson, 2000b: 71)*

[138] The traditional role of the architect and designer has come under pressure and has in many instances change in a way which has made it common that contemporary architects and designers are rarely paid to be an artist; they are more often paid to solve a problem or ask to contribute to making a profit *(Pye, 1978: 94)*.

[139] Jacobus Johannes Pieter Oud (1890-1963) was one of the Netherlands' leading architects of the International Style of the 1920s.

[140] "The Guggenheim Museum Bilbao is a modern art museum located in Bilbao, Basque Country, Spain. It is one of several museums of the Solomon R. Guggenheim Foundation. The structure, designed by Frank Gehry's architectural firm and opened to the public in 1997, immediately vaulted to prominence as one of the world's most spectacular post-modern buildings." Source: www.wikipedia.org 14.12.2004.

[141] "Frank Owen Gehry (born Ephraim Goldberg on February 28, 1929) is an architect known for his interesting use of metal sheathing for his buildings." Source: www.wikipedia.org 13.12.2004.

[142] "Peter Eisenman (b. Newark, New Jersey 1932) is one of the foremost practitioners of deconstructivism in American architecture." Source: www.wikipedia.org 13.12.2004.

[143] "Daniel Libeskind, born May 12, 1946 in Lódź, Poland, the son of Holocaust survivors, is an architect who became a U.S. citizen in 1965." Source: www.wikipedia.org 13.12.2004.

[144] "Zaha Hadid ... (born October 31, 1950) is a notable British deconstructivist architect." Source: www.wikipedia.org 13.12.2004.

[145] For instance the well-known slogans of "form follows function" and "less is more" of 20th century was drawn from both practical and theoretical attempted to be resolved the divergent traditions between conceptual aspects and aesthetics *(Dodson and Palmer, 1996: 3)*.

[146] For further deliberation see 2.2.1 (Design values as indicated by design history).

[147] One possible explanation why form follows function has not been generally accepted within the design community, could be that function is not something objective. Or put in another way, function is not something that belongs to an object or a building, instead functions are assigned by the designers, producers and or the consumers etc. *(Pye, 1978: 11)*.

[148] Most architects and designers are attempting to strike a balance between function and aesthetics in an effort to have the best of both worlds *(Pye, 1978: 90)*.

[149] Architects and industrial designers still struggle with function related question, such as "How do you determine what the thing you are going to design has got to do, what activity is proper to it, what it is for, what its purpose is?" *(Pye, 1978: 12)*. The lack of universal methods or tools which determines the form which follows by the function, does not mean that function is seen to

be of insignificance. Functions are by many architects and designers considered to be highly important, and many see it as being an inexcusable mistake to design and or make things "which do not work properly, on the grounds that their aesthetic value is more important than their efficiency" *(Pye, 1978: 90)*.

[150] For more detailed deliberations see 6.4.1.1 (Design evaluation involves subjective value judgement).

[151] "Lasdun, D 'An architect's approach to architecture' RIBA Journal Vol 72 No 4 (1965)" *(Cross, 1999: 28)*.

[152] "Sir Denys Lasdun (8 September 1914-11 January 2001) was an eminent English architect of the 20th century, particularly associated with the Modernist design of the Royal National Theatre on London's South Bank of the River Thames." Source: www.wikipedia.org 07.12.2004.

[153] Contemporary students are encouraged through their education to create novel design solutions to both new and existing problems. If one accepts and appreciate the design value of design novelty it will make sense to view design as a process of to create the ultimate particular artefact.

[154] Architects and industrial designers at Bauhaus like Walter A. Gropius was well known for a constant emphasis on "starting from zero" *(Wolfe, 1981: 12)*.

[155] Even products or buildings which are produced in great numbers, with wide distribution, still possess the quality and can be seen as being particular and not universal, as the artefact "do not represent the only possibility for accomplishing the same end or serving the same purpose" *(Nelson and Stolterman, 2003: 33)*.

[156] "Mihaly Csikszentmihalyi, a Psychology professor at the University of Chicago, is noted for his work in the study of happiness, creativity, subjective wellbeing, and fun." Source: www.wikipedia.org 09.10.2005.

[157] According to Nelson and Stolterman novel design solution is based on design values which is "guided by design judgment, that transforms the abstractness of relevant scientific knowledge into a final unique design, the ultimate particular" *(Nelson and Stolterman, 2003: 34)*. They go on to argue that design judgment is fundamentally a non-metric decision or understanding and that "it does not rely on a science of measurement to determine an objective or subjective out-come in its deliberation" *(Nelson and Stolterman, 2003: 189)*.

[158] Design projects with focus on modifications typically seek to improve an aspect of an existing artefact, such as: performance, weight, cost, appearance etc. *(Cross, 2000: 163)*.

[159] "If the building is to be innovative then this should be included in the risk assessment prior to commission" *(Porter, 2000a: 28)*.

[160] For more details on this point See 2.2.3 (Design education from a value perspective).

[161] "Eclecticism is a kind of mixed style in the fine arts, in which features are borrowed from various sources and styles. Significantly, Eclecticism hardly ever constituted a specific style in art: it is characterized by the fact that it was not a particular style. In general, the term describes the combination in a single work of a variety of influences - mainly of elements from different

historical styles in architecture, painting, and the graphic and decorative arts. In music the term used may be either eclecticism or Crossover music." Source: www.wikipedia.org 08.10.2005.

[162] The negativity which is commonly associated with eclecticism has had the effect that few architects and industrial designers will admit to the practice, and fewer still would ever agree unconditionally to the notion that such selection is the main essence of their creativity *(Collins, 1971: 25)*.

[163] The approach of eclecticism has been put forward by design movements like the Archigram Group *(Collins, 1971: 25)*.

[164] For more detail see 5.1.4 (Traditional design values).

[165] "The Louvre Museum (Musée du Louvre) in Paris, France, is one of the largest and most famous museums in the world. The building, a former royal palace, lies in the centre of Paris, between the Seine river and the Rue de Rivoli. Its central courtyard, now occupied by the Louvre glass pyramid, lies in the axis of the Champs-Élysées, and thus forms the nucleus from which the Axe historique springs. Part of the royal Palace of the Louvre was first opened to the public as a museum on November 8, 1793, during the French Revolution." Source: www.wikipedia.org 08.10.2005.

[166] "Pierre Lescot (c.1510-1578) was a French architect active during the early Renaissance. Beginning in 1546, he built the earliest parts of the palace that would become the Louvre. Nearly all of his known works have sculptural decoration by Jean Goujon." Source: www.wikipedia.org 08.10.2005.

[167] "Though Claude Perrault (Paris, 1613 - Paris, 1688) is best known as the architect of the eastern range of the Louvre in Paris, he also achieved success as physician and anatomist, and as an author, who wrote treatises on physics and natural history." Source: www.wikipedia.org 08.10.2005.

[168] It should be noted that later extension by Visconti and Hector Lefuel was done in the Second Empire's version of Neo-Baroque. Source: www.wikipedia.org 08.10.2005.

[169] "Ieoh Ming Pei (b April 26, 1917) is a Pritzker Prize winning architect, known as the last master of high modernist architecture. He works with the abstract form, using stone, concrete, glass, and steel. Pei is one of the most successful architects of the 20th century." Source: www.wikipedia.org 29.04.2005.

[170] "The Royal Festival Hall is a concert, dance and talks venue within the South Bank Centre in London. It is situated on the South Bank of the River Thames, not far from Hungerford Bridge. It is a Grade I listed building - the first post-war building to become so protected (in April 1988)." Source: www.wikipedia.org 29.04.2005.

[171] "Robert Matthew (1906 - 1975) was a Scottish architect and a leading proponent of modernism." Source: www.wikipedia.org 11.10.2005.

[172] "Whatever the merits or demerits of the addition to the Royal Festival Hall, it exemplifies an attitude which is clearly yet another legacy of nineteenth-century historicism; of the conviction

that every fragment of a building must be capable of accurate chronological identification by future archaeologists on the basis of their visible and tangible shape." *(Collins, 1971: 27)*

[173] Source: www.rfh.org.uk 29.04.2005.

[174] For more detail see 5.1.4 (Traditional design values).

[175] The quote was originally published in the From the Voice of America Forum Lectures, a series on Modern American Architecture in 1960, originally entitled Structure and Form.

[176] "Auguste Rodin (November 12, 1840 – November 17, 1917) was a French sculptor." Source: www.wikipedia.org 10.10.2005.

[177] "Felix Candela (b. Madrid, Spain 1910; d. 1997) […] Candella believed that strength should come from form not mass. This belief led to an extensive exploration of tensile shell structures. His nickname became "The Shell Builder" because of this structural favoritism. Frequently forced to act as architect, structural engineer and contractor in order to further his work, Candella sees architects as engineers who possess the ability to design both great cathedrals and low cost housing." Source: www.greatbuildings.com 10.10.2005.

[178] Design skills and knowledge in the visual composition and construction "appear to be essential in carrying out successful break-out strategies" *(Akin and Akin, 1996: 360)*.

[179] This is the case even if this point is not always stressed within design theories.

[180] "Making a depiction on paper forces some organization and specificity in terms of visuospatial features', regardless of whether or not the sketcher pays attention to them. For example, a depiction necessarily takes some shape and occupies an area of a certain size on paper, even though these visual features may not be intended by the sketcher. When a sketcher makes a new depiction, intending it to hold a spatial relation to some existing depictions, it will automatically produce spatial relations between the new depiction and other existing depictions which the sketcher does not intend. These implicit visuo-spatial features, in turn, may be discovered in an unexpected way by later inspection." *(Suwa et al., 2000: 540)*

[181] Explanatory models for creativity in design have been developed both within and outside the domain of architecture and industrial design. For instant have a number of explanatory models concerning creativity in design been developed through research in artificial intelligence *(Cross, 1997: 315)*.

[182] The English philosopher John Locke have highlighted the fact that much of most individuals thinking is of a associational nature *(Hastie and Dawes, 2001: 4, 116, 155)*.

[183] Controlled thinking is often associated with "what if" thinking. Controlled thinking is characterised by deliberate hypnotising "a class of objects or experiences and then view our experiences in terms of these hypothetical possibilities" *(Hastie and Dawes, 2001: 4)*. A general example that distinguishes what is known as automatic thinking and controlled thinking can be found in the disturbing issue of child abusers. It is often assumed that: one thing we know for sure about child abuse is that no child abuser stops on their own accord. One should report all child abuse in consideration for the child welfare, rights, wellbeing, recovery etc., but even so is it fair to ask how does one know that no child abusers stop on their own accord? The sample of

child abusers that is seen by psychologist etc. is likely to not have stop on their own accord; if not they would not have been in therapy in the first place. So the image of what a child abuser will often automatically associated with the abusers that have been and is seen by the therapists. The conclusion drawn by the therapists- that the child abusers that they have seen do not stop on their own accord; so all child abusers do not stop at their own accord, is an automatic conclusion. Controlled thinking on the other hand indicates that the logic of this type of conclusion is flawed, as it with logic reflection become clear that child abusers which are in therapy are only a sub-sample of what is the complete population of all child abusers. The possibility of a number of child abusers which stops at their own accord and which is never referred to psychologist etc. is obvious, as by definition, those referred would not have "stopped on their own accord". Consequently it can be argued that the sample psychologists are seeing is insufficient to conclude that no child abusers stop abusing a on their own accord, as it is inadequate for that particular conclusion. The type of critique pointing out the discrepancies in the above assertion by therapist with regards to child abusers and their ability to stop on their own accord is conducted within what is generally described as controlled thinking. The critique illustrates the potential limitation of reasoning which is based on what comes to mind or which is based on a particular sample one can have *(Hastie and Dawes, 2001: 4)*.

[184] See previous assertion in this section as well as 4.3.3 (Skill based as opposed to knowledge based), 4.1.1 (Technological determinism, possibilities and challenges), 4.1.2 (Economy in design) and 4.1.4 ("Wicked problems" in design).

[185] "Demonstrations of the results of the procedures of combination, mutation, analogy and design from first principles, from Rosenman and Gero. In each case, a novel design results from the procedure." *(Cross, 1997: 314)*.

[186] "Some emergent shapes (below) inferred from a group of three triangles (above), from Gero. The emergent shapes are discovered as implicit within the original." *(Cross, 1997: 314)*

[187] Later emergence was added to this list by Gero.

[188] See previous assertion in this section as well as 4.3.3 (Skill based as opposed to knowledge based), 4.1.1 (Technological determinism, possibilities and challenges), 4.1.2 (Economy in design) and 4.1.4 ("Wicked problems" in design)

[189] For more deliberation, see 6.3.2 (Framings place in design).

[190] "Picture Thinking or Visual Thinking is the phenomenon of thinking through visual processing, what most people would think with linguistic or verbal processing. It is non linear and often has the nature of a computer simulation. Where lots of data is put through a process to yield insight into complex systems, which would otherwise be almost impossible through language. Picture thinking could also be called as non-linguistic thinking and people who do such information processing are also called as Visual thinkers. It involves thinking beyond the definitions of language and has many personal referents to meaning which are almost impossible to be translated." Source: www.wikipedia.org 26.02.2005.

[191] Generally thinking tends to be divided into to main categories that is: visual and verbal thinking.

[192] For more deliberation, see 4.1.4 (“Wicked problems” in design).

[193] “Nikola Tesla (July 10, 1856 - January 7, 1943) was a physicist, inventor, and electrical engineer of unusual intellectual brilliance and practical achievement. He was of Serb descent and worked mostly in the United States.” Source: www.wikipedia.org 26.02.2005.

[194] “Walter Elias "Walt" Disney (December 5, 1901–December 15, 1966), was an American film producer, director, screenwriter, voice actor, and animator. One of the most well-known motion picture producers in the world, Disney was also the creator of an American-based theme park called Disneyland, and the founder of Walt Disney Productions, the highly profitable corporation now known as The Walt Disney Company.” Source: www.wikipedia.org 26.02.2005.

[195] Source: www.wikipedia.org 26.02.2005.

[196] For more deliberations on values related to wicked problems see 4.1.4 (“Wicked problems” in design).

[197] It is important to note that designing is a situated act *(Suwa et al., 2000: 567)*.

[198] This quote is a paraphrasing of the content found in the “The new ecology” article in the BioScience *(Odum, 1964)* This paraphrasing is frequently used as a quote which is attributed to Eugene Odum, but I have been unable to find a source with the exact quotation. The statement “the ecosystem is greater than the sum of its parts” is inscribed on the bust of Eugene Odum that adorns the entrance to the Ecology Building at the University of Georgia.

[199] “Eugene P. Odum (1913-2002) is considered to have been one of the most influential figures in the science of ecology in the twentieth century. Eugene Odum is, in fact, often referred to as "the father of ecosystem ecology."” Source: www.wikipedia.org 07.12.2004.

[200] “Holism is the idea that the properties of a system cannot be determined or explained by the sum of its components alone. It is often regarded as opposite to reductionism, although proponents of scientific reductionism state that it is better regarded as the opposite of greedy reductionism. Holism and holistic are terms coined by Jan Smuts in the early 1920s.” Source: www.wikipedia.org 07.12.2004.

[201] Neither in contemporary philosophies nor contemporary design theories.

[202] This holistic character is often considered to be characterised and enabled by: (1.) compound (material and substance), (2.) meaning (systemic relationships created intentionally in response to purpose and in fulfilment of an end) and (3.) presence (apprehension, including appearance, character and soul) *(Nelson and Stolterman, 2003: 117 f)*.

[203] “Initially, they may be required to actually build what they design; but one cannot expect junior architectural students to build anything very complex, so they inevitably tend to adopt the Bauhaus technique of designing chairs, or even small moving objects such as kites, using quite primitive materials and structural systems which have little relevance to the profession for which they are being trained. Senior students, on the other hand, tend to get so engrossed in program-

ming and analysis that they seldom reach the point of designing anything at all." *(Collins, 1971: 97)*

[204] This phenomenon is by some design scholars like Harold G. Nelson and Erik Stolterman linked to systems thinking in design, as induced by their following assertion:

> "As every design is part of an environmental system, formed by a systemic context that carries systemic consequences with its implementation, the best design is one that is a whole systems design. Systems thinking is a necessary component of design" *(Nelson and Stolterman, 2003: 115)*

[205] When faced with complex problems a system thinking approach will typically lead to the generating of a list of possible factors, which has often been called "laundry list thinking". This "assumes a one-way passage of influence from cause to effect and each factor has a fixed relative importance" *(O'Connor and McDermott, 1997: 83)*.

[206] The laundry list found within system thinking is not commonly found among architects and designers, neither is it the system thinking characteristic of a one-way passage of influence from cause to effect and the notion that each factor is given a fixed relative importance.

[207] This tendency is likely to continue and be amplified, as the technological development has made the technological aspect of large design projects more demanding and complicated, with more professions having a stake a considerable stake in a design project.

[208] Divergent frames will generate conflict as "the problem formulations and preferred solutions are grounded in different problem-setting stories rooted in different frames" *(Schön and Rein, 1994: 29)*.

[209] Holistic perspectives based on frames and value sets often determines what the different participants "see as being in their interests and, therefore, what interests they perceive as conflicting" *(Schön and Rein, 1994: 29)*.

[210] "The design will have a compositional breakdown. This means that the composition will no longer have impact on the people using or managing the system with the same kind of emergent qualities as present before. When we reach the point of composition breakdown, we have a very sensitive and unstable system to deal with. Even small changes will create dramatic effects … These interventions may consist of minor alterations to a delineated process, which someone found difficult to implement within the given structure […] they [will] eventually threaten the basic structure of the original design." *(Nelson and Stolterman, 2003: 279)*

[211] Escalation in design is a term found in J.P. Eberhard article "We ought to know the difference".

[212] Regression in design is a term found in J.P. Eberhard article "We ought to know the difference"

[213] William L. Pereira "was featured on the cover of Time magazine in 1968 as a leading planner of his generation, if not as one of its a major architects." *(Edwards, 1999: 25)*

[214] Pereira "was in that sense one of the true moderns; he took it as his obligation to create a better life - albeit a life like his - for as many people as possible" *(Edwards, 1999: 25)*.

[215] "Lancelot Brown (1715/1716 - February 6, 1783), more commonly known as Capability Brown, was an English landscape gardener, now remembered as "the last of the great English eighteenth-century artists to be accorded his due", and "England's greatest gardener"." Source: www.wikipedia.org 09.12.2004

[216] "The story was repeated often in the Pereira office, particularly by planner and later teacher at Harvard Graduate School of Design, Donald Cameron." *(Edwards, 1999: 293)*

[217] This approach was approved by Lawson as his tutor *(Lawson, 1997: 54)*.

[218] Loaning and storing books can be seen as a particular sub problem with regards to the design of a new library.

[219] For further deliberation see 4.2.2 (The emphasis on novel design solutions)

[220] For further deliberation see 1.2.1 (Field of study and clarification).

[221] For further deliberation see 1.2.1 (Field of study and clarification).

[222] Some would argue trespass as oppose to venture.

[223] For further deliberation see 4.2.3 (The "holistic" approach).

[224] This distinguishes design firms from many other firms which are based on expertise from other professions.

[225] For further deliberation see 4.1.2 (Economy in design).

[226] For further deliberation see 4.1.1 (Technological determinism, possibilities and challenges)

[227] For more details see 4.2.3 (The "holistic" approach).

[228] For further deliberation see 4.2.2 (The emphasis on novel design solutions).

[229] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[230] For further deliberation see 4.2.1 (Design verses art) and 3.2.1 (The artist that lives inside the professional designer).

[231] For further deliberation see 4.1.1 (Technological determinism, possibilities and challenges).

[232] For further deliberation see 4.1.1 (Technological determinism, possibilities and challenges).

[233] "Julien Guadet (1834 - 1908), who was a professor at the French Academy of the Beaux-Arts." Source: www.arkitera.com 20.05.2005.

[234] For further deliberation see 4.1.2 (Economy in design).

[235] It can be argued that the architectural practice is manly changing due to the fundamental forces of digital technology, environmental concerns, technological change in the building sciences, and globalization. Moreover, these fields interact, which in turn exaggerate and increase the rate of change and complexity. The sum of these changes from a technological perspective is getting close to what can be described to be virtually unintelligible for a sole architects *(Cuff, 2000: 346)*. For further deliberation see 4.1.1 (Technological determinism, possibilities and challenges).

[236] For further deliberation see 4.1.1 (Technological determinism, possibilities and challenges).

[237] For further deliberation see 3.2.5 (The design profession's peculiarities and abnormalities), 4.1.1 (Technological determinism, possibilities and challenges), 4.3.2 (Tacit knowledge in design) and 4.3.3 (Skill based as opposed to knowledge based).

[238] For further deliberation see 4.1.3 (Participants in the creation of design).

[239] For further deliberation see 3.2.4 (Designer's unsettled designer-client relationship) and 3.3 (The design profession from a society perspective).

[240] "Michael Polanyi (March 11, 1891 - February 22, 1976) was a Hungarian/ English polymath whose thought and work extended across physical chemistry, philosophy, theology and economics." Source: www.wikipedia.org 09.12.2004.

[241] "The word tacit has its origin in the name and work of a Roman historian and public orator, Cornelius Tacitus, in the first century A.D. Tacitus was born and grew up in the south of France where he belonged to a family of civil servants and military leaders whose loyalty and interest lay with the Roman empire. He was well educated and rose through the ranks, carrying out a number of tasks connected with both war and peace, until he achieved considerable status in the capital city. He was critical of the Roman way of life, finding it to have become decadent, but rather than criticizing it directly, he wrote a history of the German tribes of the north, pointing out that their clean living and honourable way of life meant that they were a coming nation. There was tremendous power in this unspoken criticism, and for many centuries, to say that someone was taciturn was to say that he was deeply critical but silent. Gradually the word came to have a more general meaning, but the aspect of significance has never disappeared: tacit knowledge is unexpressed, but it is both dynamic and influential." *(Edwards, 1999: 295)*

[242] He was particularly concerned with the general failure among a number of sciences to recognise the importance of what he describes as tacit knowledge and of the internal human processes of creativity and imagination.

[243] A similar observation was made by the philosopher Gilbert Ryle which in his writing in the classic The Concept of Mind (1949) advanced a similar thesis exemplified with the fact: "that people before Aristotle were able to argue well, although the theory of logical discourse had not yet been formulated" *(Phillips, 1987: 93).*

[244] For further deliberation see 6.4 (Design evaluation is based on value sets).

[245] "Dr. Robert J. Sternberg. IBM Professor of Psychology and Education. Department of Psychology Yale University." Source: www.yale.edu 14.12.2004.

[246] Knowing How and Knowing That is a discourse which also Gilbert Ryle introduces in his book "The concept of mind" *(Ryle, 1949: 27 - 29).*

[247] This point will be deliberated on in section 4.3.3 (Skill based as opposed to knowledge based).

[248] "Such routine actions, which undergo continuous development, are meaningful components within the particular setting of architectural practice. But they are exactly the elements of which outsiders have no inkling and so develop distorted images of architects and their work." *(Cuff, 1991: 5)*

[249] For further deliberation see 4.3.1 (Design generalist versus specialisation).

[250] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based) and 4.3.3.1 (Empirical based research and its influence).

[251] For further deliberation see 4.3.1 (Design generalist versus specialisation).

[252] Gibbons asserts that a firm's knowledge assets are normally more than the sum of the professional competence of its workforce, and that competence and knowledge bears upon a firm's business strategy, its specific technological dimension, and the transformation process the firm is exploiting *(Gibbons, 1994: 25)*.

[253] For more details see 8.2 (Company size in design) and 4.3.1 (Design generalist versus specialisation).

[254] For further deliberation, see 4.3.1 (Design generalist versus specialisation) and 4.1.2 (Economy in design).

[255] "It amazes me how many psychologists, sociologists, and social workers do not know the data, do not know the mathematics and statistics that are relevant, do not know the philosophy of science, and are not even aware that a controversy exists in the scholarly literature. But what can you expect, when I find that the majority of clinical psychology trainees getting a PhD at the University of Minnesota do not know what Bayes' Theorem is, or why it bears upon clinical decision making, and never heard of the Spearman-Brown Prophecy Formula!" *(Meehl, 1986: 374)*.

[256] "If PhD psychologists spend half their time giving Rorschachs and talking about them in team meetings, they do not like to think that a person with an MA in biometry could do a better job at many of the predictive tasks." *(Meehl, 1986: 374)*

[257] ""This is what I do; this is the kind of professional I am." Denting this self-image is something that would trouble any of us, quite apart from the pocketbook nerve." *(Meehl, 1986: 374)*

[258] ""I'm a Freudian, although I have to admit Freudian theory doesn't enable me to predict anything of practical importance about the patients." Although not self-contradictory, such a cognitive position would make most of us uncomfortable." *(Meehl, 1986: 374)*

[259] "Somehow, using an equation to forecast a person's actions is treating the individual like a white rat or an inanimate object, as an it rather than as a thou; hence, it is spiritually disreputable." *(Meehl, 1986: 374)*

[260] "I agree with Aquinas that caritas is not an affair of the feelings but a matter of the rationally informed will. If I try to forecast something important about a college student, or a criminal, or a depressed patient by inefficient rather than efficient means, meanwhile charging this person or the taxpayer 10 times as much money as I would need to achieve greater predictive accuracy, that is not a sound ethical practice. That it feels better, warmer, and cuddlier to me as predictor is a shabby excuse indeed." *(Meehl, 1986: 374)*

[261] "There is a kind of general resentment, found in some social scientists but especially people in the humanities, about the very idea that a computer can do things better than the human mind. I

can detect this in myself as regards psychoanalytic inference and theory construction, but I view it as an irrational thought, which I should attempt to conquer." *(Meehl, 1986: 374 f)*

[262] Generally have most people including experts had and have a:

> "great misplaced confidence in their own global judgments, a confidence that is strong enough to dismiss an impressive body of research findings and to dominate predictions in our legal and medical systems." *(Hastie and Dawes, 2001: 64 f)*

[263] "Success was measured in a variety of manners, including course grades, relative class rank, salary, importance of job position, and peer and employer evaluations" *(Cuff, 1991: 43 f)*. Research to establish a correlation was conducted in the following profession: engineering, business, teaching, and medicine *(Cuff, 1991: 43)*.

[264] For more details, see 2.2.3 (Design education from a value perspective).

[265] "Andrea Palladio (November 30, 1508 - 1580) was an architect born in Padua, Italy." Source: www.wikipedia.org 12.07.2005.

[266] Carlo Lodoli (1690-1761) exists as a footnote in most major history books of modern architecture, as writings of Lodoli have not been found, but his teachings are known through the fact that "his lectures in a school for young Venetian nobles were taken down by Andrea Memmo and collected into a book entitled Elementi di Architettura Lodoliana" *(Kaufmann, 1955: 95)*.

[267] "In positivist philosophy, normative is contrasted with its antonym, positive, when describing types of theories, beliefs, or statements. A positive statement is a falsifiable statement that attempts to describe ontology. A normative statement, on the other hand, is a statement regarding how things should or ought to be. Such statements are impossible to prove or disprove, thus forever banishing them from the world of the scientific." Source: www.wikipedia.org 13.07.2005.

[268] "Epistemology, from the Greek words episteme (knowledge) and logos (word/speech) is the branch of philosophy that deals with the nature, origin and scope of knowledge." Source: www.wikipedia.org 12.07.2005.

[269] For further deliberation see 3.1.1 (Defining the concept of profession) and 3.1.2 (The emergence of professions).

[270] Design methodology is the study of the principles, practices, and procedures of design *(Cross, 2001b)*. This movement has undergone a evolution which have made design scholars divided into first-generation design movements and second-generation design movements *(Bayazit, 2004: 16 - 22)*.

[271] For further deliberation see 1.2.1 (Field of study and clarification).

[272] This move of architecture and industrial design school into the university system has for instance, taken place in some countries such as United Kingdom *(Duffy and Hutton, 1998: xiii)*.

[273] "Sir Herbert Edward Read (1893 - 1968) was an English poet and critic of literature and art." Source: www.wikipedia.org 12.07.2005.

[274] As this does not generally qualify as research (see extended arguments below) *(Lawson, 2002: 112)*.

[275] "At the College, we give Higher Doctorates or Honorary Doctorates to individuals with a distinguished body of exhibited and published work - but we do not at present offer research degrees entirely for work where the art is said to 'speak for itself'. Rightly or wrongly, we tend to feel the goal here is the art rather than the knowledge and understanding. … And we feel that we don't want to be in a position where the entire history of art is eligible for a postgraduate research degree. There must be some differentiation." *(Frayling, 1993: 5)*

[276] Category number three links to the aspirations found in the De Stijl, Modern Movement and the Design methods movement with its emphasis on basing the "process of design (as well as the products of design) on objectivity and rationality" *(Cross, 2000: 94)* and it focus on developing scientific design processes *(Cross, 2001b: 49)*. This development was not without its critics and there was a considerable backlash against the focus on objectivity and rationality and a rejection of its underlying values in the 1970s *(Cross, 2001b: 50)*. This was particular the case for the Design methodology movement, which was heavily criticised notably by some of the early prominent contributors to the movement it self, such as Christopher Alexander and J. Christopher Jones *(Cross, 2001b: 50)*. Jones expressed his discontent and dissatisfaction in statements like:

> "I reacted against design methods. I dislike the machine language, the behaviourism, the continual attempt to fix the whole of life into a logical framework." *(Cross, 2001b: 50)*

But even with revolt among its early pioneers in the 1970s and with "very limited evidence of practical applications and results" *(Cross, 2001b: 50)*, have the Design methodology movement continued to develop in engineering and some branches of industrial design *(Cross, 2001b: 50)*. The Design methodology movement has generally failed to make an impact on the field of architecture, but both the influential architecture movements like De Stijl and Modern Movement represents the same focus on objectivity and rationality as the Design methodology movement.

[277] For further details see 3.1 (The concept of profession).

[278] "Everybody's judgement depends upon his perceptions, on the aspects he considers, and on the respective emphasis laid upon them" *(Rittel, 1976: 81)*. This is not a phenomenon restricted to the design professions, as critics have pointed out that generally is much of what is labelled knowledge within many academic domains:

"indeed highly contaminated by ideology, and that many theories (particularly of human behaviour) are little more than highly elaborated belief systems rooted in their authors' values" *(Buenaño, 1999: 44)*

[279] For further deliberation see 5 (Designers' distinctive design values) and 6 (Values and design decisions).

[280] "There is hardly any professional discourse in architecture which has built up a consistent system of coherent hypotheses to be argued systematically" *(Rittel, 1976: 79 f)*.

[281] For further deliberation see 4.2.2 (The emphasis on novel design solutions).

[282] See 4.3.1 (Design generalist versus specialisation).

[283] For further deliberation see 4.3.1 (Design generalist versus specialisation).

[284] For further deliberation see 4.2.3 (The "holistic" approach).

[285] "Diabetes mellitus is a medical disorder characterized by varying or persistent hyperglycemia (elevated blood sugar levels), especially after eating. All types of diabetes mellitus share similar symptoms and complications at advanced stages. Hyperglycemia itself can lead to dehydration and ketoacidosis. Longer-term complications include cardiovascular disease (doubled risk), chronic renal failure (it is the main cause for dialysis), retinal damage with eventual blindness, nerve damage and eventual gangrene with risk of amputation of toes, feet, and even legs. The most important forms of diabetes are due to decreased production of insulin (diabetes mellitus type 1, the first recognized form), or decreased sensitivity of body tissues to insulin (diabetes mellitus type 2, the more common form). The former requires insulin injections, while the latter is generally managed with oral medication and only requires insulin if the tablets are ineffective. Patient understanding and participation is vital as blood glucose levels change continuously, while successfully keeping blood sugar within normal limits has been compellingly shown to reduce or prevent development of the complications of diabetes. Other risk factors that can require addressing to reduce complications are: cessation of smoking, optimizing cholesterol levels, maintaining a stable body weight, controlling high blood pressure and having regular exercise." Source: www.wikipedia.org 22.12.2004.

[286] "Most organizations do not reward staff or programs for exposing shortcomings. … Relatively few organizations have created appropriate conditions for learning […] The difficulty of establishing a clear causal link between positive outcomes and the physical environment. […] Reluctance by organizations and building professionals to participate in a process that may expose problems or failures or may be used as a method to focus (or deflect) blame. […] Fear of soliciting feedback from occupants on the grounds that both seeking and receiving this type of information may obligate an organization to make costly changes to its services or to the building itself. Lack of participation by building users. […] Failure to distribute information resulting from POEs to decision makers and other stakeholders. Pressure to meet design and construction dead-lines, which can create a time barrier to sustained POE activity. […] Lack of in-house staff having the wide range of skills and technical expertise needed to direct and

manage the results of evaluations and to communicate the information so that it is useful and non-threatening. Organizations may be reluctant to hire consultants to conduct and analyze POEs if resources are limited and there is a lack of executive-level commitment to such programs. […] Organizational structures can create barriers when responsibilities for POE administration and lessons-learned database development are assigned to different offices, thereby creating a need for interoffice collaboration and blurring the lines of accountability." *(ebrary Inc., 2001: 4 f)*

[287] Due to this values have POE only to a limited degree entered the architectural education, in the same way as it has not made universal (or considerable) impact on the architecture profession. For further deliberation see 4.2.3 (The "holistic" approach) and 4.2.2 (The emphasis on novel design solutions).

[288] For further deliberation see 3.1.1 (Defining the concept of profession).

[289] For further deliberation see 4.2.3 (The "holistic" approach) and 4.2.2 (The emphasis on novel design solutions).

[290] For further deliberation see 5.1.2.2 (Consultation and participation).

[291] "The American Institute of Architects is the professional organization for architects in the United States." Source: www.wikipedia.org 30.12.2004.

[292] Within engineering failure is seen as inevitable even with the emphasis on research as the foundation for the profession. But the failure in engineering has the flowing characteristics:

> "Indeed, failures appear to be inevitable in the wake of prolonged success, which encourages lower margins of safety. Failures in turn lead to greater safety margins and, hence, new periods of success. To understand what engineering is and what engineers do is to understand how failures can happen and how they can contribute more than successes to advance technology." *(Mitcham, 1997: 269)*

[293] For further deliberation see 4.1.4 ("Wicked problems" in design).

[294] This view is not without opposition, David Pye argues as Schön that design is more than problem-solving in his book the "The nature and aesthetics of design", but the rational is different. Pye argues that it is the nature of compromises in design which have led design theorists to classify design as a problem-solving activity. But more importantly for this section do Pye differs from Schön implicit questioning of the usefulness of research, as Pye argues that "most design problems are essentially similar no matter what the subject of design is" *(Pye, 1978: 75)*. This view indicates that it is possible to gain valuable knowledge through empirical studies of already existing novel design solutions.

[295] For further deliberation see 4.1.4 ("Wicked problems" in design).

[296] For further deliberation see 4.1.4 ("Wicked problems" in design).

[297] "Paul Cézanne (January 19, 1839 - October 22, 1906), the painter of and from Aix-en-Provence, was the bridge from Impressionism to Cubism. In paintings such as the 1885 Mont

Sainte-Victoire and 1887 Madame Cézanne we can see the inspiration for the Cubists and even the Fauvists." Source: www.wikipedia.org 14.12.2004.

[298] "Samuel Taylor Coleridge (October 21, 1772-July 25, 1834) was an English poet, critic, and philosopher and, along with his friend William Wordsworth, one of the founders of the Romantic Movement in England." Source: www.wikipedia.org 14.12.2004.

[299] "Ludwig van Beethoven (baptized December 17, 1770 d. March 26, 1827) was a German composer, the predominant musical figure in the transitional period between the Classical and Romantic eras. He is widely regarded as one of the greatest composers of all time." Source: www.wikipedia.org 14.12.2004.

[300] For further deliberation see 6.4 (Design evaluation is based on value sets).

[301] For further deliberation see 5.1.2.2 (Consultation and participation).

[302] "Johann Gottlieb Fichte (May 19, 1762 - January 27, 1814) was a German philosopher, who has significance in the history of Western philosophy as one of the leading progenitors of German idealism and as a follower of Immanuel Kant." Source: www.wikipedia.org 18.10.2005.

[303] "Gilles Deleuze (January 18, 1925 - November 4, 1995) was a major French philosopher of the late 20th century. His two most popular books, Anti-Oedipus and A Thousand Plateaus, both subtitled Capitalism and Schizophrenia, were co-written with Félix Guattari, but he wrote several other influential works on philosophy, literature, film, politics and fine art. His magnum opus is Difference and Repetition (1968)." Source: www.wikipedia.org 15.10.2005.

[304] "Pierre-Félix Guattari (1930 - 1992) was a French pioneer of institutional psychotherapy, as well as the founder of both Schizoanalysis and the science of Ecosophy." Source: www.wikipedia.org 15.10.2005.

[305] "Plato (Greek: Πλάτων Plátōn) (ca. May 21? 427 BC – ca. 347 BC) was an immensely influential classical Greek philosopher, student of Socrates, teacher of Aristotle, writer, and founder of the Academy in Athens. In countries speaking Arabic, Turkish, Persian, or Urdu, he is called Eflatun, which means a spring of water, and, metaphorically, of knowledge." Source: www.wikipedia.org 15.10.2005.

[306] "David Hume (April 26, 1711 – August 25, 1776) (N.B. The birth date is May 7 by the Gregorian reckoning of his time; this date being used by the International Humanist and Ethical Union when celebrating his birthday) was a Scottish philosopher and historian and, with Adam Smith and Thomas Reid among others, one of the most important figures in the Scottish Enlightenment. Many regard Hume as the third and most radical of the so-called British Empiricists, after the English John Locke and the Anglo-Irish George Berkeley, both major influences on Hume's thought. He was also influenced by various Francophone writers such as Pierre Bayle, as well as various other figures on the Anglophone intellectual landscape such as Isaac Newton, Samuel Clarke, Francis Hutcheson, and Joseph Butler." Source: www.wikipedia.org 15.10.2005.

[307] "John Stuart Mill (May 20, 1806 – May 8, 1873), an English philosopher and political economist, was an influential classical liberal thinker of the 19th century. He was an advocate of

utilitarianism, the ethical theory first proposed by his godfather Jeremy Bentham." Source: www.wikipedia.org 15.10.2005.

[308] But the unhistorical treatment of philosophy is not something only designers are accused of doing, as this can be found among different disciplines.

C H A P T E R F I V E

[1] There is neither the time nor room within the framework of this PhD to carefully and critically examine the specific values introduced in this chapter.

[2] For further deliberation, see 6.2.2 (Introduction to value set in a design context).

[3] This is still based on the assumption introduced in chapter one that design literature reflects the values that can be found among individual architects and industrial designers. For further deliberation see 1.3.2.3 (Reflection over practical limitations and opportunities).

[4] Blank slate i.e. blank mind is also commonly known as tabula rasa. "Tabula rasa (Latin: 'scraped tablet', though often translated 'blank slate') is the notion that individual human beings are born 'blank' (with no built-in mental content), and that their identity is defined entirely by events after birth." Source: www.wikipedia.org 02.01.2005.

[5] Some design scholars and design literature on design methods have in the past implied that designers arrive at a design project with a blank mind, but this view is not supported within this thesis. It is precisely the opposite that is argued, as it is in fact the exact opposite that is taking place.

[6] Design values are often the most prominent aspect which sets the premise for design principles and design decision which determines the design outcome *(Rowe, 1987: 2)*. For further deliberation, see 6.2 (Decisions making in design).

[7] For further deliberation, see 5.1.1 (Aesthetic design values), 5.1.2 (Social design values), 5.1.3 (Environmental design values), 5.1.4 (Traditional design values) and 5.1.5 (Design values based on gender).

[8] The general relation between common streams of thoughts and philosophies and the value set found in the design professions can be illustrated by a number of general influences and thinking which includes the following 10 points cited in Janis Birkeland's book "Design for Sustainability", which she mostly argues from an environmental design's point of view:

> "[1] Linear progress: humanity is destined to transcend nature through technology and social control. [2] Individual autonomy: people (at least elite white males) are meant to be independent, competitive and freedom seeking. [3] Essentialism: the idea that humans have an `essential nature', meaning that the ideal characteristics and values attributed to the (white male) elite are presumed to apply to humanity as a whole. [4] Reductionism: the world can be

> understood as a composite of separate elements or entities, and problems are best solved by specialisation, simplification and abstraction. [5] Mechanism: for most purposes, plants and animals are considered little more than (soulless) mechanisms, and engineering can substitute for natural processes. [6] Instrumentalism: nature has value to the extent it is `useful' and should therefore be harnessed in the service of humanity. [7] Hierarchical dualism: the world can be understood as sets of opposites or dualisms, and one side (reason, power, control, masculinity) is given more value ... [8] Anthropocentrism: humans are considered the centre of life; therefore, the interests of animals and ecosystems are given little weight, and are largely viewed instrumentally as resources. [9] Linear causality: consequences and impacts are seen to be linked to specific causes through linear (cause and effect) relationships and can thus be predicted and controlled. [10] Essentialism: The belief in progress, a kind of manifest destiny to be realised through technology, entailed a particular 'essentialist' notion of the nature of humankind."*(Birkeland, 2002: 115)*

[9] For further deliberation, see for Instance 5.1.2 (Social design values).

[10] Equally, lines of thought like reductionism, atomism and liberalism have influenced architecture and industrial design. This has manifested itself through architecture that have been seen as "attention seeking and often give deliberate visual expression to individualism, autonomy and competition" *(Birkeland, 2002: 115)*. Other current contemporary trends which have and might influence designers' values can be found in globalisation versus local production etc. and free-market economy versus fair trade *(Beatley and Wheeler, 2004: 171)*.

[11] "Brutalism is an architectural style that spawned from the Modernist architectural movement and which flourished from the 1950s to the 1970s. The early style was largely inspired by the work of Swiss architect, Le Corbusier (in particular his Unité d'Habitation building) and of Ludwig Mies van der Rohe." Source: www.wikipedia.org 16.04.2005.

[12] "If a student likes one particular Postmodern building in the set, for example, it is likely that he or she will also like the other examples" *(Wilson, 1996: 37)*.

[13] Some of these values will be found in all or some of the different movements. Thus if a student is an admirer and adheres to the values of Neo-Vernacular architecture, may there also be certain Postmodern values and buildings and/or certain Modern values and buildings that also appeal, but it is very unlikely that he or she will appreciate values and buildings within High Tech architecture as well *(Wilson, 1996: 37)*.

[14] This is the case even if there has been a development of a robust set of views about the way design should be practised, as introduced in chapter three and four.

[15] This can be exemplified in books like "Programs and Manifestoes on 20th-Century Architecture", by Ulrich Conrads, "By Their Own Design", by Abby Suckle and "Theories and Manifestoes of Contemporary Architecture", by Karl Kropf and Charles Jencks. These books are

all collections of influential manifestoes and/or intellectual thought pertaining to architecture and to some small degree industrial design projects. The tradition of publishing manifestos and/or the rational behind a design practice is more common among architects than among industrial designers *(Lawson, 1997: 162)*, but as Charlotte and Peter Fiell's book the "Designing the 21st Century" illustrates, the rationale held by industrial designers is also to some degree published, as the book includes a number of industrial designers' thoughts behind their value base.

[16] For further deliberation, see 6.3.2 (Framings' place in design).

[17] For further deliberation, see 1.2.1 (Field of study and clarification).

[18] For further deliberation, see 3.2.2 (Pluralism tendency within design profession).

[19] For further deliberation, see 4.2.1 (Design versus art).

[20] For further deliberation, see 4.1.1 (Technological determinism, possibilities and challenges) and 4.1.2 (Economy in design).

[21] In the past new styles were promoted by both individual architects and industrial designers etc., as well as amateur builders. The pluralistic nature of design was indicated in chapter three in section 3.2.2 (Pluralism tendency within design profession).

[22] Other values which cannot be classified as aesthetic design values, but which have influenced the diversity of aesthetic reality, will be introduced in subsequent sections of this chapter.

[23] The use of art as an inspiration in these two terms can be found in architectural works by contemporary architects like: Peter Eisenman, Richard Meier, Rem Koolhaas and Zaha Hadid *(Maxwell, 2004: 6)*. For more details, see 4.2.1 (Design verses art).

[24] The Expressionist movement was inspired by the idea of exploiting and drawing on the creator's self, and on drawing technique which was not preoccupied with exact figural representation *(Morgenthaler, 2004: 425)*. Expressionism as an art form and as architecture and industrial design matured during the 20th century, and is now seen as a broad cultural phenomenon which encompassed a variety of artistic methods *(Morgenthaler, 2004: 427)*.

[25] Among these are architects like Le Corbusier and Alvar Aalto, as well as expressionists architects like Hans Scharoun and Erich Mendelsohn. Architects like Eero Saarinen and Jørn Utzon are also known for their self-expression *(Morgenthaler, 2004: 427)*.

[26] This emphasis on artistic aspects and self expression is linked both to art movements , individual architects, industrial designers, design historians and critics that claim to see individual "genius" in some architectural and industrial work, as well as design educators that "talk of 'innate talent' for design in some students" *(Gelernter, 1995: 7)*. It should also be pointed out that the exact source of form is not clear and defies rational explanation *(Gelernter, 1995: 7)*. This point was first introduced in chapter four. For further deliberation see 4.2.2.1 (Creativity in design).

[27] These values are often considered to be ahead of their time, and is often seen as a struggle against the old and being bent on heading toward the new *(Heynen, 2004a: 97)*. Consequently, avant-garde inspired design values are often characterised by being radical, controversial and not in line with consensus, in addition to often celebrating disruption *(Heynen, 2004a: 97)*. For

instance, avant-garde values have been an important contributor to the radicalising of the basic principle of modernity, which has created an urge toward continual change and development within architecture and industrial design. It has been argued that avant-gardism has been more prominent in literature and the arts than it has been within the domain of architecture and industrial design, but nevertheless avant-garde values and thinking had an impact on the design world. For further deliberation, see 4.2.2 (The emphasis on novel design solutions).

[28] The Modern Movement within the design domain is known for its dismissal of historical roots, its proclaimed effort to create new realities based on the intentions of crating a clean slate and with an intended break from the past. Architects often associated with avant-garde design values include prominent architects like: Walter A. Gropius, Hannes Meyer and Ernst May. They are all known for believing that their mission was to contribute to the design of all aspects of life, and "they aimed at a reconceptualization of the whole process of building, including construction techniques, housing typologies, and urbanism" *(Heynen, 2004a: 97)*. More contemporary architects have also been linked with the avant-garde design values, often called neo-avant-garde architects and includes architects such as Peter Eisenman and Bernard Tschumi *(Heynen, 2004a: 98)*.

[29] Especially compared to what has often been characterised as architecture and industrial design created in accordance within Modernistic design values.

[30] Supermodernism can be descried as a style that is characterised by an aesthetic of neutrality, minimalism, and abstraction *(Steer, 2004: 1279)*, and the structures are often airy, minimalist or monolithic, and surfaces are often transparent or translucent through the abundant use of glass. Even if super- modern structures often exploit technological innovation, are they often characterised by being "generally visual and symbolically simple, with clean lines, a minimalist style, and neutral materials" *(Steer, 2004: 1278)*. The allowance for design values such as artistic aspects and self-expression within Supermodernism can be illustrated in the following quotation:

> "Supermodernist architects seek expressivity; buildings are intended to be as autonomous and obviously separate from their surroundings; as contemporary and new, reflecting the present; as technically innovative; and finally, as a clean slate, an intended break from the past." *(Steer, 2004: 1279)*

[31] The aesthetic style classified as Supermodernism can be found in works by firms like: Rem Koolhaas's Office of Metropolitan Architecture (OMA), Jean Nouvel, Dominique Perrault, Herzog and De Meuron, and Inaki Abelos and Juan Herreros *(Steer, 2004: 1278)*.

[32] This includes architects like Frank O. Gehry, Peter Eisenman, Daniel Libeskind, and Zaha Hadid.

[33] The technological development introduced in chapter four has contributed to greater artistic freedom from a technological point of view, but from a value perspective is it the design value of

Artistic aspects and Self-expression that has laid the foundation for this development within architecture and industrial design.

[34] Even if the concept of the Spirit of the Time is problematic, the evidence of built form suggests “that designers at any given time share certain ideas which infuse their work” *(Gelernter, 1995: 8)*.

[35] “Zeitgeist is originally a German expression that means ‘the spirit (Geist) of the time (Zeit)’. It denotes the intellectual and cultural climate of an era. (collective consciousness, collective unconscious in psychology) The concept of zeitgeist goes back to the German philosopher Johann Gottfried Herder. However the word itself was coined by the philologist Christian Adolph Klotz in 1769, when he translated the Latin genius seculi (genius meaning guardian spirit and saeculum century) into the German zeitgeist.” Source: www.greatbuildings.com 20.10.2005.

[36] Hume used “arts” in its broader traditional sense.

[37] Hume spoke of the spirit of the ages generally and did not introduce “the spirit of the age” as an aesthetic tool which could be utilised by architects and designers to determine aesthetic forms *(Hume, 1965: 50)*.

[38] Before Pugin’s time non-visual principles were not extensively used as guidelines in matters of taste, which was due to a considerable agreement with regards to aesthetical style among patron, artist and craftsman (which in this context implies architects and industrial designers) *(Brolin, 2000: 107)*.

[39] The spirit of Pugin’s time could not, according to Pugin, be expressed by a “pagan” style that he deemed classical architecture to be.

[40] “Historicism has developed different and divergent, though loosely related, meanings. Elements of all some these appear in the extensive writings of G.W.F. Hegel, one of the most influential philosophers of 19th-century Europe, as well as in those of a philosopher he deeply influenced, Karl Marx. Variants of historicism Hegelian historicism […], Popperian historicism […], New historicism […], Biblical historicism” Source: www.wikipedia.org 12.02.2005.

[41] “William Morris (March 24, 1834 – October 3, 1896) was one of the principal founders of the British Arts and Crafts Movement and is best known as a designer of wallpaper and patterned fabrics, a writer of poetry and fiction, and an early founder of the socialist movement in Britain.” Source: www.wikipedia.org 21.10.2005.

[42] The Spirit of the Times design value contributed to the demise of architecture and industrial design which built on utilising aesthetical styles and forms from the past. Both Ruskin and Morris asserted and accepted that buildings and products must change as societies change *(Powell, 1999: 10)*.

[43] For further deliberation, see 5.1.1.6 (Classic, Traditional and Vernacular aesthetics) and 5.1.4 (Traditional design values).

[44] Famous quote, but unable to find the book or article in which this quote was first stated.

[45] Francesco Milizia (1725 - Roma, 1798) was an Italian architect.

[46] Quoted in Francesco Algarotti's (an Italian philosopher and art critic) book "Saggio sopra l'architettura", which was published in 1756. *(Bertoni, 2004: 100)*.
[47] Equally, architects like Abbé Marc-Antoine Laugier argued for Functional Honesty *(Laugier, 1975: 14 f)*.
[48] This point can be illustrated in the ideal shape of a concert hall, which:

> "should be generated by setting out uninterrupted sight lines for every spectator; the shape and location of the foyers should be determined by the flow of people to and from their seats; and the outside appearance should be shaped by the symbolic role of a concert hall as a focus of civic pride." *(Gelernter, 1995: 6)*

These aspects can all be accorded to functionalism used in determining the form of a given concert hall.
[49] For further deliberation, see 2.2.1 (Design values as indicated by design history).
[50] "Christopher Alexander: A professor-emeritus (the University of California, Berkeley) and licensed contractor as well as architect, Christopher Alexander (born October 4, 1936 in Vienna, Austria) is noted for his design of building complexes in California, Japan, and Mexico. However, he may be famous mostly for his popular appeal and his theoretical contributions. With Sarah Ishikawa and Murray Silverstein, he produced and validated an architectural system, a pattern language designed to empower any human being to design and build quite well at any scale. He began the project because he believes that users know more about the buildings they need than any architect could. Based in England, he continues to practice architecture and consult in planning." Source: www.wikipedia.org 18.11.2005.
[51] This can be illustrated as Pugin asserts in the following:

> "Pointed architecture does not conceal her construction, but beautifies it: classic architecture seeks to conceal instead of decorating it, and therefore has resorted to the use of engaged columns as breaks for strength and effect;—nothing can be worse." *(Pugin, 1969: 3)*

[52] "Eugène Emmanuel Viollet-le-Duc (January 27, 1814 - 1879) was a French architect, famous for his restorations of medieval buildings." Source: www.wikipedia.org 09.01.2005.
[53] For further deliberation, see 2.2.1 (Design values as indicated by design history) and 4.2.1 (Design verses art).
[54] This can be illustrated in the following account of a famous course (Vorkurs or introductory course) at the Bauhaus school taught by Josef Albers:

> “Albers would walk into the room and deposit a pile of newspapers on the table and tell the students he would return in one hour. They were to turn the pieces of newspaper into works of art in the interim. When he returned, he would find Gothic castles made of newspaper, yachts made of newspaper, airplanes, busts, birds, train terminals, amazing things. But there would always be some student, a photographer or a glassblower, who would simply have taken a piece of newspaper and folded it once and propped it up like a tent and let it go at that. Albers would pick up the cathedral and the airplane and say: ‘These were meant to be made of stone or metal—not newspaper.’ Then he would pick up the photographer’s absentminded tent and say: ‘But this!—this makes use of the soul of paper. Paper can fold without breaking. Paper has tensile strength, and a vast area can be supported by these two fine edges. This!—is a work of art in paper.’” *(Wolfe, 1981: 13 f)*

[55] Many socially aware architects and industrial designers typically object to “good design” based on the design value of Structure, Function and Material honesty because of the implication of being for the well-off, as in the quote “the choice between an expensive high-style kitchen chair and a knock-off that sells for a tenth the price is only a reality for the better-off” *(Brolin, 2000: 123)*. For some architects, industrial designers and scholars the design value of Structure, Function and Material honesty is seen as a tool to control taste. This is the case with regards to the idea that the properties of a given material and or technique actually determines the form in a design project, as well as Structural Honesty *(Brolin, 2000: 123).*

[56] “John Pawson is a contemporary British architect and designer associated with minimalism. Notable projects by Pawson include London's Cannelle Cake Shop, several Calvin Klein stores, and Medina House in Tunis.” Source: www.wikipedia.org 24.10.2005.

[57] This view was promoted by architects like Charles L. Eastlake, whom argued that the public’s “lust of profusion” should bee seen as a violation of “artistic propriety” *(Brolin, 2000: 127).*

[58] Original title was “Ornament und Verbrechen” and it was published in 1908.

[59] This link is asserted by architects, industrial designers and design scholars alike, and it can be exemplified by assertions made by the industrial designer Massimo Vignelli when he argues that: simplicity is not a style “but a far-reaching reaction to the noise, the visual noise the disorder and the vulgarity” *(Bertoni, 2002: 57)*. Equally, design scholars like Maggie Toy argues the same point when she asserts that minimalist architecture has the effect of allowing users to:

> “free themselves from the everyday clutter of life and to relax in a calm haven of elegant simplicity devoid of fuss and clutter, soothed by the tranquillity and restfulness of unencumbered space.” *(Toy, 1999: 7)*

[60] This type of thinking and design values has often led to a standardisation of form, which in turn has led to some degree of repetitive form expression. The repetitiveness or monotony is

especially evident within architecture with the development of curtain walls with their identical glass panels etc. *(Maxwell, 2004: 7)*. From a technological perspective it is questionable whether simple forms are always more fitted to mass production than other forms based on other aesthetic values. However, it should be noted that the fact that the mass production argument is doubtful from a technological standpoint does not necessarily make it doubtful from an marketing point of view.

[61] The design value of Simplicity and Minimalism can be found among architects like Walter Gropius, Frank Lloyd Wright and Luis Barragan. Both Gropius and Wright had a direct connection with the Arts and Crafts ideology, which "refocus artistic production from its classical roots to its modern agenda" *(Zipf, 2004: 77)* as well as being considered to be exponents of the Arts and Crafts revolution concerning "simplistic" form *(Zipf, 2004: 77)*.

[62] "'Less is more' is a quote often attributed to the architect Ludwig Mies van der Rohe, and sometimes to Buckminster Fuller. The quotation actually comes from the poem 'Andrea del Sarto', by Robert Browning." Source: www.wikipedia.org 10.12.2004.

[63] The design value of simplicity is not generally accepted within design, nor is the mantra of "less is more" which has its contra mantra in the "less is a bore" by the post-modern architect Robert Venturi.

[64] The Minimalist Design Movement was first named by the design scholar Charles Jencks.

[65] Many of these architects focussing on simplicity, both in Europe and America, have drawn on the Japanese design traditions and Japanese architects such as Tadao Ando, Kasuo Shinohara, Fumihiko Maki or Arata Isozaki *(Murray, 1999: 8), (Melhuish, 1994: 11 - 13)*. One example of this is the British architect John Pawson, whom for some is the personal reincarnation of minimalism in architecture *(Ruby and Ruby, 2003: 16), (Melhuish, 1994: 11), (Murray, 1999: 8)*. Pawson achieved international fame from first and foremost his design of boutiques for the American fashion designer Calvin Klein which is found in a number big cities around the world (Calvin Klein shops are found in Tokyo 1994, New York 1995, Seoul 1996, Hamburg 1999, Paris 1999, Dubai 1999, Taipei 2000 etc.) *(Ruby and Ruby, 2003: 21)*. Other British based architects which focus on simplicity includes Tony Fretton, David Chipperfield and David Adjaye *(Ruby and Ruby, 2003: 16)*.

Mediterranean architects adhering to the same design value include architects like Claudio Silvestrin, Alberto Campo Baeza, Edouardo Souto de Moura and Alvaro Siza *(Melhuish, 1994: 13), (Ruby and Ruby, 2003: 16), (Bertoni, 2004: 10)*. Equally, the design value of Simplicity and Minimalism has had a considerable influence among Swiss-German architects, including architects like Peter Zumthor and Peter Märkli, as well as firms like Diener & Diener, Herzog and de Meuron, Gigon & Guyer *(Ruby and Ruby, 2003: 17), (Bertoni, 2004: 10)*. One example of this influence can be found in the Herzog and de Meuron designed Bankside Tate Gallery in London which is designed according to the design value of simplicity *(Toy, 1999: 7)*.

[66] However American architects like Richard Gluckman and Michael Gabellini have created buildings which have become synonymous with Minimalist architecture *(Toy, 1999: 7), (Bertoni, 2004: 10)*.

[67] This includes designers such as Donald Judd, Asnago, Vender, Shiro Kuramata, Rolf Sachs, Hans J. Wegner, Bruno Munari, AG Fronzoni, Antonia Astori and Enzo Mari *(Bertoni, 2004: 6, 14, 18, 26, 28)*.

[68] This has particularly been the case for prominent fashion designers such as Giorgio Armani, Calvin Klein. Issey Miyake, Yohji Yamamoto and a number of architects and industrial designers *(Bertoni, 2004: 10, 28 - 30)*. Collaboration between fashion designers and architects (industrial designers) has include the following architects and fashion designers: Pawson, Silvestrin, Gabellini and Kuramata — Armani, Miyake, Sander and Klein *(Bertoni, 2004: 28 - 30)*. This has been followed through in a number of books and magazines that promote simplicity as a design value, no one more so than the magazine called Wallpaper* which was founded in 1996 *(Ruby and Ruby, 2003: 22)*.

[69] "Antoni Gaudí i Cornet (more widely known in the English speaking world under the Spanish version of his first name, as Antonio Gaudí, or, just simply, Gaudi), (25 June 1852–10 June 1926) was a Catalan architect famous for his unique designs expressing sculptural and individualistic qualities. His works are categorised under the Art Nouveau style of architecture, a precursor to modern architecture." Source: www.wikipedia.org 23.05.2005.

[70] "Leonardo da Vinci (April 15, 1452 – May 2, 1519) was an Italian Renaissance architect, musician, anatomist, inventor, engineer, sculptor, geometer, and painter." Source: www.wikipedia.org 21.06.2005.

[71] In these notebooks do Vinci points out the importance of getting inspirations and designing in accordance with the design value of Nature. This is particular evident when he asserts that:

> "Though human ingenuity may make various inventions which, by the help of various machines answering the same end, it will never devise any inventions more beautiful, nor more simple, nor more to the purpose than nature does; because in her inventions nothing is wanting, and nothing is superfluous, and she needs no counterpoise when she makes limbs proper for motion in the bodies of animals." *(Leonardo da and Richter, 1970: 126)*

[72] "Anthropomorphism, also referred to as personification or prosopopoeia, is the attribution of human characteristics to inanimate objects, animals, forces of nature, the unseen author of things, and others. 'Anthropomorphism' comes from two Greek words, ανθρωπος, anthrōpos, meaning human, and μορφη, morphē, meaning shape or form." Source: www.wikipedia.org 20.06.2005.

[73] It is worth nothing that the emphasis on symmetry within architecture has roots which dates back the Classical Greek period and has persisted "through the Gothic and the Renaissance, and

has even weathered to a surprising degree the upheaval of the Modern Movement" *(Aldersey-Williams, 2003: 14)*.

[74] This is evident when Ruskin argues that:

> "All perfectly beautiful forms must be composed of curves; since there is hardly any common natural form in which it is possible to discover a straight line." *(Ruskin, 1925: 195 f)*

[75] This link can be indicated through a type of reasoning illustrated in the following:

> "Forms are not beautiful because they are copied from nature; only it is out of the power of man to conceive beauty without her aid. […] But I think I am justified in considering those forms to be most natural which are most frequent; or, rather, that on the shapes which in the every-day world are familiar to the eyes of men, God has stamped those characters of beauty which He has made it man's nature to love; while in certain exceptional forms He has shown that the adoption of the others was not a matter of necessity, but part of the adjusted harmony of creation." *(Ruskin, 1925: 102 f)*

[76] This view of utilitarian forms was at the time sanctioned by the writings of scientist and philosophers like Charles Darwin and Herbert Spencer *(Brolin, 2000: 130)*.

[77] "Ernst Heinrich Philipp August Haeckel (February 16, 1834 - August 8, 1919), also written von Haeckel, was a German biologist and philosopher who popularized Charles Darwin's work in Germany." Source: www.wikipedia.org 20.06.2005.

[78] Ernst Haeckel: Kunstformen der Natur 1899-1904. This work was illustrated by lithographer Adolf Giltsch *(Haeckel et al., 1998)*.

[79] "Art Nouveau ('new art' in French) is an art and design style that peaked in popularity at the beginning of the 20th century." Source: www.wikipedia.org 18.06.2005.

[80] In particular, biology and zoology illustrations had an impact on designers like Hermann Obrist, René Binet, August Endell, Bruno J. F. Taut[80], and Louis Comfort Tiffany[80] *(Aldersey-Williams, 2003: 15), (Pearson, 2001: 48)*.

[81] "Dr. Fritjof Capra, PhD. (born February 1, 1939) is an Austrian-born American physicist." Source: www.wikipedia.org 17.06.2005.

[82] "James Ephraim Lovelock (born July 26, 1919), FRS, is an independent scientist, author, researcher and environmentalist who lives in Cornwall, in the west of England. He is most famous for proposing and popularizing the Gaia hypothesis, in which he postulates that the Earth functions as a kind of superorganism (term coined by Lynn Margulis)." Source: www.wikipedia.org 17.06.2005.

[83] This is a theory where Lovelock argues that the Earth functions as a kind of self-regulating superorganism.

[84] "Of the hill" is an idea promoted by the prominent architect Frank Lloyd Wright.

[85] All, for purpose of simplicity, are included in the design value of Nature, even if it can be argued that there are substantial differences between the three different aspects.

[86] These domains have all at some point throughout history been considered to be "part of nature" within this context of the design value of Nature.

[87] "Lucy the Elephant is a six-story elephant-shaped architectural folly constructed of wood and tin sheeting in 1882 by James V. Lafferty in Margate City, New Jersey, two miles (3.2 km) south of Atlantic City, in an effort to sell real estate and attract tourism." Source: www.wikipedia.org 22.06.2005.

[88] It is situated between the Long Island towns of Flanders and Hampton Bays.

[89] This includes prominent architects like Victor Horta, Charles Rennie Mackintosh and Antoni Gaudi *(Pearson, 2001: 12, 34)*.

[90] Wright was deeply committed to Organic Architecture, to the extent that he "offered fifty-two definitions of it in one lecture and associated it with the free plan, free space, freedom from restraint" *(Jencks, 1995: 109)*. He inspired other architects like the Italian born Paolo Soleri, Arthur Dyson, Dan Liebermann, Kendrick Bangs Kellogg, and John Watson which have all produced designs in the organic tradition *(Pearson, 2001: 39)*. Equally, the "maverick" architect Bruce Goff designed buildings which is know of its organic nature *(Pearson, 2001: 39)*. This has inspired architects like Herb Greene, Bart Prince, Mickey Muennig, and Eugene Tsui to follow suite *(Tsui, 1999: x - xii), (Pearson, 2001: 39)*. Some of the above mentioned architects founded the US Association of Organic Architects *(Pearson, 2001: 39)*. Other architects, whom have focused on Organic Architecture include European architects like Hugo Haring *(Jencks, 1995: 109)*, Eero Saarinen and Jørn Utzon *(Aldersey-Williams, 2003: 17)*. The two architects well known for celebrated projects which have drawn on inspiration of nature, includes the "Eero Saarinen's aquiline TWA Terminal at New York's Kennedy Airport and Jørn Utzon's polysemous Sydney Opera House" *(Aldersey-Williams, 2003: 17)*.

[91] For example the designer, architect and inventor Buckminster Fuller designed a car which shape was based on the study raindrops in 1933 *(Senosiain, 2003: 3)*. Equally, did automotive engineer Ferdinand Porsche state that the VW Type 1 (often called the Beetle or Bug) should "look like a beetle; you've only got to look to nature to find out what streamlining is" *(Waters, 2003: 141)*. Another industrial designer whom has famously drawn on the design value of Nature is Philippe P. Starck and his work which includes a lemon squeezer, toothbrushes and chairs *(Waters, 2003: 151 - 154)*.

[92] For further deliberation see 5.1.3 (Environmental design values).

[93] "The pack-donkey meanders along, meditates a little in his scatter-brained and distracted fashion, he zigzags in order to avoid the larger stones, or to ease the climb, or to gain a little

shade; he takes the line of least resistance. [...] The Pack-Donkey's Way is responsible for the plan of every continental city; including Paris, unfortunately" *(Le, 1929: 5 f)*.

[94] "James Henry Breasted (August 27, 1865–December 2, 1935) was born in Rockford, Illinois and was an archaeologist and historian. He was educated at the Chicago Theological Seminary, Yale University (MA 1891) and the University of Berlin (PhD 1894). He was the first American citizen to obtain a PhD in Egyptology. Breasted was in the forefront of the generation of archaeologist-historians who broadened the idea of 'Western Civilization' to include the entire 'Near East' in Europe's cultural roots." Source: www.wikipedia.org 28.10.2005.

[95] Industrial design in this context includes its history of traditional craftsmanship.

[96] "The Arts and Crafts Movement was a reformist movement, at first inspired by the writings of John Ruskin, that was at its height ca. 1880-1910. The movement influenced British decorative arts, architecture, cabinet making, crafts, and even the 'cottage' garden designs of William Robinson or Gertrude Jekyll." Source: www.wikipedia.org 10.01.2005.

[97] As well as "elevate the craftsman to a more prominent position in the design professions" *(Zipf, 2004: 75)*.

[98] This point can be exemplified by architects like Charles Rennie Macintosh whom derived a number of his forms from Scottish Baronial castles. Equally, did architects like Sir Edwin Lutyens draw on forms from medieval house in the southern English county of Surrey, as well as Charles Annesley Voysey which "stripped down medieval house forms to their underlying essences" *(Gelernter and Dubrucq, 2004: 1091)*.

[99] Vernacular building traditions are linked to country and regions, which will be further introduced in 5.1.1.7 (Regionalism).

[100] For instance, classicism was given a renewed importance within the domain of architecture with the teaching of principles of ancient Roman Classicism at the École des Beaux Arts (The École des Beaux Arts was a prominent and influential architecture school in Paris during the 19th-century) *(Gelernter and Dubrucq, 2004: 1091)*.

[101] The bases for a revival of the design value of Vernacular aesthetics can be found in the work of scholars like Sibyl Moholy-Nagy and her book "Native Genius in Anonymous Architecture". Equally, Bernard Rudofsky contributed with his book "Architecture without Architects" to this focus. And finally, scholars like Amos Rapoport also contributed with the book "House, Form and Culture".

[102] "Successful architect and urban planner from Luxembourg. Well known for his development of Poundbury 'village' in Dorchester for the Prince of Wales." Source: www.wikipedia.org 10.01.2005.

[103] "Lewis Mumford (October 19, 1895 – January 26, 1990) was an American historian of technology and science, also noted for his study of cities. Mumford was influenced by the work of Scottish theorist Sir Patrick Geddes." Source: www.wikipedia.org 27.10.2005.

[104] Thus has it since the Renaissance been critical of an outside power to impose an international, globalizing, universalizing architecture which marks is a clear brake from the particular local identity in order to manifest its domination *(Lefaivre and Tzonis, 2003: 34)*.

[105] "The term 'southwest' ... refers to: [...] The American Southwest" Source: www.wikipedia.org 10.01.2005.

[106] "Cape Cod (1033 km²) is an arm-shaped peninsula forming the easternmost portion of the state of Massachusetts, in the north eastern United States." Source: www.wikipedia.org 10.01.2005.

[107] De Re Architectura is a Roman text.

[108] Enclaves were identified by looking for common architectural attributes such as "a common treatment of site, common spatial arrangement, common materials and common decorative details" *(Lefaivre and Tzonis, 2003: 18)*.

[109] For instance, within architecture one of the many changes started with the change in emphasis found in the previously mentioned École des Beaux Arts in Paris. The school went from being a world centre for Roman Classicism during the 19th-century, to a school that focused on Regionalism and vernacular architecture at the start of the 20th century *(Gelernter and Dubrucq, 2004: 1091)*. This can be illustrated by Julien Guadet, a professor of theory at the École at the turn of the 19th century, whom taught his students that "a building in the city should be different from one in the country, just as one at the seaside must be different from one in the mountains" *(Gelernter and Dubrucq, 2004: 1091)*. The design value of Regionalism promoted at the École des Beaux Arts in Paris inspired a movement of architects later named Academic Eclecticism, "which among other things attempted to fuse the regional with the universal" *(Gelernter and Dubrucq, 2004: 1091)*. The Academic Eclecticism movement was characterised by architects which "derived their ideas from traditional architectural styles that they believed embodied timeless and universal principles of design" *(Gelernter and Dubrucq, 2004: 1091)*. But at the same time they emphasised that design should fit in to a particular geographical setting *(Gelernter and Dubrucq, 2004: 1091)*.

[110] "Martin Heidegger (September 26, 1889 – May 26, 1976) was a German philosopher. He studied at the University of Freiburg under Edmund Husserl, the founder of phenomenology, and became a professor … in 1928. […] Beyond his relation to phenomenology, Heidegger is regarded as a major … influence on existentialism, deconstruction, hermeneutics and postmodernism." Source: www.wikipedia.org 27.10.2005.

[111] "Nordic man has to be friend with fog, ice and cold winds; he has to enjoy the creaking sound of snow under the feet when he walks around, he has to experience the poetical value of being immersed in fog" *(Norberg-Schulz, 1980: 21)*.

[112] For further deliberation see 5.2.1.4 (Simplicity (Minimalism).

[113] Equally, it can be illustrated in his architectural work like the Prairie School, with its low horizontal lines, which Wright argued captured the essence of America's Midwestern plains. Or in his later designs for the Arizona desert which look "distinctly different from the ones he

designed in Wisconsin" *(Gelernter and Dubrucq, 2004: 1091)*. Other prominent architects like Bernard Maybeck[113] also aligned themselves with the same design value of Regionalism as Wright, and a number of architects like: Robert Venturi, Robert Stern, Antoine Predock, Harry Teague and Glenn Murcutt sought regional expressions *(Gelernter and Dubrucq, 2004: 1091 f)*.

[114] Prominent architects in these countries such as Alvar Aalto have been considered to be regionalists *(Lefaivre and Tzonis, 2003: 27, 42)*. Aalto's work is thought to supersed "the adversary stance of romantic regionalism, interpreting modernity as a protesting attitude to bureaucratic and technocratic imperialism" *(Lefaivre and Tzonis, 2003: 42)*.

[115] A number of architects have practiced in accordance with the design value of Regionalism, this includes architects like:

> "Sedad Eldem, Paul Rudolph, Richard Neutra, Ricardo Porro, Minette de Silva, Lina Bo Bardi, Tai Kheng Soon, William Lim, Victor Gruen, Matthew Nowicki, Ludwig Hilberseimer, Artur Glikson, Ralph Erskine, J.B. Jackson, Oluwole Olymiyiwa, Kenzo Tange, Giancarlo de Carlo, Ernesto Rogers, Oscar Niemeyer … [and] Max Borges." *(Lefaivre and Tzonis, 2003: 53)*

[116] Supermodernism is characterised by an "emphasis on space and place rather than on form (or style as an end it itself)" *(Steer, 2004: 1278)*.

[117] Contemporary examples of this can be found in Jean-Marie Tjibaou Cultural Centre in Nouméa, New Caledonia, which was design by the renowned Italian architect Renzo Piano *(Lefaivre and Tzonis, 2003: 82)*. The centre was created with the concept of celebrating the vernacular Kanak culture of New Caledonia in mind as well as being "devoted to the memory of the political leader, Jean-Marie Tjibaou, who was assassinated in 1989" *(Lefaivre and Tzonis, 2003: 82)*. It consists of 10 units, all measuring between twenty and twenty-eight meters in height and with different functions or evoke certain themes, with the consistent form of vertically positioned shell-like structures which resemble the traditional huts of a Caledonian Village. Another example can be found in The Nordic Embassies in Berlin, Germany created by Alfred Berger and Tiina Parkkinen, which contains the embassies of the five Nordic countries *(Lefaivre and Tzonis, 2003: 88)*. The building is broken down into a constellation of six buildings, each one with an identity of its own where each of the countries is expressing "their sovereignty and individual culture in their respective buildings" *(Lefaivre and Tzonis, 2003: 88)*. In order to achieve the final design of the national embassy buildings the architects from each Nordic country were invited to contribute *(Lefaivre and Tzonis, 2003: 88)*.

[118] "Mohandas Karamchand Gandhi (October 2, 1869–January 30, 1948) (Devanagari:, Gujarati) was a national icon who led the struggle for India's independence from British colonial rule, empowered by tens of millions of common Indians. Throughout his life he opposed any form of terrorism or violence, instead using only the highest moral standards. His philosophy of non-violence, for which he coined the term satyagraha, has influenced national and international non-

violent resistance movements to this day, including the American Civil Rights Movement led by Martin Luther King." Source www.wikipedia.org 08.11.2005.

[119] This relationship between social awareness and social design values within the two design professions and society, can to some extent, be illustrated by the social design values found in design movements like: the Arts and Craft movement, the Modernist movement and the Neo-rationalism movement *(Zipf, 2004: 77), (Johnson, 2004: 1084)*. For example, the Neo-rationalism movement is characterised by connecting architecture to political theories such as Marxist theories and other social theories and values *(Johnson, 2004: 1084)*.

[120] It is worth pointing out that the ethical consumer values link is more often found in industrial design than architecture. The social values within the domain of industrial design often covers ethical consumer issues such as: (1.) should industrial designers work for companies which operate within oppressive regimes, (2.) ought industrial designers work for companies which operate without labour force regulations regarding proper wages and conditions of the work-force, (3.) must industrial designers avoid working for businesses without environmental responsibility regarding issues such as nuclear power, animal testing and pollution etc., (4.) should industrial designers work for companies which business model affects infringement of land rights and/or in armaments and (5.) ought industrial designers avoid working with companies which have an irresponsible marketing *(Whiteley, 1995: 101)*.

[121] This as social design values are, for instance, connected to "semiotics, which recognizes that buildings carry meanings (signs) and symbolic over-tones" *(Johnson, 2004: 1084)*. Similarly social values have been linked to aesthetics style and its relationship with cultural continuity or history *(Johnson, 2004: 1084)*.

[122] Rationalism within the context of architecture and industrial design is often characterised by a search for the objective design principles with universal application. This implies search objective principles regardless of complexity or culture, as most functions are naturally more or less similar throughout history.

[123] Romanticism is within the context of architecture and industrial often associated with an emphasis on personal freedom for the architect and or the industrial designer found in design movements like Expressionism and sensualism as well as among architects like Oscar Niemeyer and Frank O. Gehry *(Johnson, 2004: 1084)*.

[124] For instance, architects like Walter Gropius, Mies van der Rohe and Le Corbusier believed in a "mirage of the architect as seer and sociological priest" *(Hughes, 1991: 167 f)*.

[125] "Levittown was the name of two places in the United States of America: Levittown, New York Levittown, Pennsylvania and for a time, there was also a Levittown, New Jersey. It has reverted to its former name of Willingboro Township, New Jersey." Source: www.wikipedia.org 18.01.2005.

[126] The firm Levitt and Sons focused on developing and building "simple" and affordable houses, created these suburbs. The emphasis within the Levittown development was, apart from making money, an effort to create and cater to contemporary social values. This was achieved by

providing affordable housing and by creating viable community with public schools, professional-size baseball fields, and a town halls etc. *(Smith, 2004: 762)*. Prior to the Second World War Levitt and Sons built luxury homes, but after the war their focus changed to building affordable houses. Levitt and Sons was and still is a considerable home builder and has build about 140,000 houses, mainly in the eastern United States *(Smith, 2004: 762)*. They are well known as a considerable contributor to the mass-produced suburban developments *(Smith, 2004: 762)*.

[127] "Favela is a term commonly used in Brazil to describe squatter areas such as shanty towns and slums. The term 'favela' was coined after the Morro de Favela hillside in Rio de Janeiro where freed slaves first established a squatter community in the 1890s. The favela is fundamentally different from inner-city slums and tenements, due to both how they were created and their locations. However, due to the disparate distribution of wealth in Brazil, the term favela is widely used to refer to both shanty towns and slums." Source: www.wikipedia.org 18.01.2005.

[128] A program based on the design value of Social change has led to reform and develop of the Favelas which is called Favela-Bairro *(Segre, 2004: 446)*. The program started by serving 90 shantytowns and slums with a population of 300,000 inhabitants, based on an emphasis described in the following:

> "(1) completing or constructing main urban infrastructures; (2) providing environmental changes that ensure that favelas look like standard neighbourhoods; (3) introducing visual symbols of the formal city as a way to identify favelas as neighbourhoods (paved streets, parks, urban furnishings, and public services); (4) consolidating and inserting favelas into the planning process of the city; (5) implementing social types of activities, such as setting up day care centres for children, income generation processes, training programs, and sporting, cultural, and leisure activities; and (6) promoting the legalization of land subdivision and providing individual land titles." *(Segre, 2004: 447)*

These points indicate the strong commitment to the design value of Social change in the Favela's program, which can be linked to a competition organised by the Brazilian housing secretariat and the Brazilian Institute of Architects. This competition had a number of architects engaged them-selves in developing new ideas and methodological approaches to develop improvements for the Favelas *(Segre, 2004: 447)*. The contributors to this development included contributions from architects such as "Planejamento and Arquitetura, Fåbrica Arquitetura, Arquitraco Cooperativa, and Archi 5 studios" *(Segre, 2004: 447)*. This in addition to the older, but prestigious works by architects like "Paulo Case, Luis Aciolli, and Mauricio Roberto" *(Segre, 2004: 447)*. These design projects are alleged to have the effect of promoting a new affiliation between "technical expertise and the degraded areas of Rio de Janeiro" *(Segre, 2004: 447)*.

[129] Socially engaged architectural buildings have been documented to some extend by Richard C. Hatch in his book “The Scope of Social Architecture”. Within this book, Hatch describes an international movement often referred to as the Social Architecture movement.

[130] No page number is available. The quotation can be found on page 2- 3 when printing out the document on A4 paper.

[131] One example of these organisations can be found in the American National Center for Appropriate Technology (NCAT), which is a non profit organisation working to develop and introduce “small-scale, low-cost and self-help technologies appropriate to the needs and resources of low-income communities” *(Whiteley, 1993: 110)*. Equally, similar organisations have been established in Europe, which includes organisations such as the Unit for the Development of Alternative Products (UDAP) and the London Innovation Charitable Trust (LICT).

[132] This point can be illustrated by the arguments which took place surrounding and within the City Beautiful movement, which was marred by value conflicts among “architects, landscape architects, engineers, artists, and civic leaders over the direction and meaning of the fledgling city-planning profession” *(Gale, 2004: 263 f)*. Within this movement some advocate “the functional elements of city planning, including efficiency, economy, safety, and reform of social conditions” *(Gale, 2004: 264)*. Yet, others asserted that:

> “the aesthetic and cultural attributes of European baroque ideals and neoclassical architecture would inspire civic pride, respect for democratic values, and cultural growth among citizens and visitors to American cities.” *(Gale, 2004: 264)*

[133] “Thomas Sowell (born 30 June 1930) is a prominent American economist, political writer, and conservative-libertarian[1] commentator. He is presently a senior fellow at Stanford University's Hoover Institution.” Source www.wikipedia.org 28.11.2005.

[134] This tradition includes scholars like: Kevin Lynch, William H. Whyte, Clare Cooper Marcus and Wendy Sarkissian, Jan Gehl and Carolyn Francis and Clare Cooper Marcus *(Beatley and Wheeler, 2004: 81)*. The work conducted by these authors has not only been inspirational for architecture and industrial designers, but has also laid the foundation for a new discipline of social and environmental aware design, which is “devoted to researching how built environments work for people” *(Beatley and Wheeler, 2004: 81)*

[135] This is linked to “Performance Design” which is a concept linking user participation and consultation to “scientific method of analyzing functional requirements, including the psychological and aesthetic needs of people” *(N.N, 1967: 104 f)*.

[136] POE typically focuses on the requirements of building occupants, which characteristically includes issues such as “health, safety, security, functionality and efficiency, psychological comfort, aesthetic quality, and satisfaction” *(ebrary Inc., 2001: 1)*. The information collected is

then analysed to discover "successes and failures in processes, products, and other building-related areas" *(ebrary Inc., 2001: 1)*, all this for the "purpose of improving the quality and life-cycle cost of future buildings" *(ebrary Inc., 2001: 1)*. POE is based on the preconception that users' needs create valuable input to the building process and that this can be captured through "systematically assessing human response to buildings and other designed spaces" *(ebrary Inc., 2001: v)*.

[137] POE was developed and inspired by scholars like Christopher Alexander, Robert Sommer, Edward T. Hall, Oscar Newman and Clare Cooper.

[138] The findings in a POE attempted to lay the foundation for improvements to existing buildings and create a foundation of knowledge which future building can be based on *(ebrary Inc., 2001: v)*. All in an effort to improve on successes and avoid repeating mistakes pointed out by users of buildings and products *(ebrary Inc., 2001: 1)*.

[139] However, a key concept within POE is that:

> "Individual judgments by the designer and the layperson must not be abandoned, but must be augmented by more complete and rigorous techniques." *(Friedmann et al., 1978: 2)*

Traditionally, POE studies has been conducted using "questionnaires, interviews, site visits, and observation of building users" *(ebrary Inc., 2001: 3)*, whereas today web based questionnaires are often used. A number of organisation have successfully used POE to improve existing buildings, among these are organisations such as the U.S. Army, the U.S. Postal Service and the Disney Corporation *(Preiser et al., 1988: 12)*, *(ebrary Inc., 2001: 5)*. Even if POE has been around since the begging of the 1960s *(ebrary Inc., 2001: 2)*, there have been relatively few organizations and architecture offices which have fully incorporated the "lessons from POE programs into their building delivery processes, job descriptions, or reporting arrangements" *(ebrary Inc., 2001: 4)*.

[140] Some of the best-known examples of participatory design are, according to Hilde Heynen, found in Europe *(Heynen, 2004b: 1048)*, and include works like: the design of the Medical Faculty of the Catholic University of Louvain by Lucien Kroll, and Byker housing project (Newcastle upon Tyne, 1981) by Ralph Erskine. Another well-known building, which is based on the design value of Consultation and Participation, is the ING Bank (formerly NMB) headquarters building near Amsterdam in the Netherlands. It was developed with a participatory process where the whole design process "involved representatives from all future building occupant groups as well as all members of the design and consultancy teams" *(McDonald, 2004: 1281)*.

[141] This includes organizations like the International Association for Public Participation and the Civic Practices Network that are all promoting and contributing to the development of the design value of Consultation and Participation.

[142] This renewed focus on reduction of crime through the build environment can be illustrated with Wood which argued that “housing projects can never employ enough police officers, caretakers, service engineers, etc., to prevent crime from occurring” *(Wood, 1961) (unable to get hold of a copy so no page number can be given), (Colquhoun, 2004: 38)*. On the basis of this argumentation she recommends that designers should work closely with residents in an effort to redesign public and semi-public spaces in a way which affects crime rates *(Wood, 1961) (unable to get hold of a copy so no page number can be given), (Colquhoun, 2004: 38)*. Equally, Jacobs contributes to the relation between crime and the build environment by drawing attention to how “new” housing developments were a failure (“New” housing developments tend to refer to modernist housing projects before 1961 in this context.), especially in relation to higher incidences of crime *(Jacobs, 1961: 76 f)*. In much the same way, Newman contributed to the awareness of these issues with his research connected to houses owned by the New York Housing Authority, which provided detailed statistics on the physical form of housing in New York, including profiles of residents and crime records *(Newman, 1972: xiv - xvi)*. Based on this research Newman found that 3-storey buildings had a lower crime rate than buildings higher than 6 storeys and developments larger than 1,000 dwellings *(Newman, 1972: 27 - 34)*.

[143] “Crime prevention through environmental design (CPTED) is a multi-disciplinary approach to deterring criminal behaviour. CPTED strategies rely upon the ability to influence offender decisions that precede criminal acts. As of 2004, most implementations of CPTED occur solely within the built environment.” Source: www.wikipedia.org 21.01.2005.

[144] Within this line of thought is the emphasis typically on “developing social and economic strategies with physical development to produce sustainable communities” *(Colquhoun, 2004: 38)*.

[145] The specifics of these three strategies have mainly been developed based on work conducted by a number of specialist researchers in crime prevention in the USA and the UK *(Colquhoun, 2004: 38)*.

[146] It is not only among architects and industrial designers that the emphasis on this type of strategy can be found, as it can also be found among national governments, cities, neighbourhoods, and citizens *(Wekerle and Whitzman, 1995: 6 f)*.

[147] For instance, the architect Barry Poyner has co-authored a book with Barry Webb called “Crime Free Housing”, which sets out to show how a number of design considerations can assist in preventing crime. Poyner and Webb list of considerations includes: (1.) moderate locking security, (2.) facing windows, (3.) high fences at the sides and rear, (4.) access for servicing and deliveries, (5.) space at the front, (6.) a garage at the side of the house, (7.) avoid through-pedestrian routes, (8.) surveillance of access roads and (9.) green spaces outside housing areas *(Poyner and Webb, 1991: viii f)*.

[148] For instance, the automotive industry’s emphasis on security has led to a reduction in car theft *(Press et al., 2001: 2), (Sallybanks and Brown, 1999: 24)*. Other examples can be found in products like the Adshel i+ terminal, which is an electronic information service for outside use in

towns and cities designed by PSD Associates. This terminal has been designed with a particular focus on resisting “vandalism and misuse, and facilitate easy repair, overall semiotics convey a message of strength” *(Pease, 2001)* (no page number available, it is located in the beginning of the report), *(Press et al., 2001: 7)*. This emphasis can be indicated by the following assertion made by Barry Jenkins whom is the Design Director at PSD Associates:

> “Much of the psychology of strength is that it looks like it’s strong … normal people with a slight criminal tendency wouldn’t want to try and vandalise it because it is too much hassle. So by not making this flimsy in its appearance or fine in its detailing it does look more resistant.” *(Press et al., 2001: 8)*

Equally, the PersonaS, which is a cash machine with a special technology i.e. three cameras “which uses the customer’s iris as the means of identification rather than PIN numbers or signatures” *(Pease, 2001) (no page number available, it is located in the beginning of the report)*, also has been designed with Crime prevention in mind. In much the same way, is Stop Thief, which is an anti-theft chair, also designed with the value of Crime prevention as a main concentration. The Stop Thief was developed as part of a research project by Central Saint Martins College of Art and Design and it has been piloted in Pizza Express and Maxwell’s restaurants *(Pease, 2001) (No page number available, it is located in the beginning of the report)*. The design has particular emphasis on “keeping bags safe while their owners relax in busy cafes, bars and restaurants” *(Pease, 2001) (no page number available, it is located in the beginning of the report)*. Even the London Underground has focused on crime prevention through design. Some of the trains on the London Underground have been refurbished based on the design value of Crime prevention. The design was supplied by Cre'active Design, which radically changed the original “interior layout, allowing greater fields of view, much improved lighting and better demarcation of personal space” *(Pease, 2001) (no page number available, it is located in the beginning of the report)*. This was all made in an effort to reduce crime conducted to the underground, and as a means to increase the sense of security among the users of the London underground trains.

[149] This includes organisations like the British Design Council *(Pease, 2001: 45)*, Crime Prevention Through Environmental Design, The European Designing Out Crime Association and Designing Out Crime Association. They are all organisation that are attempting to influence architects and designers to design with the design value of Crime prevention in mind.

[150] Part of a speech delivered at the Riverside Church, NYC called Beyond Vietnam. April 1967.

[151] “The Reverend Martin Luther King, Jr. (January 15, 1929 – April 4, 1968) was an American Nobel Laureate, Baptist minister and Negro (The word Negro is used for historical reasons) civil rights activist. He is one of the most significant leaders in U.S. history and in modern history of non-violence and is considered a hero, peacemaker and martyr by many people around the world. A decade and a half after his 1968 assassination, Martin Luther King Day, a U.S. holiday

was established in his honour. He also was awarded the Presidential Medal of Freedom." Source: www.wikipedia.org 05.11.2005.

[152] This is a perspective that can be challenged from a number of positions, including the straightforward argument that "Third World" is an inappropriate term considering the unquestionable fact that there exists only one world. Countries covered by the tern Third World are generally located in Africa, Latin America, and Asia, but it is important to point out that not all countries in these regions are coved by the term.

[153] This notion of special solutions may be as questionable as the term "Third World", but this is irrelevant in relation to whether the design value exists or not. However, stepping out of the role as researcher for a second, I personally would like to express my deepest apology to anybody reading this section that are from a country regarded as developing country in this context. My apology is both for the type of thinking which is behind the term "Third World" and the foundation which tends to be behind the design value called "Third World" i.e. that some countries disserves different solutions than the rest of the world, commonly found among design scholars, westerns architects and industrial designers.

[154] One of the early representatives of the design value of the "Third World" type to thinking within the architectural profession was Hassan Fathy with his emphasis "on self-help, concern for the poor, cultural authenticity and individualism" *(Richards et al., 1985: 24)*. Indeed was Fathy one of the early vocal promoters of the design value of "Third World", which is now widely accepted among sections of the architectural and industrial design professions *(Richards et al., 1985: 24)*.

[155] Buildings that have been developed with emphasis on the design value of "Third World" has often been referred to as "Third World Housing" *(Strassmann, 1998: 589)*.

[156] A number of experiments were made in attempting to export these changes to the "Third World", which included different building concepts and technology such as: "concrete panels, stacked boxes, spun fibreglass, extruded plastics, sprayed cement. bamboo reinforcing, and several other inventions" *(Strassmann, 1998: 590)*. International competitions and conferences were held in support for this development, but after two decades of trials was only a small number of proposed solutions still actively supported. In practical terms, it was only stabilized soil blocks, fibre-reinforced roofing tiles, and a machine for hand pressing concrete blocks that have survived as intermediate technology. This was due to the fact that conventional "bricks, blocks, and reinforced concrete remained cheapest as materials" *(Strassmann, 1998: 590)*, and low wages within the Third World allowed them to be handled and put into structures economically *(Strassmann, 1998: 590)*.

[157] This as there is often a considerable amount of unemployment in many "Third World" countries *(Strassmann, 1998: 590)*.

[158] The successes rate of these three strategies have come into question as experience in Puerto Rico, Colombia, and elsewhere "showed that, considering administrative expenses and subsidies,

these dwellings still cost" *(Strassmann, 1998: 590)* more than the inhabitants and the government of these nations could afford to pay to shelter everyone *(Strassmann, 1998: 590)*.

[159] The architecture of empowerment is a strategy which "requires commitment, dedication and mental outlook very different to those of conventional architectural practice" *(Yunus, 1997: 7)*.

[160] This include individuals such as: Hassan Fathy, Ismail Serageldin, Suha Özkan, Charles Correa, Arif Hassan, Michael Cohen and Mona Serageldin *(Yunus, 1997: 7)*.

[161] Practical design solutions designed in accordance with the design value of the "Third World" includes products such as: wind-up radios invented by Trevor G. Baylis and the Hippo Water Roller (a roller design to improved access to water) designed by Pettie Petzer and Johan Jonker. Equally, the solar powered hearing-aid is another example *(Ngubane, 2003: 3)*.

[162] This includes organisations like the International Council of Societies of Industrial Design (ICSID), which plays a considerable roll in promoting the design value of "Third World" *(Viljoen, 2003: 4)*. This has taken place through activities such as conferences like the Design Education for Developing Countries conference held in Durban 1993 and the Design for Development Initiative in 1997 *(Viljoen, 2003: 4)*. Another contributor can be found in the organisation called the Design for the World, Design for the World was founded by the International Council of Graphic Design Associations, International Council of Societies of Industrial Design, International Federation of Interior Architects and Barcelona Centre de Disseny *(World, 2002: 2)*, which is cooperation between industrial design schools and humanitarian and cultural organizations. Design for the World cooperates with the following industrial design schools (institute):

> "California State Polytechnic, the Illinois Institute of Technology, the University of Illinois in Chicago, the University of Helsinki, the Institute of Design in Chicago, the Universidad Javeriana de Colombia, and several design schools and universities in Barcelona." *(World, 2002: 8)*

Practical application of this cooperation can be found in the development of water filters in Bolivia, which have been developed in a cooperation between designers and the Medecins Sans Frontières *(World, 2002: 5)*. Equally, the development of the "Sharps Container", which provides "safe disposal of medical waste, especially 'sharps' (syringes, broken vials, razor blades, etc), to avoid contamination" *(World, 2002: 5)* that can be a considerable risk at health centres in developing countries, is also base on a cooperation between industrial designers and humanitarian organizations *(World, 2002: 5)*.

[163] "The term sustainability has its origins in the 1987 World Commission on Environment and Development report, Our Common Future. The concept was central to "a global agenda for change" in current development patterns focusing on both underdeveloped and industrialized countries. The term recognizes the interdependency of economic, social, and environmental factors necessary to sustain life on Earth. The defining quote from this report is: 'Sustainable

development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future' (WCED 1987)." *(McDonald, 2004: 1280).*

[164] The first is a type of thinking that has to a greater or smaller degree been applied to wildlife species and fisheries as well as to forestry through out history *(Beatley and Wheeler, 2004: 8)*. It is based on the perspective that humans should take on the stewardship of natural resources for their own use and long-term benefit *(Beatley and Wheeler, 2004: 8 f).*

[165] The Second perspective is linked to the idea of preservation, where the intrinsic value of all that can be found in nature is based on the line of thought that nature should be protected for its own sake. This implies that all in nature has value and should be preserved due to its own worth.

[166] Environmental values within architecture and industrial design have considerable historical roots which date back to the time of Vitruvius and other ancient theoreticians *(McDonald, 2004: 1280),* and environmental design values can be found among a number of architects and industrial designers *(Whiteley, 1995: 96).*

[167] A particular side effect has been the rediscovery of the vernacular building practices, as these buildings tends to be adapted to local climates, materials, and traditions in an environmental friendly manner *(Beatley and Wheeler, 2004: 181).*

[168] Within these two developments complex ecological and technological issues become the order of the day for architects ranging from comfort levels to global warming. For example, the energy crisis in the early seventies spurred on the development of energy conserving building technology, which "laid the groundwork for the broad ideals of sustainability" *(Cuff, 2000: 347).*

[169] Generally, the field of environmental building and product technology has evolved in many western countries, which has in turn influenced architects and industrial designers with regards "eco-tech, green building, or sustainability, environmental concerns" *(Cuff, 2000: 348).*

[170] "Buildings consume one-third of the total energy produced in the United States, produce 40 percent of the carbon dioxide emissions that have been linked to global warming and air pollution, and generate 33 percent of landfill construction waste." *(McDonald, 2004: 1280)* This alone suggests that environmental technology and environmental design values will grow in importance in the imminent future *(Cuff, 2000: 348).*

[171] It can be noted that within western architecture many of these "ancient" skills and techniques abound with the introduction of artificial lighting, air conditioning and other technological developments in contemporary architecture which do not focus on environmental issues *(McDonald, 2004: 1280).*

[172] "The Industrial Revolution is the name given to the massive social, economic, and technological change in 18th century and 19th century Great Britain." Source: www.wikipedia.org 28.01.2005.

[173] These city sizes were virtually unknown before the 19th century, an exception may be found in ancient Rome which may have been home to a similar number of inhabitants *(Beatley and Wheeler, 2004: 7).* This development was based on coal-fired industrial factories that drew workers from the countryside to the cities. This all led to "privatization of formerly commonly

held rural land, and increasingly centralized rural landownership" *(Beatley and Wheeler, 2004: 7),* which in turn pushed country dwellers away from their traditional communities *(Beatley and Wheeler, 2004: 7).*

[174] In general, the early period of the Industrial Revolution was marked by deforestation and air and water pollution, which "reached new, and in some cases still unmatched heights" *(Beatley and Wheeler, 2004: 7).*

[175] The unsustainable aspect of the early days of the Industrial Revolution was pointed out by writers such as Henry David Thoreau, Frederick Engels, Charles J. H. Dickens and David H. Lawrence *(Beatley and Wheeler, 2004: 7).*

[176] One of the first to contribute to this development was the British urban planner Ebenezer Howard with his book "Tomorrow: A Peaceful Path to Real Reform" (later published as "Garden cities of tomorrow"). Other urban planners and writers like Scottish Patrick Geddes and the American Lewis Mumford also addressed the environmental problems created by the Industrial Revolution.

[177] Some landscape architects and park designers attempted to preserve and bring nature into cities, but this effort was often "ignored by developers and the nascent city planning profession in the nineteenth and twentieth centuries" *(Beatley and Wheeler, 2004: 113).* The trend was instead to fill in or pave "over streams, wetlands, and shorelines to make way for urban expansion" *(Beatley and Wheeler, 2004: 113).* It was not uncommon to develop roads or railroad lines which cut many cities off from their waterfronts *(Beatley and Wheeler, 2004: 113).* Generally hills were levelled and native vegetation removed, as well as other trend such as:

> "Landowners platted lots and built roads without considering the implications for wildlife, native plant species, or human recreation. With the advent of central heating, electric lighting, air-conditioning, long-distance food transport, and huge dams and pipelines bringing water from hundreds of miles away, urban residents became well insulated from nature in all its forms, and even from the limitations of climate and local geography." *(Beatley and Wheeler, 2004: 113)*

[178] This was all given a boost by the energy crisis that was brought on by the 1973 Arab oil embargo. It gave the passive solar architecture movement of the 1970s renewed importance *(McDonald, 2004: 1280).* But the passive solar architecture movement was viewed by many as failing "to address broader environmental and architectural concerns" *(McDonald, 2004: 1280).* Even during and after the oil embargo, solar strategies remained on the fringe of new building construction. Generally, energy conservation requirements received a renewed focus as "energy conservation requirements were soon written into many building codes" *(Beatley and Wheeler, 2004: 181).* This was not only due to an emergence in ecological design value among architects

etc, but was in part a response to energy crises brought on by the oil embargo *(Beatley and Wheeler, 2004: 181)*.

[179] This includes a number of architects and industrial designers whom were focusing on environmentally friendly ways to harness the energy in the natural elements, including sun through day-lighting design, passive solar heating, passive cooling, as well as wind or earth *(Mostaedi, 2003: 7)*, *(McDonald, 2004: 1280)*. Even water recycling, reuse, and biological wastewater treatment have received focus from architects. This as the flow of resources into cities and wastes out of them has had considerable environmental implications *(Beatley and Wheeler, 2004: 125)*.

[180] This strategy has especially been applied with regards to energy, where the focus has been directed at renewable energy sources such as:

> "wind power (the world's fastest growing alternative energy source), solar power, geothermal energy, biomass con-version (the burning of organic materials for energy), and co-generation (the use of waste energy or steam from one industrial process for heat or power)." *(Beatley and Wheeler, 2004: 125)*

[181] Architects involved in creating this type of systems includes the late John Tillman Lyle, John and Nancy Todd, and Sim Van der Ryn *(Beatley and Wheeler, 2004: 133)*.

[182] Sustainable resource systems typically attempts to create "'regenerative' systems such as sewage treatment marshes that use natural processes to improve the environment" *(Beatley and Wheeler, 2004: 133)*, as oppose to more "mechanical" or technology-based systems which is characterised by trying to intervene in or override natural systems *(Beatley and Wheeler, 2004: 133)*.

[183] Qualitative recommendation tools include the Green Building Advisor which was created by the Center for Renewable Energy and Sustainable Technology (CREST), E build, Inc., and Design Harmony, Inc. *(McDonald, 2004: 1280)*. Computer-based life-cycle assessment tools have been developed to help assess the "economic and environmental measures for sustainable building materials" *(McDonald, 2004: 1282)*. Computer tools are also providing assistance for "building performance issues such as energy (Energy plus, DOE2, and Energy-10) and lighting design (Lightscape and Lumen-micro)" *(McDonald, 2004: 1280)*. These tools give designers qualitative recommendations with regards to sustainable issues, such as "bibliographic, video, and electronic resources as well as documented case study buildings" *(McDonald, 2004: 1280)*.

Another example of tools and methods that supports architects that focus on sustainability is the Building for Environmental and Economic Sustainability (BEES) tool from the National Institute of Standards and Technology. This tool performs comparative analysis "of material selections on their environmental merit (e.g., global warming, ozone depletion, embodied energy) as well as their economic cost" *(McDonald, 2004: 1282)*. Equally, the life-cycle assessment tools like the

ATHENA enable a comprehensive “environmental accounting of a product throughout its entire manufacturing and use cycles in terms of energy, water, air, and solid waste effects” *(McDonald, 2004: 1282)*. Another development is a concept called an “ecological footprint” which “considers the far-reaching energy, water, and material resource effects involved in everyday patterns and products of consumption” *(McDonald, 2004: 1282)*. All these tools and methods support architects that aim to conduct design projects in accordance with the design value of sustainable development.

Equally, the development of tools and methods that assist in assessing the environmental performance of sustainable architecture, in practical terms, is often a sustainable rating system *(McDonald, 2004: 1282)*. One of the earliest rating systems based on sustainable design values is the Malcolm Wells’s Wilderness-based Checklist published in 1969 *(Guzowski, 2000: 391 f)*. A more recent rating system is the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) *(McDonald, 2004: 1282), (Edwards, 2001: 25)*. Other rating system includes the “Green Builder Program and Building Research Establishment Environmental Assessment Method (BREEAM) in the United Kingdom” *(McDonald, 2004: 1282), (Edwards, 2001: 25)* and the Eco-quantum software developed in the Netherlands *(Edwards, 2001: 25)*.

[184] Both architects and industrial designers surge in focus on “Green” design can partly be attributed to the publication of Brundtland Commission in 1987 and the Rio Earth Summit round held in 1992.

[185] Examples of this can be found among architects like Sim Van der Ryn and Stuart Cowan, Itsuko Hasegawa, Brenda and Robert Vale and Kenneth Yeang *(Kropf and Jencks, 1997: 113 f, 157 - 159, 164 f)*. Other similar manifestos that focus on environmental values in design can be found on the internet, this includes the Hannover Principles by William McDonough. Generally the design manifestos vary in their concrete recommendations, which is parallel to some of the different lines of thought which exist within the general environmental discourse.

[186] Generally, architects and industrial designers will select “Green building” materials as part of a design project conducted according to the sustainable design value. This often has the side effect of producing a non-toxic indoor air quality due to the non-toxic properties found in green materials. For more details, see 5.1.3.3 (Health).

[187] To address this and other related issues architects will typically employ strategies that put emphasis on the following ideas and concepts: (1.) the integration of architecture and landscape, (2.) the combination of shelter and garden space, (3.) the use of nature-related symbolism as a means of connecting architecture to its cultural context and to an earth-centred imagery, (4.) green design research and environmental technology innovations and (5.) visionary and conceptual ideas in architecture and urban planning *(Wines and Jodidio, 2000: 67)*.

For example, in architectural terms this perspective puts emphasis on aspects such as: (1.) the site selection and size of building, (2.) energy conservation strategies (use of low-embodied-energy materials), (3.) passive solar strategies, (4.) low-energy systems, (5.) ecological sound building materials (recycled and renewable materials), (6.) indoor air quality (reduction of ozone-depleting chemicals), (7.) water conservation and waste minimization and (8.) the use of renewable energies *(McDonald, 2004: 1280), (Wines and Jodidio, 2000: 65 f)*.

[188] Urban planners such as Patrick Geddes,[188] whom pointed out in his book "Cities in Evolution" that there was a tendency for large cities to disperse as they grew because of the influence of cars and industrial power, and that the concept of a "city line" was being transformed by the growth of metropolitan regions *(Adams, 2004: 1086)*.

[189] This focus and development has been the source for several "new" terms in urban planning like: "'patches' of habitat, 'edge' environments, 'corridors' of wildlife movement, and 'mosaics'" *(Beatley and Wheeler, 2004: 116)*.

[190] This include architects like: William McDonough whom is responsible for projects such the headquarters of Environmental Defence in New York City, the Ford Motor Company's renovated River Rouge plant, a green Wal-Mart store and the environmental studies building at Oberlin College in Ohio *(Beatley and Wheeler, 2004: 181), (McDonald, 2004: 1282)*. Others include the architectural firm Dougherty and Dougherty that designed the Center for Regenerative Studies at California State Polytechnic University at Pomona *(McDonald, 2004: 1281)*. The building is generally presented as being based on the sustainable design value *(McDonald, 2004: 1281)*, as it is an example of a building with integrated design solutions that demonstrate "ecological site planning as well as sustainable building strategies" *(McDonald, 2004: 1281)*. Equally, the architecture firm Matsuzaki Wright Architects designed the C.K. Choi Building at the University of British Columbia *(McDonald, 2004: 1281 f)*. Similar environmental architecture projects include: the Village Homes designed by Mike and Judy Corbett, Audubon Building in New York City by the Croxton Collaborative Architects, the Building Establishment (BRE) Headquarters in Hertfordshire, England, by Feilden Clegg Bradley Architects LLP, the Menara Mesiniaga in Selangor, Malaysia by Kenneth Yeang, the Thoreau Center for Sustainability at the San Francisco Presidio by TLMS Architects *(McDonald, 2004: 1282)*, and The Beddington Zero Energy Development (BedZED) which is UK's largest carbon neutral ecovillage which is designed by Bill Dunster Architects.

[191] This includes Norman R. Foster with his design of the glass dome for the Reichstag redevelopment in Berlin and Auburn University Rural Studio with the design of Bryant House (often called the "Hay Bale") *(Cruickshank, 2000: 303), (Mostaedi, 2003: 7)*.

[192] For example, the American Institute of Architects (AIA) is responsible for publishing the "Environmental Resource Guide" which is geared towards helping architects deal with the technological issues related to environmental design values. It gives "qualitative descriptions of the impacts of common building materials" has on the environment *(McDonald, 2004: 1280)*. Equally the US Green Building Council promotes environmental values through the building

codes and standards called the Leadership for Energy and Environmental Design (LEED) *(Beatley and Wheeler, 2004: 181)*.

[193] This can be illustrated by an argument made by the industrial designer Niels Peter Flint when he recommended a shift from what he use to do, namely, designing "hundreds of fridges for Japanese teenagers or 2,000 separate pairs of door handles" *(Williams, 1989: 16)* to designing things that cause as little pollution and consumption of energy. This type of perspective tends to imply a focus staring "right from the production process through to its use — and then on to recycling" *(Williams, 1989: 16)*.

[194] This including organisations like O2 *(Whiteley, 1993: 84 f)*.

[195] A number of books promote green design and sustainable design values among architects and industrial designer. This includes books like the "Cradle to Cradle" by William McDonough and Michael Braungart, "Ecological Design" by Sim Van der Ryn and Stuart Cowan, "Regenerative Design for Sustainable Development" by John Tillman Lyle, "The New Autonomous House" by Brenda Vale, and Robert Vale, and "The Natural House Book" by David Pearson *(Beatley and Wheeler, 2004: 181 f)*.

[196] There are a number of reasons for the fact that environmental design values have not become one of the main priorities among architects and industrial designers. The focus on other design values may be one explanation and another may be that "economics and sustainable development co-exist uneasily" *(Beatley and Wheeler, 2004: 159)*. The uneasy co-existence is not specific to the design professions as current economic theory and practice is characterised by leaving:

> "out many important social and environmental factors that represent the costs as well as the benefits of development. Traditional economic tools make it difficult to incorporate externalities such as pollution, resource depletion, and degradation of human living environments. They also have no good way to take long-term costs and benefits into account, assume endless growth in material consumption, inadequately take into account market distortions caused by subsidies and regulations, and in many other ways fail to promote sustainable development." *(Beatley and Wheeler, 2004: 159)*

As economy plays an essential roll in design projects it is not surprising to find that environmental design values are not dominating the design professions. Another possible explanation might be that environmental values, such as sustainability, are often at odds with social justice (economic equity). The issues of equity which is linked to sustainability is by far the least represented sustainable issues within public policy debates *(Beatley and Wheeler, 2004: 143)*, and the general environmental movement itself has "developed with little consideration of the equity implications of its issues" *(Beatley and Wheeler, 2004: 143)*. The relationship and general awareness between social justice and environmental issues has in large part developed in the 1980s by "working-class communities fighting against the location of garbage incinerators, land fills, and toxic chemical hazards near their neighbourhoods" *(Beatley and Wheeler, 2004: 143)*. But this awareness of social justice and environmental values is not restricted to working-class communities as both "African-American and Latino activists also criticized mainstream environmental groups" *(Beatley and Wheeler, 2004: 143)* for their lack of focusing on equity issues related to environmental development.

[197] "Abraham Lincoln (February 12, 1809 – April 15, 1865), sometimes called Abe Lincoln and nicknamed Honest Abe, the Rail Splitter, and the Great Emancipator, was the 16th President of the United States (1861 to 1865), and the first president from the Republican Party." Source www.wikipedia.org 08.11.2005.

[198] Abraham Lincoln, Message to Congress, December 1, 1862. A number of websites like www.wikiquote.org 15.12.2005 states that this quotation can be found in the book "God's Own Junkyard" by Peter Blake, but I have been unable to locate the quote, and have not found any other sources apart for numerous websites.

[199] "The Latin word basilica (derived from Greek basiliké stoà, royal stoa), was originally used to describe a Roman public building (as in Greece, mainly a tribunal), usually located at the centre of a Roman town (Forum)." Source: www.wikipedia.org 04.02.2005.

[200] Consequently, many buildings became obsolete as this contributed to a shift in land value which directed economic development away from central cities. This was particularly the case in North America *(Kalner, 2004: 12)*.

[201] Based on this it is important to note that the design value of Re-use and Modification is different from restoration and preservation, which will be introduced in a later section. For further deliberation, see 5.1.4.2 (Restoration and Preservation).

[202] This can be exemplified by the re-use of the Roman amphitheatre in Lucca that was:

> "simply absorbed into the urban fabric, with houses built into its raked structure and the open centre filled with new buildings: only in the nineteenth century was the monument 'rediscovered' by archaeologists." *(Powell, 1999: 9)*

And in much the same way medieval abbeys have, like the one in Malmesbury in the UK, been subdivided for use as a clothing factory *(Powell, 1999: 9)*. Equally, ordinary houses has also often been re-faced over the centuries, so it is not uncommon for an eighteenth-century brick or stucco frontage to conceal a medieval timber frame *(Powell, 1999: 9)*.

[203] The design value Re-use and Modification has a considerable tradition within urbanism, especially the segment of the late nineteenth and early twentieth centuries that were concerned with "'conservation' or 'preservation' of natural lands, resources, and species" *(Beatley and Wheeler, 2004: 120)*. An example of the "preservation" of nature within the context of cities can be found in Central Park in New York City, even if this park is highly landscaped and not grown out of a natural development, does it represent a willingness to preserve nature within the context of a city.

[204] Restoration of "brown-field" sites to their former natural habitat takes place both within cities and outside the cities *(Beatley and Wheeler, 2004: 113 f)*, which links the design value of re-use and preservation to the design value of sustainability.
[205] Re-use and modification within contemporary urbanism has become catchphrases, especially within the urban sustainability agenda, where the focuses often have been on:

> "cleaning up contaminated lands (often known as 'brownfield' sites), replanting native vegetation, and restoring streams, wetlands, or other watershed elements." *(Beatley and Wheeler, 2004: 120)*

[206] Equally, the strategy of reusing entire quarters as well as former industrial sites has been adopted in the regenerating of Berlin in Germany *(Powell, 1999: 17)*.
[207] Architects like Frank Gehry, Bernard Tschumi, Norman Foster, Enric Miralles, Terence Conran, Ieoh Ming Pei, Eric Owen Moss and Herzog & de Meuron have all been involved in conversion and rehabilitation schemes *(Powell, 1999: 10, 13, 14)*.
[208] More specifically the re-use of public buildings is often associated with "large transportation facilities like train stations and civic buildings built in the 19th and 20th centuries" *(Kalner, 2004: 12)*. Equally industrial buildings are often buildings with large structural spans and large windows and or skylight etc. that have made this type of buildings particular suited for conversion to housing projects etc. *(Kalner, 2004: 12)*. Private buildings, which in this context implies large houses, have often been re-used or converted into a number of different purposes, as they "can serve multiple functions because of the inherent flexibility of the prototype" *(Kalner, 2004: 12)*. Finally, commercial buildings that are re-used are often buildings that have served as symbols of the advances that have taken place in architectural technology in the 20th century. These buildings are re-used for a number of purposes, but because of the technology employed in constructing these types of building they often pose "unique preservation problems, as architects must address issues related to preserving buildings that employed contemporary technology" *(Kalner, 2004: 12)*. This include prominent projects like the Pension Building in Washington, D.C. which after a major restoration project now hosts the USA National Building Museum in addition to government offices *(Kalner, 2004: 12), (Powell, 1999: 13)*. The Pension Building in Washington was out of use for a number of years until 1984 when a major restoration project was started *(Kalner, 2004: 12)*. This massive 1880s block is now a popular venue for government receptions and other prestigious social gatherings *(Powell, 1999: 13)*. Equally, the Old Post Office Building in Washington, D.C. was renovated in 1978. The three lower levels of the building were converted into restaurants and retail spaces and the rest of the building serves as office space *(Kalner, 2004: 12)*. Similarly, the PSFS building in Philadelphia (which was the first International Style skyscraper) is another prominent example of re-use. The PSFS building was constructed in 1932 and served as headquarters for what used to be the oldest bank in the United States until the beginning of the 1990s when the bank ceased to exist *(Kalner,*

2004: 13). The building stayed dormant for some years before it was converted into a hotel *(Kalner, 2004: 13)*.

[209] This includes buildings like the Union Station in St. Louis, US, and the Gae Aulenti's in Paris, France, which was adapted into the Musée d'Orsay *(Powell, 1999: 11), (Kalner, 2004: 12)*.

[210] For instance the once-prosperous 1820s Quincy Market in Boston, US was faced with abandonment and possible demolition until in 1976 it was revitalised as a centre for specialist shopping through re-use and modification *(Stratton, 2000: 13), (Powell, 1999: 12)*. This transformation was conducted by the Benjamin Thompson Associates and its huge commercial success which contributed to changing "the image of old buildings not only in Boston but throughout the USA" *(Powell, 1999: 12), (Stratton, 2000: 13)*. Even the refurbishment of London's Covent Garden Market in 1980 was inspired by the development in Boston, "though there was a more conservationist approach to the treatment of the nineteenth-century buildings" *(Powell, 1999: 12)*. Like the Quincy Market, Covent Garden quickly transformed into a major tourist "attraction resulting in the resurgence of the whole quarter and the opening of such 'draws' as the London Transport Museum and the Theatre Museum" *(Stratton, 2000: 14)*.

[211] Examples of this can be found in the former Carnegie mansion in New York City which is now housing the Cooper-Hewitt Museum and the Frick Museum in New York City which is housed in the former residence of Henry Clay Frick *(Kalner, 2004: 13)*. Another example of re-use and modification can be found in Ieoh Ming Pei extension and reconstruction of the Louvre museum in Paris, France competed in 1993 *(Powell, 1999: 14)*. In much the same way, the Italian architect Carlo Scarpa had an extensive reputation for taking on transformation project, which included the reconstruction of the Castelvecchio museum in Verona *(Powell, 1999: 11)*. Equally, Italian architects Franco Albini, Guido Canali and previous mentioned Gae Aulenti have also done re-use work *(Powell, 1999: 11)*. Likewise examples of the same trend can be found in Norman Foster's work on the British Museum and of Berlin's Reichstag, Gae Aulenti's renewal "of the National Gallery of Catalunya in Barcelona and David Chipperfield's extension scheme for the Neues Museum in Berlin" *(Powell, 1999: 14, 18)*. In much the same way a number of chateaus and castles have been converted and re-used as hotels in countries like France, Spain, and Portugal etc. *(Kalner, 2004: 13)*.

[212] The SoHo neighbourhood in New York City is an example of this approach, and the Lowell Mills in Lowell, Massachusetts is another example *(Powell, 1999: 13), (Kalner, 2004: 13)*. Equally have redundant Yorkshire mills and riverside warehouses in Leeds and Manchester been modified into flats, bars and restaurants etc. *(Powell, 1999: 13)*. The same type of development is also taking place in France where old textile mills around Lille have been change into housing and shopping complexes" *(Powell, 1999: 13)*. Other examples can be found in a mill at Brede north of Copenhagen in Denmark, and a mill in Enschede, Netherlands, which has been converted into a textile museum with apartments in the upper floors *(Stratton, 2000: 19)*.

[213] An example of this can be found in the re-use of the former carpet mill Templeton Factory in Glasgow, Scotland, which has been converted into a hybrid research and business incubator centre *(Kalner, 2004: 13)*.

[214] An example can be found in the US Tax Reform Act passed by Congress in 1976 providing tax incentives for refurbishing old buildings. Equally was federal funding increased in support of re-use and modification under the presidency of Jimmy Carter *(Powell, 1999: 12)*. It can even be argued that the U.S. government which owns many outstanding historic buildings and structures has taken a "lead in finding new uses for its stock of buildings, serving as an example for private sector development" *(Kalner, 2004: 12)*. Similar support can be found in Europe with the Urban Aid Programme introduced in 1969 in the UK *(Stratton, 2000: 20)*.

[215] For further deliberation, see 5.1.4.2 (Restoration and Preservation).

[216] "Aristotle (Greek: Αριστοτέλης Aristotelēs; 384 BC – March 7, 322 BC) was an ancient Greek philosopher. Student of Plato and teacher of Alexander the Great. Aristotle and Plato are often considered as the two most influential philosophers in Western thought. He wrote many books about physics, poetry, zoology, logic, government, and biology." Source: www.wikipedia.org 10.11.2005.

[217] All in all these trends have contributed to sweeping changes in sizes, form, and demographic composition around the world. This took hold first in England and later in continental Europe and then in the United States.

[218] The most important health problems in this context included potential "epidemics of contagious diseases such as typhus, cholera, smallpox, and yellow fever" *(Frank et al., 2003: 13)*.

[219] "As early as the 1790s, for example, physicians had associated the outbreak of a typhus epidemic in Manchester, England, one of the world's first industrial cities, with working conditions in that city's cotton mills … In 1837, an American physician, Dr. Benjamin McCready, assigned blame for the ill health of New York's poor to the living conditions in the city's tenements" *(Frank et al., 2003: 13)*

[220] One of these was Edwin Chadwick, which in his "Report into the Sanitary Conditions of the Labouring Population of Great Britain" proved that life expectancy was much lower in towns than in the countryside.

[221] The public pressure did not go unnoticed, thus, partly through pressure from people like Chadwick and partly through fear of cholera was the first Public Health Act passed in 1847 in the UK. This bill set out to ensure that the built environment contributed to improving and protecting public health *(Benevolo, 1971: 49)*. On the back of this law was extensive sanitary powers granted to new local authorities known as Local Boards of Health *(Sutcliffe, 1981: 49)*. For example, one of these Boards of Health in:

> "1851, it put forward the question of subsidized housing on a national scale, and succeeded in establishing that towns with over 10,000 inhabitants should

> be allowed to build economic houses for the working classes” *(Benevolo, 1971: 49)*

However, the Act only had a limited effect, as it did not force towns to take action, so in 1854 the Board of Health was abolished. This work was continued in 1866 with the introduction of a new and more progressive sanitary law and further progress was made “in 1875 and 1890, when the Housing of the Working Classes Act brought together all laws on sanitation and popular housing” *(Benevolo, 1971: 49)*.

[222] “Frederick Law Olmsted (April 26, 1822–August 28, 1903) was a United States landscape architect, famous for designing many well-known urban parks, including Central Park in New York City, the country’s oldest coordinated system of public parks and parkways in Buffalo, New York, the country’s oldest state park, the Niagara Reservation in Niagara Falls, New York, Mount Royal Park in Montreal, the Metropolitan Parks System in Boston, Massachusetts, Cherokee Park (and the entire parks and parkway system) in Louisville, Kentucky, as well as Jackson Park, Washington Park and Midway Plaisance in Chicago for the World's Columbian Exposition.” Source: www.wikipedia.org 10.11.2005.

[223] For instance Olmsteds’ adherences to the Health design value can be found in an essay he co-authored with his partner Calvert Vaux in 1868 where they stated that improvement in the health of urban dwellers would result from the:

> “abandonment of the old-fashioned compact way of building towns, and the gradual adoption of a custom of laying them out with much larger spaces open to the sun-light and fresh air.” *(Sutton and Olmsted, 1971: 36)*

[224] According to Olmsted, should the congested city with its manufacturing, poor sewage systems, narrow streets and sites, and masses of urban poor be tackled by the redesigning of the city according to a different model *(Frank et al., 2003: 16)*.

[225] This approach foretold of the twentieth-century American city.

[226] They typically promoted developments characterized by: (1.) decentralized settlement patterns, (2.) separation of dissimilar land uses and (3.) neighbourhoods consisting of single family housing in leafy suburbs *(Frank et al., 2003: 11 f)*.

[227] The thinking behind the horizontal and decentralized city “contributed, in a fundamental way, to the formation of a societal consensus about how the modern city ought to be built” *(Frank et al., 2003: 12)*.

[228] “Modern zoning is generally regarded to have begun in Germany toward the end of the 19th century. Concerned about rapid urban growth and development, German academics and municipal bureaucrats created the "districting" scheme, wherein entire cities would be differentiated by land uses and building types. The intent was to control and channel

development brought about by industrialization, including the public health problems associated with pollution, overcrowding, and unsanitary environments." *(Frank et al., 2003: 22)*

[229] It should be noted that to this day health, safety, and welfare have been the main considerations which underpin the legal basis for zoning *(Frank et al., 2003: 21)*. The argument for zoning has often been based on the "protection of the physical health and the financial wellbeing of the upper and then, later, the middle classes, not the working and immigrant poor" *(Frank et al., 2003: 21)*, which is different from the social design values i.e. perspective which often focuses on the poor.

[230] For instance, the development of decentralized cities has been attributed to the increase in car ownership which has taken place in Western societies during the 20th-century *(Frank et al., 2003: 3)*.

[231] The link between housing and health was mainly argued from two specific aspects: (1.) the structures should be freestanding and (2.) sites need to be distributed so as to maximize the amount of sunlight that reaches each individual structure *(Frank et al., 2003: 21)*. For instance, these ideas became institutionalized during World War II in the US, when "model subdivision and health codes issued by the Federal Housing Administration (FHA) and professional societies included such recommendations" *(Frank et al., 2003: 21)*. Equally, the emphasis on health within architecture can be indicated by the World Health Organization's Healthy Cities projects in Europe. The aim of these projects had been to develop "healthy urban planning principles and practices" *(Barton et al., 2000: 1)*.

[232] Emphasis on climate-based understanding for construction detailing often implies considering issues such as window placement, room layout, screened porches, overhangs, trellises, and patios *(Baker-Laporte et al., 2001: 19 f)*. For instance, some of these features extended the outdoor living space and acts as a climatic buffer zone, as well as reducing the amount of tracked-in dirt which enters the building which in turn provides the opportunity for a cleaner living space etc. *(Baker-Laporte et al., 2001: 20 f)*.

[233] The aim to reducing toxic emissions through careful choice of building materials often implies a focus on:

> "(1) Eliminate sources of pollution. (2) Substitute healthier materials. (3) Exercise prudence when using unavoidable toxic substances. (4) Cure materials before they are installed within the building envelope. (5) Seal materials so that they offgas less." *(Baker-Laporte et al., 2001: 25)*

[234] Quality control measures during the construction process with regards to health issues are established to ensure that the building will perform as intended with regards to health *(Baker-Laporte et al., 2001: 27)*.

[235] Provide occupants with education to ensure an ongoing healthy environment, and educational efforts geared towards the users of the building to ensure that new developments do not introduce toxic materials etc. *(Baker-Laporte et al., 2001: 19)*.

[236] The Sick building syndrome is due to the change which has taken place in the construction of Western buildings, which has become (1.) more tightly sealed than buildings used to be and the introduction of (2.) thousands of chemicals that has been incorporated into contemporary building materials *(Baker-Laporte et al., 2001: 1)*. The change in degree of how tightly sealed contemporary buildings are compared to buildings constructed three decades ago can be illustrated in the statistics which shows that before the energy crisis of the 1970s a typical average home exchanged all the air once per hour, nowadays a well sealed home exchanges the air once every five hours or less *(Baker-Laporte et al., 2001: 1)*. These two changes have had the effect of trapping the chemicals so that the fumes remain trapped inside the indoor environment, which causes peoples to inhale chemicals and absorb them through their skin etc. *(Baker-Laporte et al., 2001: 1)*. The change of air in indoor spaces every five hours or less affects the air quality to an extent which is considered not enough to ensure a healthy air quality *(Baker-Laporte et al., 2001: 1)*.

[237] A number of industrial designers and organisations have worked to develop and promote health related products, which includes product like “the Bealift”, an aid for bathing handicapped children” *(Whiteley, 1993: 110)*, as well as:

> “domestic ventilator to free people with respiratory problems from their ties to a hospital-based `iron lung'; a portable lightweight unit to help people who have difficulty boarding a bus or coach; … and work on electric town vehicles.” *(Whiteley, 1993: 110)*

[238] www.design-council.org.uk 19.01.2005

[239] One example is the Swedish design group called Ergonomi Design Gruppen, which was established in 1969 in Sweden. This industrial design firm focused on, and has a long tradition in designing for users with special needs *(Whiteley, 1993: 117)*.

[240] “David Chipperfield (b. 1953) is an English architect, born in London. He has offices in London, Berlin and Shanghai. One of the few modernists in architecture, his practice is driven by a consistent philosophical approach, rather than a 'house style'.” Source: www.wikipedia.org 11.11.2005.

[241] For more details, see 4.2.2 (The emphasis on novel design solutions) and 4.2.2.1 (Creativity in design).

[242] For further deliberation, see 5.1.1.6 (Classic, Traditional and Vernacular aesthetics).

[243] More specifically did some architects continued in the centuries-old custom of designing in classicism traditional classicism styles during the 20th century *(Amundson and Miller, 2004: 269)*. It was even considered “appropriated by those who abstracted its principles in the modern

effort for an ahistorical architecture (early modernism)" *(Amundson and Miller, 2004: 269)*. For more details, see 3.2.2 (Pluralism tendency within design profession).

[244] "New Urbanism is an urban design movement that became very popular beginning in the 1980s and early 1990s. The goal of New Urbanists is to reform all aspects of real estate development and urban planning. These include everything from urban retrofits, to suburban infill. There are some common elements of New Urbanist design. New Urbanist neighbourhoods are walkable, and are designed to contain a diverse range of housing and jobs. New Urbanists support regional planning for open space, appropriate architecture and planning, and the balanced development of jobs and housing. They believe these strategies are the best way to reduce the time people spend in traffic, to increase the supply of affordable housing, and to rein in urban sprawl. Many other issues, such as historic preservation, safe streets, green building, and the renovation of brownfield land are also covered in the Charter of the New Urbanism, the movement's seminal document." Source: www.wikipedia.org 08.02.2005.

[245] It should be noted that the New Urbanism movement was formally named the Congress for the New Urbanism (CNU) *(Beatley and Wheeler, 2004: 74)*. The name CNU was chosen as to deliberately position "themselves as an alternative to the 1930s modernist architectural movement known as the Congres Internationaux d'Architecture Moderne (CIAM)" *(Beatley and Wheeler, 2004: 74)*. The first New Urbanism (CNU) annual Congress was held in Alexandria, Virginia in 1993, and a charter stating the main principles of the movement was issued in 1996 *(Beatley and Wheeler, 2004: 74)*.

[246] It is also often asserted within this tradition that both industrialisation and modernisation have:

> "deprived architecture and the city of their very essence, turning architecture into a soulless repetition of the same and the city into a loose conglomerate of freestanding buildings without any streets or squares in which public life could unfold." *(Heynen, 2004b: 1049)*

New Urbanism typically focused on traditional neighbourhood design in the early days, and design proposals were often characterised by grid-like street layouts, "mid-block alleys, village centres with small shops and workplaces, front porches, and garages at the rear of houses rather than in the front" *(Beatley and Wheeler, 2004: 74)*. These features are typical for the types for town that was used as main inspiration for the early days of the new urbanism movement. "If these designers had used European small towns as a model instead, they might well have gravitated toward more winding, organic street patterns and more urban housing forms" *(Beatley and Wheeler, 2004: 74)*.

[247] This includes the architect and author Leon Krier whom has been arguing for the Tradition design value since the 1960s *(Amundson and Miller, 2004: 269)* as well as the architect Rob Krier *(Beatley and Wheeler, 2004: 74)*. As a recognition of Krier relentless work in contributing

to promoting and contributing architecture based on the Tradition design value in 2003 he receive the first Driehaus Prize, which is a prize awarded for “great contributors to the practice of classical architecture or traditional architecture and architectural preservation” *(Amundson and Miller, 2004: 269)*. Other architects include the founding members of the New Urbanism movement whom are: Andrés Duany, Elizabeth Plater-Zyberk, Peter Calthorpe, Stefanos Polyzoides and Elizabeth Moule.

[248] This include the Seaside and Kentlands by Andres Duany and Elizabeth Plater-Zyberk, as well as similar development called Laguna West by Peter Calthorpe *(Beatley and Wheeler, 2004: 74)*. The late Philip Johnson, along with his partner John Burgee, had also occasionally designed projects that were based on the traditional design value. This includes buildings such as the College of Architecture in Houston (1985), Texas *(Heynen, 2004b: 1049)*. Equally has Demetri Porphyrios design a residential college at Princeton University in the neo-Gothic style.

[249] This has been promoted by authors and architects such as Demetri Porphyrios and Maurice Culot as well as previously mentioned Leon Krier *(Heynen, 2004b: 1049), (Beatley and Wheeler, 2004: 74)*. European buildings that illustrated the Tradition based design value can be found in projects such as Lakense Straat complex in Brussels, Belgium and the Richmond Riverside in London, United Kingdom by Quinlan Terry *(Heynen, 2004b: 1049)*. Another example can be found in the development called Poundbury by Leon Krier *(Amundson and Miller, 2004: 269)*. Equally can a classicist revival also be found in the work of the Belgian architect Charles Vandenhove such as the Théatre des Abbesses complex in Paris, built in 1996, other buildings can be found in Belgium, Holland, and France *(Heynen, 2004b: 1049)*.

[250] More specifically did Prince Charles deliver a now famous speech to the 150th anniversary of the Royal Institute of British Architects (RIBA) in 1984, where he criticised the planned addition to Britain’s National Gallery, and described it as “monstrous carbuncle on the face of a much-loved and elegant friend” *(Amundson and Miller, 2004: 269)*. The Prince advocated then and has continues to argue for a return to classical and traditional architecture *(Amundson and Miller, 2004: 269)*. The Prince of Wales has promoted individual architects, projects and urban design which is design according the traditional design value through his the Prince Charles' Prince of Wales Institute *(Beatley and Wheeler, 2004: 74), (Heynen, 2004b: 1049)*. Equally has both Demetri Porphyrios and Quinlan Terry challenged the leading trend of urban planning, both within the UK’s planning establishment and the RIBA *(Tilman, 2004: 621)*, by advocating a design focus which is aligned with the traditional design values.

[251] This includes organisation such as the International Network for Tradition Building, Architecture and Urbanism (INTBAU) in London and at the University of Notre Dame in the USA *(Amundson and Miller, 2004: 269)*.

[252] Restoration is in the context of architecture and industrial design understood as the work performed on a building or a product in order to return the building or the product to a previous state. See also 5.1.3.2 (Re-use and Modification).

[253] For further deliberation, see 5.1.3.2 (Re-use and Modification).

[254] The first scholarly writings that eventually laid the foundation for the design value of Restoration and Preservation can be found among antiquarians like John Aubrey, Anthony Wood and Browne Willis *(Colvin, 1999: 206 - 216), (Ross, 1996: 10)*. Aubrey's essay the Chronologia Architectonica which was published around 1670s *(Colvin, 1999: 206 - 216), (Ross, 1996: 10)*. Wood's publication of the Historia, et antiquitates Universitatis Oxoniensis/The history and antiquities of the University of Oxford (originally published in Latin, later did it appear in English) was published for the first time in 1674 *(Ross, 1996: 10)* and Willis's A Survey of the Cathedrals of York, Durham, Carlisle, Chester, Man, Lichfield, Hereford, Worcester, Gloucester and Bristol etc. was published in 1727. All contributed to the foundation of the design value of Restoration and Preservation *(Ross, 1996: 10)*. Documenting then existing architecture started their shift in attention from places and events to architecture. Their work contributed to laying the foundation for what we know as restoration and preservation. Even if they were not occupied with conserving old buildings, the establishment of the tradition of documenting architecture and product has been seen as a cornerstone for the design value of Restoration and Preservation. The foundation of the Society of Antiquaries of London in 1717 and the Dilettanti in 1733 contributed to bringing the knowledge an emphasis on antiquarian, which we know today as archaeology, architectural history, art history, conservation, heraldry, anthropology, and ecclesiastical studies, forward among a number of scholars *(Ross, 1996: 10)*.

[255] One of the specific events that led up to the formation of the SPAB was Morris's horror at the proposed "restoration" of Tewkesbury Abbey (the second largest parish church in England) *(Bronski and Gabby, 1999: 14), (Ross, 1996: 12)*. On the back of this "Morris urged the Society to educate the general public so that they would have a reverence for all ages of history displayed in buildings" *(Bronski and Gabby, 1999: 14)*. Thus to ensure that the public would not favour a particular style etc. *(Ross, 1996: 14)*. These and other developments lead to the introduction of the Ancient Monument Protection Act in 1882 in Great Britain *(Ross, 1996: 12)*.

[256] For instance, legislation such as the National Historic Preservation Act was passed in the United States in 1966, and has played a part in ensuring the design value or Restoration and Preservation in the US *(Bronski and Gabby, 1999: 13)*.

[257] It has been considered to be one of the significant and popular professional movements of the 20th century *(Tomlan, 2004: 616)*.

[258] For instance, teaching restoration and preservation was introduced in the curriculum's at the University of Virginia in 1957, Cornell University in 1962, and Columbia University in 1964 *(Tomlan, 2004: 617)*. In 1973, Columbia University became the first school in the USA to offer a graduate degree program in preservation *(Tomlan, 2004: 617)*.

[259] Tools employed in restoration and preservation reflect this, as they are developed from a wide range of knowledge i.e. science, art, craft, and technology *(Weaver and Matero, 1997: 1)*.

[260] This identification of world heritage sites has been done by the United Nations Educational, Scientific and Cultural Organization (UNESCO) *(Ross, 1996: 48 f)*.

[261] Listing has to a varying degree been introduced in a number of countries including Great Britain and the USA *(Ross, 1996: 48 f), (Bronski and Gabby, 1999: 13 f)*. Within these countries, the number of listed buildings has steadily increased over the last decade. For instance, the number of listed buildings in Great Britain has steadily increased from 0.7% of the total buildings in 1970 to 2% by 1987, and it had risen to 2.25% of the total buildings by 1996 *(Ross, 1996: 45 f)*. By 1999 were there over 500,000 listed buildings in Britain. A similar development can be found in the "historic centres of Italian cities that are safeguarded by controls that cover buildings and streets in minute detail" *(Powell, 1999: 9)*. All in all is it possible to argue that within a Western context the historic:

> "buildings legislation, based on a complex mix of historicist, didactic, nationalistic, nostalgic and even moral precepts, … is now virtually universal."
> *(Powell, 1999: 9)*

[262] In some countries a listed building may have alterations such as an extension, as long as the extension enhances the chances of preserving the building *(Ross, 1996: 7)*.

[263] An example of this can be found in Great Britain, where the emblematic red telephone booth has been listed as there was an attempt to replace it by British Telecom in the 80s and the 90s *(Ross, 1996: 48 f)*. The first telephone booth was listed in August 1986 and later thousands more became eligible for listing *(Ross, 1996: 48)*. The first telephone booth which was listed in August 1986 was of an unusual early design from the 1920s and early 1930s *(Ross, 1996: 48)*.

[264] For example, André Malraux's[264] "secteurs sauvegardes inspired legislation in Britain and the USA in the 1960s designed to protect whole areas" *(Powell, 1999: 19)*.

[265] This includes US based organisations such as: the Association for Preservation Technology established in 1968, Preservation in Action established 1974, and National Trust for Historic Preservation founded in 1949 *(Weaver and Matero, 1997: vii), (Tomlan, 2004: 617 f), (Bronski and Gabby, 1999: 13)*. It also includes organisation such as: the National Trust for Places of Historic Interest or Natural Beauty (also known as the National Trust) in England, the National Trust for Scotland and The National Trust of Australia. Other organisations which contribute to restoration and preservation include the English Heritage (EH) which "administers England's government grants for the preservation of ancient monuments and historic buildings" *(Bronski and Gabby, 1999: 14)*.

[266] This includes the Athens Charter which was created at the First International Congress of Architects and Technicians of Historic Monuments held in 1931*(Bronski and Gabby, 1999: 13)*. The charter is of a static nature which sets general principles for work on historic buildings or monuments etc., as well as addressing specific principles for restoration including preservation and the technique of conservation *(Bronski and Gabby, 1999: 13)*. The Athens Charter was followed up with a new charter called the Venice Charter at the second International Congress of Architects and Technicians of Historic Monuments held in Venice in May 1964 *(Bronski and*

Gabby, 1999: 13). The International Council on Monuments and Sites (ICOMOS) was founded in 1965 as a result of the Venice Charter, and offers advice to the United Nations Educational, Scientific and Cultural Organization (UNESCO) on World Heritage Sites. The ICOMOS organisation adopted in 1979 the Burra Charter which was influenced by the Venice Charter and the outcome of the Fifth General Assembly of ICOMOS in Moscow in 1978 *(Bronski and Gabby, 1999: 14)*.

[267] An equal assertion can be found in:

> "The true basis for any serious study of the art of Architecture is in those indigenous structures, the more humble buildings everywhere, which are to architecture what folklore is to literature or folk song are to music, and with which architects were seldom concerned
> […]
> these structures are national, of the soil; and though often slight, their virtue is intimately interrelated with environment and with the habits of life of the people. Their functions are truthfully conceived, and rendered directly with natural feeling. They are always instructive and often beautiful." *(Wright and Gutheim, 1941: 59 f)*

[268] Unable to find the original book, but the quotation can be found on page 85 in "Frank Lloyd Wright, writings and buildings / selected by Edgar Kaufmann and Ben Raeburn".

[269] Bernard Rudofsky has even phrased it as "architecture without architects" in his book of the same title published in 1964.

[270] For more details, see 5.1.1.6 (Classic, Traditional and Vernacular aesthetics).

[271] An indication of this type of emphasis and thinking can be found as early as 1882, when the British architect William Simpson published a report on the architecture of the Himalayas called "Architecture in the Himalayas" *(Simpson, 1883)*. Equally did Frank Lloyd Wright in 1910 applauded vernacular architecture with assertions such as "this is why buildings are growing in response to actual needs, fitted into environment by people who knew no better than to fit them to it with native feeling" *(Wright and Gutheim, 1941: 63)*. Wright continued the argument by asserting that vernacular buildings are "better worth study than all the highly self-conscious academic attempts at the beautiful" *(Wright and Gutheim, 1941: 63)*. Other architects like Le Corbusier were focusing on vernacular architecture by sketching peasant houses in Serbia and Bulgaria *(Oliver, 2004: 1402)*, as well as being "profoundly drawn to the vernacular buildings of the Greek islands and the Algerian M'Zab" *(Oliver, 2004: 1402)*. In addition, prominent architects like Alvar Aalto, Michel de Klerk and Luis Barragån have drawn on regional building for inspiration *(Oliver, 2004: 1402)*, *(Morton, 2004b: 1063)*.

[272] This can be illustrated by Wright whom referred to the building processes of vernacular architecture, describing it as being "spontaneous", "unconscious", and or "intuitive" *(Oliver,*

2004: 1402). Another indication of the somewhat patronising view can be found in professional architects' tendency to study vernacular architecture "more for their own benefit than for any that might accrue for the survival or protection of the traditions themselves" *(Oliver, 2004: 1402)*.

[273] One example of this can be found in Bernard Rudofsky exhibition in 1964 called Architecture Without Architects at the Museum of Modern Art (MoMA) in New York *(Rudofsky, 1964) (no page number available, but it is found in the Acknowledgements)*. The exhibition lasted from November 9, 1964 to February 7, 1965 *(Rudofsky, 1964) (no page number available, but it is found in the Acknowledgements)*. This exhibition was also published in the previously mentioned book called "Architecture without Architects". The book and the exhibition highlighted the "aesthetic merits of vernacular traditions from nearly 30 countries that had been an inspiration for many architects in the 20th century" *(Oliver, 2004: 1402)*. Other important contributions to the awareness of the vernacular building traditions in the same time period were made by design scholars such as Sibyl Moholy-Nagy in her book the "Native Genius in Anonymous Architecture" and by Amos Rapoport in his book the "House, Form and Culture".

[274] One of the earliest examples of this effort of preserving these buildings can be found in the Swedish open-air museums called Skansen established in 1897, which displays vernacular architecture *(Oliver, 2004: 1402)*. Other similar museums includes the Maihaugen in Norway, the Seurasaari in Finland, Lyngby in Denmark and Arnhem in Holland *(Oliver, 2004: 1402)*.

[275] This includes the building practises in countries like China, India, Indonesia, countries in Southeast Asia and in much of Africa *(Oliver, 2004: 1402)*.

[276] This includes work by the Egyptian architect Hassan Fathy with his design for the village of New Gourna in West Luxor *(Oliver, 2004: 1403), (Morton, 2004b: 1063)*, Sedad Hakki Eldem whom has interpreted the Turkish building tradition *(Oliver, 2004: 1403)*. Equally, the Indian architects Charles Correa and Balkrishna Doshi have designed projects in accordance with local vernacular building traditions *(Oliver, 2004: 1403), (Morton, 2004b: 1063)*. Other architects like Geoffrey Bawa in Sri Lanka, Robi Sularto in Indonesia, and Andre Ravereau in Africa has also made use of the vernacular design value in their work *(Morton, 2004b: 1063), (Oliver, 2004: 1403)*.

[277] It has been argued that:

> "Anyone who has ever cared for babies or small children, even for a few hours away from a domestic environment, knows how little thought has been spent on making public space accessible to parents." *(Hayden, 1984: 214)*

There are some notable exceptions typically found in Scandinavia, where, for instance, "banks provide children's play areas with small furniture and toys while parents do their banking" *(Hayden, 1984: 214)*.

[278] This is for instant common practise for the Scandinavian based furniture shop IKEA.

[279] This includes books like "Redesigning the American Dream" by Dolores Hayden. Equally, the essay and article collection edited by Catherine R. Stimpson called "Women and the American City", and the Rosi Braidotti, Ewa Charkiewicz, Sabine Häusler and Saskia Wieringa book called "Women, the Environment and Sustainable Development" focused on gendered issues within the design domains. Other authors and books that highlight these issues include the "Housing as if People Mattered" by Clare Cooper Marcus and Wendy Sarkissian and (a section of) the book "Safe Cities", by Gerda R. Wekerle Carolyn Whitzman which focuses on how housing needs among women, children and the elderly can be met *(Beatley and Wheeler, 2004: 150)*.

[280] This can be indicated by the fact that within the United States, in 1970, only 3.7 percent of some 57,081 registered architects were women, and by the 1980, the number had risen to 8.3 percent *(Weisman, 1992: 3, 6)*. Even if women in the recent past made up about half the enrolments in the most prestigious architecture programs in the USA *(Agrest et al., 1996: 10)*, women in 1995 only represented about "8.9 percent of registered architects and 8.7 percent of tenured architecture faculty" *(Agrest et al., 1996: 10)*. The same trend can be found in the United Kingdom, as only 5 per cent of architects practising in architectural offices in 1975 and in 1978 was only 5.2 percent of all architects were women *(Rendell, 2000: 228), (Fogarty et al., 1981: 223)*. This has increased throughout the 1980s, but women remain underrepresented in UK architectural firms, as the percentage had only increased to 11 per cent by 1997 *(Rendell, 2000: 228)*. This is not surprising, as on an average about 27 per cent of all architectural students are women, but "only 9 per cent of women complete their studies and practise architecture" within the UK *(Rendell, 2000: 228)*.

[281] Even so should it be noted that within the context of USA, female architects like Maya Ying Lin have contributed to important national memorials like the Vietnam Veterans Memorial in Washington, D.C. In the same way no female architect had by 1996 ever been awarded the AIA Gold Medal, and it was not until 2004 when the first female architect, Zaha Hadid, received the Pritzker Prize *(Agrest et al., 1996: 10)*.

[282] This include architects and designers like; Eileen Gray, Lilly Reich, Susana Torre, Clare Robinson and Michelle Kauffman *(Rendell, 2000: 231, 234)*.

[283] This includes firms like the United Kingdom based MUf and the USA based Liquid Incorporated *(Rendell, 2000: 234 f)*.

[284] This can be exemplified by products such as feminized headphones etc. (headphones have often been thought of as gender-neutral). For example, Ross Electronics produces a range of headphones that they call Stylers, which through design, targets female buyers. This was done through designing them as fashion accessories and "packaging them into compacts with four pairs of interchangeable plastic earpieces coloured pink, blue, green and yellow" *(Attfield, 1989: 209)*.

[1] English translation of the French text “Le coeur a ses raisons, que la raison ne connaît point”.

[2] “Blaise Pascal (June 19, 1623 – August 19, 1662) was a French mathematician, physicist, and religious philosopher.” Source: www.wikipedia.org 23.02.2005.

[3] “Le coeur a ses raisons, que la raison ne connaît point” *(Pascal et al., 1914: iv, 277)*.

[4] What constitutes the three different phases varies from different design projects, but can typically be detailed into something like the following: (1.) the initial phase is typically focused on identifying the need or motivation for the building or product or a creative process which aims to generate the early design concepts. It is often seen as the creation phase of design process with often has limited consideration for the development and production phases; (2.) the design phase aims to leads to a definition of a particular/specific building or product, which is then subject to further development and refinement before going into full-scale production and (3.) the working drawing phase is the finalisation of the design phase with the aim to create working designer drawings and the ironing out of potential construction problems etc. *(Cross, 2000: 200 f), (Cuff, 1991: 91)*.

[5] The realisation of a building or a artefact produced by industry tends to be the effort of a group consisting of an number of different disciplines including a designer (industrial designer or architect) *(Pye, 1978: 59)*. For further details, see 4.1.3 (Participants in the creation of design).

[6] Designers operating under the entrepreneur paradigm tend to take on the responsibility for the sales of the artefact. In short the architect and the industrial designer build what he/she draws *(Edwards, 1999: 33)*.

[7] The initial settings are influenced by the physical and economic environment which every building or product constitutes itself within. This includes aspects such as:

> “the character of the surroundings, the prevalent climatic conditions, the state of the money-market, and the ability of the building contractors to deliver specific materials or equipment at specific times to the building site.” *(Collins, 1971: 50)*

In addition, the political context plays a roll in setting the staring conditions of a design project such as statutory zoning restrictions etc. Even the historical context of a given project tends to contribute to the initial setting, this typically includes relationship between different buildings and/or different products as well as earlier work by the same architect and or industrial designer *(Collins, 1971: 50)*.

8 For further deliberation see 6.3.2 (Framings’ place in design) and 6.3.2.1 (Framing utilised by designers and its link to values).

[9] For further deliberation see 6.2 (Decisions making in design).

[10] "Arthur William Radford (February 27, 1896 – August 17, 1973) was an U.S. Navy Admiral, Commander-in-Chief of the United States Pacific Command and Chairman of the Joint Chiefs of Staff." Source: www.wikipedia.org 23.11.2005.

[11] First stated in "The Man Behind the Power" in Time, February 25, 1957, page 27 *(Ransom, 1958: 257)*.

[12] This can be illustrated in that it is less common for our great-grandparents generation to considered the option of divorce or few political leaders of previous times considered developing weapons of mass destructions *(Hastie and Dawes, 2001: xiv)*. Equally, engineers of previous time were not asked to produce energy by constructing nuclear power stations that could poison vast areas of the earth as a result a single (or a number) operator's bad judgment[12] *(Hastie and Dawes, 2001: xiv)*. Within the time of previous generations, engineers had not developed technologies and weapons with the capabilities to render the planet uninhabitable if the political establishment make a few undesirable decisions *(Hastie and Dawes, 2001: 1)*.

[13] This can be seen in a prisoner's ability to "experience near ecstasy over eating a single crust of bread or cultivating a single weed" *(Hastie and Dawes, 2001: xiv)*. Equally is this point evident in that "successful" peoples tend to "adapt to their riches and find them-selves on an unsatisfying 'hedonic treadmill'" *(Hastie and Dawes, 2001: xiv)*.

[14] Decision makers in this context include individuals, groups, organizations, and governments etc.

[15] The general challenges of decisions making, its subjective nature and its contexts dependence, has always been a challenge that has occupied philosophers throughout the centuries. And it have lead to murmurs suggestions on ways in which decision making can be good or bad *(Hastie and Dawes, 2001: xiv)*.

[16] Rationality and reasoning has traditionally been defined as people's "capacity to think logically, to set ends for ourselves, and to deliberate about the best means for achieving those ends" *(Lakoff and Johnson, 1999: 513)*. General rationality tends to imply assumptions such as (the following is a direct quotation): (1.) rational thought is literal, (2.) rational thought is logical (in the technical sense defined by formal logic), (3.) rational thought is conscious, (4.) rational thought is transcendent, that is, disembodied and (5.) rational thought is dispassionate *(Lakoff and Johnson, 1999: 513)*. The framework of assumptions behind rationality can be summarised into three main points. First, there is a general assumption that "people are generally thought to be effective in pursuing their goals" *(Tversky and Kahneman, 2000: 209), (Quattrone and Tversky, 2000: 452)*. Second, is it assumed that evolution and competition favour rational individuals and organizations over less rational ones. Third, it is assumed that the intuitive and compelling appeal of the axioms of rational choice make "it plausible that the theory derived from these axioms should provide an acceptable account of choice behaviour" *(Tversky and Kahneman, 2000: 209), (Quattrone and Tversky, 2000: 452)*.

[17] Geronimo Cardano 1501-1576 was a mathematician, physician, accountant, and inveterate gambler which worked on analysis of the practice of gambling *(Hastie and Dawes, 2001: 19)*.

[18] "Jeremy Bentham (IPA: ['benθəm]) (15 February 1748 – 6 June 1832) was an English gentleman, jurist, philosopher, and legal and social reformer. He is best known as an early advocate of utilitarianism and animal rights." Source: www.wikipedia.org 22.11.2005.

[19] "John von Neumann (Neumann János) (December 28, 1903 – February 8, 1957) was a Hungarian-American mathematician who made important contributions in quantum physics, set theory, computer science, economics and many other mathematical fields." Source www.wikipedia.org 27.03.2005.

[20] "Oskar Morgenstern (January 24, 1902 - July 26, 1977) was a German-born American economist. He applied the game theory to business." Source: www.wikipedia.org 27.03.2005.

[21] The theory is not based on studying human behaviour, it is a theory based on mathematics, which discusses utility and it relevance to optimal economic decisions making. Even so, their theories have been considered to have general relevance through the fact that their utility concept is based on general utility (personal value), as opposed to solely financial outcomes of decisions.

[22] More generally, game theory is a branch of applied mathematics that studies strategic situations where players choose different actions in an attempt to maximize their returns. "Game theory has since been widely used to analyze real-world phenomena from arms races to optimal policy choices of presidential candidates, from vaccination policy to major league baseball salary negotiations. It is today established, both throughout the social sciences and in a wide range of other sciences." Source: www.wikipedia.org 30.11.2005.

[23] "Daniel Kahneman (born 1934 in Tel Aviv, Israel) is a key pioneer and theorist of behavioural finance, which integrates economics and cognitive science to explain seemingly irrational risk management behaviour in human beings. He is famous for collaboration with Amos Tversky and others in establishing a cognitive basis for common human errors using heuristics and in developing the prospect theory." Source www.wikipedia.org 21.02.2005.

[24] "The pleasure of eating is one thing; the pleasure of hearing music, another; the pleasure of an amiable act, another; the pleasure of drunkenness or of anger is still another." *(Putnam, 2002: 51)*

[25] This can be illustrated by the following assertion by the American economist Gary S. Becker:

> "All human behaviour can be viewed as involving participants who maximize their utility from a stable set of preferences and accumulate an optimal amount of information and other inputs from a variety of markets" *(Becker, 1976: 14)*

It has also been applied to "nonfinancial, nonmarket behaviours including marriage, education, and murder" *(Hastie and Dawes, 2001: 22, 200)*. According to the utility tradition, most deliberate decisions are taken by individuals based on a prediction of how that individual will feel about a given outcome that one think will occur if one choose one course of action as oppose to a another *(Hastie and Dawes, 2001: 199 f)*. This behaviour is attributed to everyday situations like choosing what one wants to study at school/university, when deciding to get married, or when choosing a medical option etc. In all of these situations one considers how likely they are to enjoy the outcome, both in short term as well as in the long run *(Hastie and Dawes, 2001: 200)*.

[26] A number of studies, particularly in the filed of psychology reveal that people in general do not satisfy the logics of maximised expected utility in many decision-making contexts *(Hastie and Dawes, 2001: 251)*. These findings have led many in the fields like psychology and behavioural economics to reject the concept of maximised expected utility.

[27] Reid Hastie and Robyn M. Dawes attempt to define rationality in their book "Rational choice in an uncertain world", when they asserts that rationality is dependent on four criteria as quoted in the following:

> "1). It is based on the decision maker's current assets. Assets include not only money, but physiological state, psychological capacities, social relation-ships, and feelings. 2). It is based on the possible consequences of the choice. 3). When these consequences are uncertain, their likelihood is evaluated according to the basic rules of probability theory. 4). It is a choice that is adaptive within the constraints of those probabilities and the values or satisfactions associated with each of the possible consequences of the choice." *(Hastie and Dawes, 2001: 18)*

[28] "Human categories are typically conceptualized in more than one way, in terms of what are called prototypes. Each prototype is a neural structure that permits us to do some sort of inferential or imaginative task relative to a category. Typical-case prototypes are used in drawing inferences about category members in the absence of any special contextual information. Ideal-case prototypes allow us to evaluate category members relative to some conceptual standard." *(Lakoff and Johnson, 1999: 19)*

[29] Habit is in this context "choosing what we have chosen before" *(Hastie and Dawes, 2001: 18)*.

[30] Conformity is:

> "making whatever choice (you think) most other people would make or imitating the choices of people you admire ... imitation of success can be adaptive in general, although not, for example, if it is imitation of the drug use of a particular rock star or professional athlete." *(Hastie and Dawes, 2001: 18 f)*

[31] Cultural mandates are "choosing as we have been taught by parents and other authorities" *(Hastie and Dawes, 2001: 19)*.

[32] "Amos Tversky (March 16, 1937 - June 2, 1996) was a pioneer of cognitive science, a long-time collaborator of Daniel Kahneman, and a key figure in the discovery of systematic human cognitive bias and handling of risk. With Kahneman, he originated prospect theory to explain

irrational human economic choices. He received his doctorate from the University of Michigan in 1965, and later taught at the Hebrew University in Jerusalem, before moving to Stanford University. In 1984 he was a recipient of the MacArthur Fellowship." Source: www.wikipedia.org 20.02.2005.

[33] In short, the rational theory is commonly violated by decision makers, and these findings are too "widespread to be ignored, too systematic to be dismissed as random error, and too fundamental to be accommodated" *(Tversky and Kahneman, 2000: 210)*.

[34] This based on "seminal work of Herbert Simon (1955, 1978) and the emergence of cognitive psychology" *(Quattrone and Tversky, 2000: 452)*. An example that illustrates the limitations on memory and computational capabilities was an experiment conducted by Richard E. Nisbett and Timothy DeCamp Wilson. The results found that the order of choices given to individuals has an impact on which choice is selected. This was undertaken by arranging a single row of merchandise (dresses and stockings), and then asking individuals to make selections from the row of items. The experiments showed that individuals generally chose the item at the far right regardless of where in the row the items were placed. Nisbett and Wilson observed that most individuals scanned the products from left to right that corresponded with the reading direction (left to right) of the individuals that took part in the experiment. A possible explanation for this behaviour is that each new product on the row seemed to possess desirable characteristics that the one previously scanned did not possess–because there was no product on the right side, there wasn't anything to compare with at the beginning of the row *(Nisbett and Wilson, 1977: 243 f)*.

[35] "Metaphorical, frame-based, and prototype reasoning are cognitive mechanisms that have developed in the course of human evolution to allow us to function as well as possible in every-day life." *(Lakoff and Johnson, 1999: 527)*

[36] In addition is "the prescriptive use of rational-choice models … never purely objective and never independent of choices made within some" *(Lakoff and Johnson, 1999: 533)* value system.

[37] "Adolf Hitler (20 April 1889 in Braunau-am-Inn, Austria-Hungary — 30 April 1945 in Berlin, Germany) was leader of the National Socialist German Workers Party (1921-1945) and Führer und Reichskanzler (leader and chancellor) of Germany during the Third Reich (1933-1945). A charismatic orator, Hitler is regarded as one of the most significant leaders in world history. The military-industrial complex he fostered pulled Germany out of the post-World War I economic crisis and for a time controlled the greater part of Europe. Hitler's attempt to create a Greater Germany (Grossdeutschland), beginning with the annexation of Austria (Anschluss) and the invasions of Czechoslovakia and Poland, was one of the primary causes of World War II, which began in 1939. The embrace of total war both by the Axis and Allied powers during this time led to the destruction of much of Europe. He also allowed the implementation of racial policies culminating in the genocide of the Holocaust. Although he had hoped to be the founder of a thousand-year Reich, he was reported to have committed suicide in his bunker beneath the ruins of Berlin with the Soviet Red Army closing in." Source: www.wikipedia.org 22.02.2005.

[38] "The first humans to reach the Geographic South Pole were Norwegian Roald Amundsen and his party on December 14, 1911. Amundsen named his camp Polheim. Amundsen's main competitor Robert Falcon Scott reached the Pole a month later. On the return trip Scott and his party of four all died of hunger and extreme cold. There have been many expeditions to arrive at the South Pole by surface transportation. The leaders of some of the first of these are, in order: Amundsen, Scott, Hillary, Fuchs, Havola, Crary, Fiennes. US Admiral Richard Byrd on November 29, 1929 became by the assistance of his first pilot Bernt Balchen the first person to fly over the South Pole. The fastest unsupported walking journey to the Geographic South Pole from the ocean is 47 days and was set in 1999 by explorers Tim Jarvis and Peter Treseder, who manhauled 200 kg sleds containing food and cooking fuel." Source: www.wikipedia.org 23.11.2005.

[39] "Captain Sir Robert Falcon Scott (June 6, 1868 - March 29, 1912) was a British Naval officer and Antarctic explorer. Having narrowly failed to be the first to reach the South Pole, beaten by Roald Amundsen and his party, Scott and his party died on the Ross Ice Shelf whilst trying to return to the safety of their base. Scott has become the most famous hero of the "heroic age" of Antarctic exploration." Source: www.wikipedia.org 21.02.2005.

[40] "Roald Engelbregt Gravning Amundsen (July 16, 1872–June 18?, 1928) was a Norwegian explorer of polar regions. He led the Antarctic expedition of 1910–1912 that was the first to reach the South Pole. Amundsen was born to a family of Norwegian ship owners and captains. Inspired by Fridtjof Nansen's crossing of Greenland in 1888 he decided on a life of exploration." Source: www.wikipedia.org 21.02.2005.

[41] "Dr. Benjamin Franklin (January 17, 1706–April 17, 1790) was an American journalist, publisher, author, philanthropist, abolitionist, public servant, scientist, librarian, diplomat, and inventor. One of the leaders of the American Revolution, he was well known also for his many quotations and his experiments with electricity." Source: www.wikipedia.org 20.02.2005.

[42] Volume 5.

[43] For further deliberation, see 3.1.1 (Defining the concept of profession).

[44] For further deliberation, see 3.1 (The concept of profession).

[45] For further deliberation, see 3.1.1 (Defining the concept of profession) and 4.3.3 (Skill based as opposed to knowledge based).

[46] For further deliberation, see 4.3.3 (Skill based as opposed to knowledge based).

[47] For further deliberation, see 4.3.3 (Skill based as opposed to knowledge based). In addition, the two professions tend to operate within framework that is characterised by some unresolved ethical issues, which transcended into the practice of decision making within the two professions. For further deliberation see 8.1 (Ethics in design).

[48] This ethical limitation might differ from those found in the general society *(Spector, 2001: 8)*.

[49] Architects and industrial designers have in the past avoided the scrutiny of the ethical content of their claims for professionalism *(Spector, 2001: 30)*. This as the ethical dilemmas which are faced by architects and to some degree industrial designers often stems from "conflicts between

private and public interests that come to the fore in design deliberations" *(Spector, 2001: 30)*, and which often "cannot be resolved without ignoring or arbitrarily narrowing the scope of legitimate claims" *(Spector, 2001: 30)*. For further deliberation see 3.2.5 (The design profession's peculiarities and abnormalities).

[50] It can be argued that "any opinion expressed about a building or group of buildings can, in its widest sense, be called a rational judgement" *(Collins, 1971: 36)*.

[51] For further deliberation, see 5 (Designers' distinctive design values).

[52] "The uniqueness of each project, the distinctive qualities of every client, the idiosyncratic character of each award jury, the lack of control over such uncertainties as the conditions and costs of construction, new complexities of building regulation and financing, and the sheer problems of maintaining groups of people who can work well together all contribute to the makeshift character of architectural practice." *(Blau, 1984: 10)*

[53] For further deliberation, see 2 (Introduction to values), 3 (Values in the design profession), 4 (Values in design practise), and 5 (Designers' distinctive design values).

[54] For further deliberation, see 6.4 (Design evaluation is based on value sets).

[55] For further deliberation, see 6.4 (Design evaluation is based on value sets).

[56] For further deliberation, see 6.4 (Design evaluation is based on value sets).

[57] For further deliberation, see 3.2.2 (Pluralism tendency within design profession) and 6.4 (Design evaluation is based on value sets).

[58] For further deliberation, see 4.3.1 (Design generalist versus specialisation) and 4.3.3 (Skill based as opposed to knowledge based).

[59] This makes the two design professions radically different from other professions which has developed "clear branches of knowledge and practice that divide the fields (within, for example, medicine and engineering)" *(Blau, 1984: 38)*. This is all linked to the design value of generalist which where introduced in chapter four. For further deliberation see 4.3.1 (Design generalist versus specialisation).

[60] For further deliberation see 3.2.5 (The design profession's peculiarities and abnormalities), 4.1.1 (Technological determinism, possibilities and challenges), 4.1.2 (Economy in design), 4.1.4 ("Wicked problems" in design), 4.3.1 (Design generalist versus specialisation) and 4.3.3 (Skill based as opposed to knowledge based).

[61] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based), 4.1.1 (Technological determinism, possibilities and challenges), 4.1.2 (Economy in design) and 4.1.4 ("Wicked problems" in design).

[62] Bearing this is mind, it is to some degree contradictory that within a considerable part of the contemporary design profession is it the simple (some would say elegant) solution which is considered to be the ting to strive for *(Nelson and Stolterman, 2003: 137)*. This illustrates that design is not governed by strict logic or reason, but is much more of values that are held in high esteem among architects and industrial designers.

[63] "Many designers remain wary of systematic procedures that, in general, still have to prove their value in design practice." *(Cross, 2001a: 91)*

[64] For further deliberation, see 4.3.1 (Design generalist versus specialisation) and 4.3.2 (Tacit knowledge in design).

[65] Contrary to general belief within the architecture and industrial design professions, a considerable amount of general research indicates that a substantial amount of expert judgments could "be made more equitably, more efficiently, and more accurately" *(Hastie and Dawes, 2001: 63)* by utilising statistical models along side expert judgments, compared to relaying solely on expert judgments *(Hastie and Dawes, 2001: 63)*.

[66] This type of professors can be found in many fields including the two design professions.

[67] "Ray Arthur Kroc (5 October 1902–14 January 1984) was founder of the McDonald's Corporation. Dubbed the Hamburger King, Kroc was included in the TIME 100 list of the world's most influential builders and titans of industry and amassed a $500 million fortune during his lifetime." Source: www.wikipedia.org 28.03.2005.

[68] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based) and 4.3.3.1 (Empirical based research and its influence).

[69] For further deliberation see 3.2.2 (Pluralism tendency within design profession) and 6.4 (Design evaluation is based on value sets).

[70] For further deliberation see 6.4 (Design evaluation is based on value sets).

[71] "Jules Henri Poincaré (April 29, 1854 – July 17, 1912), generally known as Henri Poincaré, was one of France's greatest mathematicians, theoretical scientists and a philosopher of science." Source: www.wikipedia.org 28.11.2005.

[72] "Konrad Zacharias Lorenz (November 7, 1903–February 27, 1989) was an Austrian zoologist, animal psychologist, and ornithologist." Source: www.wikipedia.org 28.11.2005.

[73] This tends to be the case in frame conflicts, value conflicts, or more practical decision conflicts etc., and this individual knowledge base has also implications which are essential to academic aspects within the two design domain. For further deliberation see 6.4 (Design evaluation is based on value sets).

[74] It should be noted that there is no discipline which describes abnormal circumstances, "any more than there is a discipline devoted to the study of the unpredictable" *(Rorty, 1979: 320)*.

[75] This implies that, as for society in general, some values are replaced by new once or given less importance when reaching a new period (shared paradigm) of relative calm within a given field of sciences. For further deliberation see 2.1 (Introduction to values from a general perspective).

[76] For further deliberation, see 3.2.2 (Pluralism tendency within design profession) and 5 (Designers' distinctive design values).

[77] To some extent, according to Rittel, there is a shared "agreement" on what is considered to be essential aspects professional assessment within architecture, which is to a considerable degree disputed within the context of this thesis. But Rittel's assertion that the internal disagreement within the profession "is usually due to differing weights associated with these aspects and to

variation in how the 'scores' are assigned to each various aspect" *(Rittel, 1976: 81 f)* are in line with what is described within this thesis (different weighing of the different values in a value set).

[78] Instead architectural and industrial design schools, and to some extent design practice, are prone to fads and ideologies (lees so for practice except for its sales gimmicks) *(Rittel, 1976: 80)*. See 2.2.3 (Design education from a value perspective).

[79] For further deliberation, see 2.2.1 (Design values as indicated by design history).

[80] I have not been able to fine the original source of this quote, but it can be found on in the note number 31 of Jeremy Till article "Lost judgement".

[81] For further deliberation, see 4.1.2 (Economy in design).

[82] Resolved in this context implies that the original disputing parties agrees on a political solution and or approach of how to tackle the problem etc. (agreement in this context is not consider to be a compromise between the different factions) *(Schön and Rein, 1994: 4)*.

[83] The general boundary between disagreement and controversy is often blurred or elusive with regards to general politics, as well as with regards to design issues. Even so, controversy has a tendency to arise in a way that is unmistakably clear. Controversy is mainly characterised by its "stubborn resistance to resolution by recourse to 'the facts.'" *(Schön and Rein, 1994: 4)*, as facts tends to "play a very different role in policy controversies than in policy disagreements" *(Schön and Rein, 1994: 4)*. The differences between disagreement and controversy can be observed in the way the different "parties to a controversy employ different strategies of selective attention" *(Schön and Rein, 1994: 4)*.

[84] Emerging economies includes in this context many Asian countries as well as countries in the Third World.

[85] The link between politics and design and its common linkage to a value base raises some fundamental question with regards to the relationship between designers and democracy (and the concept of profession within architecture and industrial design).

[86] Ken Yeang 1948 – Malaysian architect, educated I the UK (Cheltenham College and Architectural Association and a doctorate from Cambridge University). Ken Yeang is the author of several books and has been teaching at number schools of architecture in Europe, the United States of America and Asia as well as being a practising designer *(Lawson, 1994: 119)*.

[87] These two dimensions have been described by Harold G. Nelson and Erik Stolterman as the "x" and a "y" dimension of design *(Nelson and Stolterman, 2003: 232 f)*. According to these authors is the x dimension associated with order and the temporal relationships of the activities in the design process. The "x" factor is typically connected to technological issues etc., as well as being connected to designer's ability to think systematically and logically. The "y" dimension is according to Nelson and Stolterman related to dimensions like a "well-developed intuition, a perceptive sense of the wholeness of the situation and an ethical and aesthetic appreciation of the design situation" *(Nelson and Stolterman, 2003: 233)*. The two authors summarises the "x" dimension as being about doing things in the "right way" and the "y" dimension as being about

doing the “right thing” *(Nelson and Stolterman, 2003: 233)*. In other words, the way that fits the terms used with this thesis, is the “x” dimension based on facts where as the “y” dimension is based on the value judgments taken by the designer. These two dimensions are present at the same time in the design process *(Nelson and Stolterman, 2003: 233)*. And many designers, according to Nelson and Stolterman, assign flexibility to the value dimension (y) while attempting to control the technological dimension (x), which in this context is the fact aspect *(Nelson and Stolterman, 2003: 233)*.

[88] More specifically the division of the complexity closely linked to the concept of an overall wicked problem (ill-structured problems or ill-defined problems) and its tame sub problems (well-structured problems or well-defined problems). For further deliberation, see 4.1.4 (“Wicked problems” in design).

[89] Fact based problem solving often demands controlled and/or local thinking, whereas associative and visual thinking tend to be classified as automatic thought processes *(Hastie and Dawes, 2001: 4)*. Within architecture and industrial design there is very little tradition of what is here described as controlled thinking, whereas much of the majority of design education and practise is geared towards gaining associative (automatic) skills/knowledge. For further deliberation, see 4.2.2.1 (Creativity in design).

[90] For further deliberation, see 4.2.2.1 (Creativity in design).

[91] For further detail, see 4.1.4 (“Wicked problems”) in design and 4.2.2.1 (Creativity in design).

[92] This might especially be the case with regards to sub-problems (factual based) problems.

[93] For further deliberation see 4.2 (The internal design realm from a values perspective).

[94] “These responsibilities involve energy conservation ranging from insulation, organizing buildings around a focal heat source like a heating/cooking stove, conservatory or hypercaust wall, re-use of waste heat — for instance retrieving heat from waste water or refrigeration coils — to alternate energy production such as solar heating. They involve careful selection of building materials and the ways they are put together.” *(Day, 1990: 16)*

[95] These conflicting issues is pointed out by Christopher Day in his book “Places of the soul”, when he asserts that:

> “Architectural demands so often lead in different directions, in potential conflict — like energy conservation and biological effects, the straight and the curved, cosmic geometry and organic response to environmental circumstance — that the results will be one-sided and disastrous unless they can be brought into a conversational balance. Similarly, architectural elements need to be brought into conversation or they fight against each other.” *(Day, 1990: 29)*

[96] For further deliberation, see 4.1.2 (Economy in design).

[97] The economies’ impact on design compromises and conflicts is pointed out by David Pye in his book “The nature and aesthetics of design”, when he argues that not only is economy a vital

part of design projects, but that all design is to a degree of failure, and that the failure within architecture and design is inherent quality of design, as general economy imposes that conflicting requirements and issues will have to be balanced with in an economic reality. For further deliberation see 4.1.2 (Economy in design).

[98] Pye also asserts that the "designer or his client has to choose in what degree and where there shall be failure[/compromise]" *(Pye, 1978: 70)*.

[99] The economic impact on design decisions, especially within the domain of industrial design, can be illustrated by the way economy imposes a number of external factors. This includes factors such as, the general economic climate "influencing the ability of the consumer to buy, … the size of the market, the competitors and the changes in the market-place" *(Davies-Cooper and Jones, 1995: 83)*. And in practical technological factors will often play a part in the overall economy which is influencing the design decision, as it for instant is possible to make an air-plane lighter, "but this action will probably increase manufacturing cost" *(Ulrich and Eppinger, 2003: 6)*.

[100] "The Scottish Parliament Building is now the home of the Scottish Parliament at Holyrood, within the UNESCO World Heritage Site in Edinburgh. The Members of the Scottish Parliament (MSPs) held their first debate in the building on Tuesday, September 7, 2004. The formal opening by Queen Elizabeth II took place on October 9, 2004." Source: www.wikipedia.org 11.04.2005.

[101] The cost is currently at £431 million are expected to come in around £470 million. Source: www.wikipedia.org 11.04.2005.

[102] Source: www.wikipedia.org 11.04.2005.

[103] Available at www.holyroodinquiry.org 11.04.2005.

[104] "Peter Fraser, Lord Fraser of Carmyllie (b. 29 May 1945), was educated at Loretto School, Musselburgh and graduated BA (Hons) and LLM (Hons), Gonville & Caius College, Cambridge, before going to Edinburgh University. He was called to the Scottish Bar in 1969 and in 1972 he lectured part-time in constitutional law at Heriot-Watt University for 2 years. In 1979 he was appointed Standing Junior Counsel for the Foreign and Commonwealth Office and became a Queen's Counsel in 1982." Source: www.wikipedia.org 11.04.2005.

[105] For further deliberation see 6.3.2 (Framings place in design), 6.3.3 (Design decisions are primarily based on value sets) and the introduction to this chapter.

[106] For further deliberation see 2.2 (Introduction to values in design), 6.3.2 (Framings place in design) and 6.3.3 (Design decisions are primarily based on value sets).

[107] For further deliberation see 6.3.2 (Framings place in design) and 6.3.3 (Design decisions are primarily based on value sets).

[108] In other words, there is not a common value set which is shared among all within the design professions. For example, environmental architecture (which Christopher Day is advocating in his book) is sometimes criticised for "over-emphasize the technological advantages and under-

value the social and aesthetic aspects" *(Wines and Jodidio, 2000: 64)*. The criticism even goes future by statements like:

> "There is an unbalanced amount of effort currently being spent to create a sanctimonious mythology around what is basically a collection of admirable engineering innovations." *(Wines and Jodidio, 2000: 64)*

This criticism hints at a perception that environmental orientated/conscious architecture and industrial design has a main component that is a celebration of environmental technological solutions and innovations, which should mainly be attributed to the engineers and innovators, not to architects and industrial designers. Even if not all architects and industrial designers would agree with Day's argument (it will depends on the architects and industrial designers value set), many designers nowadays accept that the natural environment is fragile and that the natural environment should at some level be considered while designing *(Nelson and Stolterman, 2003: 30)*. Equally it is generally accepted that safety is an issues which at some level has to be considered in regards to the final design outcome *(Nelson and Stolterman, 2003: 30)*. For further deliberation see 5 (Designers' distinctive design values).

[109] For further deliberation, see 6.3.3 (Design decisions are primarily based on value sets).

[110] An illustrative example of this can be found within the domain of architecture in the potential conflicts that exist between the regionalism and the universalism. Regionalism and the universalism have often been seen as mutually exclusive which within architecture *(Gelernter and Dubrucq, 2004: 1090)*. This, in an historical context, has led to a development where architects on the one hand are sensitive to regional practicalities and which often mock higher aesthetic concerns and meanings, and on the other hand are high-fashion designers which "may disparage regional concerns as parochial or inconsequential in relation to bigger philosophical issues" *(Gelernter and Dubrucq, 2004: 1090)*. For further deliberation see 5 (Designers' distinctive design values).

[111] Artistic aspects and Self-expression, The Spirit of the Times, Structural, Functional and Material Honesty, Simplicity and Minimalism, Nature and Organic, Classic, Traditional and Vernacular aesthetics and Regionalism.

[112] Social change, Consultation and participation, Crime prevention and "Third World".

[113] Green design and Sustainability, Re-use and Modification and Health.

[114] Tradition based design, Restoration and Preservation and Vernacular.

[115] For further deliberation, see 6.3.3 (Design decisions are primarily based on value sets).

[116] For further deliberation see 4.2.2 (The emphasis on novel design solutions) 4.1.4 ("Wicked problems" in design) and 5.1.1.1 (Artistic aspects and self expression).

[117] The "strong" ideals and values approach has its roots in the patron design relationship and this type of value set and emphasis function well under conditions where the designer works with a

liberal patron. For further deliberation see 3.2.4 (Designer's unsettled designer-client relationship) and 4.1.3 (Participants in the creation of design).

[118] For further deliberation see 6.3.2 (Framings place in design) and 6.3.3 (Design decisions are primarily based on value sets).

[119] Generally the overall conflicting issues which architects and industrial designers concern themselves with do not lend themselves to being resolved by decision making based on maximising expected utility, whereas some sub-problems will to some extent lend themselves to the concept of maximising the expected utility. This is to some extent inline with the difference of "Wicked problems" and "tame problems" introduced in chapter four. See 4.1.4 ("Wicked problems" in design).

[120] For further deliberation see 2.2 (Introduction to values in design), 6.3.2 (Framings place in design) and 6.3.3 (Design decisions are primarily based on value sets).

[121] For further deliberation, see 4.1.2 (Economy in design).

[122] For further deliberation, see 4.3.3 (Skill based as opposed to knowledge based) and 6.2.1 (Design is generally value based as oppose to fact based).

[123] For further deliberation see 3.2.1 (The artist that lives inside the professional designer).

[124] The lack of consensus with regards to design methods within architecture and industrial design can be attributed to a number of factors, including the lack of a "systematic strategy for questioning their own beliefs, whether in the form of opinion, intuition or nonevidential understanding" *(Edwards, 1999: 61)*.

[125] It reflects that the design profession lacks a viable "general" theory for design practice *(Edwards, 1999: 62)*.

[126] "Roy Edward Disney (born January 10, 1930) was a long time senior executive for the Walt Disney Company, which his father Roy Oliver and his uncle Walt founded. He is still a major shareholder, and currently serves as a consultant for the company with the title Director Emeritus. He is perhaps best known for organizing the ouster of two top Disney executives: first, Ron Miller in 1984, and then Michael Eisner in 2005." Source: www.wikipedia.org 29.11.2005.

[127] These individual values are drawn from the main groups: aesthetic values, social values, environmental values, traditional values and gender values.

[128] Analysis of architecture and industrial design related literature conducted within the scope of this thesis, revealed that designers adhere to a number of values which make up a values set, and this value set is organised in a value hierarchies *(Ball-Rokeach et al., 1984: 26)*. For further deliberation, see 2.1.3 (Value hierarchies).

[129] Value hierarchies are characterised by being structured through giving greater or smaller importance etc. to the different values. For further deliberation, see 2.1.3 (Value hierarchies).

[130] For further deliberation, see 2.1.3 (Value hierarchies).

[131] How one view values and value sets (hierarchies) relevant in a design context may depend on how one views design generally. For instance, if one subscribes to the view that architecture and industrial design mainly involves problem solving, as asserted by Herbert Simon in his famous

book “The sciences of the artificial”, it maybe difficult to see how a value set (hierarchy) plays an essential roll in design. However, if one adheres to the viewpoint of Donald A. Schön which he asserts in his book “Educating the reflective practitioner”, it is maybe more self-evident than value sets playing an essential role.

[132] For further deliberation see 5.1 (Introduction to individual design values).

[133] “William James (January 11, 1842, New York - August 26, 1910, Chocorua, New Hampshire). William James was born in New York, son of Henry James, Sr., an independently wealthy and notoriously eccentric Swedenborgian theologian well acquainted with the literary and intellectual elites of his day.” Source: www.wikipedia.org 20.02.2005.

[134] For further deliberation see 6.2.1 (Design is generally value based as oppose to fact based).

[135] For further deliberation see 4.3.3 (Skill based as opposed to knowledge based) and 6.2.1 (Design is generally value based as oppose to fact based).

[136] Donald A. Schön has even named two of his books “The reflective practitioner”, and “Educating the reflective practitioner”. It should be noted that design projects tends to be characterised as being complex, indeterminate, indefinable and paradoxical by the same group of authors *(Nelson and Stolterman, 2003: 189), (Schön and Rein, 1994: 172), (Schön, 1987: 42, 157)*.

[137] Equally, does the writing of Nelson and Stolterman illustrate the same point when they argue:

> “Nevertheless, the outcome of good judgment complies with the criteria and constraints supporting the driving intention and expectations [i.e. values] of any particular decision-making process. The operational outcome of any judgment is dependent on the nature of the intention [i.e. values].” *(Nelson and Stolterman, 2003: 189 f)*

[138] “Victor Hugo Novelist, poet, playwright, dramatist, essayist and statesman, Victor-Marie Hugo (February 26, 1802–May 22, 1885) is recognized as one of the most influential French Romantic writers of the 19th century. His most well known works are the novels Les Misérables and Notre-Dame de Paris (The Hunchback of Notre-Dame). Though conservative in his youth, he later became a passionate supporter of republicanism, and his work touches upon many of the major political and social issues and artistic trends of his time.” Source: www.wikipedia.org 05.12.2005.

[139] The analytic sequence seems backward with regards to most everyday decision-making compared to the goals and values and then choices and actions orientated sequence that characterises ordinary decision-making. There are exceptions where the analytic sequence is the norm, examples of this can be found in a number of domains including psychoanalysis (where one “attempt analytically to discover what our behaviour implies about its precursors in desire and belief” *(Hastie and Dawes, 2001: 252)*), economics and mathematics etc. This as:

> "analytic interpretation is as valid as—and more popular than—the synthetic interpretation, among the experts in economics and mathematics who are the primary users of the theory." *(Hastie and Dawes, 2001: 252)*

[140] "Sir Frederic Charles Bartlett (1886-1969) was a British psychologist and professor of experimental psychology at the University of Cambridge from 1931 until his retirement in 1951. With Kenneth Craik he was responsible for setting up the Medical Research Council's Applied Psychology Research Unit (APU) at Cambridge in 1944, becoming Director of the unit after Craik's early death in 1945. He was one of the forerunners of cognitive psychology." Source: www.wikipedia.org 06.12.2005.

[141] Online reference so no page number is available, the point is situated at the very beginning of the article.

[142] "Erving Goffman (June 11, 1922 - November 19, 1982), was a Canadian sociologist and writer. Goffman received his B.A. at the University of Toronto in 1945 and his M.A. and Ph.D. from the University of Chicago in 1949 and 1953 respectively." Source: www.wikipedia.org 06.12.2005.

[143] Relativism in this context can be linked to the argument that people's meaning, value, beliefs, behaviours etc. have no absolute references. A relativist tends to claim that humans understand and evaluate beliefs and behaviours in terms of historical and cultural context etc. Relativism is considered to be an important concept within philosophy and social sciences (anthropology and sociology etc.). Philosophers have concerned themselves with exploring how beliefs might or might not in fact depend on truth for such items as language, conceptual scheme, culture etc., where ethical relativism is one example. Social scientists (anthropologists), on the other hand, have been occupied with relativism as a methodological point of view. This methodological relativism is concerned with avoiding ethnocentrism, or applying one's cultural standards to the assessment of other cultures, which in practical terms is about the ability of the researcher to suspend (or brackets) his or her own cultural biases, while attempting to understand beliefs and behaviours in their local contexts.

[144] To avoid the trappings of epistemological relativism a number of scholars whom subscribe to relativism have taken one of three main strategies. The first strategy relies on reality's resistance to multi interpretations, which is based on the idea that:

> "individuals who hold conflicting views of some reality, about which they are locked in intractable controversy, nevertheless live in a larger reality, an every-day world about which they share many perceptions." *(Schön and Rein, 1994: 43)*

This can be exemplified with policy practitioners who see a particular political development differently, but which still can agree on the existence of certain social "facts" in the political and or economic situation etc. *(Schön and Rein, 1994: 43)*. Even if the different policy practitioners see a given political situation through the lenses of their own frames, it is possible that they might “recognize a need to restructure their framing of the situation in order to take account of” *(Schön and Rein, 1994: 43)* stubbornly resistant fact. “But there is nothing in the strategy of truth-through-the-lens-of-a-frame that suggests how such a possibility might be realized” *(Schön and Rein, 1994: 43)*, which brings us to the other strategies.

The second strategy is not based on appealing to shared perception of facts, but on resolving frame conflicts by appealing to “consensual, logically independent criteria for evaluating frames and choosing among them” *(Schön and Rein, 1994: 43)*. The conflicting parties representing different frames “might evaluate their respective frames by reference to a common criterion of utility” *(Schön and Rein, 1994: 43)*.

The third strategy adheres to the concept of “mapping” or translating from one frame to another *(Schön and Rein, 1994: 43)*. It is based on the idea that through “mapping” or translating opponents representing different frames will come to understand one another's conflicting views implied in the different framing *(Schön and Rein, 1994: 43)*. Through this gained understanding it is possible to “make an informed choice among their conflicting frames or to synthesize elements of them in a new frame that they would jointly construct” *(Schön and Rein, 1994: 43)*.

Even with these three strategies, framing is not left without troublesome questions within a practical context. Questions like:

> “How might the sponsors of conflicting frames ever get from a shared perception of "facts" to a coordinated restructuring of their frames? Are there consensual, logically independent criteria for choosing among conflicting frames, and if so, is it possible to apply them in an objective way? Are there workable procedures for mapping, or translating, across conflicting frames, and, if so, how may they be used to enable policy antagonists to arrive at shared understandings?” *(Schön and Rein, 1994: 43 f)*

[145] Inspiration to challenge frames in general can be found among writers whom embrace epistemological relativism, in particular postmodernist writers that often relish “in their discovery of multiple, conflicting, fundamentally irreconcilable interpretations of reality” *(Schön and Rein, 1994: 42)*. But from a practical point of view epistemological relativism is problematic, and this has led many philosophers and social theorists, particularly among those who write with practice in mind, to consider epistemological relativism with a great deal of scepticism and ultimately an unacceptable trap *(Schön and Rein, 1994: 42 f)*.

[146] For further deliberation, see 4.1.4 (“Wicked problems” in design).

[147] For further deliberation, see 4.1.4 (“Wicked problems” in design).

[148] Everyday problems or problem areas in general range over a broad spectrum, at one end characterised by “order” and “harmony” (virtual absence of disagreement), and at the other end by “chaos” and “conflict” (wicked problems, controversy etc) *(Schön and Rein, 1994: 181)*. In short, many problems that one has to deal with in everyday life are complex and/or have a “wicked nature”. For further deliberation, see 4.1.4 (“Wicked problems” in design).

[149] Online reference so no page number is available, the point is situated at the very beginning of the article.

[150] Frames typically impose restriction, give direction and/or provide meaning through selective simplification to what ought to be decisions within the domain of a given frame *(Shmueli et al., 2003) (Online reference so no page number is available, the point is situated at the very beginning of the article)*.

[151] This point is argued by scholars like Schön and Rein when they assert that frames belong to the “taken-for-granted” world of policy making, and that people are usually unaware of the role of frames in organizing, actions, thoughts, and perceptions *(Schön and Rein, 1994: 34)*.

[152] Online reference so no page number is available, the point is situated at the very beginning of the article.

[153] This point is in line with research in cognitive psychology, communication, and decision-making which “suggests that frames, which filter people’s perception of a problem, can affect conflict processes and outcomes” *(Kaufman and Smith, 1999: 164)*.

[154] Online reference so no page number is available, the point is situated at the very beginning of the article.

[155] An practical instant of this characteristic can be found in the continuity in welfare policy under both Gerald R. Ford (Republican) and James Earl “Jimmy” Carter, Jr. (Democrat) administrations in the USA *(Schön and Rein, 1994: 35)*. Similar examples can be found in the Scandinavian countries with regards to welfare policy.

[156] In much the same way within the political domain, a design project can be transformed as implemented (implemented in this context implies both that the frame is being sketched out and the physical implementation of the design). The end result might be that the original frame does not correspond with the real implementation of the design. This can be due to the above-mentioned points, as well as compromises that are forced upon the designers or be part of the development that is taking place in the design process. For further deliberation, see 6.3.2 (Framings place in design).

[157] For instance, within a political context what is considered to be a frame conflict or conflicts that occur across frames depended on the way one see the “generic institutional action and metacultural frames that underlie conflicting policy positions” *(Schön and Rein, 1994: 35)*.

[158] The potential within a new frame or reframing may lie latent because other reforms that are dependent on it are not forthcoming. Consequently, may policies will “be reframed as a result of cumulative, incremental adaptations to a changing situation” *(Schön and Rein, 1994: 35)*.

[159] "Gilbert Keith Chesterton (May 29, 1874 – June 14, 1936) was a prolific English writer of the early 20th century. He was one of the most influential writers during this period, inspiring many historic figures with his works. He was deeply motivated by religious matters, a search which culminated in his reception into the Roman Catholic Church." Source: www.wikipedia.org 05.12.2005.

[160] Much in the same way that it is not possible to see a Gestalt figure simultaneously as both an old woman and a young one *(Schön and Rein, 1994: 29)*.

[161] Most people are aware of what one persons or a community considers to "unsanitary and unsightly another may find comfortable, homelike, or even picturesque" *(Schön and Rein, 1994: 29)*.

[162] "James G. March is Professor Emeritus at Stanford University. […] Since 1953, he has served on the faculties of the Carnegie Institute of Technology, the University of California, Irvine and (since 1970) Stanford University. […] He is best known professionally for his work on organizations and decision making." Source: www.wikipedia.org 15.03.2005.

[163] For further deliberation see 6.4.1.1 (Design evaluation involves subjective value judgement).

[164] These differences can be attributed to the fact there is a "fundamental difference between moments of problem solving when matters are poorly defined and those with clarity and sufficiency of structure" *(Rowe, 1987: 34)*.

[165] Design is essentially prescriptive, whereas science is predominantly descriptive. Scientists are focused on understanding the present and predict the future as well as understanding the past, whereas architects and industrial designers are concerned with prescribing and crating the future. "Thus their process deserves not just ethical but also moral scrutiny" *(Lawson, 1997: 127)*.

[166] See section 4.1.4 ("Wicked problems" in design).

[167] Many of the desirable ends which are found in design projects "are irreconcilable within the context in which they are presented to the designer" *(Spector, 2001: 65)*.

[168] These challenges and problems tend to be set at the briefing of a project (set at the time an architect or industrial designers is introduced to a given design project).

[169] For further deliberation, see 3.2.4 (Designer's unsettled designer-client relationship).

[170] This was first introduced in chapter three. For further deliberation, see 3.2.4 (Designer's unsettled designer-client relationship).

[171] For further deliberation, see 3.2.4 (Designer's unsettled designer-client relationship).

[172] Generally do many architects and industrial designers, as well as their clients, see the supposed ability to design as ones way out of "tough situations" and as the main asset of the design profession and the design process *(Spector, 2001: 65)*.

[173] Behind many mediocre buildings or unsuccessful products there is often either an architect or an industrial designers whom is doubting his or her own talent, and perhaps wondering if other designers could have done it better *(Spector, 2001: 66)*.

[174] As mentioned earlier, is it very seldom that individual architects, industrial designers or design offices will walk away from a given project at this initial stage.

[175] The emphasis of utility within architecture has historical roots which date back to Marcus Vitruvius, which is indicated the previously introduced assertion where Vitruvius argued that architecture "must be built with due reference to durability, convenience, and beauty" *(Vitruvius Pollio, 1960: 17)*. But none of the concepts asserted by Vitruvius lends themselves easily to a utility decision making process, even if there is clearly some utility aspects connected to durability, convenience and beauty. For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[176] For example it is often difficult for architects and/or industrial designers to assess the ecological implications of design decisions *(Lawson, 1997: 80 f)*. Even if:

> "Most of the energy consumed in the developed countries is connected with the manufacturing and use of products. A very high proportion indeed is connected with the construction industry. Similarly, levels of pollution and atmospheric emissions are heavily influenced by the decisions of industrial designers, architects and town planners." *(Lawson, 1997: 80 f)*

For more on the limitation of utility in design see section 6.3.3 (Design decisions are primarily based on value sets).

[177] For further deliberation see 2.2 (Introduction to values in design) and 2.2.1 (Design values as indicated by design history).

[178] For further deliberation see 6.3.3 (Design decisions are primarily based on value sets).

[179] For further deliberation see section 6.3.3 (Design decisions are primarily based on value sets).

[180] Design problems and/or challenges that are characterised by difficult trade-offs between several and at times numerous desirable ends, as well as being yet imperfectly understood (partly uncertain, ill defined, complex, and incoherent).

[181] The concept of framing in the context of design is often referred to as idea(s), metaphor(s), concept(s) and framework (primary generators) among practising architects, industrial designers and design scholars.

[182] Framing can be a tactic and when successful tends to reduce the complexity found in a design project to something which is cognitively manageable for architects and industrial designers *(Darke, 1979: 43)*. For further deliberation, see 6.3.1 (Introduction to framing).

[183] For further deliberation, see 4.1.4 ("Wicked problems" in design).

[184] These key features are linked to what is known as "problem framing" within the design domain *(Cross, 2001a: 96)*.

[185] Architects and industrial designers alike tend to make sketches of solution concepts which are considered to be an important tool in identifying consequences of a given frame and proposed design *(Cross, 2000: 21, 25)*. Sketching is also seen as being an important tool for keeping the exploration on going as:

> "Sketches incorporate not only drawings of tentative solution concepts but also numbers, symbols and text, as the designer relates what he knows of the design problem to what is emerging as a solution. Sketching enables exploration of the problem space and the solution space to proceed together, assisting the designer to converge on a matching problem—solution pair. Problem and solution co-evolve in the design process." *(Cross, 2000: 25)*

[186] For further deliberation see 6.3.1.1 (Value set is an essential part of framing).

[187] For further deliberation, see 4.2.2 (The emphasis on novel design solutions), 4.2.2.1 (Creativity in design) and 4.2.3 (The "holistic" approach).

[188] For further deliberation, see 4.2.2.1 (Creativity in design).

[189] This can be indicted for example by housing design where one typically finds a "frequent switching between considerations of dwelling type plans and considerations of site layout" *(Darke, 1979: 38)* at the early stages of the design process. But later in the design process the frame concerning dwelling type plans will not be reframed unless "there is a fairly glaring mismatch between it and the detailed requirements" *(Darke, 1979: 38)*.

[190] Analysis inhibition is within architecture and industrial design often linked to escalation and regression or to the collection of too much divergent information without any effective means for prioritising the information. For further deliberation, see 4.2.3 (The "holistic" approach).

[191] For further deliberation, see 4.1.4 ("Wicked problems" in design).

[192] For further deliberation see 2.1.3 (Value hierarchies), 4.1.3 (Participants in the creation of design), 6.2.1.3 (A design problem and compromise perspective) and 6.3.3 (Design decisions are primarily based on value sets).

[193] For further deliberation, see 4.2.3 (The "holistic" approach).

[194] For further deliberation see 6.3.2.1 (Framing utilised by designers and its link to values).

[195] For further deliberation see 6.4.1.1 (Design evaluation involves subjective value judgement).

[196] This example was introduced in 2.2 (Introduction to values in design).

[197] This is due to a number of reasons, but one which is often cited in design literature is that design projects are characterised by being partly uncertain, ill-defined, ill-structured, complex, and incoherent, which makes listing and analyse a challenge *(Cross, 2000: 25), (Schön and Rein, 1994: 172), (Schön, 1987: 42), (Schön, 1987: 157)*.

[198] The basic logic behind framing within the architecture and industrial design is that it is considered to be challenging to fully understand the "problem" without considering the "solution" *(Cross, 2000: 21, 25)*. This as design projects tends to be partly uncertain, ill-defined, ill-structured, complex, and incoherent *(Cross, 2000: 25), (Schön and Rein, 1994: 172), (Schön, 1987: 42, 157)*.

[199] For further deliberation see 6.3.3 (Design decisions are primarily based on value sets).

[200] Augmentation made in Jane Darke's article "The Primary Generator and the Design Process" which was originally published in New Directions in Environmental Design Research Edited on page 325 – 337 *(Darke, 1978)*.

[201] Architects and industrial designers whom are considered to be experienced and somewhat outstanding are repeatedly found in various "studies to be proactive in problem framing, actively imposing their view of the problem and directing the search for solution conjectures" *(Cross, 2001a: 96)*.

[202] For further deliberation see 4.1.2 (Economy in design).

[203] "Sir Basil Spence (13 August 1907-19 November 1976) was a notable Scottish architect, most famously associated with the Cathedral in Coventry, but also responsible for numerous other buildings in the Modernist style." Source: www.wikipedia.org 17.03.2005.

[204] For further deliberation, see 4.2.2.1 (Creativity in design).

[205] These strategies have the potential benefit of making design decisions less an intuition based experience and more based on rationality, as well as the potential benefit of making the design professions more of scientific discipline *(Spector, 2001: 66), (Cross, 2000: 94), (Cross, 2001b: 49)*. For further deliberation see 4.3.3 (Skill based as opposed to knowledge based).

[206] Through more or less extensive information gathering architects and industrial designers will often feel less dependent on their personal intuition, experience and tacit knowledge etc. when making design decisions.

[207] For further deliberation, see 6.3.2 (Framings place in design).

[208] For further deliberation see 6.3.2 (Framings place in design) and 6.3.2.1 (Framing utilised by designers and its link to values).

[209] This is a fact highlighted by David Pye when he asserts that "purely utilitarian" design does not exist, which he defines as design being in compliances with "the requirements of use, and of ease and economy, but ignoring the requirement of appearance" *(Pye, 1978: 34 f)*.

[210] David Pye points out that within the development of buildings or products, aesthetics versus economy are more or less in a constant conflict, which many architects and industrial designers find troubling. According to Pye "many designers and manufacturers consistently expend useless work on satisfying" *(Pye, 1978: 35)* a particular appearance. Even if aesthetic appearance in a building or a product does not lend itself to utility analysis (especially not when integrated or compared to other aspects found in a design project), a surprisingly large proportion of manufacturing time in nearly every field is "taken up with … work catering for the requirements of appearance" *(Pye, 1978: 35)*.

[211] The qualitative questions of *In what way better?* or *To what extent better?* often match what designers tend to ask themselves compared to the quantitative questions related to a utility approach *(Spector, 2001: 79)*.

[212] For more detail, see 4.1.4 ("Wicked problems" in design).

[213] For further deliberation see 6.2.1 (Design is generally value based as oppose to fact based).

[214] But as pointed out by Bernard Williams, John Dewey, Michael Stocker, Elizabeth Anderson and others is the task of “deciding between incommensurables … hardly an exceptional undertaking; rather, it is an everyday business” *(Spector, 2001: 80)*. It is probably worth pointing out that the decisions taken by architects and industrial designers differs from everyday decisions in its durability and far-reaching consequences *(Spector, 2001: 80)*.

[215] As for other experts within other domains, there is a number of reasons why it is likely that practising architects and industrial designers, as well as design scholars, have a considerable confidence in a designer’s expert opinions. The general list by Paul E. Meehl introduced in 4.3.2 (Tacit knowledge in design) is most likely to apply to designers and to some extent design scholars in the same way as for other professionals. One of the main details pointed out by Meehl with regards to confidence in expert opinions is the sheer ignorance that exists among a number of professions to the research that is challenging this confidence. The same ignorance probably exists within design professions, as the architecture and industrial design literature that is cited in this thesis has not pointed out the controversies that exist with regards to expert opinion in general, versus performance of utility and statistics approaches. Nor has the controversy that exists with regards to expert opinion in the scholarly literature been pointed out. This indicates that Meehl’s points apply to the design professions. In addition, architecture and industrial design have the same feedback problems that are often found in many subjects domains, which have been introduced in a previous section, which is a great contributing factor and containment of the belief in the intuitive judgment of experts *(Hastie and Dawes, 2001: 67)*.

[216] Generally throughout the design process designers are faced with the task of making decisions with regards to “sub-solutions or alternative features that might be incorporated into a final design” *(Cross, 2000: 139)*. Choosing and making decisions with regards to “alternatives is therefore a common feature of design activity” *(Cross, 2000: 139)*.

[217] This decision characteristic is in line with the general decision behaviour as argued by Amos Tversky in his article “Elimination by aspects”. In this article Tversky argues that decision makers often eliminate alternatives by aspects, and that this often involves a process where the decision maker establishes a desired aspect related to a number of alternatives *(Tversky, 1972: 284 f, 297 f)*. Then the process continues with an elimination of alternatives that do not possess the desired aspect (or enough of them). Then a new desired aspect is introduced and the remaining alternatives are eliminated on the basis of this desired aspect. This continues until either a single alternative is left or so few are left that they can be evaluated more thoroughly by other means *(Tversky, 1972: 284 f, 297 f)*.

[218] Value set will, in this context, incorporate all the value aspect that has been introduced in chapter three, four and five.

[219] Evaluation is by some scholars reserved for systematic judgments where the evaluator is focusing on making clearer what the evaluation criteria are or what it is compared with etc. Goal achievement analysis tends to be the main analysis in evaluation literature. Other analysis includes result analysis, context analysis, achievement analysis, process analysis, efficiency

analysis. Within this thesis is the term used more loosely incorporating elements of all of mentioned analysis as well as architectural and industrial design criticism.

[220] "Social groups may disapprove of particular techniques; osteopaths, naturopaths, chiropractors and Christian Scientists may challenge the academic supremacy of traditional medicine; but the arts of healing and litigation are nevertheless firmly based on the same universal concepts of natural justice and normal health which have existed unchanged for centuries." *(Collins, 1971: 142)*

[221] "No modification in popular views concerning the absolute right to enjoy personal property has ever seriously threatened the Fifth Amendment, nor have the remarkable statistical changes in the incidence of pock-marks or infant mortality affected our ideas as to what constitutes a normal complexion or a normal duration of life." *(Collins, 1971: 142 f)*

[222] The lack of a factual and research based basis has previously been introduced in 4.3 (Knowledge foundation from a values perspective) and 6.2.1 (Design is generally value based as oppose to fact based).

[223] The previous mentioned book of Sturgis is examples of this tradition as it introduces a historical overview starting from 460 B.C. to 1895 in other suggest appropriate architectural evaluation.

[224] It should be noted that it "was not until the 1960s that the methods and criteria upon which such criticism was to be based were the subject of systematic scholarly research" *(Collins, 1971: 108)*.

[225] "David Foster Wallace (born February 21, 1962 in Ithaca, New York) is an American novelist, and short story writer." Source: www.wikipedia.org 22.12.2005.

[226] On the basis of this tends critics within the design domains to have three main roles which includes description, interpretation and judgement *(Attoe, 1993: 524)*.

[227] For further deliberation, see 5.1.1.2 (The Spirit of the Times).

[228] For further deliberation, see 5.1.1.6 (Classic, Traditional and Vernacular aesthetics).

[229] For further deliberation, see 5.1.3.1 (Green design and Sustainability).

[230] For further deliberation, see 5.1.1.3 (Structural, Functional and Material Honesty).

[231] It can include visitors, regulatory agencies, occupants, neighbours etc.

[232] May consist of client, architect, consultant etc.

[233] Cuff acknowledges the design professional challenge which are associated with heir definition of design quality, when she for instant is highlights that "professional evaluation of quality … is challenged by the conception of design as a social act" *(Cuff, 1991: 197)*.

[234] Modern buildings characterised as having an element of aesthetic experiments with functional shortcomings includes buildings designs by well-known architects, like Mies van der Rohe with his Farnsworth House in Plano, Illinois, Louis Kahn with his design of the Richards Medical Research Center in Philadelphia, "and perhaps the most famous of all, Frank Lloyd Wright's Guggenheim Museum in New York" *(Spector, 2001: 91)*.

[235] "Founded in 1937, The Solomon R. Guggenheim Museum is a modern art museum located on the Upper East Side in New York City. It is the best-known of several museums founded by the Solomon R. Guggenheim Foundation, and is often called simply The Guggenheim." Source: www.wikipedia.org 06.04.2005.

[236] Generally a successful product from an aesthetic point of view can be evaluated very differently from a functional point of view. This can be illustrated by the case of the now old RE5050 radio, which received much design media coverage and acclaim, but did not receive the same positive response from publications which focused on the functional aspect of the product *(Whiteley, 1995: 103)*. The product was generally considered to be a success from a design point of view by the design press, but at the same time was it considered to be substandard product in terms of functionality from a functional (hi-fi) point of view by the hi-fi press, such as Which? etc. *(Whiteley, 1995: 103)*.

[237] This points to differences in the evaluation criteria used by the public and designers, and the phenomenon poses the proposition whether an evaluation of products by the design profession and the design press is out of tune with the evaluation of consumers. It also points to the question of which criteria the consumer using when evaluating a purchase of a given product, compared to which criteria the design profession and the design press uses when evaluating the same product.

[238] For further deliberation, see 5.1.1 (Aesthetic design values).

[239] The architectural and industrial design style debate stretches back over the centuries and is alive and thriving within the contemporary design domains *(Cruickshank, 2000: 336 f)*.

[240] Contrary to much of the emphasis found in some design schools did "the classical tradition survived through the 20th century, despite the advent of anti-historicist and anti-ornament Modernism" *(Cruickshank, 2000: 337)*.

[241] For further deliberation see 6.3.2 (Framings place in design) and 6.3.3 (Design decisions are primarily based on value sets).

[242] The dismissal of public evaluation is linked to an argumentation that the general public do not have the same design competence as that of practising professional architect or industrial designers have. For further deliberation see 2.2 (Introduction to values in design).

[243] For further deliberation see 3.2.3 (Designer's unsettled relation towards society).

[244] "Walt Whitman (May 31, 1819 – March 26, 1892) was an American poet, essayist, journalist, and humanist born on Long Island, New York. His most famous work is the collection of poetry, Leaves of Grass." Source: www.wikipedia.org 30.12.2005.

[245] For further deliberation, see 1.1.2 (Contemporary value discourse).

[246] For further deliberation, see 3.2.4 (Designer's unsettled designer-client relationship).

[247] Even a "successful" dialogue between the student and teacher is no guarantee for the student's compliance with the teachers definition of design quality *(Schön, 1987: 116)*.

[248] "Hammurabi (also transliterated Hammu-rapi or Khammurabi) was the sixth king of Babylon. Achieving the conquest of Sumer and Akkad, ending the last Sumerian dynasty of Isin, he was the first king of the Babylonian Empire." Source: www.wikipedia.org 04.04.2005.

[249] The Babylonian king Hammurabi's Code of Laws is know as the Code of Hammurabi and the Codex Hammurabi *(Eisenberg and Yost, 2004: 194)*.

[250] " 229 If a builder build a house for some one, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death. 230 If it kills the son of the owner the son of that builder shall be put to death. 231 If it kills a slave of the owner, then he shall pay slave for slave to the owner of the house. 232 If it ruin goods, he shall make compensation for all that has been ruined, and inasmuch as he did not construct properly this house which he built and it fell, he shall re-erect the house from his own means. 233 If a builder build a house for some one, even though he has not yet completed it; if then the walls seem toppling, the builder must make the walls solid from his own means. 234 If a shipbuilder build a boat of sixty gur for a man, he shall pay him a fee of two shekels in money. 235 If a shipbuilder build a boat for some one, and do not make it tight, if during that same year that boat is sent away and suffers injury, the shipbuilder shall take the boat apart and put it together tight at his own expense. The tight boat he shall give to the boat owner." Source: www.wsu.edu 04.04.2005.

[251] "The city of London adopted regulations for the construction of common walls, rights to light access, drainage, and safe egress in case of fire" *(Eisenberg and Yost, 2004: 195)*.

[252] "The Palazzo Pubblico (town hall) is a palace in the city of Siena, Italy. Construction began in 1297 and its original purpose was to house the republican government, consisting of Podesta and the Council of Nine." Source: www.wsu.edu 04.04.2005.

[253] For further deliberation see 6.3.1 (Introduction to framing), 6.3.1.1 (Value set is an essential part of framing), 6.3.2 (Framings place in design) and 6.3.2.1 (Framing utilised by designers and its link to values).

[254] No page number available, this point is located in the first part of the article.

[255] No page number available, this point is located in the first part of the article.

[256] No page number available, this point is located in the first part of the article.

[257] For further details, see 5.1.3.3 (Health).

[258] In the same way as environmental issues have not dominated the two design professions, there has traditionally been little focus on environmental issues with design codes. For further deliberation, see 5.1.3 (Environmental design values).

[259] For further deliberation see 6.3.2 (Framings place in design) and 6.3.2.1 (Framing utilised by designers and its link to values).

A P P E N D I X

[1] Legal legislation and its consequent restriction which applies to the design professions differ to some extent depending on which country. The legal framework tends to limit the design freedom, as ethical restriction tends to limit aspects in most professions.

[2] For further deliberation see 3.2.1 (The artist that lives inside the professional designer).

[3] For further deliberation, see 3.1.4 (Ethical guidelines and standards).

[4] Inner conflict among professionals is describe by scholars such as Bernard Williams which introduces the concept of the “uneasy professional” *(Williams, 1995: 196)* in his article called the “Professional Morality and Its Dispositions”.

[5] The concept of the uneasy professional within the domain of architecture and industrial design can be illustrated by assertions made by the architect Henry N. Cobb in his article called “Ethics and Architecture” where he states the following:

> “I cannot recall a single commission undertaken by my firm in the past thirty years that has not required us to make difficult choices concerning how and to whom we render our professional service and how and to whom the intended building will make itself useful. These choices are difficult because the numerous constituencies whom we, as a matter of professional responsibility, see ourselves as serving—the client institution, the building's users, its neighbors, and so on—these diverse constituencies are often fiercely committed to widely divergent and deeply conflicting principles of human duty. This is especially true in the large-scale urban building projects that have always constituted a significant component of our practice. Hence, a disquieting ambivalence with respect to ethical issues—a pervasive uncertainty about how best to fulfill my duty as a professional—is a nearly perpetual state of mind for me, as surely it must also be for every architect in practice today whose work significantly touches or shapes the public realm.” *(Cobb, 1992: 47 f)*

[6] For further deliberation see 3.2.3 (Designer’s unsettled relation towards society).

[7] For further deliberation see 5.1.2.2 (Consultation and participation).

[8] Source: 1997 AIA Firm Survey sited in *(Cuff, 2000: 353).*

[9] The Sources is the Design in Britain 2001 publication by the British Design Council. The specifics are found in part two on page 20, which was available on the British Design Council web pages (www.designcouncil.org.uk), September 2004.

[10] Asian and European architects firms for instant often find themselves competing unsuccessfully against globalize US based corporate architect offices *(Cuff, 2000: 353)*.