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CREATING A DESIGN CULTURE

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FORGING THE CRUCIBLE FOR DESIGN COMPETENCE

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Harold Nelson
Erik Stolterman

VERSION: July 2001:v2

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This book is dedicated to:

Anne, Autumn, Erikka,
Maria, Adam, Ludvig

Table of Contents

Acknowledgements

There are many people who have helped us in developing both the content of this book and its form. We owe them a great deal and would like to give them our thanks for their friendship, support and professionalism. We want to thank the following individuals and organizations specifically.

We would like to thank our colleague and friend Bob Sandusky, co-founder and officer in the Advanced Design Institute.

We have had the chance to work with a number of professional colleagues in different design fields over the years. Their questions, thoughts and ideas have greatly helped us to formulate our own composition.

Some of the best ways of testing new ideas is to present them to minds that are still critical and full of energy. We are deeply thankful to our students, both in United States and in Sweden, that have helped us by reading earlier versions, asking questions, being honestly critical of ideas, but especially for encouraging us to go on with our work.

We also want to thank the Swedish research funds, *Riksbankens Jubileumsfond* and *HSFR* for their financial support. Without their support this work would never have been possible.

Harold Nelson   Erik Stolterman
Seattle   Djäkneböle

Prelude

Genesis is ongoing. We continuously create things that form the world people experience as their own. When we create these new things, artifacts, organizations, processes, symbols and systems we engage in design. To come up with the idea and to give form, structure and function to these designs is at the core of design as an activity. This book is about that activity.

Design is a natural human ability and everyone designs all the time. Design framed in this way is of course related to what is traditionally thought of as design such as architectural or interior design, industrial design, engineering design, graphic design, urban design, information systems design, software design, fashion design and other forms of physical design. In our framing of design we also include among others design areas such as organizational design, social systems design, educational design, work place design, and healthcare design. We use the concept of design as a way to define a specific tradition and culture of inquiry and action that is inclusive of all the above mentioned domains of design.

In the struggle with an ever more complex understanding of reality we believe that the traditions of inquiry and action prevalent in our contemporary society do not give the support and aid we need in meeting the emergent challenges of accidental or intentional change. In the attempts to design the world to be what we would like it to be, the traditions we have at hand can't fully give us support in that task. The traditions of science, art, spirituality, economy and technology do not embody the specifics of design, what can be understood as the philosophy of design and the praxis of design. Each of these traditions have developed a depth of knowledge and insight that is impressive, but is focused on a particular aspect of our human experience, necessary but not sufficient in the management of human affairs. They have their own purposes and goals. Each tradition gives support and power within that tradition. Design is an essential and necessary addition to the palette of traditions.

In addition to the theoretical and practical content required for the design tradition to become an equal among equals in the spectrum of traditions it is especially important to have a container or crucible in place to define the limits and space for designing. This is essential because, without it, a design process cannot occur, The design tradition requires the presence of a design culture that defines general limits and a context that defines the particular limits for any design project. A social container is required to provide the space and protective environment required for a process that is both powerful and vulnerable at the same time.

What is presented here is a *composition* of what we believe is a broad and deep understanding of design and designing as a culture of inquiry and action. This composition is in itself a design. It is not an attempt to present a true or accurate description of an idealized design culture. Nor is it an attempt to answer all questions that might emerge concerning what a design culture might or ought to be. It is essentially our understanding of design as its own tradition and not merely a variant of science or art or technology or spirituality. It is an attempt to build a different understanding of design based on some foundational and fundamental ideas we believe must be present in the development and implementation of a design culture.

This book is an introduction to many ideas that deserve a book of their own. We feel that it is important however to present them as a whole, as part of a composition. We are not proposing a theory or a set of theorems or axioms. Instead we have chosen to use *foundations*, *fundamentals* and *metaphysics* as the unifying elements of the book. The reason for this is that this structure better reflects the level of our intention in making a case for a design culture. We have over a long time found that there are emergent patterns informing the composition of our ideas as a whole. We have found that it is possible to make a composition from this tripartite relationship of concepts that in different ways reflect what we see as the core or substance of design.

The idea of a culture of design signifies the breadth and depth of design understanding this book tries to evoke. A design culture promotes an understanding of design that is transcendent of particular contexts or specific disciplines. A design culture is broad in its scope and deep in its meaning and utility. By formulating design thinking in this way we are

defining a firm pallet from which designers in any field can bring this new appreciation for the potential of design into action. With this in mind we will use the term design to stand for this broader meaning of a design culture.

The composition we present here is, we believe, carefully designed. It is a whole. It is similar to a painting where all parts and their relationships contribute meaning to the whole. No part can be removed and replaced in a simple way without changing the overall composition. It is something that, we hope, holds together and has integrity and authenticity. This does not mean that we are unwilling to critically discuss and evaluate better alternatives and improvements to this particular composition. We do believe that the way we have composed this platform creates a whole that is more than the individual sum of ideas presented and has an emergent quality of its own giving it a strength of meaning that can be significant in the development of a design culture.

Design is something we do all the time and everywhere. To design is always the most effective and efficient means of getting organizations and individuals to new places. Design is therefore about leadership – and leadership should therefore be about design. As a consequence a design culture is also about how to be and think as a leader. Leadership today demands action, creativity, and the ability to act based on an overwhelming amount of insufficient information within restricted limits of resources and time. These demands put on a leader cannot be met from within the traditions of science, art or pragmatic technology only. The demands faced by leaders today is to be able to imagine adequate responses that are sustainable – in all their implications. This is a task that calls for judgment, not for problem solving. It calls for good compositions, not for true solutions. We argue that a design culture is not only for designers but for leaders as well and that leaders and designers are one and the same. It is useful for a leader to understand leadership tasks as design tasks, the leadership role as a design role and to think and act in a designerly way.

Writing a book on a topic this broad means that some important ideas are left out by necessity. To be comprehensive is an idealized goal but not a reachable one, especially in a book. Our goal has been to come up with an adequately composed platform upon which to base a design

culture that is presented by necessity in sections and parts; the palette of our composition. At the end of the book we have added two parts not included in the overall composition but still valuable. To create a bridge between the concepts of a design culture and what it means for the individual designer in his or her design praxis, we have added a section on the design of the designer – on the *character of the designer*. The book ends with a synthesis, a *contemplation*, of what we believe to be the emergent ideas that best describe our composition as a whole. We reflect on what we have tried to accomplish in the book, and what our hopes are for the future in relationship to this perspective of design.

The design of the book is based on the notion of reflections and substance. We hope that the book as a composition will evoke an understanding of *what design is all about*, which is the substance of the book. Each part and chapter is an attempt to reflect that substance. Each reflection brings only one perspective of the substance, which is not enough. By moving between different reflections, recognition and understanding of the substance itself, i.e. what design is all about, hopefully emerges.

This means that we encourage readers to choose to read the reflection (chapter or part) that seems most interesting or suitable based on personal preferences. Even if the book is planned as a composition with an overarching structure, the chapters are more or less possible to read independently. Our hope is that each reflection will intrigue the reader to read more and more chapters, and maybe finally from that be able to create an understanding of the substance - the core of design.

Our hope is that this book might influence people to participate in the design of a design culture. With such a culture in place designers will find themselves encouraged and safe to pursue their design intentions in an supportive environment.

In our attempts to present a broad understanding of design in the form of a composition we have been pragmatic in our relation to other sources. We have drawn from many resources of intellectual traditions, and we have used philosophers and design thinkers in ways not always obvious from their own perspective. When we make a reference to a specific philosopher or thinker this does not imply that we endorse the

entirety of their work. When it comes to our own ideas we have always tried to be congruent with the design tradition. It is the composition of our thoughts as a whole that carries our message.

I. THE FIRST TRADITION

Humans did not discover fire – they designed it. Neither was the wheel merely a discovery of our ancestors, it too was designed. The habit of labeling significant human achievements as discoveries rather than designs discloses a critical bias in our Western tradition. For example, absent from the conflicting descriptions of Leonardo da Vinci as either scientist or artist, or both and more, is the missing insight into his essential nature as a designer. His genius was in part, his exceptional intellect but primarily it was in his complex, integrative approach to the world as an archetypal designer that made him so distinct in his own time as well as ours. Through his imagination important additions to our real world were created. This has been the contribution of all designers through time; they are the creators of nearly our whole experienced reality.

Their designed artifacts accompany the remains of our earliest human ancestors. In fact designed implements have been found which predate the earliest human fossil remains discovered so far. Design activity and ability is what begins to make the distinction between species that are not yet human and human beings. The ability to design is what helps make us human. It is the means by which we make meaning in the world in addition to our describing and explaining the world.

Design is the ability to imagine, *that-which-does-not-yet-exist*, to make it appear in concrete or concretized form as a new, purposeful addition to the real world. *Design is the first tradition* among the many traditions of inquiry and action developed over time including; art, religion, science and technology. We design our cosmologies, our homes, our businesses and our lives as well as our artifacts. Design touches nearly every aspect of our experienced world. We design to be human and we can design because we are human. Every human can and does benefit from design activity. It is an important capacity not only for those who

desire to be designers but to those who are served in the design relationship as well. Things that really count and are highly valued come from design when not from nature. Design is a valuable activity for everyone including managers, administrators, software designers, educators, community activists, environmentalists and others not just those considered to be designers.

Design is a very powerful way of working and being. The ability to create the world that people experience as the very fabric of what they believe to be reality is beyond full appreciation. This ability to design can and has done great service to humanity as well as great harm. Possessing the ability to engage so powerfully in the world is the essence of human potential. But it is also true that humans are very fallible. We cannot know for certain that what we design is what ought to be designed. We cannot know with any guarantee what the unintended consequences of design will be and we cannot know with certainty the systemic effects of a design implementation. We can be god-like in the co-creation of the world but we cannot be god-like in our guarantee that the design will be only what we intended it to be for the reasons we intended and with full understanding of the necessity of the design in the first place. We are always startled by unintended consequences and other surprises.

An archetypal designer was represented in the Greek pantheon of gods in the persona of Hephaistos, "the lame god", who appeared in African and Mideastern mythology as well. Depending on the particular story you read the reasons for the lameness of Hephaistos varies but as a consequence of his condition he was required to create artifacts which allowed him to overcome his handicap which set him apart from the other more perfect gods. His great creativity and craftsmanship attracted the attention of the other gods who contracted for his services in the creation of jewelry, homes, armor and other godly necessities. He had the full potential of the other gods but did not have the full capacity of the other gods. This lack of capacity required him to bring things into existence to overcome his imperfection. He became the archetypal designer in order to more closely fulfill his potential with the aid of his own creations. In the process he could even contract to improve the experienced realities of the uncompromised deities. Human designers share Hephaisto's challenge. We must design because we are not perfect yet we share the potential of

creator gods to do great good or immense harm as we continually demonstrate to others and ourselves.

As shown in the table below the question of why we design does not lend itself to a simple answer. As Hephaistos we have to design because we want to survive but humans also seem to have a will for continuous improvement and development. Different psychological theories also tell us that we have other purposes, for instance, we want to make a difference in the world. At the highest level it might be that we want to participate in "the" creation. We want to make the world *our* world.

• Survive
• Thrive
• Improve
• Evolve
• Serve
• Make something of lasting quality
• Create something of real consequence
• Participate in "the" creation

Fig. 1 Purpose of Designing

There are in the same way levels of motivation. At the most basic level we as humans have to design - it is our calling. But that is not enough, we are also motivated by a desire to be in control and in service. At a more abstract level we are drawn to design because we feel a lack of wholeness - we do not find the world in a condition that is fulfilling to us. And finally we are motivated to design because it is a means to enlightenment. It is a way for us, as well as for Hephaistos to become what we are challenged to be.

• Calling
• From necessity
• To control
• To be of service
• Lack of wholeness
• For enlightenment

Fig. 2 Motivation for Designing

Design as a unique way of thinking and acting does not have the long well developed historical tradition of intellectual cultures like science or art. In the West, design as a focus for philosophic reflection was broken at the time of Socrates, Plato and Aristotle. The term philosophy is a compound word composed of two Greek terms: philo and sophia. Philo is love and sophia is wisdom thus the term philosophy means the love of wisdom. During the pre-Socratic period in Greece the defined understanding of wisdom or sophia was the 'knowing hand'. Sophia was an integration of thinking and action.

However during the time of the philosophers named above, sophia was cleaved in two. In the philosophic writings of Aristotle, sophia or wisdom became primarily the concern for first principles in the emerging domain of the philosophy of science nearly leaving out practical wisdom altogether. Sophia was not only divided, but the components were placed at the extremes of a hierarchy. In Plato's Republic those who *thought* about things were at the pinnacle of society. While those who *made* things were positioned at the bottom of the social hierarchy. This hierarchy is expressed even in today's world. Polarities between people such as white collar, blue collar or management and labor or intellects and workers continue to play out this split in sophia. The split is further played out in the polarization of ideas like rigor versus relevance, feeling versus intellect, thinking versus doing or abstract versus concrete.

These polarizations have influenced the way in which we justify taking any collective action. The trigger for initiating change is primarily based on the possibility of a clear and urgent understanding of problems. Political action, professional performance, economic decisions, social planning, or business choices are almost entirely justified on the grounds that life is a set of problems requiring solutions. A great deal of formal and experiential education and training is based on preparing to better identify and solve problems creatively, efficiently, fairly, rationally and prudentially. This reactive mode applied to every realm of life is supported by well-developed procedures for problem solving. These procedures have been identified by Horst Rittel as *tame problem* solving procedures and can be exemplified by the following example (Rittel 1972).

1. Understand problem
2. Gather information
3. Analyze information
4. Generate solutions
5. Assess the solutions
6. Implement
7. Test
8. Modify

Fig. 3 Solving Tame Problems

Tame problems are appropriate for simple or trivial concerns but more important issues are better characterized according to Rittel as *wicked problems*. The characteristics of wicked problems as identified by Rittle do not lend themselves to procedures or even easy characterizations. If taken seriously the wicked nature of these problems lead to paralysis. This paralysis is most often skirted by the assumption that they can be recast as tame problems. This of course exacerbates the original wicked problem and creates an even worse mess.

• Cannot be exhaustively formulated
• Every formulation is a statement of a solution
• No stopping rule
• No true or false
• No exhaustive list of operations
• Many explanations for the same problem
• Every problem is a symptom of another problem
• No immediate or ultimate test
• One-shot solutions
• Every problem is essentially unique
• Problem solver has no right to be wrong

Fig. 5 Characteristics of Wicked Problems

This focus on problems whether wicked or tame as the primary justifiable trigger for taking action has limited our ability to frame change as an outcome of intention and purpose rather than as a move away from undesirable situations. It means that wise action or wisdom is starved of its potential. Wisdom and specifically design wisdom is a much richer

concept because of the shift away from focusing only on moving away from an undesirable state to focusing on taking intentional actions towards states of reality which are desirable and appropriate.

Only the intellectual component of the pre-Socratic concept of wisdom remained present throughout the history of western thought and development. Wisdom was treated as the summation of data translated into information translated into knowledge. On the rare occasions when wisdom was discussed in practical settings the challenge was how to make and maintain these linkages. The wisdom of making, producing and acting remained unattended and unconnected to the wisdom of reason. Wisdom in the realm of design requires that we take a step back. Design wisdom is the reintegration of sophia. Design wisdom is the integration of observation, reflection, imagination, action and production.
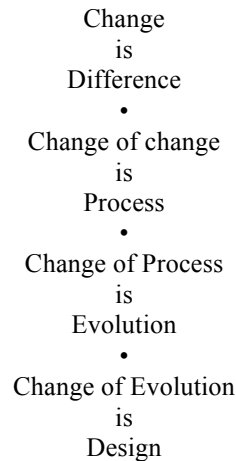
Another aspect of design wisdom in addition to the reintegration of sophia is the reintroduction of the analogue in a world dominated by the digital and the analytic. A digital perspective of the world has heavily influenced the western traditions of thinking for centuries. This has allowed us to make significant advances in technology and related scientific endeavors over these past centuries. The analogue has become conspicuous in its absence in contemporary technical societies.

Individuals struggle to comprehend their experience of life as an integrated complex whole without clear, distinct taxonomies or categories nor clear boundaries between sharply defined elements. The digital and analytic approach to understanding and making sense of this undifferentiated experience helps but is insufficient. Design wisdom contains the ability to move from the analogue experience of life to the digital or analytic perspective of the world and back. This aids understanding and facilitates intervention in the living out of life. One of the most vital aspects of design is that the outcome of the necessary digital and analytic intervention must be transformed back into the analogue so that life continues to be experienced as a whole with each addition of the new.

Another component of design wisdom concerns the nature of *change*. Change is an often-evoked concept in politics, planning, management and other forms of intervention but is often not clearly articulated. In the tradition of scientific thinking, change is a consequence

of either *chance* or *necessity*. Probability theory and statistical analysis are examples of our approach to change as a result of chance. Scientific principles or laws and rules of behavior are examples of our approach to necessity or certainty being the cause of change.

In order to help develop a tradition or culture of design thinking the concept of *intention* needs to be added as an agent of change to the ones already existing. The concept of change needs to be deepened as well in this context. Change in association with design thinking has levels of meaning and consequence:

<div align="center">

Change
is
Difference
•
Change of change
is
Process
•
Change of Process
is
Evolution
•
Change of Evolution
is
Design

</div>

Fig. 6 Hierarchy of Change

The challenge to cultures or societies on how to deal with change at these multiple levels has been formulated by Arnold Toynbee and presented in mythic terms in the work of Joseph Campbell (Campbell 1968). In this model of different social systems to the pressures of time has historically evoked four types of responses (see Fig. 7). According to Toynbee's model, historical research into the behavior of past civilizations, the only ones who successfully move through major challenges or crisis of change are those who engage in change in a designerly manner leading to transformational change. Of course cultures, civilizations, nations and other forms of large scale social systems can escape major change over extended periods of time. But when the pressures for change build

internally or externally, accidentally or intentionally, successful survival and improvement seem to come only as consequences of a design approach.

A. "return" to the good old days

B. "hang-on-to" the present

C. "reach" for a utopia

D. radically "transform" the existing

Fig. 7 Toynbee's Social Change Strategies

We are pushed into design because of the perceived pace of change in contemporary human affairs. We are further pushed by the explosion of information we are challenged to gather, understand and utilize. We are again pushed by the increase in technologic development with the fallout of incomprehensible numbers of distinct artifacts which confronts us with more varieties of what can be done than with varieties of what we know we want done. Changing social structures and patterns in partnership with changing values and traditions have conspired to create an impossibly complex, diverse environment within which we must navigate professionally and personally.

We are also pulled into design because it allows us to initiate intentional action out of strength, hope, passion, desire and love. It is action, which generates more energy than is consumed. It is creative and innovative inquiry that creates more resources of greater variety and potential than those used. Design action is distinct from problem action, which is initiated out of need, fear, weakness, hate, pain and other reactive motivations.

The need or desire – the push or pull – for change is often assumed to imply the need for comprehensive analysis and rational decision-making leading to a clear choice for action. The reality is that analysis leads to ever-greater numbers of paths needing more analysis. The consequence is that decisions cannot and are not made rationally, at least not in the rational tradition of scientific comprehensiveness. The real world is much too complex to be understood comprehensively.

Design on the other hand utilizes a process of *composition* that pulls a variety of elements into relationships that form a functional assembly serving the purposes and intentions of diverse populations of human beings. In addition design evokes emergent qualities through composition serving deeper, larger and more comprehensive needs and desires that transcends the functional qualities .

As shown above the design tradition's thread of continuity became frayed and broken in the course of the Western world's focus on and development of science and technology. To be able to deal with change it is now critical to pick up these design threads, weave them into new patterns and integrate them into a more wholistic fabric of life.

For design to be successfully developed and utilized there is a need to create a design culture. That is to have a social, economic, political and personal environment into which designing and designers can and will be invited – a design culture. It is equally important to have competent designers who have the education and experience to practice design from a broader perspective than the traditional practices of material design.

Why is there at this point in time a need for a design culture? And is it possible to present some essential qualities of such a culture in a book? We believe that it is and that this book can be among the first in such an attempt. A culture can, of course, never be created by merely writing a book, but we hope to initiate a reflective dialogue on what a design culture might look like at least in the beginning stages of its development.

The first step in establishing a design culture would be to conceptualize design as a way of looking at the human condition as a frame of reference that is its own unique tradition. In every particular design there are dimensions of technology, art and science, but in the totality of all design efforts it is the inclusiveness of generalized aspects of the experienced world that gives all applications of design a commonality. Designers from any design field, formally defined or not, can relate to other designers because they all are trying to add to or change the real world. They change the world by their creativity and innovation in both particular and universal ways.

A culture is never a natural occurrence. A culture is created by design. Cultures are a lived tension between tradition and innovation, between stability and change. This type of social structure and process, i.e. culture, can always be changed, developed, deepened, misunderstood, or misinterpreted. In contrast to many cultural traditions, design has not been dealt with in an adequate and sufficiently conscious or deliberative way. Any change in cultural tradition can easily be blocked by habits we do not see or understand. A culture often consists of ideas, guidelines, and "common sense" understanding we take for granted without questioning their origin or benefit. This means that there is a need for both open and critical minds in the creation of a design culture.

Even when we focus on the cultural similarities among different kinds of designers we do so based on the recognition and acceptance of differences. It is important to acknowledge that every designer has a specific *field of design expertise* - a field of specific crafts, skills and knowledge such as: industrial design, architecture, information design, software design, urban design, organizational design, educational design, instructional design, etc. Every designer needs knowledge and skills concerning materials, tools, methods, languages, traditions, styles, etc. in their specific field, but this book is not about these focused skills that a designer needs to master.

We argue that in order to be a thoughtful and responsible designer you always have to question the cultural tradition within which you act. Any general understanding of what design is about has to be challenged and critically analyzed by the individual designer, in addition any individual understanding of design should be the result of reflective practice, intellectual apperception and intentional choice. This book is meant to be a resource in the creation of such an individual understanding of design.

II. FOUNDATIONS

Although it is popular to assume that any new or different way of thinking must be defined by a paradigm it is equally important to uncover the conceptual foundations upon which any culture of inquiry and action are built. This *pallet* or hypostasis, acts as a support and frame of reference for the approach we are about to present.

We believe this pallet contains some of the most foundational ideas necessary in a design culture. If taken seriously as truly foundational these ideas will help any designer and champion of design to create an understanding of the preconditions for real design inquiry and action, which is to understand the characteristics of a design culture.

We have focused on the design foundations of *real, service, systems,* and *whole*. In the following chapters we explore each of these foundational precepts in greater detail.

The foundation of these design foundations is free will.

1. The Real et al.

When a new finding in science is presented, it is as a discovery. The researcher has found something that has always been around in the world without us being aware of it. Science is about finding. Most of us believe that through history we have found the principles and laws that govern the world of physics and also the processes governing the natural world of animals and plants. We believe we have found gravity, evolution, entropy, and other seminal natural laws by careful observation and critical evaluation. We seldom think about these ideas as if they were designed since they reside in the world of truth as truths.

In the world of the real however we recognize that we create as well as find. The real world, which is essentially an artificial world, is very much designed and created. We do not talk about our cities as if they are findings, nor about our cars and houses as discoveries nor about our organizations as natural artifacts brought to light by careful empiricism. We see them as created. They are true only in the sense that they exist - not in the sense that they are deterministically the only possible and correct car, house or organizations nor are they great accidents of time and chance.

We know, in our experience of everyday life, that we have the power to decide what will become part of our real world. We can design the real world in almost any form someone desires. And we are quite certain that there is little chance of some day discovering the right answer to the question of what kind of world we ought to have created and continued to maintain. Even though there are people claiming they have access to the 'truth' and that they are able to discern what should or should not be regarded as an appropriate addition to our real world, most of us know that the way the world is designed is a result of human judgments, and that we must do the best we can to create a world of quality, beauty and fulfillment knowing that not everyone will use the power of design for these same ends.

Of course, there are truths that in many ways helps us to make these judgments. We know nowadays about the sensitivity of our natural

environment, we know the importance of being concerned about water and air, and almost all of us are convinced (though this might not be a truth yet but only a hope) that we have to take care of all forms of life on the planet if we want our own species to survive. We have learned how it is possible to build or make artifacts that are safer for us and the environment. But to integrate all of these and the infinite number of truths we have not yet discovered into a single design situation is too complex of a task for any of us. No matter how much we want to satisfy all possible truths, in a design situation we will find that some of them are contradictory, unclear or not yet revealed and that they do not provide us with one single correct choice.

This means we will never be able to ground design on the idea that the right design is "out there", embedded in reality, only needing to be discovered. To the contrary, design is about creating something which does not yet exist, it is not about finding something already in existence. Science can help us in design by providing knowledge about structures, laws and processes governing the natural or real world but the only thing this kind of knowledge will be able to give us is a description or explanation of existing things. This kind of knowledge cannot provide insight into what should be brought into existence through intention, imagination and innovation.

Designers want to be able to make good judgments. Design judgments that will at the very least make a company efficient, a nonprofit effective, or a governmental agency politically popular. They want to make designs that lead to better products, services, organizational behavior or global sustainability. They also want to be seen as designers worth the compensation, prestige and trust they desire or have invested in them.

Not only designers, but leaders and managers as well are facing ever-increasing demands on their design judgment skills. The market overflows with workshops and training sessions that promise to provide the right sequence of experiences that lead to painless, accessible, and cost effective problem solving skills which can consistently provide solutions to complex problems embedded in confusing circumstances or better yet provide ready made and transferable answers.

The desire for consistency and certainty has been part of the human condition for as long as we know. The earliest cosmologies and associated rites and rituals were all meant to give structure to chaos and mystery but there always seemed to be less predictability than desired and more unpredictability than tolerable. Ancient decision-makers would go through great effort and cost to ask the Oracle at Delphi for a simple answer to their straightforward question only to be given responses that by necessity required deeper thinking on the questioner's side. The early Christians found that their leader spoke only in parables leaving centuries of interpretation of what the true answers were. Despite the popularity of these and other traditional sources of wisdom, decision makers have continued to look for other means of inquiry that would provide information that was more accessible, straight to the point, accurate, consistent and stable over time.

In the Western tradition the right answer was soon identified as an outcome of rational thought using the protocol of scientific method. This approach worked so well for gaining a better understanding of the natural world and for the creation of sophisticated technology that it was only natural that managers, administrators and even designers in leadership roles in organizational systems would come to depend on this particular design of inquiry for the determination of the right choice and the concomitant right action with the subsequent desirable outcomes as outlined above.

The scientized approach, with some exceptions, however has not provided the kind of guarantee of outcomes imagined possible. This comes from what is confusion between what is 'true' and what is 'real'. Science deals only with what is true but managers and definitely designers must deal with what is real as well.

When something is true, it has to be true in all cases and situations. A statement that sometimes is true and sometimes not, is not what we expect from, at least a scientific, truth. Science deals with what is general and universal. There are extensive discussions concerning whether some of the newer scientific methods used in social science, such as case studies, interpretative studies, qualitative methods, have the ability to create any kind of universal or generalizable truths. If a rational method leads only to an understanding of the specific case and not to

some universal regularities than it is not really considered to be a scientific method. Based on this kind of thinking, modern social science is accused by researchers of being the same thing as either journalism or creative writing.

In science we strive to infer from particulars to the universal. This is done by the method of induction. Through science we can also explain something particular with the help of the universal, the method of deduction. But the process for creating the ultimate particular is neither induction nor deduction. Design is a process of moving from the particular, general and universal to the ultimate particular – the specific design. The way we do this is by making design judgments. What we desire to come into existence is a matter of judgment – based on will and intention and can never be found in explanation, description, or prediction.

In design we are not dealing with the universal – we are dealing with the particular. We always design a particular design, something that is located and situated in specific time and place. A design, such as a car or an organization, a curriculum or a community, is *particular*. It is not the universal car, the universal organization, community or curriculum. We are creating the particular which when taken together with other particulars makes up the whole of experienced reality. Even for products that are designed in great numbers with wide distribution there is the quality of being particular and not universal.

The distinction between what is true and what is real can be made in the following way. A painting by Cezanne is real, the atomic weight of copper is true. An experience is real, a scientific observation is true. An organization is real, a 'proven' fact is true. An individual's perspective is real, a predictable event is true. The true comes from accurate descriptions and explanations through controlled observation; William James' "tough-minded" empiricism. The true can also come from careful abstract reasoning and logic; William James' "tender-minded "rationalism (James 1975). The real on the other hand is a result of action taken through judgment formed by intention. Even if this distinction between the true and the real can be challenged from a purely philosophical perspective – it is valid and vital from the perspective of design

Right decisions and appropriate actions in human activities do not and cannot arise from what is true only. Not appreciating this leads designers and decision-makers into the dead ends of analysis paralysis and value paralysis. Decisions and actions must be based on what is real in addition to what is true. The real and the true are of course not exclusive. When dealing with the real we often benefit from the kind of support given to us by the true. Scientific knowledge is essential to any designer. But knowing about the true is not enough when dealing with the real and the ultimate particular. This is a symmetry however, not a polarity. That is, it is a unity rather than a compromise between the two.

Design inquiry leads to a knowing inclusive of actions as a well as ideas. There have been many ways of engaging in inquiry developed over time. These designs of inquiry have been sufficiently successful at different times in the right contexts resulting in contests between champions of specific designs to determine which form of inquiry is superior. This is especially true of designs of inquiry that focus on revealing truth. The hegemony of science and scientific thought in the developed world in the last century is an indicator of the outcome in the most recent battle for dominance among designs of inquiry. A belief in the scientific method as the only valid method of inquiry for describing and explaining the world is a hallmark of our technologic age. Science as an activity of scientific inquiry has often been called the new religion of the contemporary age.

The way a designer chooses to acquire and inquire for knowledge deeply affects how the design work is done. If the designer chooses a scientific approach the whole design process will have strong similarities with the research process. This will influence what is considered to be preconditions, what is possible, what is needed, what is desired, and what the outcome will be.

C. West Churchman (Churchman 1971) introduced the idea of designing systems of rational inquiry by contrasting and comparing historical designs of inquiry. The basic forms of rational inquiry Churchman discusses are: Fact Nets, Consensus, Representation, Dialectic, Progress, Mechanism, Teleology, and Probability. Churchman uses famous philosophers as examples of the designs of inquiry he presents. All the approaches he discusses are formed and developed in the

tradition of the true and the scientific search for knowledge. They are all based on the idea of the rational approach guided by strict rules on how to go about finding knowledge. In today's world of design we can find modern approaches resembling all these traditions. A designer can greatly benefit from having a basic knowledge of traditional designs of inquiry. Such knowledge can be of help in the constant flow of "new" approaches.

But there are other approaches that have influenced our society and how designers think about inquiring for knowledge. In some societies the most dominant form of inquiry is the *spiritual*. In the spiritual tradition knowledge is not necessarily something we have to gain for ourselves or to discover in the world. Knowledge is handed down to us through different channels from some kind of divine or spiritual source. The work of a designer who builds on this tradition will be radically different. It is not uncommon in today's world to find designs inspired and even argued to be "given" to humans from a higher source.

A form of inquiry over which there is a great deal of disagreement is the one defined as *intuition*. Intuition is a form of unconscious knowing. A basic version of intuition is *instinct*. When we find animals engaging in design like activity, for instance creating tools, we do not ascribe any advanced forms of inquiry to their behavior. Instead we define their behavior as instinctive and not based on reason at all. In the same way it is possible to understand some of our human design behaviors as more a result of instinct than reason and reflection.

There are many types of relationships between or among different designs of inquiry. Most often the relationship is defined as either a polarity or a continuum between different specific approaches to inquiry. One of the more enduring is the polarity between two cultures of inquiry identified by C.P. Snow (1953) as that between science and the humanities. An equally enduring example of a continuum relationship that is that defined between art and science. On this continuum for example, architecture has been placed at the midpoint and as a consequence design is often referred to as occurring at the same midpoint. Design is also considered to be a midpoint between intuition and logic or imagination and reason.

The bodies of knowledge created as a consequence of particular approaches being used also define designs of inquiry. These bodies of

knowledge can be defined from many cultures and traditions and are often referred to as *nontraditional* such as a nontraditional approach to medicine or a nontraditional approach to science. These designs of inquiry are not as well known in the technologically developed regions of the world because of the hegemony of science as the standard of inquiry in the Western tradition. The outcome of this type of inquiry is the true which other forms of inquiry are considered to be inferior at determining.

Design is a compound form of inquiry composed of the *true*, the *ideal* and the *real* approaches to gaining knowledge (see Fig 1- 1). It is apparent that there are a broad spectrum of forms of inquiry that have been designed over the course of human history, some long forgotten while others still form the armature upon which we form particular ways of asking and answering questions posed to the human condition. In the contemporary everyday world of experience there are several common forms of inquiry in use at any time. Inquiry into the *true* and inquiry into the *ideal* are well-formed modalities of inquiry with long traditions of development, suitable vocabularies, historically defined frames of reference and well defined instruments of thought. The same is not true for inquiry into the *real*.

designs of inquiry	*outcomes*
real	*particulars*
true	*facts*
ideal	*norms*

Fig. 1 – 1 Components of Design Inquiry

Inquiry into the real is not only a form of reflective inquiry but is action oriented as well with a focus on production and innovation as when

utilized for design. The real as a designed form of inquiry is essential to the desig goal of creating the *not-yet-existing*. It is about the creation of the *not-yet-real* and the particular. By comparing the three; the real, the true and the ideal, some differences and similarities are revealed (see Fig. 1-2). We will not go through this comparison in detail here but just mention that it is a good instrument for reflection and deeper appreciation of the design of systems of inquiry. It can also be used as an analytic tool when the purpose is to determine the basic design underlying a specific approach to inquiry. For instance, it is possible to examine different disciplines of design in order to reveal the assumptions behind the tradition of inquiry and action dominate in a specific discipline.

Designs of Inquiry & Action

foundations	the real *	the true	the ideal
intention	evoke the particular	reason the universal or general	reveal the ultimate
purpose	serve & fulfill	understand	transcend
form	systemic	taxonomic	natural or ordained
unity	wholeness	comprehensive	oneness
fundamentals			
motivation	desiderata & inspiration	curiosity & wonder	angst & awe
understanding	meaning	fact	enlightenment
input	imagination	observation	inspiration
meaning making	judgment	reason & logic	meditation
output	composition	description & explanation	perfection
process	creation & production	knowing	being

*design catalyst

Fig. 1-2 Designs of Inquiry: The Real, The True and The Ideal

Even if we have so far primarily stressed the notion that design resides in

the real, design inquiry is in actuality an emergent, compound form of inquiry that is inclusive of the *real*, the *true* and the *ideal* approaches of inquiry. These particular designs of inquiry are essential to designers and their work. Design thinking is analytic, integrative and unifying in different proportions at different times in the design process. When taken together as a whole the resulting approach to knowledge acquisition is much more than the individual approaches taken in summation (see Fig. 1-3). Design inquiry is much more robust in effect than when the individual component approaches to inquiry are utilized separately and the outcomes taken as an aggregation of insights and understandings. Design inquiry displays emergent qualities as a consequence of being a compound that are not apparent within each individual traditional approach to knowledge acquisition.

true

real[*] → ◆◆ → **Design Inquiry & Action**

ideal
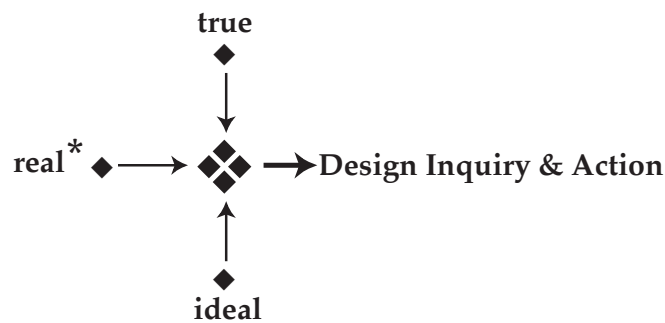
*catalyst in forming design compound

Fig. 1- 3 Design Inquiry & Action; an Emergent Compound

Design inquiry is both a journey and a destination. The journey is change and the destination is ends or outcomes. Change is an often-used term with many meanings but for design it has particular applications that are essential to any appreciation of design's distinct qualities. One of the first meanings of change that has considerable importance in design is that which denotes the process of coming *into* existence, a birthing, genesis or creation. This attribute of change is dramatically different from the more common use of the term that is applied to distinguishing difference *in* the

already existing. Change as difference *in* is also distinctly separate from difference *between* which is essentially the definition of information.

Change is initiated or triggered differently depending on which design of inquiry is dominant (see Fig. 1-4) in any situation and the type of change, whether the process of coming into existence or transforming that which is in existence already. Scientific inquiry focuses on change that is triggered by change and necessity. Statistics and probability theory deals with change by chance while laws, principles and rules define change by necessity. Change that is triggered from the normative tradition, i.e. the ideal, is often attributed to some form of sovereign intervention that represent sources of authority that span from the Words of God(s) to peer pressure.

Designs of Inquiry & Action

	the real	*the true*	*the ideal*
change	human intention	chance & necessity	sovereign intervention

Fig. 1- 4 Triggers for Change

Change that is triggered by human intention is of course at the heart of design. Although design change is a product of influences from chance and necessity as well as sovereign intervention it is a hallmark of design that human intention is essential and central to instigating a change process.

Human intention is a *cause* of change. The idea of cause is complex but key to understanding designed change. Cause is natural as defined by science through the conceptualizations of chance and necessity. Design must accommodate change brought about by natural causes but the equally challenging forms of cause are those that are rooted in human intention. These intentional forms of cause are diverse and manifest. The type of intentional cause that is of particular interest here is design cause. Design cause is important both to initiating change that

concerns both the process of coming into existence and changing what is already in existence.

The kinds of outcomes or ends available to a change process vary widely depending on the approach being used (see Fig 1–5). Each designed form of inquiry has its own ends. The point of intentional change triggered by design cause is to bring about an outcome or end that is desired.

Designs of Inquiry & Action

	the real	*the true*	*the ideal*
ends	that-which-is-desired-to-be	that-which-can-be	that-which-should-be
	that-which-is-not-yet	that-which-is	that-which-ought-to-be

Fig. 1- 5   Design Ends

Of course the obvious end or outcome to inquiry is knowledge. The type of knowing that is made available as an outcome is determined by the primary mode of inquiry (see Fig. 1-6). The interesting thing about design knowing is that it emerges from a conscious not knowing. It utilizes reason, intuition, and imagination as constituent elements in emergent design knowledge but design knowledge requires that the initial state of knowing is that of intentional ignorance.

- Conscious knowing…………..**reason**
- Unconscious knowing………..**intuition**
- Subconscious knowing……….**imagination**
- Conscious not knowing………**design thinking**

Fig. 1-6 Design Knowing

Design is about evoking or creating the real but design has to be grounded in what is already real as well as true. Since the real is always overwhelmingly complex and rich, we have no way to grasp the totality of that complexity and richness using only the conceptual tools created to reveal what is true and factual. The scientific and analytic tools available to us are not designed to handle the real – at least not wholistically. From the design perspective the real is a whole and any new design is therefore something that is both real and whole. Any new design will be too complex and rich to be completely understood in the process of creation to be predictable in how it will serve the world and how it will in turn change the world.

The initial step is to realize that the real as both the particular and the ultimate particular are concepts that distinguish design from other traditions of inquiry and action. The real must be approached through judgment augmented by science based tools and methods but not primarily so. Design, to be accepted as a legitimate decision-making process and competent leadership foundation needs to be grounded in the tradition of science and truth but not to the exclusion of the tradition of judgment based reality or the normative tradition of the ideal. There is a need to combine what is true, ideal and what is real into a balanced relationship, a compound, incorporating multiple dimensions of the designerly palette.

2. Service

Design is quite different from other traditions of inquiry and action in that *service* is the defining element of distinction among design relationships. Design is by definition a *service relationship* and design activity is animated through systemic relationships between those being served such as clients, surrogate clients, customers, end users, and all those in service including the designers. Design is about *service on behalf of the other*. This is not obvious when observing the behavior of typical professional designers neither is it sufficiently dealt with in the contemporary writings on design.

Being in service does not mean being a servant or subservient. It does not mean acting as an expert or a mere facilitator on behalf of someone else's needs. On the other hand service does not exclude self-expression by the designers or others. It just means that self-expression is not dominant as in the traditions of science and art. Service is also different from many other relationships by not being defined as a producer-consumer relationship.

Service is not about helping people create what they already know they want. The success of the design process can be best determined when those being served experience the *surprise of self recognition* between what emerges from a design process and their original expression of that which they dimly perceived as desirable in the beginning (their desiderata). The designer's role, when in service, is to mid-wife what could not have been imagined fully from the beginning by either client or designer but which results in the intended *expected unexpected* yet 'familiar' outcome. To contract with a designer has this double intention of both wanting the expected and desired outcome but also to be surprised with the unexpected that still is recognizable as something that is in *resonance* with the familiar and desired. The client will, if the design is done in service of the client, understand that the outcome is something new but at the same time something fitting the particular situation.

A service relationship is a distinct, complex, systemic relationship with a particular focus on the dimensions of responsibility, accountability, and intention that are embedded in the relationship. Designed artifacts, concrete or conceptual, only have value and meaning because of this intentional service relationship. It is through the presence of a service relationship that change and the consequences of change can come to have meaning and give meaning to individual and collective lives. To a designer, a service relationship is the basic 'cause' of design. To be in service creates the challenge of designing something desired but not yet fully formed in the imagination of the client or others being served.

There is an important distinction between finding meaning in things that happen and making meaning by causing things to happen. One is reactive and adaptive and one is proactive and intentional. To be in service is to be proactive. It means that the designer cannot wait for things to happen as wished for by the client. The client does not fully know what is concretely desired in the beginning. They are only aware that something is pressing for expression. This expressing of desiderata may be masked by feelings of discomfort for those who lack a critical self-awareness. In this case designers must help bring to the surface a clearer articulation of desiderata as a positive, proactive impulse in distinction to the more common repulse of negative feelings concerning contexts and situations in life.

A designer 'makes' meaning by creatively designing in a manner of empathy that draws on the preformed desires of those being served. To be proactive and intentional is not to ask a client what fully formed outcome is to be designed for but, through designerly communication with the client, to discern the intentions of vaguely cloaked desiderata as of yet not fully recognized by them. To be in service means to build on these gossamer findings of purpose, to surpass them and to concretely conceptualize them in such a way that surpasses the knowledge and imagination of those being served while fully representing their authentic self-interests.

The presence of the binding relationship of service in design contributes to the clear distinction between the tradition of design and those of art or science. Science and art are essentially traditions that are in the best sense 'self-serving'. Scientists are motivated by their own

curiosity and pursue their passion for knowing in order to satisfy their own curiosity objectively. Their gift is knowledge that may be of use somehow and sometime in human affairs. Artists express their passions, feelings and understandings of the world out of their own need for self-expression. Their gift is when these insights are shared with audiences who can then make what they will of these personal glimpses into the human condition. The designer is instead not 'self-serving' but 'other-serving'. It is of course possible for designers to choose themselves as the client, the one to be served, but that is a special case.

Service that is not servitude treats the other as an equal. This does not mean the same as being similar, as in categories of social science, or equivalent, as in egalitarianism, but equal in terms of the right to have anyone's desiderata become the seed for purposeful change. Service is distinct from helping which, by its very nature, creates a unilateral relationship. In this type of relationship all power and resources reside in a dominant role, leaving the other a position of being helpless and indebted:

> 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)

Therefore, service is very different from relationships based on inequality where the other is to be treated as helpless or unable to attend to their own self-interests. The latter type of relationship is one of the more popular and self-reinforcing types of contracting relationships in contemporary times. Nonprofits, governmental agencies and NGO's spend millions of dollars on behalf of the helpless, sick, unlucky or tragedy struck. In many instances this is necessary since there are no good alternatives within easy reach and there seems to be more than sufficient justification for an urgent unilaterally triaged intervention into the lives of others.

But as a consequence, philanthropy and related approaches of doing good have formed a too well worn and habitual path to the formation of relationships of inequity that prevent service relationships from forming when possible and where appropriate. Those who have the

power and resources to define norms often treat people who are just different in cultural, social or economic appearances as needy or helpless. This is also true for those who find themselves in unhappy circumstances that are the systemic consequence of influences unaffected by well meaning localized fixes.

Benefactors spend a great deal of their money and influence in these pseudo-contract relationships. As a result there is a symbiotic relationship between the spenders and the providers. Often the providers need the helpless and powerless upon which to build a deeper sense of purpose and meaning in their own lives. In other cases the helpless are there to be taken care of in order that the provider's status of power and success can be legitimized or justified in social contexts.

The spenders need the clear and urgent call-to-arms to mask the more difficult and challenging job of dealing with the human condition in all of its complexity and potential including dealing with any other human as an equal in diversity. Everyone feels rewarded at some level in this type of relationship. Important values such as caring and love can form the basis of the best of these relationships. However this is at the expense of many other important human values including those that support dignity, equity, creativity and individuality.

Interestingly, even if service is a defining characteristic of design, some design professions are in fact not, a priori, framed within the design service tradition. Architecture for instance can be approached from the science or art tradition and not forfeit its character as architecture from the perspective of practitioners and patrons. In fact architecture is often referred to as a midpoint between art and science as if these two traditions were extreme poles on some continuum. Also other fields of design such as product design and information systems design is thought of as a mix of 'hard' science and art. Instead of seeing these professions as being somewhere between science and art they should be recognized as professions in the tradition of design. Design as a tradition is not situated between art and science – it is its own tradition, with one characteristic being the service relationship.

Whether or not architecture, industrial design, information systems design or any other historically determined design profession is to be approached from a design tradition is an entirely intentional choice.

The consequences of this choice however are significant to the praxis of the profession. This is maybe most visible in the way these fields have developed their traditions of education. Education in art is commonly radically different from science education. The values upon which education is built and the forms within which it is structured differ a lot. If design is to be taken as its own tradition then design should foster its own tradition of education based on the fact that to design is to be in service.

Design communication assumes immense importance in support of the service function. The service tradition is about listening and helping people to express what will help them live fuller lives and become more fully human. Design, as a tradition of service, may be inclusive of rhetoric and persuasion as is true of science and art, but that is not its essential nature. Service is not in the realm of rhetoric. It is not a process of convincing people of needs or desires they have not authored. Selling, in the tradition of commodities and customers, is not as seminal to the design process from the perspective of those being served because it is their own intentionality that triggers the design process from the very beginning with an acknowledgment of their desiderata.

   The service relationship brings everyone involved along at the same pace in the same place and does not depend on selling outcomes as much as it does *communicating progress*. Design is a *form of democracy*. Not the arithmetic democracy of majority rule or the representative democracy of elected political bodies but the democracy of self-determination through interrelationships of service. Design as a service tradition is the kind of democracy that can embrace the growing diversity and complexity of human interests in today's world.

   Being in service as a designer demands a heightened and refined ability to 'listen'. To hear to what is pressing for expression as much as what is being expressed. It is important to utilize *notitia* in this task (Hillman 1992). Notitia consists of an act of attention that is complete and uncompromising, that senses every nuance, that can bring into focus details and patterns of connection that elude more passive encounters with real world situations. Notitia allows a relationship of true empathy to form between the server and served.

Design communication is at the heart of any successful design process. It is a complex process that is multi-dimensional and multi-phased. As a process, design communication moves from the initial phase of building *trust* (through conversation) to one of finding *common ground* through dialog (through logic) in shared understanding. The process must then move to the creation of an *uncommon understanding* through 'diathenic graphologue' (letting an imagined thing be seen through its image) which then secures common acceptance of a new understanding thus paving the way for the collaborative realization of a newly designed whole. These three phases of the process constitute design communication and form the capacity of service in design.

The core relationship in the design process is that between the designer and the client. The designer is in the service of the client. But it is not uncommon that this relation is distorted. Given a simple model where the influence on the design process is visualized by the width of side facing each part we can construct a number of models. The first two models "*designer artist*" and "*designer facilitator*" represent quite simple relationships where one of the two parts fully dominate the relation (see Fig. 2-1).

In the designer artist case the designer has the complete influence of the process and the client has none. The designer is not interested in the desires and needs of the client, instead he creates and composes a design based on his own judgment of the situation. The designer acts in the same way as an artist where the need to express own self is at the core. In some fields we can see this type of designer being glorified as a "primadonna". In architecture there are internationally known names taking on clients that will subsume to any wishes of the designer.

When the opposite situation is at hand the designer "obeys" any wishes from the client. The client knows what he or she want or need and also know how a design would be like that would answer to their wishes. The client is in this case also the creative part of the process. The designer becomes a facilitator. To facilitate is an important part of any process but it is not the core of being a designer.

The other two models show other forms of relationships where either the designer or the client has influence but there is still an

unbalanced relation. In design we often see designers become "*technicians*" which mean that they don't stand for any intentional creative part of the process, instead they answer and respond to questions and wishes from an intentional client. Sometimes we might see the opposite, i.e. when the client has to respond and answer to initiatives taken by the designer. The designer enters the design process as an *expert*.

designer

client
designer artist

designer

client
designer facilitator

designer

client
designer expert

designer

client
designer technician

designer

client
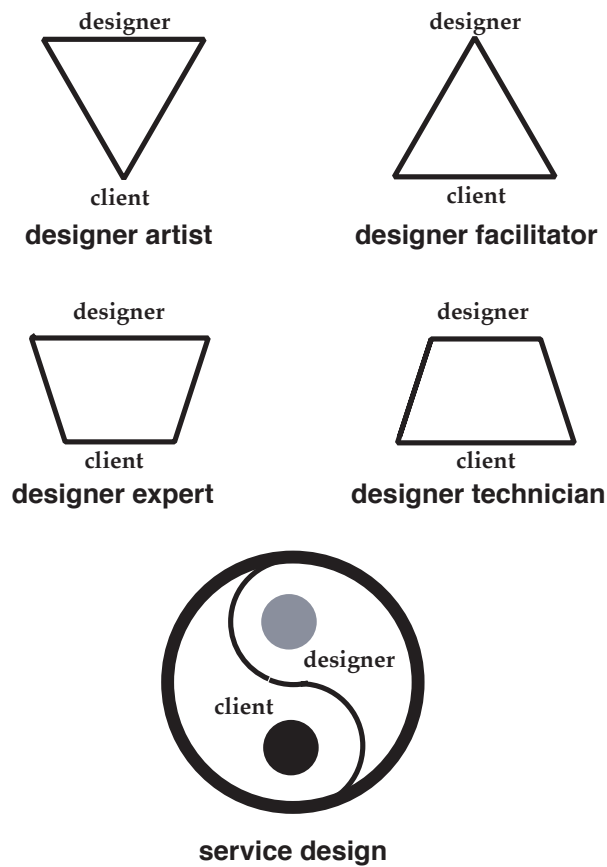
service design

Fig. 2-1 Design Relationships

It is difficult to find a good way to visualize the full complexity between

the designer and the client. One of the more complex models is shown in the "service design" model, which we have borrowed from the Chinese Yin-Yang model. This model shows an intricate relationship where both sides are fully part of the process. Both sides inside themselves include a part of the other side. It is a balanced relation but it is not a relation without tensions. The model shows that tension is at the core of the relationship. It is in the complexity of the relation and in the tension between its different character that imaginative and innovative design work takes place. It is also a model that shows that mutual respect is necessary and vital to any real design relationships.

Even if the relation between the designer and client is the most obvious one it is only one of all the possible relationships in design. Service is an interrelationship among individuals who are not only different in character and biology but also who are intentionally diverse in their roles played out in any particular design project. Unlike the majority of group process theories and models of collective activity, service is not an egalitarian relationship or a hierarchical relationship. These are problem-focused relationships. Design is instead an inclusive activity consisting of *a composition of formalized roles* around the idea of service. This integrative principle guides the formation of design teams and the complex web of relationships with others who are, in one way or another, a part of any design process. The composition of roles is always unique. In any design situation this composition has to be considered in the earliest stages of the design process.

In a service relationship the designer is responsible to more than the client assuming accountability for others who will be affected by any particular design activity as well. This includes stakeholders, stockholders, decision-makers, producers or makers, end users, customers, and surrogate clients. In addition even more comprehensive and systemic inclusiveness ought to include future generations and the natural environment.

Service relationships are more diverse and comprehensive than the singular relationship between clients and designers (see Fig. 2-2). The different forms of relationship among design roles as presented below are not exclusive of each other. The relationships among any particular set of roles in any particular situation can be compound ones consisting of

several different types. In some cases it may be appropriate to treat a set of relationships as one-dimensional but this is a matter of intentional choice.
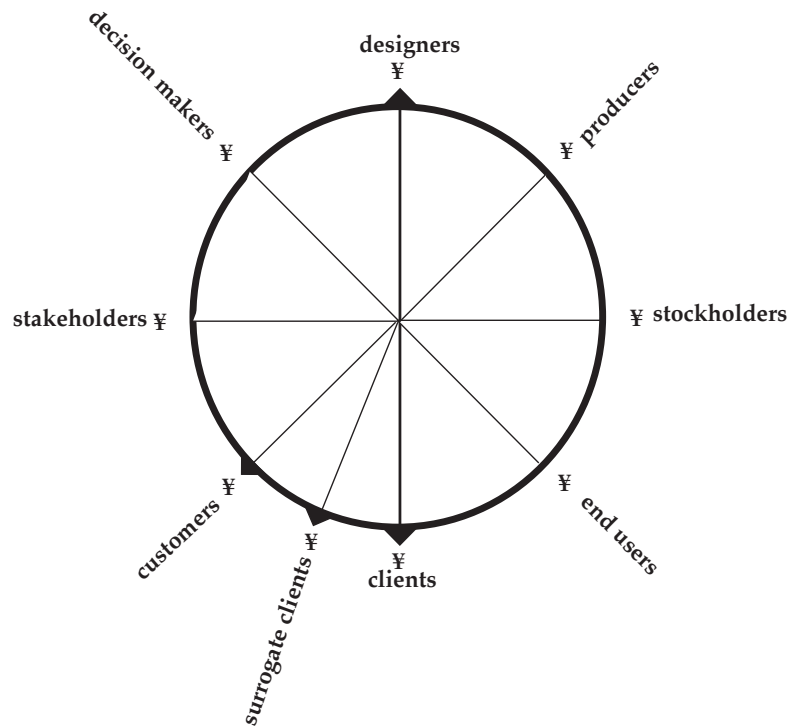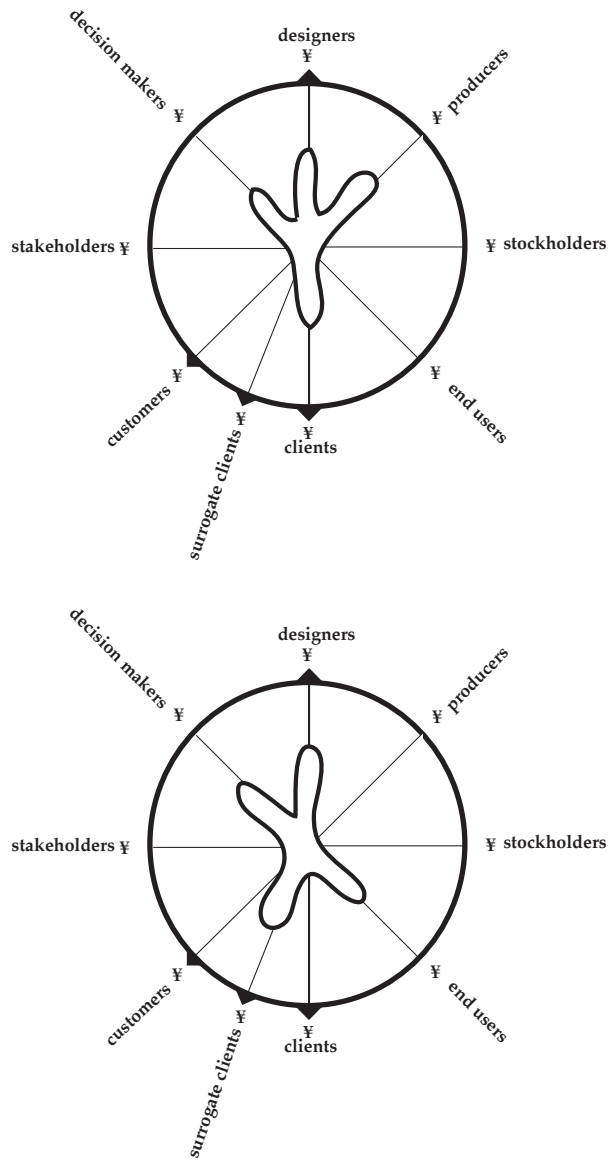

Fig. 2-2 Design roles and relationships

The choices of which roles are relevant to the design situations are determined in the contracting process. Determining which roles ought to be brought up for consideration is the responsibility of the designers in collaboration with those being served since the relevance of many roles

may not be immediately apparent to everyone involved. The relationships are uniquely defined by the quality of an interrelationship as well.

The relationships among the roles are defined by the intentional choices made for each particular design situation in accord with the design purpose of those served in that unique situation. These *compositions of relationships have to be designed* and can be shown graphically (see Fig. 2-3). Graphic representations like these fail to show the full complexity and richness of the relationships but it becomes obvious that in every design situation possible compositions of relationships are almost infinite. Since this is the case and since there is nothing that by necessity or law determines how these relationships should look like in each specific design situation – it has to be the result of an intentional design. In any design situation it can be a good idea to experiment with different compositions and to imagine how these compositions might influence the design process and the outcome. Also in this process of designing the relationships there is a need of close communication between the designer and the client. The designer has the experience of many similar design situations and can be in service to the client. Once again the service relationship between the designer and client is at the core of the process.

**Fig. 2-3 Examples of Intentional Choices of Relationships of
Roles for Particular Design Situations and Purposes**

In a design situation it is not always easy to identify possible roles and relationships. It may not always be the case that formal or semi-formal roles, such as stakeholders, stockholders, decision-makers, producers or makers, end users, and customers are the most suitable. There are other ways of reflecting on relationships. As a designer and client the notion of who I am in relation to others can be best thought of as the relation between concepts such as "I", "me", "we", "they", "it", etc (see Fig.2-4.).
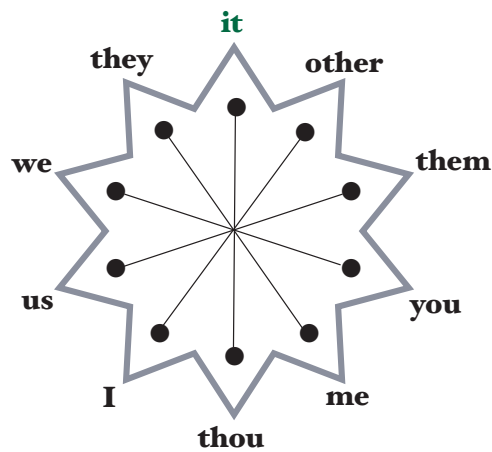
Fig. 2-4 Relationships in design

Thinking about a relation as "I"- "you" is very different from thinking about the same relation as "I"-"they". Building on some of the basic work of Erick Jantsch as influenced by Martin Buber and others (Jantsch 1975), concepts and design adaptations of qualities of relationship found in "I-it" and "I-Thou" can be usefully modified and expanded. Many other qualities of relationships can be defined which might include "I-us", "we-other" and "we-they" for example. Other combinations and permutations are obvious and appropriate depending on a particular design situation (Fig. 2-5).
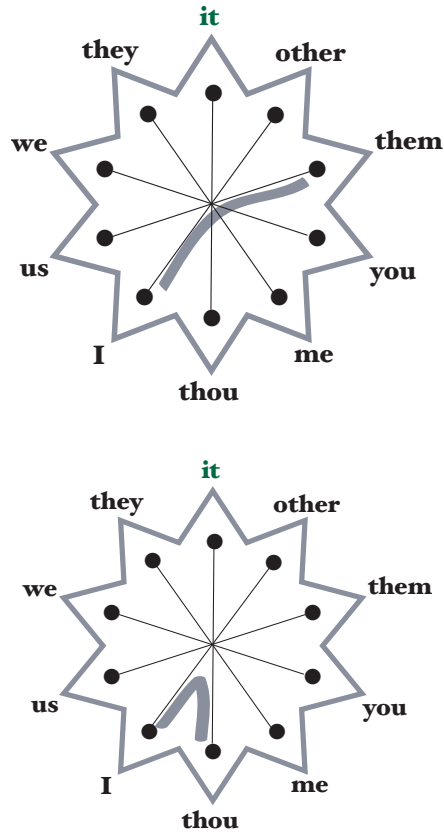
Fig. 2-5 Examples of design relationsships

Once again it is necessary for a designer to reflect on these roles and relationships. The way these relationships will be set up and understood in the specific design situation will strongly influence who will take part in the process and on what conditions. It will affect the role of the designer and what will be expected from all involved parties. Design is about service, but as we have shown here the complexity of roles and relationships make it necessary to devote both time and reflection to prepare for a design process. To often design processes are troubled in the middle of the process by relationships not planned for. A lot of time has to be spent on bringing in new roles and on going through parts of the process again. An intentional approach to the design of roles and

relationships is needed.

Service should be understood as the full partnership between those being served and a designer, working in a *conspiracy* (i.e. breathing together) forming a tensional but collaborative social system. Formal and informal agreements or contracts govern these roles and their relationships. In any contractual relationship there is need for a clear understanding of agency based on agreement and consent as to the intention of the contract. There are many types of contract intentions that are categorically different from one another. Only one is a *service* contract. For example there are four basic types of contracts based on intentionality that include a science, a helping, an art and a service approach (see Fig. 2-6). The service type of contract is the primary contract in design although aspects of the other types may be appropriate in different proportions at particular times.
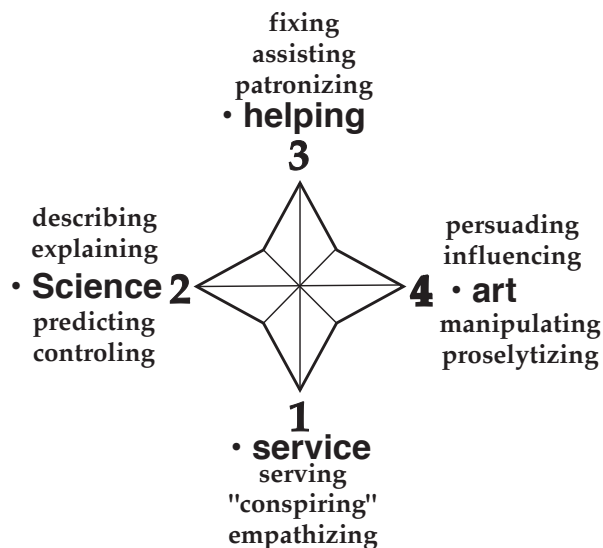
Fig. 2-6 Contract intentions

An important consideration is that the desire for intentional change often prompts one of the other three type of contracts to be formed by default rather than by intention, when, in fact, the service contract is the most

appropriate. For instance, if action needs to be taken in consideration of a certain situation, a science approach, that consists of describing, explaining, predicting and controlling, is not the kind of approach that supports making design judgments. Science provides descriptions and explanations but does not provide a basis for overall judgments in situations where knowledge and information are not complete, which is always the case in design.

The intentional relationships of serving, empathizing and 'conspiring' form the binding forces of a design team; a composition of diverse design roles distinctly different but equitable in character. Because of this those in the role of client experience change motivated out of their own desiderata or desires rather than being changed by someone else's presupposed understanding of what is best for them on the assumption of inequity in capacity.

The notion of conspiracy in this domain implies a level of integration between diverse people who are also serving in diverse roles within the design process that transcends mere management of group process. This notion is similar to the concept of 'flow' in the creative process as presented by Csikszentmihalyi (1990) where normal divisions and distinctions of everyday activity blend into a seamless experience of intentionality. This symbiotic relationship is possible only if there is an exchange of empathy. Empathy in the case of a design situation is the ability to 'be' as the other while remaining a whole self. These states of alignment are given direction through emerging understandings of desiderata during the process of serving.

A designer needs to know about dramatically different qualities of contracts. These differences must also be clear in the mind of the client so that the expectations are aligned with the designers understanding.

From within the service intention some contracts will be legal documents following prescribed laws and procedures while others will be implied contracts. These latter contracts will be formed with those who cannot, for whatever reasons, enter into a formal, face-to-face contracting process such as children, future generations, those who are in ill health or handicapped by external circumstances. These contracts need to be built on alternative conceptual principles of agency that are made explicit. This

difference between these two types of contracting can be understood as the difference between *legal contracting* and *value contracting*.

A designer needs the ability to form intentional service contracts. This ability must be based on knowledge of possible relationships in the particular design situation and on willingness for empathy and conspiracy. The first step is to acknowledge the complexity of how being in service becomes realized in the form of contracts of relationships. The next step is to understand how this process of contracting is an intentional process of composition. The way empathy and conspiracy can lead to a situation where contracts are formed, relationships are built, is always unique and has to be cared for guided by notitia and communication.

3. Systems

The natural and historical human condition is analogue. Meaning making in human experience is dependent on being contained in an analogue context. It is only the most recent infinitesimal fraction of the human lifeline of technologic cultures that the analogue experience in interaction with life has not been dominant. In some cultures like the Chinese, the analogue remained dominant during the great analytic and digital transformation of the West before slowly giving way to the analytic and digital themselves. The success of the analytic and digital in the material development of the West is undeniable but the consequence of not reintegrating these approaches back into an analogue life experience is becoming more apparent. Much of modern life is experienced as fractured, confusing and stressful. The challenge for designers is to take advantage of the benefits of the analytic and digital in their design approaches, and in the process of integrating these into an overall compositional processes, to introduce designed artifacts into the world as analouge contributions rather than as attached elements.

The lack of integration of the digital and analytic processes and concomitant artifacts of design into an analogue life experience is the primary reason for the levels of angst and yearning in individuals for a more integrated, meaningful and wholistic life experience. Too much of modern life in the West is distressful because it is not accessible as an analogue experience. Designers and technologists have played a part in this by creating things, which have not been reintegrated into a meaningful analogue context. Design begins with the analogue, is served by the analytic and digital but must finish as an analogue composition in order to fit back into human experience.

Design has many distinct challenges. One of the most important is the ability to move from an integrated analogue reality through a phase of analytic understanding digitally expressed and back to an analogue experience of coherency through the seamless integration of a new and purposeful design into human experience (see Fig. 3-1).
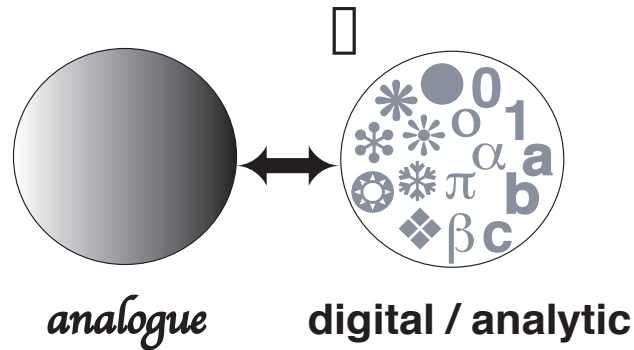
Fig. 3-1 Analogue to digital / analytic to analogue – the design process

The artifacts of design praxis are always *social systems* or elements of social systems. This is true whatever the actual outcome of the design process (i.e. product, building, service, process, or abstract concept). Not only are the artifacts systems related but the agents of change - the designers and the design teams - are social systems as well. Design roles and relationships are systemic. Design processes are both systemic and systematic. This is why it is essential for designers to understand systems, and utilize systems thinking and a systems approach as the basis for design reason.

There is another seminal reason for using a systems approach as the reasoned basis of design. Life is an analogue experience. Breaking experience into segments or units of information has been a successful strategy for the creation and introduction of evolution altering changes into social and cultural realms. The typically difficult transformation or integration of digitized artifacts back into the natural analogue form of experienced life does not negate the instrumental value of digitizing the analogue. A digital frame of reference allows human intention and will to enter into dialogue with a process that is designed to be experienced and adapted to rather than engaged in purposefully. The systems approach facilitates the transformation of experience from the analogue into the instrumentally necessary digital form required for intentional action and back into the analogue of preferred experience. This is quite different from the reductionist analytic process of science. The ability to

successfully move from the analogue to digital and back again is essential to the success of design and is dependent on the competencies associated with systems thinking and action.

Despite the recent focus on this period of history as the digital age, the Western world has been digital for the last 750 years. Time, space and energy have all been divided into 'packets' which prove to be very stable over time as abstract forms of information. These packets provide information only when in correct relationship with each other. However the relationships themselves do not provide meaning. Thus the division of the day into hours, minutes and seconds meter the passage of a day without saying what kind of a day it was. The grid demarcates traffic patterns and real estate but does not delineate the human qualities of neighborhoods, communities or hometowns. Electrical impulses are digitized forms of energy converted into digital modes of communication, which cannot translate the message. The ability to digitize human experience is a valuable asset in forming and sharing design communication but is insufficient alone.

There has been another equally valuable capacity, which is even older in the Western tradition. The design of science as a disciplined mode of rational inquiry, formalized by Aristotle and bench marked by the Scientific Revolution, has become the dominant acceptable means for describing and explaining the natural world and intervening in it through prediction and control. Rational analysis is the ability to analyze and understand complex assemblies by separating them into natural or logical subassemblies and constituent parts. The ability to break events, structures or other phenomenon into independent entities or variables has proven to be essential to design analysis. Independent variables are created through a process of reduction, isolation and compartmentalization, utilizing distinction making by cleaving at 'natural' or 'logical' separations. Scientific thinking provides a significant portion of the designer's pallet upon which the design process stands and a critical understanding of the elements-of-design spread across the designer's palette. This is accomplished by revealing truths, which, if not absolute, are adequate. These truths are essential but not sufficient for a comprehensive design process however. Whether describing, explaining or creating assemblies of parts, a process of composition (i.e. creating the

analogue) must be utilized. Science has not so far focused on this compositional aspect. To move from a well described and well-analyzed reality to a new design that will fit in to this reality and become part of the analogue is a question for design. It is a result of intention and judgment, it is about what we want the analogue whole to be like. For this we need an understanding of the analogue experience of reality – we need systems thinking.

The domain of systems and systems thinking does not have a predefined field of interest or content area. Like science or art and other traditions of inquiry, it is a lens through which observation, imagination, compre-hension, understanding and action are focused on any particular domain of human existence or within any frame of reference defining the human condition. In this quality it is exactly like design. Systems thinking is the logic of design. Some characteristics of the systems thinking that are essential and supportive of design thinking are that it:

- interrelates different ways of thinking and acting
- describes and explains complexity
- reveals relationships among elements and subassemblies
- discerns patterns of relationships and elements
- creates unity out of difference and diversity
- delineates a whole that is greater in total than the sum of its parts
- discerns boundaries or limits of complexity
- defines contexts and environments visa-a-vie systems
- integrates systemic processes and structures into functional assemblies
- defines systems behavior in terms of control and purpose
- discloses a unifying identity or character
- relates system as a whole to larger wholes

Fig 3-2 Systems thinking supportive of design thinking

The difference between a systems perspective and a design perspective, is essentially the difference between observing and acting. Between seeing something as a system or a composition and between crafting an assembly or creating a composition. Systems thinking is as an approach about rational observation and is distinct from the reasoning of design. Design *reasoning* is based on systems thinking and a systems approach to

the development and integration of design knowledge.

The term system has many definitions promulgated by a pantheon of contemporary systems thinkers. A systems approach can refer to a way of thinking about the human condition, or it can refer to the description and explanation of the things that affect the human condition. The latter of these two different approaches include the scientific approach to understanding systems as real things whether concrete or abstract while the former, a systems inquiry approach, focuses on a way of thinking which allows different fields of interest to be related to each other in the affairs of humans.

Systems thinking is both a very new and a very ancient approach to meaning making. Modern systems approaches are often catalogued as a branch of science as in the study of complex phenomena, or as in the unification of all rational knowledge. Some contemporary systems thinkers restrict systems ideas to the domain of the newer sciences exclusively. However West Churchman, a well-known systems philosopher, starts with the *I Ching* as the oldest systems book (Churchman 1979). He points out that historical cosmologies and religions are systems approaches to meaning making for generations of humans. From this perspective, Systems thinking is part of a very old and fundamental tradition of giving form and meaning to human existence, which has unfortunately given way, over time, to the powerful attraction of reductionist analytic thinking.

Ackoff and Gharajedaghi (1999) have captured the complex history of more recent systems thinking in a simple three part model that defines systems thinking as first generation, second generation and third generational systems thinking. The first generation exemplified by operations research focuses on interdependency in the context of mechanical or deterministic systems. The second generation exemplified by cybernetics and open systems theory focuses on interdependency and self-organization in the context of living systems. The third generation exemplified in their words as design focused on self-organization and choice in the context of sociocultural systems. The use of design in this context is related but different to the concept of design developed in this book.

New systems thinking has also been associated with the thoughtful but nonscientific theories and ideas associated with 'new age' thinking. Synthesis and integration are the primary motivating principles behind any such approaches to gaining a more comprehensive understanding of reality and are the elements that are common to all systems approaches. One of the more valuable insights from this approach to systems is the appreciation that many traditional cultures were and are very systemic even though the language and concepts they would use to describe their own realities would be very dissimilar from formal systems language developed in the Western tradition.

The scientific approach to systems treats the scholarly domain of systems as a disciplinary field bounded by all the principles, approaches and traditions of any disciplined inquiry. This has built-in limitations of course in that there are key differences between the categorization of knowledge as a discipline and the categorization of knowledge from a systems thinking perspective; by definition. The scientific approach to the study of systems is systems research in the same formal sense that scientific disciplines engage in research. Unfortunately the term research is often used casually to mean anything from a literature search to informal information gathering as part of a systems related inquiry.

Disciplinary inquiry is based on clearly defined relationships of similarity for the development of knowledge and its dissemination in categories of commonality. Disciplines have evolved over time into ever narrowing specialization with the belief that this increased expertise and thus value. These areas of expert knowledge share little common ground among them although recent research has attempted to find patterns of knowledge which cut across sets of disciplines and professional domains. In addition to historical disciplinary divisions of knowledge, new disciplines continue to emerge adding to the number of distinct and separate domains of knowledge. Any attempt to gain or utilize knowledge from a broader more inclusive perspective is perceived by disciplinarians as too shallow and dilettantish. This creates a situation where rigor and relevance become difficult to reconcile. Compromise between these two conditions result in fields of knowledge defined in terms of being interdisciplinary or multidisciplinary (see Fig. 3-2). The utilization of interdisciplinary or multidisciplinary knowledge is extremely challenging

because of the continued dominance of experts and expert knowledge in an integrative process that by definition breaks down barriers of expertise.

The systems thinking approach is a distinctively designed form of inquiry that does not fit into the traditional prescriptive specifications of a discipline. It also offers an alternative to the forced compromise between in-depth, narrow specialization and broad but shallow generalization. The systems approach from a disciplinary perspective focuses on relationships between domains of knowledge and on the patterns of relationship that become visible as a consequence (see Fig. 3-3). These patterns provide a map for the development of hybrid forms of knowledge and for their application in theoretically or pragmatically relevant ways. These patterns are given meaning through interpretation similar to the way that raw scientific data is interpreted and given meaning.
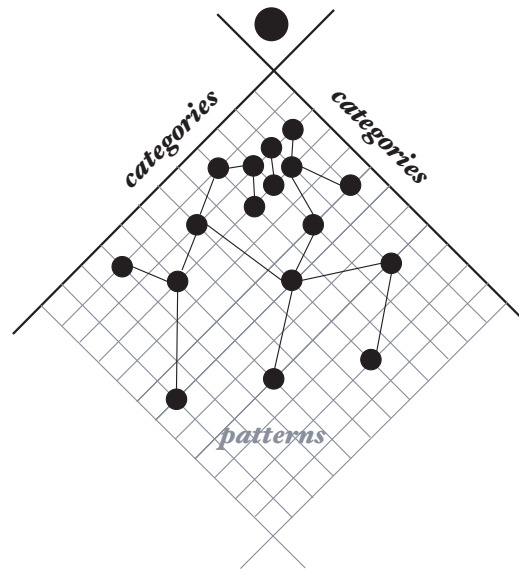
Fig. 3-3 Patterns of Connections

In design systems have to be described and represented to be analyzed and understood. A designer has to create a representation of what are the

vital and characteristic qualities of the context where the new design will reside. Systems thinking is valuable since it helps to focus on aspects of the analogue reality that are of importance to any kind of design. Even though many systems approaches are very different the common thread is that principles such as relationship, unity, and integration are essential descriptors of any phenomenon being studied or contemplated. *The primary descriptors concern emergent qualities such as pattern, compound, system and composition.*

This is in contrast to the analytic disaggregation of phenomena into constituent parts that is the hallmark of the scientific method, an approach to knowledge creation and application that has proven to be such a powerful ally in facilitating human prediction and control of the natural world. It is in our culture a challenge to keep the basic intention of systems thinking, i.e. with focus on emergent qualities, without starting to use the systemic 'tools' to work in a reductionist way. Our culture tells us that the more precise we know the details, the deeper knowledge we have about specific properties, the better off we are. To engage in a real systems thinking mode with the emphasis on gaining a better understanding of patterns, compounds, and compositions is therefore difficult but for a designer necessary task.

Representing systems so that the essence of the system as imagined or observed can be communicated to others is a complex demanding skill. Models, diagrams and other forms of cognitive art (Tufte 1990) are essential when the focus is on systems. The dominant linear format of text falls short when used without other methods of representing complex, dynamic entities. Describing, explaining and imagining systems necessitates the ability to represent them through form, structure, process and dynamic representations. Cognitive art represents systems while diathenic graphologue communicates the nature of systems. Both are essential means in design communication.

Systems, including designs of inquiry, can be represented through the concept of *compounds*, a complex set of interrelated elements in unique blends. Compounds can be formed through focused intention or be formed by habit. Constituent elements of any particular compound can be revealed indirectly through *reflections* or *projections* of the complex, emergent whole form of the compound onto frames-of-reference that are

less complicated and more accessible. Compounds can also be revealed less satisfactorily as constituent elements through their reduction into parts, (as in the story of the blind men describing an elephant as a spear, snake, fan, wall and rope) or revealed through images which are distortions because of intervening factors or elements ("through a glass darkly").

Compounds exhibit their own unique emergent qualities and behaviors in the same way, for example, that hydrogen and oxygen atoms, when combined in specific proportion, become water. Compounds represent the substance and not the form in the way that water, continuing with the example, is the substance and waves are the form. Patterns, systems and compositions differ from compounds in that they represent form and not substance.

Systems thinking or inquiry can be understood as an emergent quality arising from the mix of different epistemological (i.e. approaches to inquiry and learning) approaches combined in proportion within the constraints of focused contexts (see Fig. 3-4). The emergent compound of design inquiry and action becomes a *world-approach* in the way that inquiry for description and explanation form *worldviews* paradigms or Weltanschauungs. A world-approach emerges as a compound of contexts and intentions or directions and aims (see Fig. 3-5). For example, in social systems design, the *contexts* are categorizations of types of systems such as social, economic, political, religious and legal. An example of epistemological *elements* would be the *real, true* and *ideal* as introduced in chapter 1 (see Fig. 3-6).
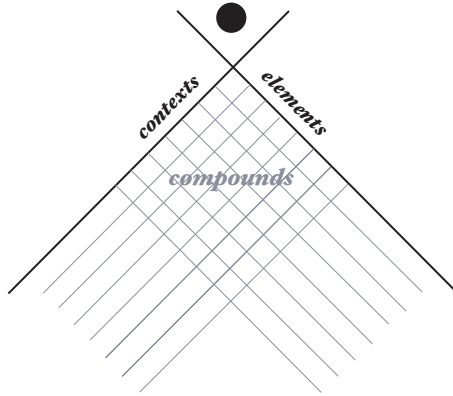
Fig. 3-4 Systems Thinking Compounds
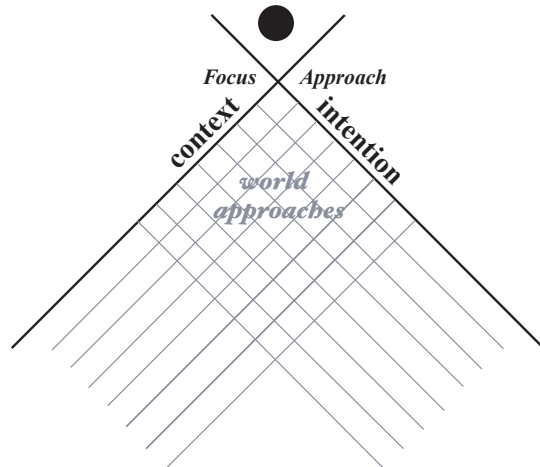
**Fig. 3-5 World-Approaches: Systems Epistemology**
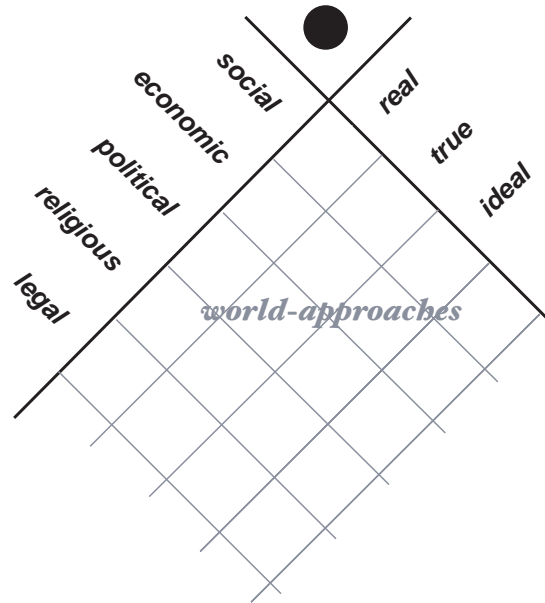
Fig. 3-6 Example of World-Approaches (i.e. *Compounds*) Palette

Although complex systemic world-approaches or worldviews are difficult to formally model or map they can be imagined as an emergent form set against multiple reflective modes of understanding and meaning making which are more accessible cognitively (for example the concept of *paradigm* creates coherent frames-of-reference). As an alternative they can be thought of as images intercepted by a coherent cognitive surface when illuminated from different perspective points. For example Plato's shadows of idealized forms on a cave wall is an example of a single perspective projecting onto a single surface. The scientific perspective on light itself as projected onto two different frames of reference reveals the nature of light to be both wave and particle. The Christian trilogy – the father, son and holy spirit – is an example of a single perspective of God projected into three different spaces of reference. The reflected or projected images are formed by the internally coherent rules of the game for each frame-of-reference. Being able to take the images together, as a whole, is the function and value of systems thinking in the design

tradition.

    As an example a real world event projected onto three different frames-of-reference can reveal dramatically different understandings, values and meaning yet remains a coherent singular event in the world. It may be seen as vice from a social point of view or as a virtue in the business world while treated with indifference in the political arena (see Fig. 3-7). Complex ideas or beliefs are perceived as paradoxes when images from two different frames-of-reference of the same complex thing are viewed together. When light is observed as both wave and particle there is a desire to resolve the paradox into one or the other reality. In the social realm paradoxes that cannot be resolved by dominance of one image over another are resolved by strategies like compromise or trade-off. Attempts to resolve unresolvable differences between images are not the answer however.
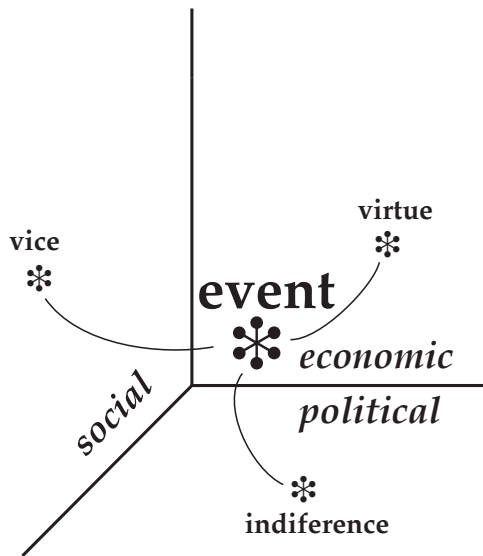
Fig. 3-7 Different References of the Same Event

The tensions created by an awareness of two or more such images needs to be mediated through a systems approach. An example of such mediation would be Aristotle's concept of the *mean* – mediated judgment

– where understanding emerges from a unification of difference (i.e. *composition*). Unfortunately without this understanding, the tensions and paradoxes of multiple images are too often dismissed pejoratively. Within reductionistic thinking the concept of *duality* evokes such a reaction. According to this approach the *right* way to think is to stay within one frame-of-reference and act as if the image is a true, undifferentiated form rather than merely the shape of something more complexly comprehensive. An alternative is to deal only with pure systems designed from within one frame-of-reference and from one perspective. The systems theories that reject concepts such as parts, elements, components relationships or complexity in their inventory of acceptable systems concepts reject the possibility of multiple, paradoxical images generated from a singular form. This is for example, the distinction between a *systems science* (a distilled worldview) and *systems thinking* (a compound worldview).

Systems thinking is both a worldview and a world-approach (i.e. systems approach) depending on whether your intention is to describe and explain or to act. It represents the way people think about the world in a natural way. Distillations into purer and thus simpler forms of approaches like the scientific method are difficult to attain and maintain because it is natural for people to bring their *whole* selves into the daily process of making sense out of life. The whole person is not a distillation. For the designer distillations are unnatural. Compound world-approaches and worldviews are natural. Systems thinking is a natural way to approach the world for a designer.

The term *system,* used both as a description of an embodied way of thinking and as a description of the thing that is being thought about is like the term design, is both a verb and a noun. As a noun the Greek origin of the term system is *sustema*, meaning 'a composite whole', while the verb is a derivative of the compound term *sunistanai* which means 'to bring together' (*sun* – 'together' + *histanai* – 'to cause to stand'). Thus a systems thinking approach reflects a desire to know how things are caused to stand together in unity. Systems design thinking therefore reflects a desire to understand how systems are caused to become compositions and how to be an intentional agent in that process.

The term system, as a noun, has been redefined in a number of ways in recent literature. Listed below are a few examples from well-known, contemporary systems thinkers.

We postulate that systems are examples of teleological things, i.e., things some of whose properties are functional. **...**

... Briefly, the necessary conditions that something S be conceived as a system are as follows:

1.   S is teleological

2.   S has a measure of performance

3.   There exists a client whose interests (values) are served by S in such a manner that the higher the measure of performance, the better the interests are served, and more generally, the client is the standard of the measure of performance.

4.   S has teleological components which coproduce the measure of performances of S.

5.   S has an environment (defined either teleologically or ateleologically), which also coproduces the measure of performance of S

6.   There exists a decision maker who – via his resources- can produce changes in the measures of performance of S's components and hence changes in the measure of performance of S.

7.   There exist a designer, who conceptualizes the nature of S in such a manner that the designer's concepts potentially produce actions in the decision maker, and hence changes in the measures of performance of S's Components, and hence changes in the measure of performance of S

8.   The designer's intention is to change S so as to maximize S's value to the client.

9.   S is "stable" with respect to the designer, in the sense that there is a built-in guarantee that the designer's intention

is ultimately realizable.

> C. West Churchman (Churchman 1971)
> **The Design of Inquiring Systems**

2.14. System: a set of interrelated elements, each of which is related directly or indirectly to every other element, and no subset of which is unrelated to any other subset.

Hence, a systems is an entity composed of at least two elements and a relation that holds between each of its elements and at least one other element in the et. The elements form a completely connected set that is not decomposable into unrelated subsets. Therefor, although a system may itself be part of a larger system it cannot be decomposed into independent subsystems.

2.15. Abstract system: a system all of whose elements are concepts.

2.16. Concrete system: a system at least two of whose elements are objects.

> Russell L. Ackoff and Fred E. Emery (Ackoff and Emery 1972)
> **On Purposeful Systems**

The systems paradigm is concerned with wholes and their properties. It is holistic, but not in the usual (vulgar) sense of taking in the whole; systems concepts are concerned with wholes and their hierarchical arrangement rather than the whole.

> Peter Checkland (1981)
> **Systems Thinking, Systems Practice**

As seen above, a system is defined through a confluence of systemic concepts. According to these authors a system is located both within a context and an environment with different relationships to each. A system is described as being embedded in a metasystem. It is also defined in relationship to other systems that may be competing, cooperating or influencing the system of interest. A system is profiled in reference to its boundary and whether the boundary is open or closed to things like energy, resources, and information coming from outside or emerging from within. A system is further explained through the identification of its elements, units, subsystems or other constituent parts. Another descriptor is of the processes, if any, that animates the system. Most importantly a system is explained through the patterns of relationships and qualities of relationships of its components. A system is further characterized by the emergent properties and behaviors which these patterns and combinations evoke.

The systems literature is full of descriptions and explanations of immense numbers and kinds of systems from the perspectives of a wide variety of individual practitioners and researchers. There is extensive philosophic, and to a lesser degree metaphysical, literature on systems. Systems are described, explained or conceptualized in great detail using concepts that have become normative in the systems field. Particular systemic processes have been the focus of intense interest among systems thinkers such as those of communication and control, known as cybernetics, self-making, known as autopoiesis, and complex adaptive or evolutionary behavior. Chaos theory, fractal geometry, and complexity theory are contemporary systems concepts that serve as mathematically sophisticated means for explaining and describing systems. These and other systems related concepts have been developed in great depth in recent years but it is often unclear what basic beliefs about systems from an ontological (the study of the real existence of things) or an epistemological (the study of how knowledge is gained) perspective have been put in play.

Systems are identified or characterized in many ways. Even if there is no gain or utility in knowing all the different definitions and characterizations of systems, it is important to a designer to have an

understanding of how systems and systems thinking can be defined. This is true since no designer can work without dealing with systems and without having their own understanding a systems approach.

Systems are described in part by the nomenclature of constituent elements, assemblies and materials (see Fig. 3-8) concomitant with the qualities and forms that emerge as a consequence.

Metasystem
Whole System
System of Systems; i.e.Competition & Cooperation
Environment
Contexts
Boundaries, Limits and Enclosures
Space
Form
Flow
States
Variables
Materials
Organizing Disposition
Emergence
Structures
Subsystems
Components, Elements or Units
Connections & Relationships
Functional Assemblies and Subassemblies
Feedback Control
Teleological Intention
Processes
Resources
Wastes

Fig. 3-8 Examples of System Nomenclature

Systems theorists choose their own ways of discerning types of systems or categories of systems by utilizing descriptive dimensions. Some of the dimensions by which systems are recognized or conceptualized are listed below (see Fig. 3-9). General categories or types of systems are complimentary to the many particular ones developed by different systems thinkers. For example Russel Ackoff (Ackoff and Emery 1972) categorizes systems as either mechanical, organic or social. Building on

the work of K. E. Boulding, Ludwig von Bertalanffy (Bertalanffy 1968) categorizes systems as static structures, clock works, control mechanisms, open systems, lower organisms, animals, man (sic), socio-cultural systems and symbolic systems. There are a rich variety of other categories and types developed by other system's scholars that provide important insight into the nature of systems inquirers as much as systems themselves.

1. Scale
2. Hierarchy
3. Functions
4. Purpose/Ends
5. Material
6. Scientific Divisions
7. Theoretical Frameworks
8. Kinds of Components
9. Types of Variables
10. Degrees of Complexity
11. Behavioral Dynamics
12. Ordering Logic
13. Relationships of Elements
14. Limits

Fig. 3-9 Categorizing Systems

There are many types of systems that have been identified by systems thinkers and practitioners utilizing dimensions of understanding similar to the ones presented above. A happenstance introduction to the field of systems thinking via one of these predetermined systems concepts can lead to a restricted perspective of the field of systems unless one is aware of the a prior selection of dimensions utilized in the composition of the system as an concept. Although there is some comfort in not being confronted with all the complexities and subtleties of systems thinking as a whole from the beginning it is essential for systems designers to appreciate the fullest palette possible of dimensions from which to choose. Specific types of systems in common usage vary widely across domains of interest (see Fig. 3-10).

Complex systems

Adaptive systems
Simple systems (i.e. mechanical, linear, etc.)
Spiritual systems
Religious systems
Living systems
Natural systems
Ecosystems
Conceptual systems
Abstract systems (i.e. numbers, symbolic logic etc.)
Concrete systems
Synthetic systems
Artificial systems
Governance systems
Human systems
Family systems
Activity systems
Belief systems
Whole systems
Comprehensive systems
Biologic systems
Social systems
Organizational systems
Structural systems
Process systems
Information systems
Technologic systems
Functional systems (i.e. transportation, education, legal, health, agricultural, military, etc.)
Mythic systems
Cosmological system
Philosophic systems

Fig. 3-10 Examples of Systems

This is not an exclusive list but is representative of some of the more common means of typing or categorizing systems. Any specific characterization can include aspects of any or all of these dimensions. The challenge of course is how to begin to make sense of this long list of systems types plus all the ones not listed which various systems thinkers have identified.

Particular types of systems as listed above are usually part of a generalized descriptive dimension or category that connect types of systems by some common quality or character. A category does not generate an exclusive set of systems but merely provides the continuum

along which particular system concepts fall or identifies the common ground within which each falls. It is a matter of choice as to which set will be utilized to support the systems thinker or practitioner in their work. Categories of systems are not restricted to specific forms or modes of logic as shown below in examples of possible categories of systems based the commonality of social, scientific or behavioral dimensions (see Fig. 3-11).

<div align="center">

Spiritual
Cultural
Family
Social
Socio-technical Organization

Social System Category

Societies
Species
Organic assemblies
Inorganic compounds

System Science Category

Autopoietic (self-making)
Alopoietic (other-making)
Telopoietic (purpose-making)
Mythopoietic (meaning-making)

Systems Production Category

</div>

Fig. 3-11 Categories of Systems Based on Social, Scientific and Poietic Descriptors

A systems approach is different from a systems description or explanation. From a systems inquiry perspective, determining the type or category of a system is dependent on the tradition or traditions of inquiry used to describe and explain systemic concepts. For instance a system or category of systems can be defined from a traditional scientific frame of

reference or from a humanities, art, technologic, spiritual or other distinct tradition of inquiry. This means a system or category can be defined or described using epistemological approaches from a variety of designs of inquiry. What this means is that there are no true, fixed or given types of systems or categories of systems or categories of elements making up a system; they are all a matter of *perspective, intention and choice*.

The work of the well-known systems philosopher, C. West Churchman, provides a good example. Churchman chose to explain systems from a people centered perspective (i.e. people are the dominant elements in his social systems category). He worked from an inclusive form of inquiry (i.e. compound) that expanded the concept of systems science to include broader understandings of rational thinking than is commonly used. From his systems approach he identified four categories of people who play essential roles in the activity of systems including planning and design activities (see Fig. 3-12). These categories were further developed with descriptions of role responsibilities and relationships (Churchman 1979).

Client
Purpose of system
Measure of performance of system

Decision maker
Boundary between environment and system
Components of system

Planner
Implementation of designs
Guarantor of design system

Systems philosopher
Significance of systems approach
Enemies of the systems approach
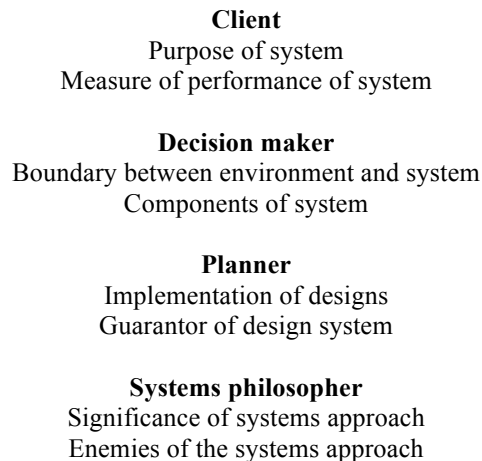
Fig. 3-12 C. West Churchman's Social System Categories

From this set of categories a series of questions were developed to interrogate any situation from a systems perspective that seems too complicated, confused and overwhelming for standard problem solving

approaches (see Fig 3-13). The questions are in two parts. The first part of the questions asks for an objective determination of the situation. The second part of the question asks for a deontic determination of what ought to be taken into account such as issues of ethics, equity and justice. This is a mix of two traditions of inquiry, one objective and one value based.

The process of answering these questions provides the necessary first foothold in a complex real world situation that allows careful next steps to unfold. Some of the next steps include the determination of the make up of the particular systems approach to inquiry and action in a particular situation much as an artist must choose the make-up of the palette from which a painting will be created.

This systems approach is objective and subjective as well as integrative of the two at the same time. Such a systems approach is not only an integration of objective and subjective thinking but is an integration of multiple traditions of inquiry as well. These forms of inquiry include: 1) design, 2) scientific, 3) philosophic, 4) artistic, 5) humanistic, 6) metaphysical, 7) religious, 8) professional, 9) spiritual, 10) pragmatic and 11) technological approaches to both inquiry and action as part of the systems approach.

Systems inquiry is brought to focus by a particular frame-of-reference based on a set of categories of systems and from the typology of particular systems. The formalization of categories of systems and the characterization of individual systems is a matter of choice as a design decision concerned with the formation of a *palette of systems* for making design judgments.

> Indeed, the selection of a definition of "systems" is a design
> choice, because throughout this essay it is the designer who
> is the chief figure. In other words, whether or not something
> is a system is regarded as a specific choice of the designer.
>
> C. West Churchman (Churchman 1971)

In the design process the designer has to make judgments and decision on how to approach reality. The designer has to design the inquiry to be used, and especially the systems approach that will be used. There is no

way to discern what this might mean in the ultimate particular case of design. It will always be a choice based on intention and will. Most important to the designer is to realize that all these choices are inevitable and will be made consciously or unconsciously. A conscious approach means that knowledge of different approaches and a devotion to reflect on the specifics in the present design situation is needed.

The choice of designs of inquiry brought into conjunction with the different types of systems (see Fig. 3-13) is a part of the development of a *palette for design*. Particularized relationships among categories of systems and the multiple modes of inquiry create compounds of inquiry and action that assists in explaining or describing a specific complex system or helps to conceptualize such a system when it does not yet exist.
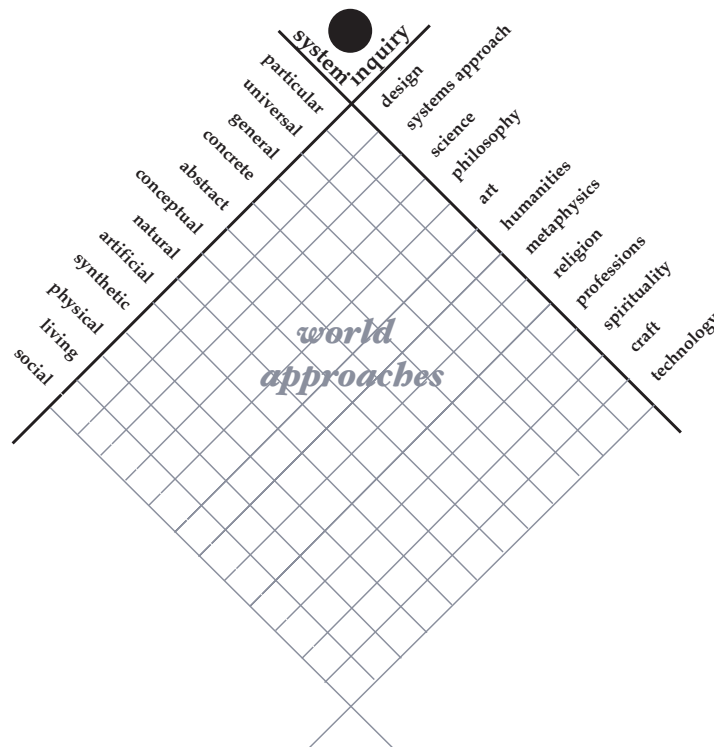
Fig. 3-13 An Example of a Systems Design Palette

The categories of systems shown in the two figures below (see Fig. 3-14 and Fig. 3-15) are examples of different types of systems categorized by different yet similar systemic domains. The category of *living systems* and the category of *social systems* are examples of just two possibilities out of a large number of available choices. Each becomes a design palette from which designers draw the elements for their systemic compositions. The example shows how these conscious or unconscious choices of the design palette leads to concrete and real differences in how to approach a design. This also means that the chosen palette will lead to different outcomes of the design process.
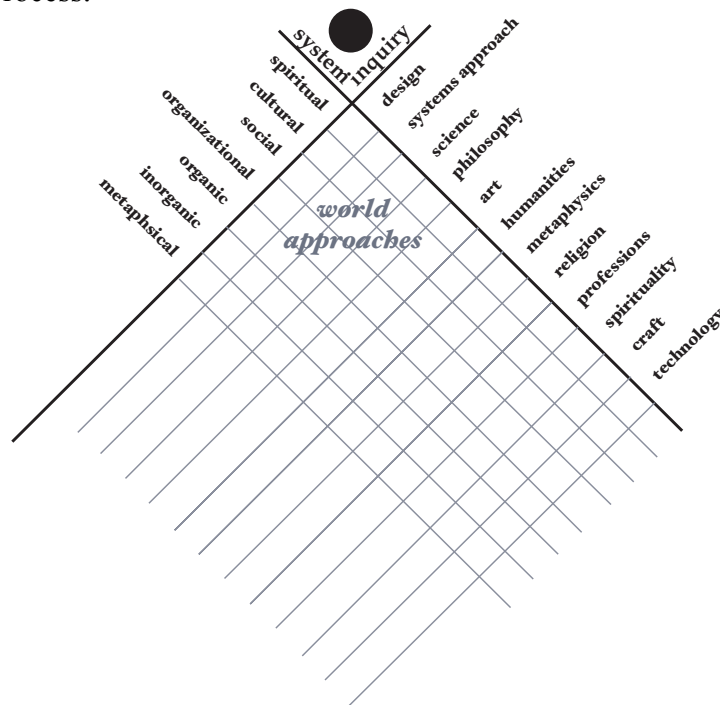
Fig. 3-14 Living Systems Inquiry
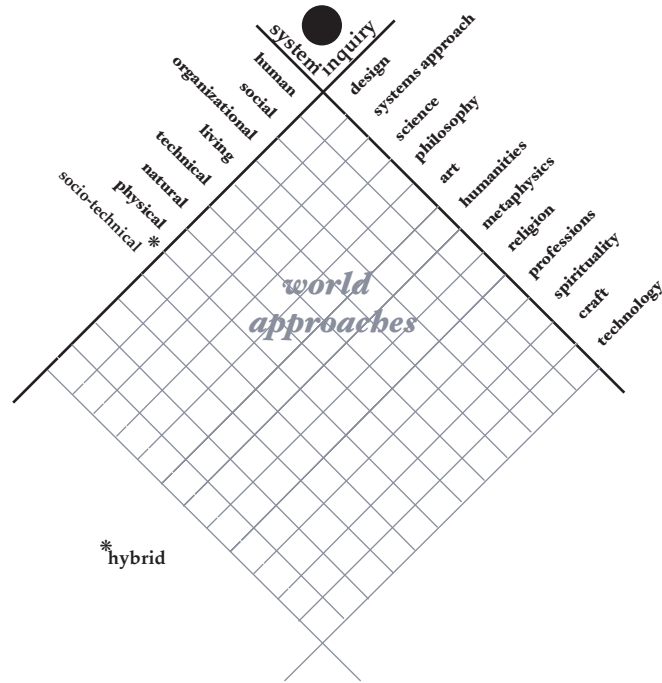
Fig. 3-15 Social Systems Inquiry

It is possible to imagine how the two choices of paletts shown in the two figures above will lead to very different descriptions and also understandings of the same system. When a designer approaches the systems at hand with these conceptual tools in mind different things will be visible and considered important. It is possible to perform an thought experiment by applying different palettes to the same system. Such experiments might help the designer to develop an understanding of the meaning of alternative chosen approaches.

System Behavior

An important aspect of system design or description and explanation is system *behavior* as a combination of structure and process or relationships and animation. Complex system behavior is a compound of system types and behavior types. For example if a category of system

types that includes the distinctions of complex, simple, dynamic and balanced is combined with internal and external behavior capacities including designing, transforming, evolving, processing, changing and maintaining, a large number of combinations and permutations of teleological designs are made apparent or possible. All with radical different meaning to a design situation and the way the design will approach the system at hand.

Behavior is descriptive of both internal functional processes and externally directed activity. Externally directed behavior focuses on relationships with other systems, the system's environment or context and the metasystem it is embedded in (see Fig. 3-16).
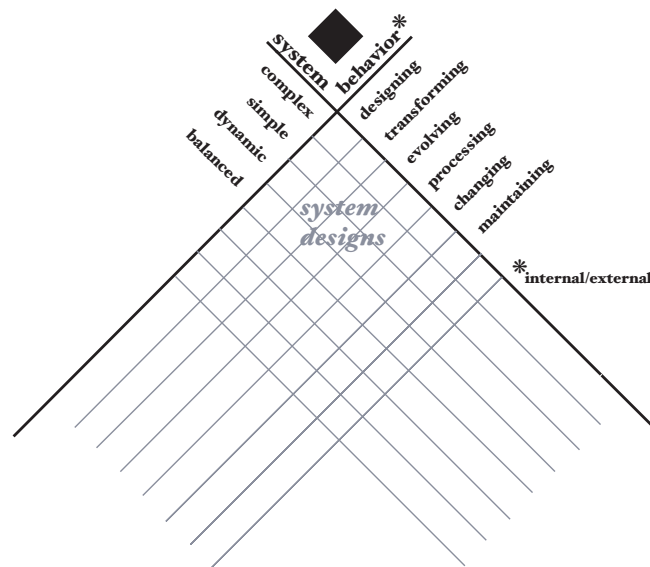
Fig. 3-16 System Designs

For example systems behavior can be defined by types of reactions to environmental conditions (see Fig. 3-17) or to the degrees of freedom a system has within teleological hierarchies (see Fig. 3-18).
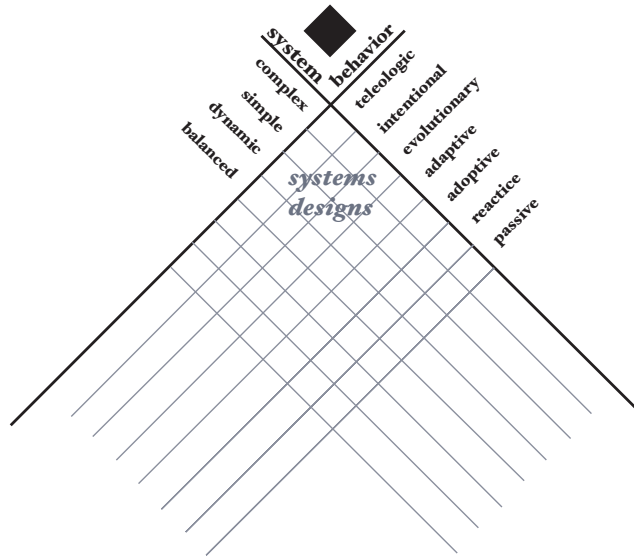
Fig. 3-17 System Behavior vis-a-vie Environment
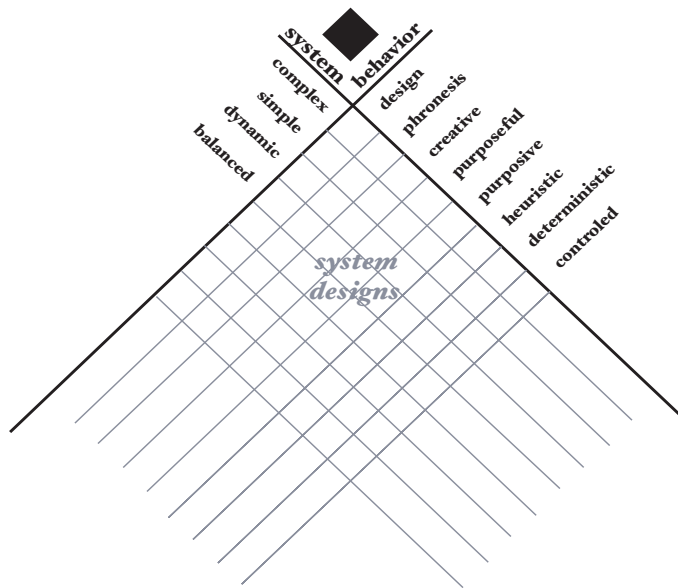
Fig. 3-18 System Behavior vis-a-vie Degrees of Freedom

Conceptualizing a 'system' is a matter of design judgment as Churchman points out (Churchman 1971). Some generalized systems concepts are directly applicable while others need to be invented. Systems boundaries are determined as a matter of judgment whether as a description or prescription the same as an artist frames their painting or a photographer crops their pictures. That which is to be considered as an element is a matter of judgment. What relationships are to be established with other elements is also a matter of design judgment. Components, including subsystems, need to be interrelated (in relationships such as competition, cooperation etc.). Systems are to be placed within systems. Every system is in a relationship with an environment. Determining what is part of a system and what is its environment is a matter of judgement (whether analyzing, fixing or designing). Every system is also within a context as a matter of *appreciative judgment.*

Not all types or categories of systems are useful in design but some are of fundamental importance. One is the categorization of systems by the degrees of freedom it has to form and direct its own behavior (see Fig. 3-19) as developed and expanded from the seminal work of Erik Jantsch and others (Jantsch 1975). This characterization of systems by their teleological or purpose driven behavior is important for understanding systems design in two ways. First the system that is being designed must have the degrees of freedom needed for it to function as intended as specified through prescriptive design criteria. Second it is important to make sure that *the designing system has at least one degree of freedom more than the system being designed*. The carpet does not create the weaver, the pot does not shape the potter. For example, an organizational design function in a corporation cannot be placed equal to or placed at lower levels of authority (i.e. degrees of freedom) than that part of the organization it is designing. If the organization itself is being designed then the designing system must include individuals who can exceed the degrees of freedom inherent in the internal roles of authority of that organization. This defines in part the meaning of leadership from a whole systems design perspective.
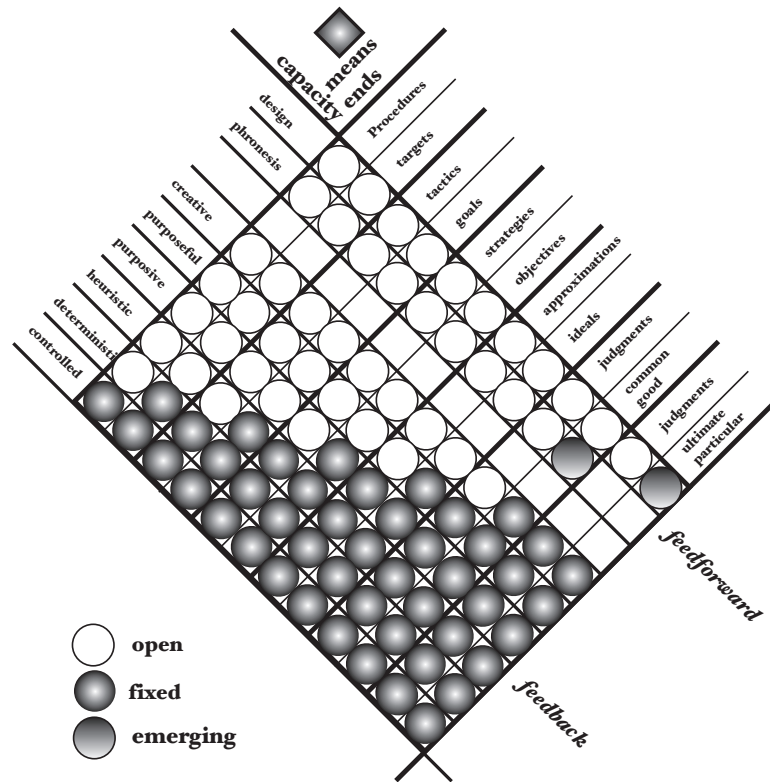
Fig. 3-19 Systems defined by Degrees of Freedom

A common mistake in systems design, especially organizational systems design, is to assume that there are models of universally ideal systems. In reality it is necessary, among other important issues, to carefully consider and specify what degrees of freedom or teleological behavior a system needs to have designed in relationship to the purpose intended if the system. For example an organizational system that is designed to manage a nuclear power station should not have high degrees of freedom designed into it. It is essential to have its behavior limited because of safety and risk factors therefore the organizational system must behave in very

deterministic ways. There is no need or desire for creative behavior or surprises from this type of system. On the other hand an airlines pilot needs to have greater degrees of freedom given that they can never expect to experience the same flying conditions routinely and must have the freedom to respond with *navigational judgment* to surprising situations as they occur. A design-capable system requires the highest degree of freedom of all of course.

A designing system is a compound of the necessary degrees of freedom and the traditions of inquiry that forms the epistemological foundation from which designing is approached (see Fig. 3-20). This forms the design palette for the designing of an inquiring system, in this case a *design inquiry* system, a particular kind of world-approach that is the design process this whole book attempts to present and emulate.
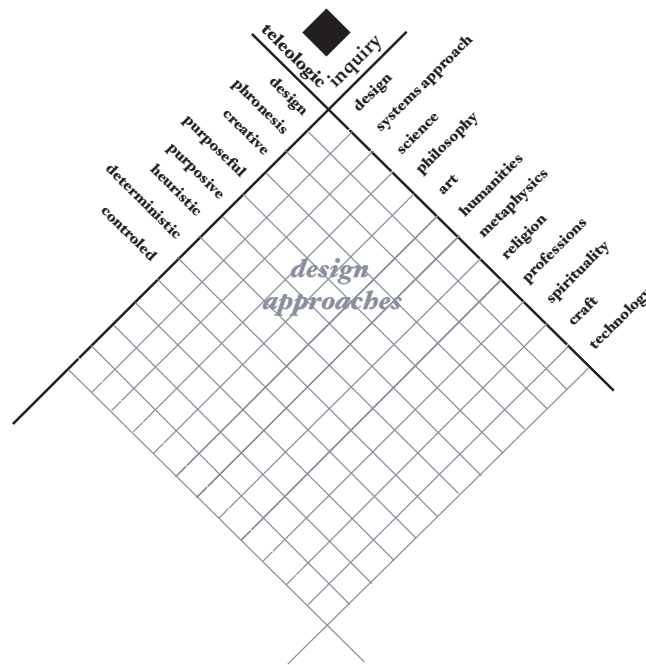
Fig. 3-20 Palette for the Design of Design Inquiry

An essential aspect of design in addition to its process of inquiry is its

capacity to produce or make that which has been formed as a design concept. An example of a palette for *design production* (see Fig. 3-21) would include categories of capacities to make. *Poiesis*, a Greek root term for making, forms the basic category for varieties of capacities to make. Systems that have the capacity for *self-making* are called *autopoietic*. Those that have the capacity to make for others is called *allopoietic*. From a design tradition systems that make meaning are *mythopoietic* and those that have the capacity to create purpose are *telopoietic*. These are just a few examples of categories of *making* that form design approaches relevant to the phase of designing that is inclusive of innovation and implementation.
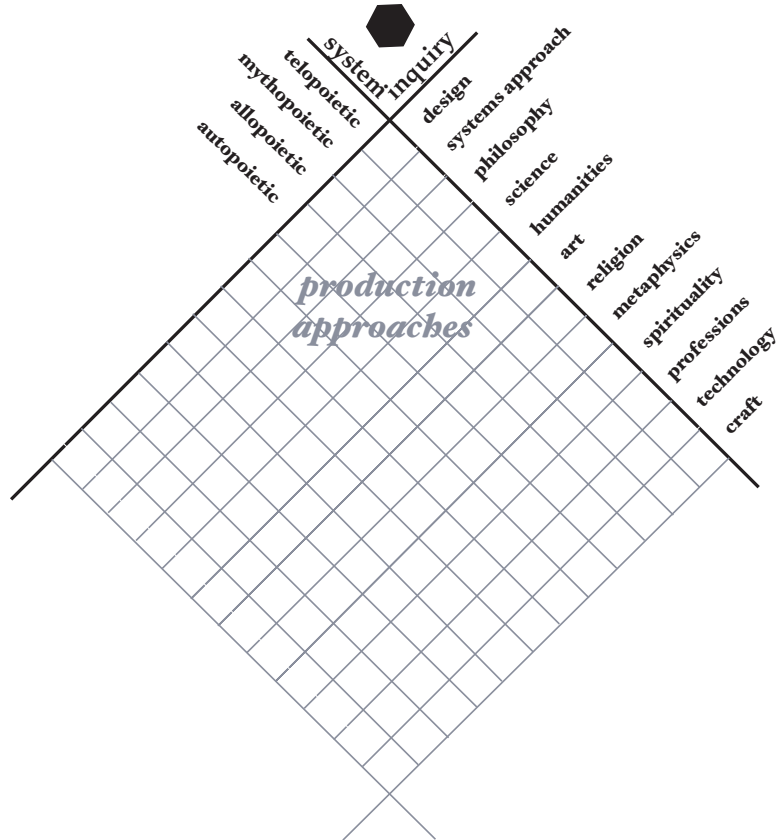
Fig. 3-21 Example of a Design Palette for Production

Systems thinking is a necessary component of designing as the essential rational component of design thinking. Design inquiry is a particular type of systems approach that in turn is a particular type of worldview and world-approach i.e. observation and action. Systems as real things (concrete or abstract) provide the necessary context or focus for design activity since every outcome of design is a social system or an element of a social system. Also design palettes are formed utilizing a systems approach to choice and judgment. Every design is part of an environmental system, formed by a systemic context and carries systemic consequences with its implementation. The best design is one that is a whole systems design.

4. Whole

What do we mean when we say that a design constitutes a *whole*? What does it mean to design wholistically? One of the foundations of design is its wholistic character. A design is never done in isolation. A design is always part of a larger whole and is itself a whole. Something that is a whole is a complex combination of *compounds, meaning* and *presence* (see Fig. 4-1). A *compound* is a blend of material and substance. It is the stuff of which things are made and not the form of things - the water and not the wave. Meaning is revealed through the ordering capacity of systemic relationships - that which causes things to stand together in ordered form - providing a comprehensible unity. In addition, meaning is revealed through the teleological aspect of ends and purposes. *Presence*, the third ingredient in the rich mixture of wholeness, is the emergent essen*ce* of a whole given comprehensibility through levels of apprehension of *appearance*, *character* and *soul*.

compound
material
substance

meaning
order/form
ends
purpose

presence
appearance
character
soul
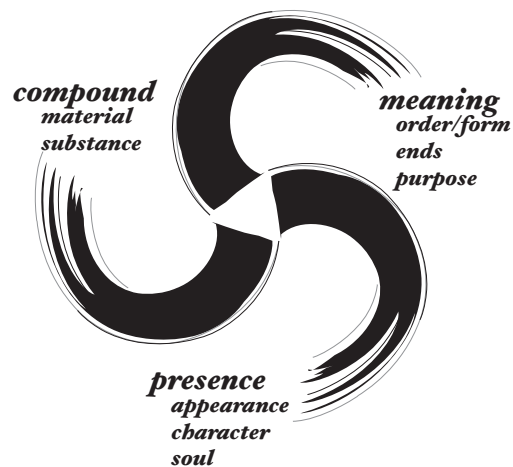
Fig. 4-1 Dimensions of Whole

A wholistic approach - as verb - in contrast to the idea of whole - as noun – requires that reflective analysts not disaggregate, compartmentalize, polarize or ignore attributes of undifferentiated life experiences. Traditional distinctions that deny integration such as mind and body, science and art, reason and imagination are examples of non-wholistic approaches that represent popular intellectual habits-of-mind. The habits of breaking things into distinct parts, into categorical differences and holding to the differences are hard to break or avoid. For example in the process of developing and presenting ideas represented as foundational elements of design for this book we were continually challenged to remain inclusive, relational and contextual always trying to hold things together in unity and not to be drawn too deeply into a focus primarily on distinctions and divisive separations from which we could not escape. Wholism captures this intention.

When we say that "the whole is greater than the sum of its parts", we must also acknowledge that the whole *is of* the parts. This has important consequences. You can not design a whole without taking into consideration the selection of parts available. You cannot conceptually or concretely impose a whole onto parts. It is not possible to design a whole and impose that emergent quality onto parts that do not embody the whole a priori. The whole takes its essence from the nature of the parts. There is an inseparable relationship between the parts and the whole. The whole cannot stand apart from the parts as an autonomous image. We also need to remember as we design that a whole is always part of something more comprehensive – another whole. A whole, made up of parts interacting as a system, functioning to serve an end, becomes the means for a greater end.

It is not uncommon to use the concept of vision as an image of the whole. But a vision is not the same thing as whole and vision is not the same as composition. A whole can never be fully described before it is composed and realized with the parts at hand. There is no way to impose a vision or image of wholeness onto parts in order to obtain a specific whole as an outcome. To create wholes it is necessary to compose them from particular elements – destined to loose their individual identity to a transcendent identity. Early definitions of wholism were concerned with this relationship of parts and wholes.

"Holism shows these opposites as reconciled and harmonized in the whole. It shows whole and parts as aspects of each other". (Encyclopedia Brittannica, 1927)

There is no single normative understanding of wholism as shown by the variety of definitions employed in contemporary philosophies and theories of wholism or wholistic approaches – ideas that are commonly used but not closely examined. Some of the most common concepts of wholism share the trait of claimed comprehensiveness. The term whole is often used to imply an inclusive understanding of the *relationship of everything to everything*. This definition has arisen because of the scientific approach to understanding wholes that has been defined as the study of comprehensive systems. The underlying assumption of this approach is that you need to know everything about a phenomenon in order to understand it and everything is connected to everything leaving no natural boundaries. Comprehensiveness requires that everything with a relationship to the phenomenon of interest is included in its analysis. Wholism defined as comprehensive is not helpful in design.

Wholism can also refer to a comprehensive understanding of the world in metaphysical terms, such as spirituality and mysticism. The belief in this case is that there is a whole from which everything emerges. Sometimes this is expanded to include the concept that each and every thing in the world is a holograph of the metaphysical whole reflecting the whole at every resolution of detail. Like the scientific approach to wholism, this understanding of wholism treats the concept of complete knowledge as the ideal.
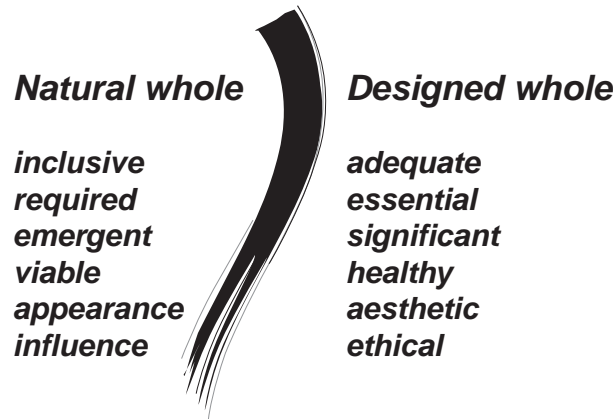
These scientific and metaphysical approaches to wholism are manifested to varying degrees in contemporary schools of thought such as deep ecology, Gaia theory, chaos theory, complexity theory, and new age sciences. These movements advocate a belief in the wholistic character of reality and become the first and sometime only ordering principle for change. These definitions of wholism are stimulating and important antidotes to the overpowering habits of reductive analysis but they are not fertile ground from which to develop design principles. From a design perspective the whole is not something to emulate or adapt to.

Another definition of wholism comes from the perspective of a systems approach; the concept of *emergence* as a seminal attribute of

wholism. A commonly stated belief in systems thinking is that the whole is greater than the sum of its parts. This means that there are emergent qualities of a whole that are revealed as transcendent properties different in kind from those properties displayed through a collection of parts. This definition of whole introduces a concept that has important insights into a deeper understanding of design than the other definitions presented above.

An emergent quality as a deterministic outcome that is the necessary consequence of the relationships, interactions and collective behavior of the constituent parts or elements of an integrated system highlights the role of chance and necessity in natural wholes versus intention in designed wholes. It is an emergent presence that embodies not only an aggregation of the collective elements of a system but that is a manifestation of deterministic qualities not integral to the parts as a result of the underlying structure of a system. Emergent qualities can also be understood as *general* qualities brought into existence by the way a whole is bound together by substance and order.

Another way of defining wholes, and the one that is a foundation of design, is to characterize the whole as a *composition* – natural and designed (see Fig. 4-2). Natural compositions are defined from the perspective of totality and emergent qualities of contingent or universal wholes. Designed compositions in contrast are ultimate particular wholes. This type of whole is evoked through intentional acts of composition taken for particular purposes at a particular time and place.

Natural whole   **Designed whole**

inclusive   adequate
required   essential
emergent   significant
viable   healthy
appearance   aesthetic
influence   ethical

Fig. 4-2 Whole as composition

Naturally composed wholes can be defined as having attributes such as being inclusive, required, emergent, viable with a presence in the world and an influence upon the world. These properties when presented as dimensions of a designed whole take on very different but equivalent aspects. Thus in the case of a designed whole, the attribute of being *adequate* replaces the attribute of being inclusive, a form of comprehensiveness. In similar fashion additional attributes of a designed whole such as being essential, significant, healthy, aesthetic and ethical stand as counterparts to the relevant attributes of natural wholes. *These attributes of designed wholes become guides for the intentional composition of wholes*. These guiding attributes are relevant both in relation to the process of composition and to the composition as outcome.

The first three attributes of a designed whole listed above are of particular interest because they are much less familiar than the attributes of health, aesthetics and ethics although these latter attributes are of no less importance because of their familiarity. Unfortunately in contemporary processes of designing, the wholistic attributes of the *adequate*, *essential* and *significant* are too often substituted by criteria that lack the same depth of meaning. The adequate is substituted by *more*, the essential by *faster*, and significant by *quick fix*.

Nor can we ever in life have a complete water-tight

> guarantee that perception has in a particular case been correctly exercised. There are no sufficient conditions: our own decision rests with perception. (Martha C. Nussbaum, 1990)

The most elusive and unfamiliar concept in design from a wholistic perspective may be the idea of the *adequate*. This concept is difficult to understand given the unquestioned assumption that any plan for action must be grounded in *comprehensive* analysis. It is an article of faith left over from the days when being comprehensive was believed to be not only possible but necessary. The faith of the encyclopediasts in the age of enlightenment that all that was worth knowing could be brought to bear on any situation (providing a clear accurate description and explanation of the situation at hand thus illuminating the right choices) has become the hypostasis upon which professional decision making confidently rests even today. There are two problems for designers with this belief. The first is that design choices may be based on reason but they are not made by reason. The second is that the explosion of information in the twentieth century has made it impossible to be comprehensive about anything. Those who continue to hold this belief continue to experience analysis paralysis.

Design is often assumed to be a member of this class of comprehensive decision making because design is understood to be primarily about making something concrete, or planning for something, or making something aesthetically pleasing. Although these may be some common features in traditional physical design, there is actually much more to design today than what these ordinary understandings imply. One of the key distinctions is that design decisions are made as design judgments leading to the creation of something which has not existed before. These design judgments are made within a context of the adequate rather than the comprehensive.

Every design process unfolds within a unique situation: a complex and dynamic reality. A designer always acts in 'response' to that reality. As designers we do not have unlimited freedom, resources, information or time and we cannot achieve perfection in design or any other domain of human existence. Rather we embrace the adequate. By adequate we do

not mean it to be a damping 'reality check' on the ambition and passion of ourselves as designers but as a framing of what the real nature of design is.

Design is not the pursuit of an ideal rational concept or the creation of an ultimate vision in a perfectible world where everything, including sufficient information, authority and resources, are in the hands of the designer. On the contrary, design can only be fully actualized by all the circumstances and specifics that makes a design situation uniquely particular. It is not about compromise or surrender to the imperfections, shortcomings, and incompleteness of the unique situation but about the splendor of the possibility of creating something not-yet-existing based on the realities of unique concrete situations and the desires of real individuals.

> But compromise too is temporary and futile. It usually means merely a postponement of the issue. The truth does not lie "between" the two sides. We must be ever on our guard against sham reconciliation…..
>
> ……Integration might be considered a qualitative adjustment, compromise a quantitative one. In the former there is a change in the ideas and their action tendencies; in the latter there is mere barter of opposed "rights of way."
>
> Mary Parker Follett, (Follett 1930)

Approaching the adequate from another perspective, it is important to appreciate the danger of creating a design motivated by a quest for the ideal or most perfect design solution. That is, it is possible to create something that cannot be supported, maintained, afforded or controlled by the recipients of a design. Many times 'good' designs bring ruin or the threat of ruin because they are not formed in the context of the adequate but formed by the unrealized quest for the comprehensive. Therefore to establish an understanding of the adequate through an act of judgment may be the most difficult and important judgment made in a design process. The judgment of the adequate will have impact on all other design judgments in the process.

The adequate can also be understood as being discerned by judgments of composition among 'purposeful differences'. There are many things in life, which are highly valued and enabling when they are mediated through intentional relationships of distinct difference. Directive judgment mediates among such difference through the utilization of compositional principles like proportion, measure, balance, contrast and complimentarity. This quality of difference is exemplified for example by the confronting differences between justice and mercy, between tradition and innovation, between creativity and control, between integrity and change or between open and closed systems. There are of course countless numbers of such intentional differences in real life. They can even be as simple as the purposeful difference between a hammer and a chisel that when mediated with skill and good judgment results in a great work of art.

Making compositional judgments among differences of this type does not result in reconciliation, resolution or trade-off but in an adequate composite. It also does not result in an ideal or absolute design. It is not a composite that is the result of a recipe or rule. Rather it is an outcome of judgment. The essential value of each difference is enhanced and enriched by being brought into a particular compositional relationship that adequately facilitates the desired end or outcome of an emergent design.

The attribute of a designed whole dealing with the *essential* refers to discernment and inclusion of anything that is judged to be an intentional necessity in fulfilling authentic human needs and desires; desiderata at both the level of the particular and collective. Often there is a sense that something important is missing in a design that does not just frustrate its function but blocks its service capacity as well.

The *significant,* as an attribute of the designed whole, deals with meaning making. Designed wholes are created by intention to evoke emergent forms and behaviors that embody the essence of that which really counts in defining and developing human potential more fully.

The three attributes of the designed whole – the adequate, the significant and the essential – discussed above can all be used for two purposes. They can be used as guides for intentional compositions of design wholes or as a foundation for a critique of designed wholes. A

designer needs to have the skill of discernment, sensibility for proportions, and judgment to actively compose wholes with these attributes. One way to acquire such skills is to intentionally critique already existing designs. To critique different types of designs from the perspective of wholes will help to show in what way the design might be a designed whole of not.

It is also possible to expand this critique to a broader class of wholes. If the adequate, the significant and the essential are the attributes for the real, then there are corresponding attributes for the 'true' and the 'ideal' (see Fig. 4-3).

frames of reference	design evaluation attributes
real	adequate significant essential
true	efficient aesthetic ethical
ideal	true beautiful good

Fig. 4-3 Critique of Wholes

With these attributes in mind it is possible to make an evaluation of all kinds of wholes. Such an exercise might also help a designer to better understand what distinguishes a designed whole from other wholes. These attributes are not to be seen as exclusive. The attributes of the ideal are not anything to dismiss as a designer, neither are the ones belonging to

the true. A designer has to act within all three perspectives, thus not forgetting that the outcome of a design is a designed whole.

For some of the attributes it is easier to make an evaluation since they have a tradition in our culture of being measured and critiqued, such as efficiency. Maybe the uncommon ones are those belonging to the 'real'. These attributes have a quality that by necessity brings the designer into the mode of judgment, and service. It also demands a high level of empathy and communication with all to be served by the design. The attributes are relational and cannot be used as measures by some general standard. The ultimate particular character of every design is visible if the attributes connected to the 'real'.

The notion of the whole does not apply only to large designs that by their size or impact make it natural to consider them as wholes. The notion of whole, especially designed whole, has the same importance for every design. Small designed artifacts, elusive designed processes, large designed system; all has the quality of being a designed whole. The degree to which each design is a whole is a consequence only of the judgment of the designer. The whole is a foundational property of the final outcome of intentional design.

III. FUNDAMENTALS

There are fundamental activities which make up the palette that support design inquiry and action in a very direct way. These fundamentals are approaches that can be intellectually understood but never learned abstractly. Fundamentals for design are learned through practice, practice, and practice in the same spirit that fundamentals for sports, art or music are learned. Mastery of these fundamentals is not an end to be reached but an ongoing never-ending process. Accomplishment is measured in terms of excellence and quality.

The fundamentals of design thinking include desiderata, interpretation and measurement, imagination and communication, judgment, composition, production and caretaking.

The underlayment of this palette is intention.

5. Desiderata

All design acts are caused by a motivation for change. Change in the world can be initiated in basically two ways. We can act because we want to move away from a situation we do not like or we can act towards an imagined but desired situation.

The good intentions that arise from the recognition of a need for change too often leads to paralysis. Change agents are paralyzed by the reality of the situation because the strategies for change, which they most commonly default to, lead to dead ends rather than next best steps. These strategies can lead to different states of paralysis including analysis paralysis, the paralysis of wicked problems (vs. tame problems), value paralysis, and wholistic paralysis (i.e. attempting to be comprehensive). All of these strategies have a common theme and focus on problem solving. They focus on "that-which-is" (description and explanation) and "that-which-ought-to-be" (ethics and morality) without considering "that-which-is-desired" (desiderata).

We can and do cause actions leading to change in the world, which are based on 'that-which-is' because we believe in a true, logically structured reality based on natural laws; a reality that can be understood through science and changed by technology. The world is thought of as a given, already finished as a design. As humans we are put on earth to react and respond to this design. Even in post modern thinking which recognizes the temporary stature of natural laws and the relativity of anything in the category of truth -- it is believed that change is based on stabilized universal and generalizable laws or principles of cause and effect rather than unique singular causes.
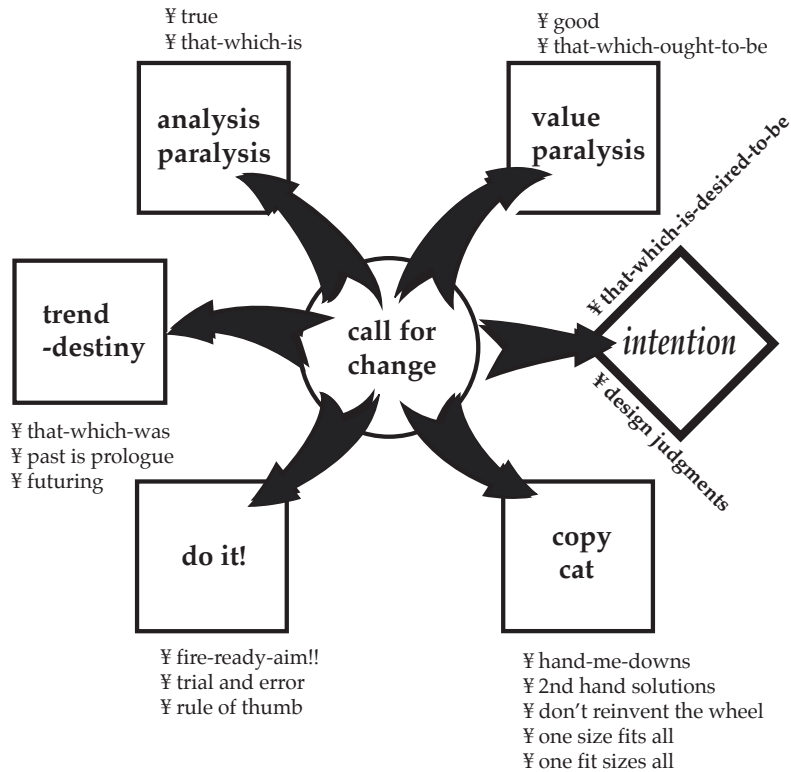
The missing insight is that description and explanation–science does not prescribe action, nor does prediction and control–technology justify action. Around the world billions of dollars is spent on studies and projects based on science and technology in the belief that by rubbing the two together the spark of prescriptive action will be given off. This of course never happens. The spark always comes from a different source.

We can and do cause changes based on 'that-which-ought-to-be' because this too is believed to be a kind of truth logically formed, based on ethical laws, religious precepts and moral codes, all in the reactive mode. The trigger for this cause of action is anything between an uneasy sense of ethical transgression to moral outrage. The outcome is as diverse as good works and holy wars.

We also create changes based on what we want or "that-which-can-be" as in our technologic creations. We can create biologic clones and new species as technology or smaller, faster, more complex electronic devises so we become convinced we want them because the ability creates the need. Although what we want is often driven by our immediate short term needs and interests, without any belief in a natural order, there is a deeper more profound sense of want which is expressed in the aesthetic terms of values as well.

These three approaches to intentional change correspond roughly to: want -- aesthetics, ought -- ethics, is --reason. In any particular situation there is never just one approach present however. Depending on what we perceive as the basis for intentional action, there will be different proportions and balances among the three. In real world contexts everything is a blend.

We use the concept ***desiderata (desires)*** as an inclusive whole -- including all three approaches: aesthetics, ethics and reason but transcending their aggregated effect in the form of an emergent quality characteristic of compositions or wholes. Desiderata is about what we intend the world to be as the *integrative outcome of all three approaches in concert.* It is the escape route from the strategies for change, which box us into paralysis, blind action or slavish mimicry (see Fig. 5-1). Desiderata is the 'voice' of design.

¥ true
¥ that-which-is

¥ good
¥ that-which-ought-to-be

**analysis
paralysis**

**value
paralysis**

¥ *that-which-is-desired-to-be*

**trend
-destiny**

**call for
change**

intention

¥ that-which-was
¥ past is prologue
¥ futuring

¥ *design judgments*

do it!

**copy
cat**

¥ fire-ready-aim!!
¥ trial and error
¥ rule of thumb

¥ hand-me-downs
¥ 2nd hand solutions
¥ don't reinvent the wheel
¥ one size fits all
¥ one fit sizes all

Fig. 5-1 Default Options and the *Intention* Option

In a "call for change"-situation people use one of several typical strategies to take action. In a simplistic way these strategies can be summarized as the "sweep in" and "block out" approaches. While the "sweep in" approaches lead to paralysis as a consequence of the ambition to discover the right solution by applying a comprehensive examination of the needs, the "block out" approaches use simple strategies to decision making without spending time and energy on in-depth examinations. The way to deal with a "call for change" is (see Fig. 5-1) to engage in an intentional design approach based on a careful examination of desiderata, guided by design judgment.

It is quite common that, in some form by a variety of titles, a needs-assessment is assumed to be the necessary first step to a design

activity meant to bring change to a social situation considered problematic. Determining needs is considered to be a responsible and necessary activity for any change agent to take on behalf of those who are in need of help. This is thought to be particularly true when the change involves the creation or modification of new social structures like business organizations, governmental agencies or not for profit institutions.

Creating need is also a very common if not more suspect approach to change, especially when focused on the creation of new technologies, commodities and services. Taken too far this leads to over consumption and addictions, an undesirable as well as destructive state of being. But when moderated, the creation of need acts as the engine for a free market system with all its apparent benefits.

There are many problems with focusing on need as the key human motivation for change or innovation. Need implies that the desired situation is clearly understood and that the real state of affairs, which is also clearly understood, is an undesired one. The difference between the desired state and the actual state is framed as a problem. It is also assumed that there is no difficulty in determining the needs that must be satisfied in order to realize the desired state. The process of satisfying needs is thought to be efficiently and effectively accomplished through a rational and direct problem solving approach.

Focusing on needs however has allowed motivation triggered by what we desire or how we know our desires to remain undeveloped – the desiderata. Human intention, when motivated from desiderata rather than need, reshapes the entire process for intentional change. Desiderata can be expressed through many domains; the mind's desire, the heart's desire and the soul's desire. To be intentional from a deep understanding of "that-which-is-desired" rather than from a difference between "that-which-is" and "that-which-needs-to-be" reverses the assumption about what can be known from the beginning.

A needs-based change animated through a problem solving approach assumes that the appropriate outcome is known from the start. When people speak of vision in this frame of reference it is as a concrete image. As stated above, it is assumed that needs emerge from an understanding of existing conditions and the difference between that

understanding and more ideal conditions. A desire-based change process leads to a desired outcome but does not start with it.

Very little intentional action in today's' world is taken out of an understanding of what is desired. The news each day is filled with reports of action that come from reactive needs for change. The experience people have in the business, political or private domains of their lives is that change and the justification for change emerge out of negative responses to events or situations in the world. The justification for action arises out of what we fear, what makes us angry, what hurts us, what we hate or what is wrong. Politicians in democracies around the world demonstrate leadership by identifying which of the many things that threaten us ought to be dealt with in prioritized order and in what way. Voters participate by identifying all their own reactive issues seeing who can be more scared into action against threats real and imagined.

This reactive response also locks us into an understanding of the world through the filter of problem solving. Russell Ackoff (Ackoff 1978) has pointed out that getting away from what we don't want does not guarantee that we get what we *do* want. On one level all of us understands this. We know that if we back away from danger we might back into an even more dangerous situation. Still, everyday conversations are filled with the language of problem, problem recognition and problem solution. There are many things wrong with this dependence on problems as the frame of reference for determining actions and priorities in our collective lives. There is a problem with problems. Rather than solving that problem it is useful to engage in an entirely different approach to intentional change.

The term desiderata may be unfamiliar but it simply refers to those things that are desired and, as a consequence often treated as a need but not, which is an important distinction, as a basic need. Thus a desideratum is something that is evoked out of a want, a desire, a hope, a wish, a passion, an aspiration, an ambition, a quest, a call to, a hunger for, or will towards. Desiderata are not a response to the problem of an unfulfilled basic human need. The negative impulse towards action which arises out of such a felt need is completely different from the positive impulse born out of the desire to create situations, systems of organization or concrete artifacts which enable our becoming more fully developed in

all our promise as human beings. Rather than treating the source of these aspirations as needs it is helpful to refer to them as design intentions.

Desire can be understood as the "force" that provides us with intrinsic guidance and energy (Trainor, 2001). Desires constitute that which we long for. As humans we have to use our desires as a way to understand how we can fulfill our lives. But desires are not all good. To find out what we desire we have to name them and reflect upon them, and examine them. When we examine our desires we will find that we have to deal with both good as well as bad desires. In this process we have to accept both types. We have to discipline the negative desires and live the positive. To recognize and differentiate positive desires from negative is one of our lifelong tasks as humans. This has been called the process of "befriending our desires". When desires have become an accepted part of our lives they will or can also function as guidance, they will help us form our intentions.

As an example of a desiderata that functions as a guide, the desire for love is experienced differently depending on the particular design of inquiry and action we choose (see Fig. 5-2). In the real, love takes on the form of eros, love of the physical world. In the true, love is manifested as agape, as an abstracted form of love. And in the ideal, love is elevated to philo, i.e. unconditional love of the ultimate.

Designs of Inquiry & Action

Desideratum	the real	the true	the ideal
love	*eros*	*agape*	*philo*

Fig 5.2 Desiderata expressed in the design of inquiry

Intention from this perspective is seminal to design inquiry and action. In a philosopher's sense intentionality is much more than just intending. It means any way that the mind has of referring to objects and states of affairs in the world (Searle 1983). As Searle points out it is one of the two basic states of mind, consciousness and intentionality. Furthermore he

argues that intentionality is made up of two basic states, belief and desire. It is at this level of resolution within the very big idea of intentionality that the concept of design intention as an expression of desire or desiderata is developed.

One of the key concepts concerning intention arose in the philosophic discourse of the Middle Ages. Here the idea of 'aim', as in aiming an arrow, became central to the unfolding meaning of intention. In this sense intention is not the target, nor the purpose, nor an end state but is principally the *process of giving direction*. This distinction is an important one for design. It is the judgment of intention that makes the decision as to what strategy of inquiry and action will be utilized in any particular change situation.

Depending on what form of action is decided upon there are concomitant modes of inquiry associated with it. These systems of intention are often referred to as cultures of inquiry and action defined in terms of academic categories including design, science, art, the humanities, spirituality and technology (C.P. Snow, 1959). Although each culture can be inclusive of the others there is a distinct 'aim' for each which is directed tangentially to the others. Some of the traditions born from these cultures would include the familiar ones of creativity, innovation, research, management and problem solving. As in social cultures different combinations of traditions live within different cultures of intention.

The intentional approaches associated with design are seminal to the development and application of leadership. Leaders require many approaches and skills but one of the most important yet most undeveloped is design. Two seminal terms, character and vision, often define leadership. Vision and the need for vision today dominate almost any discussion of leadership. Leaders are expected to have or 'come up with' a vision around which followers can rally and towards which they can surge. Vision becomes something given, a solution to a problem. Strategic planning and similar methods for the management of change have grown out of the belief that vision and visionary leadership is a priori to any intentional change process.

Intention is better understood not as the vision but as the aiming and the emergence of a desired outcome (see Fig. 5-3). Starting in a situation ("ready"), desiderata helps to aim, to form the intention. The outcome is not there when the process begins. The outcome emerges based on the situation, desiderata and intention. This process is very different from many common understandings where action is seen as a consequence of a defined goal. The goal is not there to define action. In any intentional process we know that we easily can produce many "goal"-situation that would be closer to our desires than the present. But intention is not only about where to go but about how to get there – how to aim in the specific situation to move closer to our desires.

ready ⟶ **aim** ⟶ emergence
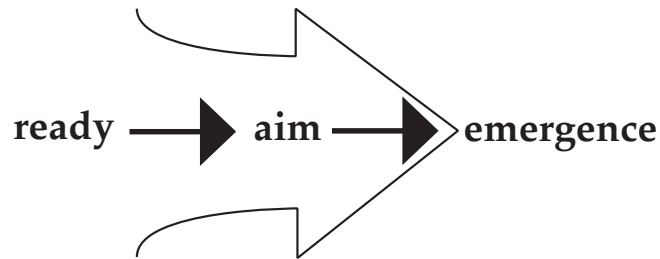
Fig. 5-3 Intention as aiming

Within the tradition of Zen a deep understanding of intention as a process of aiming has been developed. In the classic book "Zen in the Art of Archery" Herrigel (1953) portraits how the notion of aiming can be developed by careful attention and by letting go of many of our everyday assumptions on how to reach our goals in the most efficient way.

The process of aiming, of intention, can be further developed by adding a context that more fully creates a realistic complexity of intention and its relation to desires and outcome. In a design culture vision is an outcome of a process triggered from desiderata, framed and contained by appreciative judgment, animated by motivation and intensified through alignment (see Fig. 5-4). The design insight(s) that are revealed as a consequence emerge as an intense but unformed seed of wisdom known as a *'parti'*. Through the design team's energy and focus the parti is developed into an equivalent image from which vision is then formed.

Vision is the outcome of creative design based leadership, not the starting point.
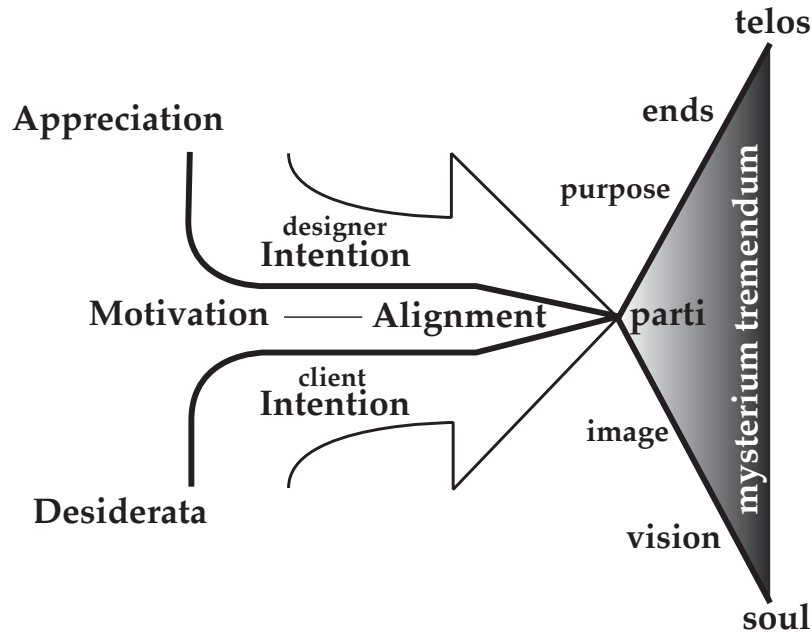
Fig. 5-4 Design Leadership Process: The Arrow of Time

This developmental process at the same time reveals an understanding of purpose in the particular case and in general as a representation of unfolding telos. In the same way that vision is an outcome of the intentional design approach, an understanding of purpose is an outcome as well. Neither begins as input.

The parti also becomes the initial starting point for the more traditionally understood design process that first develops concepts then implementation plans followed by the production and realization of the intended design with post implementation evaluation and redesign. In the redesign process improvement is achieved through a concrete reinterpretation of the parti. The majority of the design efforts by professional designers are actually in the realm of redesign in this context.

They do not as a rule begin with the trigger of desiderata but with a revisit to the accessible images generated from the original parti. If progress rather than improvement is desired however the process must be initiated with the client's expression of desiderata.

This in fact is a quintessential expression of leadership in the framework of design. Leaders are required to be many things but the essential character of a leader is that they are designers. Leadership is not defined as a role, as a profile of qualities of character, as a position in hierarchy but as *the consequence of an authentic engagement with the process of evoking vision from an initial expression of desiderata.*

Desiderata, as described above, are not the only initiating points triggering the design process. They are matched with an appreciative judgment of what is to be considered as real in any particular situation. An appreciative judgement is not a comprehensive description or explanation of what is real (Vickers 1995). Instead it is a judgment of what is to be treated as the essential and significant background or foreground of the design situation. It is within this context and against this environment that the design process unfolds. An appreciative judgment creates the frame for design inquiry and action as well as the container. Both providing the limits that are so necessary in any creative work (May 1975).

Motivation must be intrinsic in design but can be augmented by extrinsic influences as well. For the designers and others, including clients, the extrinsic motivators include such traditional rewards as money, acclaim and influence. Business literature abounds with means and methods of motivating people to be creative and innovative including both negative and positive feedback reinforcements. These seem however not to be the critical and lasting modes of motivation.

The intrinsic motivations for the design client spring from their desiderata. For the designer they spring from an empathy with the client's desiderata. But there are other motivations as well. Often designers speak of their responding to a call that cannot be ignored as if they are compelled by a necessity born into them to engage in designing [Hillman]. There is also the pull of what appears to be both a psychological and biochemical reward for engaging in a creative act that

results in a breakthrough insight. This process of coming to know through a design means is both biologically and spiritually reinforced.

Beneath these intrinsic motivators seems to reside the compelling sense of a quest for wholeness. Designers and clients seem to understand that by engaging in design they are expressing the god-like capacity to engage in the co-creation of the experienced world and what it means to be human. They are expressing the deeply embedded script which plays out the human potential to become more than they are in the present. This is the myth of Hephaestos being played out everyday in every corner of the world.

Alignment, as shown in the figure above, is a synthesis of both group process and team dynamics. Group process is necessary but insufficient. Group process is like tuning the operating systems of a plane. It is necessary that motors, control systems and operating skills are at their peak of efficiency. This state alone however does not get the plane off the ground and into the air on its way to its destination and back on the ground. This requires the plane to be animated by a flight team including flight plans, pilots, service personnel and a clear purpose for the flight. This is alignment of function and intention is true for the design process as well. The condition of alignment integrates the intentional behavior of the individual actors.

A design team, a purposeful social system, is made up of distinctly different human beings with their own distinct understandings and desires; a multi-minded system (Gharajedaghi 1999). The ability to create an alignment of these independently powerful and capable minds brings focus and magnifies potential within the design process. There are many ways in which a successful alignment can be described. A popular metaphor for this alignment is jazz improvisation. Other musical metaphors as well as metaphors based on team sports point to the same felt experience of unity in diversity. Participation in alignment has been characterized as the experience of 'flow' although this concept has application to individualized activity as an unselfconscious experience of empathy, timelessness and unity (Csikszentmihali 1990).

The capacities that become important to the designer becomes when "desiderata" is the focus and starting point of design is the ability to compose, imagine, and make good professional judgments. Engaging

with the desired, "that-which-is-not-yet", demands creativity and innovation, in order to manifest a world not yet seen (even the smallest design is part of that process). It also requires an understanding of the link between design intention and formal categories of cause in a design process.

So, why do we engage in design in the first place? We design because we desire to co-create the world. We design for survival, for pleasure, as an essential part of our self actualization and to be part of making something of lasting quality, to create things of 'real' significance, and to participate in 'the' creation. In the image of the lame god we design because we are not complete. In our quest for wholism and in the full understanding that our own creation is not yet complete, we have the capacity and urge to move always towards greater approximations of completeness. This is what motivates the best of leaders -- trying to fulfill the promise of wholeness from which we get meaning. We create meaning by design.

6. Interpretation and Measurement

Every design situation is unique and complex constituting an *ultimate particular*. For designers every design situation must be examined closely to be understood. To create introduce new designs into their real world there is a need to know the world that is already existing in a manner that makes meaningful design possible. Designers need to construct meaning out of the fundamental conditions constituting the real world within which they take design action and within which their new designs will reside.

In our modern society we can find a large number of approaches to inquiry that have been developed with the sole purpose of creating such understandings. For some the only way to reach a true understanding of reality is through the strict procedures of science. Others believe that there are intuitive approaches based on a trust of our innermost feelings and bodily sensations. Still others believe that the real can only be reached through the help of a higher power making reality visible only through spiritual experiences. Within all these approaches, no matter how different, we can find an activity best understood as *interpretation*.

Interpretation is a subjective process where the real in the world is explored thoroughly and examined closely with intention in order to understand its basic constitution. The real does not present itself to us in a form that is necessarily meaningful or easily understood. We are quickly overwhelmed by information about the immensity of the real and by its complexity. Information comes to us through direct sensory experiences, or as information we have gathered and collected, from a variety of secondary sources. The challenge is to make sense out of the information as received.

Typical approaches to discovering more about reality include instruments like surveys, scoping, statistical analysis, and direct measurement. Approaches like these are created to make reality accessible for measurement and categorization. Typically the idea is to consider only variables and scales that are unproblematic which still presents reality in forms that we can interpret making it possible to

understand and control. Other approaches that are more sophisticated with the capacity to reach deeper with greater clarity into the richness of reality include qualitative methods such as ethnography and context analysis approaches. Approaches of this kind do not use straightforward scales of measurement but rely on qualitative interpretations of more complex and rich information sources. All of these approaches are to be found as common tools in the scientific tradition. But even in the most objective truth focused approach there is a need for interpretation. In the tradition of science we can find different lines of reasoning when it comes to locating interpretation. Some researchers argue that we have to use methods that reveal the true core of reality without being colored by our subjectiveness. Others argue that any true understanding of reality can only be achieved by relying on our ability to accurately interpret reality. Our desire is to break down this polarity. We are interested in putting forward a wholistic approach to understanding the real world in design situations.

Interpretation is that part of the design process that serves the same purpose as evidence and proof does in science. Interpretation in design is part of the attempt to grasp the conditions and the context that will set the stage for our ideas and new designs. We need to know and understand the situation we are going to change. Design is not only about creating something new. It is about creating a whole by adding something new to something already in existence. A design is about the fit between the existing and the not-yet-existing. It is a composition. In a wholistic design approach everything is embedded in a context. In any design process designers have to be able to observe, describe and understand the context and environment of the design situation.

There are many ways of approaching the world in order to discern the preconditions for a design. Most of these approaches have quite narrow purposes. This means they can only focus on some limited aspect or property of reality. In attempting to interpret the full complexity and richness of reality we must approach it using a variety of restricted methods. If the design task is focused on creating a new organizational structure it is common to begin by trying to define the present structure in both formal and informal terms. We might choose to conduct interviews and surveys with the employees to see how they describe what is good

and what is bad about the existing structure. We might also study competitors, the market, financial trends, technological developments, etc. There is no end to the research that can be done and there is no limit on how much information and knowledge it is possible to create.

Traditional scientific approaches are essential to this process of understanding the design situation. The tradition of science has always been aimed at finding truth – i.e. understanding how things really are. Science has developed tools and methods with the purpose of studying existing reality and to describe it as careful and accurately as possible. In design these methods and tools are valuable since they help us to form a basic factual understanding of reality.

There is a symmetry between how *facts serves truth* and how *interpretation serves meaning*. As designers we are not foremost interested in facts serving truth, instead we are interested in creating the real. Since a designer does not have the obligation to create something that is only true it is not necessary to use methods primarily trusted or sanctioned in the name of truth. Rather a designer can use whatever approach provides the best possible understanding of reality from a design perspective. This does not mean that anything goes, or that any method or interpretation is as valid as any other. It means that the notion of validation and acceptance has a different quality in design.

In design it is important to recognize that design is intentional and therefore so must interpretation be intentional. It is intention that predisposes us in our judgment of facts and values. This means that interpretation can not be done without an understanding of a direction – without desiderata. Interpretation is an action where we observe and understand the world through our design desiderata. It is a means to discover if the world holds a valance for our designs. And if there is good fit between our chosen design and a specific situation.

Interpretation is not an activity for determining a solution by closely analyzing reality. It is not a search for the correct design hiding in the richness of reality. Instead interpretation is an act of judgment. Whenever something is chosen as data or a value it is an act of appreciative judgment. Whenever a part or aspect of reality is considered important enough to be analyzed a judgment is made. In design

interpreting reality can not be done without imposing judgment guided by intention.

This does not mean that an understanding of reality based on scientific methods is useless or misguided. Science and scientific methods provide useful and valuable information and knowledge about reality. Science helps a designer understand the basic conditions underlying reality, such as mechanisms governing natural processes and structures. Science also provides more general knowledge in the form of measures of basic conditions, statistics and frequencies. This type of general knowledge can help designers to make rational decisions and to make good judgments, but will not give specific advise in the case of the ultimate particular. Occasionally science, when based on qualitative approaches, presents reality in a more interpretive form. Such approaches however still have the basic scientific purpose of describing reality as factual accurate as possible, without the guidance of intention and desiderata that is at the core of design interpretation.

We want to bring science and judgment together in a way that is guided by intention and wholistic in its approach. But this is a difficult task since it is a move towards meaning. It is not an approach focused on deductive or inductive reasoning but on *meaning making*. As a designer you participate in creation of the real world. To do that, you need the world to make sense to you. To design is not to create things that make the world more fundamentally true. Instead through design the designer intends to create a meaningful world.

Aristotle acknowledged attempts to make meaning of complexity as a dilemma. Nussbaum shows how Aristotle argues that we have to accept a third type of choice and action other than the *quantitative approach* and the *guess* (Nussbaum, 1990). For Aristotle the third way is based on *qualitative judgment*.

Nussbaum argues that there are no reasons why we should be defensive assuming that the rhetoric of *measuring* is the only way to act if we want to be rational. For Aristotle it was not possible to reach a true understanding of the complexity of a situation by means of science only. It is this "practical wisdom" that lets us reach a sensitivity to important aspects of a concrete situation. It is an overall judgment, where we accept the contributions of each approach without the requirement of an overall

logical coherence. Aristotle argues against the idea that all aspects of a situation are comparable as equivalent. He makes a defense for *specific* judgment before the *universal* and a defense for feeling and fantasy as important aspects of a true rational judgment or choice (Nussbaum, 1990).

A complex design situation needs to be approached as a whole. We can measure and analyze a situation but any overall understanding and meaning can only be reached through design interpretation, as a form of qualitative judgment. As designers we make meaning from a situation as a whole including the systemic qualities that emerge from that whole.

When we enter into *design interpretation* we can distinguish between different acts of interpretation (see Fig. 6.1) with different purposes and outcomes.

purpose	outcome
explorative interpretation	finding meaning
generative interpretation	create possibilities of meaning
compositional interpretation	meaning of outcome emergent meaning created meaning

Fig. 6-1 Design Interpretation and Meaning

In any design situation it is important to find out as much as possible about existing conditions. It is possible to find an infinte amount of information concerning the present situation. It is possible to examine reality in ever greater detail or scope. As designers we cannot expect to be comprehensive, instead we must *find meaning* in the complexity and chaos that constitutes reality. This is an act of *exploration*. It means that the designer must, within a limited amount of time, find meaning in the way reality reveals itself to us. Finding meaning is a process of exploration since the infinite possibilities of where to look for information makes the whole process dependent not only on skills but on luck and

chance as well. To explore any real situation means to stay in relationship with purpose and desiderata. Meaning is never out there to be "found" external to the observer.

Another type of interpretation is when the intention is to *create possible meaning*. To conduct *generative interpretations* is a creative and intentional way to see where we can find possible meanings. It is a way to interpret the present in relation to the not-yet-existing. The way reality is interpreted makes it possible to produce an infinite number of possible new realities. This process is creative and generative and is always done in relation or contrast to the meaning produced in the explorative interpretation. The purpose of generative interpretation is to "experiment" with different interpretations of reality with the intention to create possible futures in relation to our intention and desiderata.

Instead of thinking of interpretation as a way to find the difference between that-which-is and a form of vision, in design it is more productive to think about this part of interpretation as a way to determine what constitutes the *context*. This is done with an understanding of context as the unchanged. In every design situation there are things that are not possible to change (environment) or that we do not want to change (context). The context forms a background to desiderata. Desiderata contrasts against the context. This is not the same as finding the difference between two states of reality. Rather we see desiderata as something contrasting with context as in a compositional relationship. We begin to compose a whole out of what already exist, the background, and what we desire to make come into existence. Design interpretation becomes compositional.

In the third type of interpretation the *meaning of outcome* of the design process is examined through the lens of a *compositional interpretation*. Building on the other two modes of interpretation the designer goes through a compositional process. The 'found meaning' and the 'possible meaning' are fused into an interpretation of a wholistic and systemic character.

Design interpretation is a way to find out where we are and if we can move in the desired direction in alignment with our intentions. To do this we need a background, a foundation, against which our interpretations are

interpreted. This foundation is not common knowledge or truth – instead it is *measurements of life*. Design is about creating aspects of the real world. It is, in the deepest possible sense, creative of our lives. We live in and by the designs we create, and we become who we are by design.

When we consider the worth of our lives we know that it is not simply measuring of a set of variables. Life is too individually rich and complex to be reduced to the sum of such measurements. Moving from standard scales of measurements requires a shift to the more appropriate *measurements of life*. Four measurements of life are *standard of life, quality of life, way of life* and *spirit of life*.

Of these four only standard of life relies primarily on traditional scales of measurements. The other three engage in interpretive meaning and value, and can only be applied by the use of intentional judgment. In design there is always room for traditional measurements in the process of interpretation, but it has a specific place and should not be considered to be the full answer in any situation.

For example, designing development policy in the nation of Indonesia that embraces hundreds of language groups and cultures, the standard of life measurement of calorie requirements for the average adult may be constant across the nation. However the source of those calories are a measurement of way of life so that fish, or corn or rice may be the preferred source for a staple food. The quality of life measures the taste and freshness of the food supply. The measure of spirit of life relates to the relationship of food to spiritual beliefs and practices. Taken together they provide a wholistic metric of the measured life. When only one or two measures are utilized the result is a pale and simplistic shadow of the full potential of design.

Since design is intentional it is always about meaning and value – where meaning is an outcome of *telos* (i.e. purpose). All design rests on a deeper belief about the meaning of life and of our actions in the world. Some of our beliefs become firm enough to stand on, which allows the next step in the design process to be taken. All design actions emanate or are 'sanctioned' by our basic beliefs. This means that our way of making meaning out of our reality is not only a way to understand our world it is also the basic foundation from which we build our new world. This is how interpretation and measurement of the world becomes intentional

and active. To a designer the world is always something to make meaning out of and also an opportunity for change in relation to our desiderata.

Belief, meaning and telos hint at a deeper understanding of the guarantor of design. At this point it is obvious that design interpretation has to do with our innermost and deepest beliefs on what our role as a designer is, what are we are 'allowed' to do, and who or what guarantees the expected outcomes of our design actions. Interpretation and measurement of the world is at the core of design activity. It makes us realize that all our creative and intentional designs have to fit into an already existing world. It also makes us appreciate that each new design, each addition, each change, actually changes the whole. Every designer is part of the 'big' design – every design contributes to the whole.

7. Imagination and Communication

Design is about bringing things into the world. It is about creating the not-yet-existing. One of the mysteries in design is where this *not-yet-existing* image comes from. In earlier chapters we presented the ideas of desiderata and intention. Our desires form the platform for our intentions. There are processes that have to be in place for this to happen.

As we discussed earlier, description and explanation do not prescribe what actions ought to be taken in any design situation, what solutions are best for any perceived design problem or what creative insight should be implemented. The most careful scientist using the most accurate instruments, calibrated to the closest tolerances cannot observe what, by definition, proceeds from human imagination as an outcome of intentionality and purpose (*telos*). The reasoning and logic of accurate description and explanation are not the same as the logic and reasoning used to determine what is desired to be in existence that is not already found in existence. The rules and principles of observation and description cannot transcend their own context and become an epistemological link to other frames of reference and designs of inquiry that may have their own rational structure or internal logic.

Prediction and control do not justify using any means towards any ends for the same reason. The deontic term *ought* is not equivalent to the instrumental term *can*. If something ought to be done in a certain way for a certain outcome it is not justifiable only because it can be done. For example, technology in the Western world often falls into the trap of assuming that something ought to be done because it can be done. The assumed link is typically lifted from a frame of reference of an economy where money as the measure of value and economic return on investment stands in for any deeper ontological aspiration. If not economic, the link is aesthetic; it is done because it is pleasing to make something that is "cool" in the vernacular of the high tech world. New designs does not come from what "ought" or what "can" be done, instead they come from desiderata and intention.

One of the processes most people first think of when design is mentioned is creativity. To design is to create, but to bring something into the world includes much more than pure creativity. It is a long process with two major ingredients: *imagination* and *communication.*

To create means that the designer must have the ability to *imagine*. Imagination is one of the fundamentals in design. It is demanded in all fields of design whatever the situational demands are on the designer. Even in a very restricted design situation, maybe even similar to many previous ones the designer has met, imagination is needed to create the composition for the specific situation. The ultimate particular design must be created by imaginative thinking. It can never be fully imitated or copied. It must in every situation be imagined and invented.

Imagination is not only needed to come up with the not-yet-existing but also in the process of interpretation. To imagine what parts, variables and aspects of reality are important in a specific design situation is a skill truly necessary in all design work. Architecture, organizational design, curriculum design, urban planning, information systems design, industrial design, social systems design, all demand a creative designer able to conceptualize ideas and to give form to these ideas in a way that makes them communicable and comprehensible to everybody involved in the design process.

The ability of giving form to an idea can with a concept borrowed from Kant, be described as the *formative faculty* of the designer (Makkreel 1990). Kant was in his thinking on the formative faculty strongly influenced by his contemporary colleagues, but he broadened the scope of the concept to a whole range of *imaginative skills*. Kant shows the importance to recognize formative skills focused on, at least, two different categories of objects: *given* objects and *non-given* objects.

In design there is always a need of formative skills concerning both these categories but they are unfortunately not always regarded as equally important. The formative skill for given objects is far more emphasized, i.e. the skill to make a good representation (image) of something already existing. This might lead to a situation where designers are not sufficiently skilled in the art of making non-given objects (i.e. new design ideas) visible, communicable and understandable. The formative

faculty for non-given objects has to be recognized as an important skill in all design fields.

The nature of formative powers or imagination has always been part the philosophical debate even if it seldom has been acknowledged as a major question for philosophers. The idea of imagining has not always been emphasized in traditional disciplines. Since science has as its major purpose to create new knowledge about reality, there has not been the same kind of interest concerning how to change reality through the process of imagining and inventing new realities. Formative actions is about the invention of new things— of a new world. It is about things only existing in the mind and the imagination of a designer and a client.

Kant also mentions other modes of formative faculties that spans from direct sense based formations to completely imaginative formations. They could be said to reflect their relative degree of dependence of the material world. For Kant the imaginative formation "does not have its cause in real representation but arises from an activity of the soul" (Makkreel 1990).

Kant also makes another distinction between formative powers, a distinction based on a temporal relation. He talks about direct image formation (which is about the present), reproductive image formation (which is about the past) and anticipatory image formation (which is about the future) (Makkreel 1990). Design is an act of anticipatory image formation. It is an act where we have to imagining the future, the not-yet-existing.

To Kant it was also obvious that all three modes of formation where dependent on *imagination*. Imagination is needed not only when we want to imagine the future but also to make a description of the present situation. A situation can not be described as it appears. Every description is based on a choice on what aspects of the situation are important enough to bring forward. This kind of decision can only be made based on good imaginative skills. The outcome of the decision must be imagined and valued related to some purpose and intention. Based on this we might conclude that no matter what kind of formative actions we are engaged in, imagination is always at the core of that activity, and also that there are no such thing as a straightforward "depiction" or an "direct image formation" without any involvement of imagination and judgment.

Imagination slowly emerges as the foundation of all kinds of formative activities. Imagination also becomes a basic skill underlying other design fundamentals such as interpretation, composition and judgment. The ability to imagine is in every step of the design process a necessary skill.

A designer relies always on the formative skill to bring ideas and visions into something possible to share with other people – to transform non-given objects into given objects. Imagination is therefore something different from creativity. Creativity is about the spark that lights an idea. Imagination is about giving form to an idea. Imagination is therefore more of a skill than can be practiced and trained. To have the skill to imagine how a new design might look like, feel, fit in the present situation, act and behave is at the core of what it means to be a good designer.

In this chapter we make the case for a particular type of design process that is facilitated by a *method of design communication* that fits the intention and character of design and best serves the variety of people involved in the process including clients as well as designers. It honors the richness and complexity of thought processes that are dependent on both solitude and collaboration, that honor individual strengths and group synergy and that can be managed to expect the unexpected outcome in alignment with the client's desiderata.

This type of inquiry is a matter of imagining and creating that-which-does-not-yet-exist but which we desire to be in existence in service of our humanity. It is about the significance of human intention and purpose in the creation of the real world. Humans have an immense capacity for power with which to cause things to come into existence for good or ill which then becomes the reality of our experienced world.

The power to communicate and enact concepts about that-which-is-not-yet is essential in this process of creativity and imagination. It is an essentially different process from the process of inductive or deductive reasoning and communication used in the realm of description and explanation. This process, a nonlinear dynamic process, grows out of the systemic relationships among individuals engaged in the design process. They are individuals in different roles that bring different skills,

perspectives and authority to the intentional process of taking actions, which causes new forms to come into existence where none existed before.

These relationships include the communication of desire, purpose and imagination. It includes the communication of ideas that are by necessity diverse; unique in nature, in quality, intent and content. It includes the communication of individual perspectives, the communication of trust and common intent, the communication of common understanding, the communication of uncommon understanding and communication of information necessary for collective action.

In order to facilitate the use of design imagination in the process of serving human intention and design judgment there is a need for a special type of communication which has utility both intrapersonally and interpersonally. The utilization of prose, spoken or written, is necessary but not sufficient in this design communication. Visual communication is equally important but still insufficient. All of the senses contribute to the work of imagination but the imagination resides in the realm of non-sense as well. Design communication therefore is dependent on both sense and non-sense as the media of the design messages and with content formed from material in addition to prose, symbols, and other visual images.

The development of communication modalities like (formal) *dialogue* processes or *visual literacy* are important aides in the design process of making the conceptual concrete. As powerful as these methods are, they are insufficient alone in the service of design imagination.

Dialogue, as formally developed, is a very effective and collaborative communication method. It is a process for gaining common understanding and common meaning (grk: *dia-logos*; meaning through words). This method is therefore useful whenever members in a design team or group need to reach a common understanding of the present or a future situation, but these dialogues are not designed to reach into the depth of imagination and create new ideas.

Visual literacy and cognitive art use symbols, graphs, sketches, signs and other types of concrete images to convey common meaning through the eye's cognitive capacity. In addition, music and other non visual types of communication appeal to all natural senses, helping to form shared understandings in diverse and divergent ways. But shared

understanding is just a part of the requisite communication needs of design.

The requisite communication process in support of design needs to convey comprehension, meaning and value of that-which-is-not-yet. This can be done through the utilization of *diathenic graphologue;* letting a thing be seen through its image (grk: *dia-theno;* to show through, let a thing be seen through and *grapho*; representation). One way to begin to understand the complexity and richness of *diathenic graphologue*, the communication of design imagination, is through a process of communication that is used in design activity involving clients and designers working on a specific design project.

The design process, as defined by communication activities, unfolds through four different of stages. The first two, *introduction* and *conversation*, are sequential followed by cyclic iterations of the next two, *dialogue* and *diathenic graphologue* which after an adequate conceptual design is established is then followed by the last phase which is the *making* of the conceptual into the concrete. Of course real projects are not this clearly delineated by step and phase yet the process remains true in spirit to the idea behind design communication.
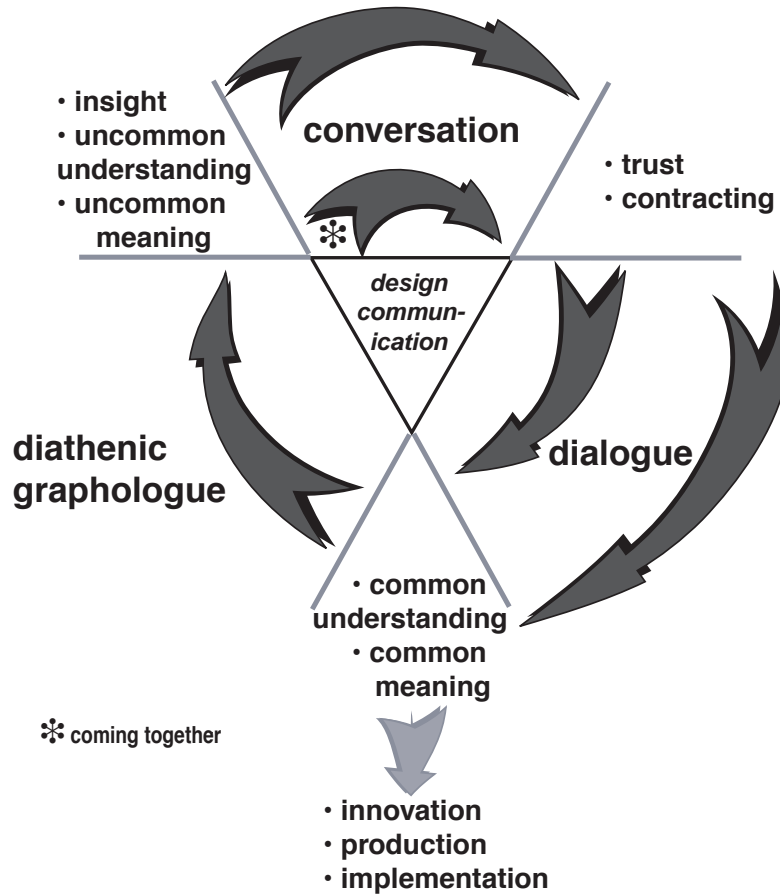
Fig. 7-1 Design Communication

Although the arrow of time flows through these stages in sequence the sequence is not necessarily linear. The *introduction* stage reflects the obvious need for initiation of contact with the 'other'; the potential design clients. The contact can be a face-to-face connection or can be a connection through empathy with clients who can never be in a face-to-face situation (vis. future generations) or who cannot represent their own interests to the fullest extent (vis. children). It may even be a client of more intimate dimensions than face-to-face such as when the designers

are their own clients or when they are acting as surrogate clients. It can to a lesser extent be the customer whose identified or provoked needs are represented by governmental or corporate providers.

The second phase of design communication begins with the triggering of the designing imagination within each individual designer evoked by the communicated (explicitly or implicitly) needs and desires of the clients. The ability to convey and listen to the other is at its best when the exchange is heard as in a *conspiracy* (i.e. breathing together) of *conversation*. To have a conversation is to explore the other and to find relations and connections that can serve as starting points for contracts and fuller relationships. This is a very sensitive process where the possibilities for emerging contracts and relationships must be carefully developed. Time and ability to slowly go from a first contact to a full conversation is the entry to a good designer/client relationship.

The conversation phase is followed by the third phase of *dialogue*. With the dialogue there is a move towards a shared understanding and expression motivated by the desire and intention of the specific situation. This phase of the process is essentially the creation of a common understanding among those within the process. It is not a process of identifying a truth that has been carried in from the outside by a participant, it is not a give and take process of compromise where pieces and parts are either accepted or rejected as part of the common ground. It is a coming to a common understanding together given the ultimate particular context of people, time, place and resources. A dialogue can be designed in many different ways. It is important that the way the dialogue is set up is in resonance with the involved people and the specifics of the situation. To reach a common understanding does not mean that everybody has to have the same understanding of the situation, it only means that everybody understands each other's understanding.

When common understanding is reach there is time for *uncommon understanding*. The not-yet-existing can not come from an understanding of the present, it has to come from imagination. Diathenic graphologue (letting a thing be seen through its image), the fourth stage, involves transporting newly formed seminal images from the depth of their creation, connecting with feelings and emotions along the way, receiving detail from the color and texture of history and character imprinted on the

way out of the designer's mind into the world of the senses. This way it will be more fully formed and synthesized in collaboration with other designer's imaginations.

These matured images are encoded in communicative artifacts using means like cognitive art which are intended to evoke the experiences legislated by the images allowing clients and others to feel, imagine or be moved by the sublime quality of the ordering principles of these images which embody the clients' unexpected expectations. The unexpected or uncommon becomes the common when the imagined becomes a shared experience with common meaning among designers, clients, decision makers, stake holders, surrogate clients, and others with logical or moral connections.

Design communication becomes cyclic at this point moving from the process of gaining uncommon understanding to transformation into common understanding and again into uncommon understanding and back again as many times as there is time and need and until the adequate is reached. At a point of adequate common understanding wrought from uncommon images the process transitions into one of making the imagined a concrete part of the real world serving the clients intentions and needs. The artifact then takes on its own life history, contributing both intended and unintended outcomes to the lives within the sphere of influence.

A designers formative powers are needed both in the process of coming up with the unexpected idea and giving form to that idea so it can be communicated. Imagination and communication are so closely related in design that they are almost nothing worth without the other. Creativity and imagination isolated are not of any value in a real design situation. Good designs must be communicated. And to be possible to be communicated they must be given form.

Imagination is not only needed as a way to create the unexpected but also in the process of interpreting the present, the clients needs and desires, future demands and possibilities. Imagination is the reflective skill we use to explore and analyze the overwhelming number of ideas that are possible in every design situation. By imagination we can visualize future compositions and explore the consequences of bringing a particular into existence.

8. Judgment

Judgment is a key dimension in the process of design. The ability to make design judgments is what distinguishes a designer as a designer. The ability to make good judgments distinguishes good design. It is the capacity to make good designs that makes designers valuable to society. It is the ability to make good judgments that makes designers and leaders one and the same. Judgment is the heart of wisdom in all of its manifestations. Judgment is the means and wisdom is the outcome. Wisdom can be defined as good judgment which enables right action and appropriate production.

> What one acquires here is not a technique; one learns correct
> judgments. There are also rules, but they do not form a
> system, and only experienced people can apply them right.
> Unlike calculating-rules. (Ludwig Wittgenstein,
> Philosophical Investigations, II.xi)

Judgment is as distinct from rational decision making as it is from intuition. Judgment has practical, pragmatic value and academic legitimacy without it being codified, generalized and routinized as science demand on behalf of reason. Judgment capacity can be learned and applied in design through intentional concentration without destroying its essence and value in the way that intellectual attention is feared by artists on behalf of intuition. The ability to make good judgments is as essential in design as it is in business, law, medicine, politics, art, or any other profession although it is not well understood, and seldom part of formal education and unevenly applied in practice. A lack of understanding and appreciation of judgment is not only revealed by its absence in curriculums and professional discourse, but by the negative connotations most commonly used in everyday conversations.

Judgment can best be understood in relationship to knowledge, knowing and the knower. Judgment is knowing based on knowledge that is inseparable from the knower. This is in contrast to decisions that are made based on knowledge that can be, and is of value primarily because it

is, separable from the knower. Judgement is based on accessing knowledge generated in the particularity of a situation, knowledge that is inseparable from the knower and is only revealed through the actions of the knower.

Judgment knowledge cannot be stored in libraries or databases, be replicated by colleagues in controlled experiments, be memorized or accumulated in a field of expertise. Judgment knowledge has instrumental value only for a particular situation and looses its relevance in the next setting. Separable knowledge deals in the universal or generalizable while the inseparable knowing of judgment deals with particulars and ultimate particulars. One can learn to make better judgments for action but cannot learn a priori the kind of knowledge necessary for particular judgements in the moment. Skills and competencies, which are forms of judgment, can be practiced and mastered in support of future actions taken from judgments in particular situations but should not be confused as knowledge for judgment itself. Scientific knowledge, the ultimate separable knowledge, play a necessary supporting role in good judgment making but is very different in character and kind from the knowing embedded in the agency of judgment.

Knowledge that is separable is part of a continuum of knowing that moves from data to information to knowledge. There is no similar continuum in judgment knowledge but there is a connection to what has traditionally been considered wisdom. A similar connection cannot be made with the continuum of separable knowledge but, wise action has been considered directly or indirectly as evidence of wisdom with the source of wise action being good judgment.

In this chapter we will examine judgment and especially design judgment. We argue that a better understanding of judgment and its different types is needed if we intentionally want to improve our design ability. Judgment can not be separated from the designer, but the designer can reflect upon judgment and approach it as an important ingredient in the wisdom of design.

Many day to day conversations are full of comments that are indicative of the distrust, dislike and repulsion felt about judgment: "don't judge me", "don't be judgmental", "That's only your judgment". Judgment is often put into the same company as opinion or conviction (as in

'nothing but ...') which, since Socrates, has not been considered knowledge in the Western tradition and thus not a candidate for wisdom; the necessary condition for right action. Paradoxically someone can receive the advice to "trust your own judgment" when others want some demonstration of personal accountability.

In a less personally hostile form, judgment is seen as detrimental to creativity. Students of creativity are always being admonished to suppress their judgment, to hold it in abeyance to allow the free flow of ideas to emerge without the voice of judgment killing them off with the violence of censorship. Creativity and innovation are often proffered as the polar opposites of judgment. In reality, judgment well managed, is a necessary component in the synthesis of creativity and innovation. Without judgment creativity is diffuse and innovation rootless.

Where judgment is acceptable in day to day settings it is in arenas of life that traditionally require judgment calls to be made. Competitions often require show judges to pick the most beautiful or well formed while competitions require umpires to make decisions on what is fair play, what is worth a game penalty or whether a specific behavior is good sportsmanship or not. Judgment takes on its most serious acceptable role in the realm of law. Judges are by role definition expected to make considered judgments based on their own experience and understanding of the qualitative as well as quantitative truth of a concrete particular situation as compared to an idealized code of law.

Of course the judgment which has concerned individuals for millennia and continues to concern many in today's world is the final judgment of an individual's life in anticipation of the inevitable end of worldly existence and the beginning of eternity. The anxiety and fear of this form of final judgment filters into attitudes towards more corporeal forms of judgment. In relationship to this kind of ultimate authority and power over the measure of an individual's worth is the rejection of judgment as a manifestation of dominance over minority or victimized populations throughout history.

The interesting point despite all of this is that in day to day activity people engage in judgment all of the time; it is common as dirt. In fact nothing would get done without judgments being made all of the time by all people. It is not just common sense or demonstrated skill or "salt-

of-the earth" wisdom. It is part and parcel of the processes of coming up with new things which are needed or desired and which are given a concrete reality in the play of human life by people everywhere everyday. They create their cultures, their realities, that which will be remembered as their history; their very existence and being.

'Real' life is complex, dynamic and uncertain. Truth is difficult enough to know even with the best science but 'reality', the domain of human experience, can be overwhelming, beyond comprehension or understanding. Careful, accurate description concomitant with clear explanation is necessary but not sufficient in the quest for enough understanding to allow wise decisions to be made.

Without the capacity to authentically utilize judgment, there is often the emergence of the situation commonly referred to as paralysis of analysis and the ever more common companion, value paralysis. These two types of paralysis results from the commonly hold assumption that decisions should be based on a comprehensive understanding of the specific situation and that this comprehensive understanding with rational logic will lead to the "correct" solution. It is also assumed that this approach does lead to results not influenced by any personal preferences - i.e. a kind of objective and unbiased process. Approaches like this will, due to its ambition of being comprehensive, lead to oversimplifications. There is a danger in not accepting the full richness of reality.

The value of judgment is that it allows individuals to overcome their paralysis and engage with the messy complexity of life in a way that, when done well, can bring function, beauty, and meaning to human existence.

Formal, rational decision making processes are often held up as the standards to be used by businesses, by government, by institutions and foundations, by communities of interest, or even by individuals when engaging with issues of dynamic, messy, complexity. Decision making based on rational analysis actually creates more choices or more options, thus divergence, than convergence in the form of focused outcomes even when there are resources and time enough to allow a comprehensive process to unfold. Judgment on the other hand is to the point. It brings diversity and divergence into focus; that is it brings form and meaning to messy real world situations. Best of all it is "on time" or "in time".

We claim that judgment is a common and basic human activity. Still there is not one single kind of judgment. Reality presents itself to us in its full richness in ways that has more or less forced us to develop different kinds of judgment. In any complex situation with a particular purpose and with a need to make decisions and take actions we rely on various kinds of judgments, including: intellectual judgment, practical judgment (i.e. ethical), systems judgment, professional judgment, and design judgment.

These various kinds of judgment relate to specific aspects of our experience of reality. People "use" these judgments to deal with problems, questions, and challenges. Nowhere can we find any of these kinds of judgment in their pure form. In whatever way we engage with reality we rely on all kinds of judgment. Even if to some degree there is an overlap we find it rewarding to focus more on one of them: the design judgment.

Design judgment holds many things in common with the other categories of judgment but the outcome or end is distinct because it deals with volition or desiderata. Design judgment facilitates the ability to create that-which-is-not-yet. It is a kind of judgment related to creative and innovative processes. It is concerned with the *compositional whole of the imagined design*. When well executed it can create beauty and evoke the sublime.

Design judgment is essentially non-metric decision or understanding. That is, it does not rely on a science of measurement to determine an objective or subjective outcome in its deliberation. Design judgment is the ability to gain or project insight, through experience and reflection, into situations which are complex, indeterminate, indefinable and paradoxical resulting in the recognition of meaning and value through relationships of unity, form, pattern and composition. Judgment is a process of taking in the whole in order to formulate a whole. The outcome of judgment is the unexpected which yet fits congruently, with integrity, the driving intention behind the process in the first place. The operational outcome of any judgment is dependent on the nature of the intention. Intellectual judgment may lead to an understanding of a general principle while a design judgment leads to a concrete particular understanding within a contextual setting.

In the examination of *design judgment* we have found it necessary to distinguish between several types of judgment. The reason for this is that the complexity of design is such that a too simple definition of design judgment will seem both insufficiently rich but also not possible to relate to the different kinds of experiences met in design practice. For instance, as a designer we face situations where we have to make an overall judgment on the quality of a specific material used in the design and sometimes we have to judge how the chosen parts of the design fit together as a whole – as a composition. These two situations are not only different in their focus of attention, they also reveal how different the act of making a judgment can be and how our skills and knowledge underlying a judgment may differ.

We do not claim that the types of judgment presented below are the only possible ones and we are careful to recognize that we only talk about *design judgment* – this is not a discursive generalized theory of judgment. Also this not an attempt to define design judgment as residing in the realm of the true, instead this is a designed concept in the realm of the real. It is an attempt to design an image of design judgment that will be practical and that might help designers and non-designers to better understand how designing works and to gain or improve their capabilities and skills as designers.

Reflecting on design judgment we can initially distinguish between *client* judgments and *designer* judgments. We can also divide design judgment into a *conscious* or *unconscious act*. In the figures below this is visualized as being inside or outside the circle – inside symbolizes unconscious judgments and the outside of the circle represents conscious judgments.

Before we explore the designer judgments we will briefly discuss the client judgments. A client has first of all to make the judgment of intention. To a client it is always possible to choose or not to choose design as a way to *approach* a situation (see Fig. 8-1). The client can make the judgment that design is not the appropriate approach and instead choose problem-solving or a scientific approach or maybe choose a management or spiritual approach. Design is in every situation only one out of many options. And of course design is not always the right option. If a client needs a process that will lead to a guaranteed and predictable

result of some kind, design is not appropriate since it is about creating the not-yet-existing which by definition is always a risky business. This judgment, if made in favor of design, marks the entry into a design project and is made by the client.
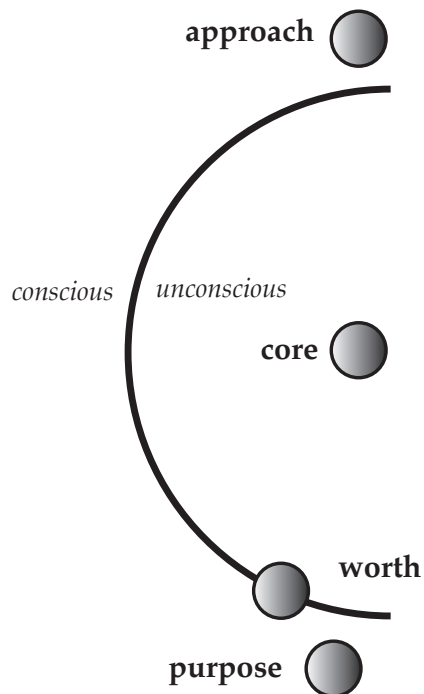
Fig. 8-1 Client Judgments

Once within the design process the client must make a *judgment of purpose*. It is the client that has to make the overall judgment concerned with the purpose of engaging in a design process. This does not mean that the client necessarily will decide what has to be the outcome of the design. By this judgment the client will set the stage for the design process and also provide the designer or the design team with a first approximate direction for their energy, thoughts and actions.

In the design process the client is also responsible for making the judgments of *worth/value.* A designer can never make that judgment on behalf of a client. A designer can suggest and maybe try to influence or educate a client to appreciate certain qualities and certain design consequences, but the final judgment of the worth and value of a design is in the hands of the client.

These client judgments ought to affect the designers judgment on whether or not to serve the client in the first place. The making of these seminal judgments by the client creates restrictions and limitations in the space of possible actions for the designer and creates accountability and responsibility for the designer concerning systemic effects of the judgments. There is never such a clear demarcation however because of the mutual influence and education clients and designers have on one another. This means that the judgments of the designer have an impact on the clients' realm of judgment. These judgments are modified and refined throughout the design process by the cross-catalytic effect judgments being made in the different domains or responsibility.

The client does not only provide an entry point into the design process. The client plays an ongoing role throughout the design process by having the responsibility for the judgments described above. Design judgments are never made once and for all. New ideas, creative changes, changed preconditions, and increased understanding and knowledge all change the context for the judgments made. Judgment in design is fully dynamic and dialectic between conscious and unconscious judgments and between client and designer judgments.

Designers are expected to make a lot of judgments and are held accountable for the consequences of each. But these judgments are not all of the same type. Depending on which category of judgment the designer is being engaged in, different strategies and tactics are required. Depending on judgment type there is also a demand for a different commitment of time and energy.

The entry point or gateway for a designer into a design process is marked by an altruistic judgment or judgment of whom to serve - the judgment of *service* (see Fig. 8-2). Once this judgment is in place with all its concomitant relationship building, contracting and related activities a design project can be initiated. Within a project we divide designer

judgments into ten different types. These ten types can be closely defined, but here we will only briefly portray them. Our purpose is to make the case that a better understanding of design judgments is fundamental to a further development a designers knowledge and skill. In the same way as the client has responsibility and accountability for client judgments (approach, purpose and worth) the designer has full responsibility and accountability for the ten presented here.
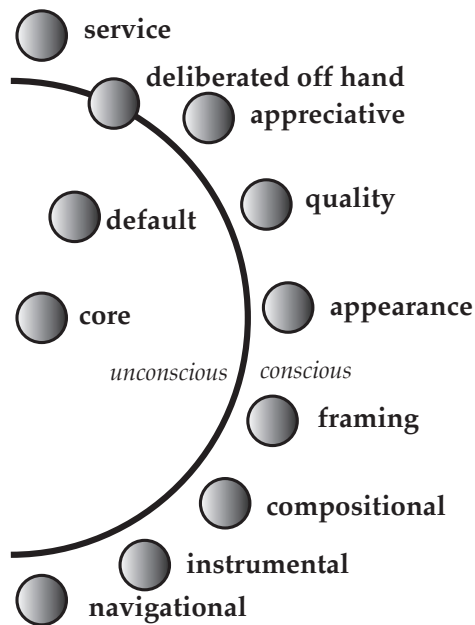
Fig. 8-2 Designer Judgments

Off hand or *default judgments* are judgments made without deliberation with an almost automatic response to a triggering situation. In some ways default judgments resemble instincts in the way that decisions are made and actions taken. The difference is that default judgments can be introduced where they did not previously exist, they can be modified and refined or replaced by new ones entirely. These judgments are expressed as bodily knowing enabled through kinesthetic intelligence. In the craft tradition they are an artless art. Action is taken without recipe, formulas or deliberation. A designer encounters often situations where default

judgment is used. It is usually seen as a sign of experience when a designer can make good default judgments in pressing situations.

Default judgments are accessible through the process of *deliberated off hand judgments*. The obvious example is learning how to ride a bicycle. As many of us remember this begins with full attention and deliberation until the judgments of balance become second nature without need for further conscious attention. This then becomes known as having possession of a skill. An example of the need to excavate and modify off hand judgments by making them susceptible to deliberation is learning to drive on the left hand side of the road after learning initially how to drive on the right hand side. Every unconscious move must be surfaced, inspected and modified often in an environment of extreme complexity with overwhelming sense data barraging the driver. After some period of time driving, decisions can once again recede into the unconscious realm of off hand judgment calls. All skills are developed in this way; in sports, martial arts and manual labor.

An *appreciative judgment* is made by determining if a particular outcome of judgment is something that is preferred because it is 'liked' as a personal preference and 'looks' attractive or 'feels' preferable due to a sense of familiarity, comfort or membership in a larger context of similar actions or things. Thus this is a kind of informed judgment but not guided by a literal matching of attributes on a one to one basis as in the case of scientific correspondence used to create rational taxonomies. This type of judgment is grounded in a sense of certainty that comes from a strong sense of self-assurance coming from membership or leadership in a collective which exhibits desirable qualities by consensus.

Appearance and *quality judgments* seem related but there is a significant difference between them. Appearance is usually associated with taste. In taste there is a presumption that desired attributes are recognizable in an identified collection of concrete particular examples and the challenge of judgment is to determine that there is enough similarity between the proposed and the existing. Most designers know what is "in style" in there specific field of design. Style changes over time, sometimes fast and dramatically. It takes a lot of work to stay in touch with style.

Quality judgments however do not have this external template to look to. Judgment of quality is made within the confines of the concept itself without reference to similar or like examples. Concepts like craftsmanship or workmanship points to the understanding of the unique in contrast to the mass produced and to the quest for excellence in the creation of things of beauty, sublimity and practicality. Quality judgment relates also to the complex relationship between the designers personal preferences, the desiderata of the client, the richness of the situation. Quality judgment has a strong relation to the ultimate particular.

Instrumental judgments are the basis for the artless art that highly skilled craftsmen and women speak about in reference to their interaction with the material and the tools of their trade. Instrumental judgment deals with the choice and mediation of means within the context of prescribed ends. It is the process of mediation that considers not only technique and instruments but proportion and gauge as well. This is the form of judgment that can be considered judgment as technology. Just as justice and mercy must be mediated in the crafting of a just society any crafting requires a form of judgment that melds absolutes into the realm of reality.

The ability to make the right choices in an environment that is changing, complex and unpredictable is the ability to make *navigational judgments*. The outcome of this type of judgment is based on the ends to be found in the moment. At the basic level this is survival. At another level it is the ability to gain advantage in the moment. At the highest level it is making choices in the moment which will contribute to a larger social good that is not predetermined and accessible in the moment. This type of judgment is an important one also in other categories of judgment other than in design. For instance this type of judgment is important to managers and as a consequence in schools of management this skill is learned through the methodology of case studies which provides the student with virtual experiences of navigational judgments made in concrete particular business settings. In the same way novels and storytelling provide larger more complex case studies with relevance beyond institutional or organizational boundary

> The experienced navigator will sense when to follow the rule
> book and when to leave it aside. The "right rule" in such
> matters is simply: do it the way an experienced navigator

would do it. There is no safe guarantee at all, no formula, and
no shortcut. And yet this absence of formula does not mean
that we have laissez-faire, or that any choice one makes is all
right. There are many ways of wrecking a ship in a storm,
and very few ways of sailing it well.
Martha C. Nussbaum, Love's knowledge; Essays on
Philosophy and Literature

Framing judgment is one of the key enabling forms of judgment on the
palette of design judgments. This judgment is at the very heart of the
deliberation in determining the adequate. It is done by defining and
embracing the space of potential design outcomes, by defining the limits
which contain the heat of creativity and by determining what is to be
considered in the design process and what lies beyond consideration.
Framing judgment can illicit the most anxiety because it is the most
divergent from beliefs in the comprehensive or complete understanding; a
form of wholism with great intuitive appeal but not the singular
importance to design judgment that is imagined from an absolutist
perspective. Framing is what is needed in the early phase of design. When
the designer faces the full complexity of a real design situation, with all
the demands from the client, with the feeling of having to little resources
and time, and maybe also with a feeling of not having enough information
and knowledge - anxiety enters. Still, as a designer you have to act. You
have to start the design process by setting the stage, by framing the
situation. This means you will find yourself intentionally deciding to
ignore some aspects and focus on other. In the same way as a
photographer chooses what will be on the photo and what will be left out
- the designer makes his framing judgments. To an inexperienced
designer this is maybe the most difficult judgment to make. Before it is
made all possibilities are still open while after the judgment is made the
design process is limited - it is a judgment of great importance. To an
experienced designer this is at the same time maybe one of the most
rewarding stages in a design process, it is a judgment that reveals the
skills and knowledge of a good designer.

The signature judgment type among the different manifestations
of design judgment is *compositional judgment.* This type of judgment is
inclusive of aesthetic, ethical and rational considerations because it is at
the center of the creative process where relationships are created among a

palette of elements with an eye towards calling forth a compositional whole which displays qualities and attributes particular to the unique character of the ultimate particular that serves the design intention most adequately. The compositional whole is formed with the aid of the guiding domains of aesthetics, ethics and reason but not in the mode of analysis. The difference cannot be understated. Unlike the famous example of blind men describing an elephant while touching different parts of the whole elephant the point is to not to create a synthesis of different perspectives. The point is that there is no elephant, there is nothing yet.

Core judgments are buried deep within each individual without the same level of ease of access as off hand judgments. Core judgments make themselves known when one is being pushed by 'why' questions. At some point the process of deliberation stops because it is at this point and beyond where meaning and value are fixed. Fixed not in the sense of the biology of instinct but in the sense that creating, modifying or rejecting these judgments take a great deal of effort in both time and intensity (Collingwood, ####). We all know the uneasy feeling when we are challenged at a level that we recognize as "who I am". We lose our ability to argue in a rational and logic way. We might even react like children when we cannot find the argument but still feels deeply that we know what is right.

     For example core judgments seem to be accessible through at least four channels: character or 'genius', life experience, creative experience and experience of the sublime.

creative experience   experiene of sublime

**core
judgment**

life experience   inborn character
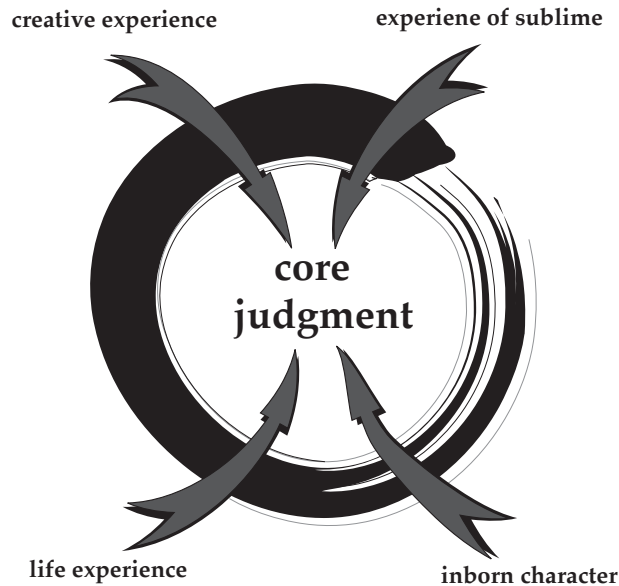
Fig. 8-3 Dimensions of Core Judgment

Inborn character is the concrete particular identity which comes into the world with us as the promise waiting for fulfillment (Hillman 1996). Core judgments seem to respond to choices that either contribute to this fulfillment or detract from it. Secondly core judgments are a composite of meanings and values formed in the *experiences of living*. These are not the product of reflection or deliberation but are embodied as lived experience. As life is experienced anew, the influences of old experiences are modified and new meaning and values are infused into the core. Thirdly the experience of the *creative* process resulting in a deep insight of consequence (i.e. not just a matter of cleverness or cunning) results in the creation of new meaning and value by definition. This new understanding becomes a part of the datum of the core. Finally an *experience of the sublime* (i.e. that which 'moves' us) brings the influence of an experience which transcends senses, feelings and emotions causing 'movement' at the core. There may be other ways to influence the core

but these four seem to be examples of access points to core judgment which we can attend to more carefully.

The client and designer roles are elements in a compound relationship animated by the interaction of the many different types of judgment being made in the context of all others. The judgments are continually being made and refined throughout any particular design process. Each set of judgments, designer or client related, must be made by the accountable individuals within the appropriate role. If, for instance, clients allow or insist on allowing the designers to make judgments of purpose and/or worth then the process becomes one of art rather than design. If, on the other hand, the clients are allowed or encouraged to make judgments like composition or framing and containing then it becomes a process of facilitation rather than design and the designers become mere facilitators.

The key understanding is that design is a system of relationships between different roles of responsibility such as designers and clients from which design activity and outcomes emerge. It is an interrelated composition that depends on the interaction of different design roles for the emergent quality of design in the same way that oxygen and hydrogen combine to form water. Wetness is an emergent quality not present in either type of atoms in isolation. In the same way the role of designer cannot exist out of relationship with client if design action is to be an emergent quality.

approach ● ● service

deliberated off hand

● appreciative

conscious | *unconscious*

● default ● quality

● core ● core ● appearance

unconscious | *conscious*

client **designer** ● framing

● worth ● compositional

● instrumental

purpose ● ● navigational
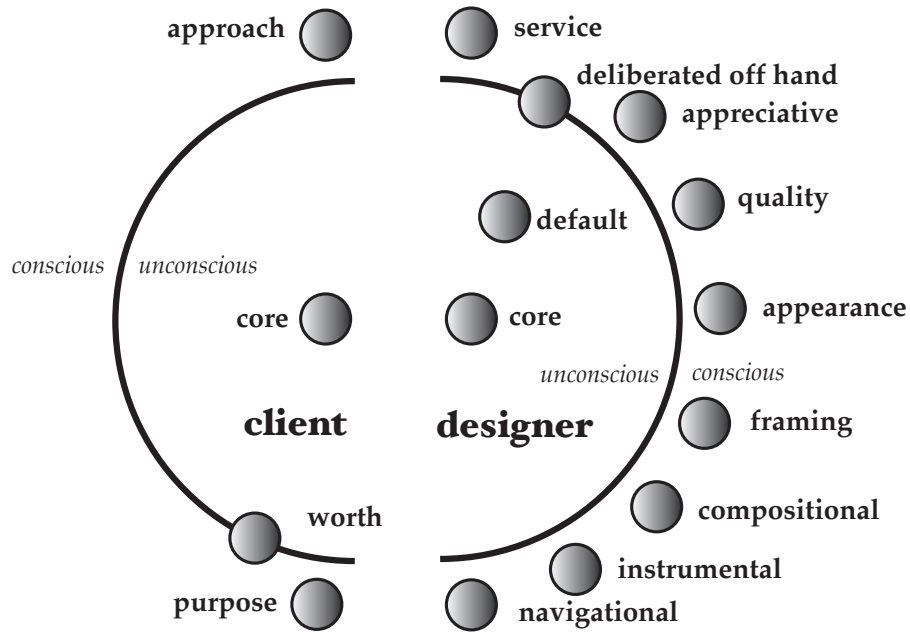
Fig. 8-4 Relationships of Judgment

Fig. 8-4 shows all the kinds and types of judgment. It creates a rich picture of complex relationships. In the design situation neither the client nor the designer can use this "map" as a guideline. The purpose of this map is to make us realize that design is a process fully guided by design judgments of different kinds and types. There is no temporal aspect in the map and there is no priority of judgments. In the real design situation these judgments are made all the time and in a complete dialectical relationship. Of course certain design processes do demand more of specific kind of judgment while others demand less. Every design process is unique. The map is still valuable as a tool for reflection and for an intentional attempt to improve ones design ability. The map might even be used as an analytical tool. It is possible to analyze design work with the help of the map. Such an analysis might be helpful to explore once

own way of approaching a design task.

We might even add one more type of judgment and that is the *mediative judgment.* All the presented judgments will in one way or another contribute to the final design. A designer needs to make judgments on how this "whole" should be judged. The designer needs to balance and proportioning through *mediative judgment* of the ten types of *designer judgments*.

The mediative judgment is an intentional attempt to decide how much the design process will rely on each type of judgment in order to reach the final "designed whole".
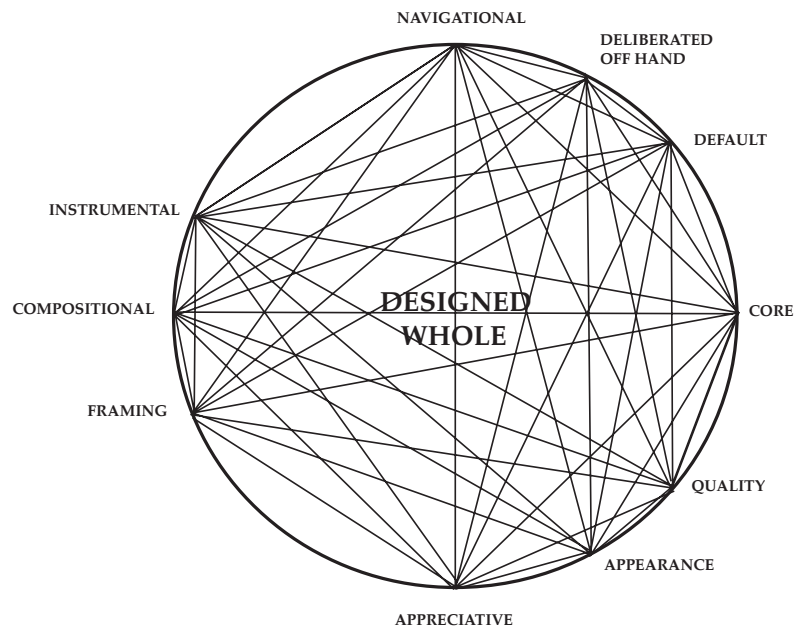
Fig. 8-5 Design Judgments

The *designed whole* is the result of all the judgments made in a design process. The designed whole is a synthesis of three wholistic domains (further developed in the chapters "Whole" and "Composition"): the adequate whole, the essential whole, and the significant whole.

The meaning of the whole in relation to judgment and design is one of the crucial aspects of design, distinguishing it from other traditions. Design judgment has a special character since the resulting design is something produced by imagination, something not-yet-existing. In all its forms judgment relies in all our capabilities as humans. It is based on intellectual and conceptual thinking, it is based on aesthetic and ethical considerations, and it is most of all founded in the character of the designer.

This chapter is based on an assumption that needs to be made explicit. That is the idea that design judgment is a full and equal partner with rational decision making and can be made more intellectually accessible and pragmatically effective. The utility of design judgment is not jeopardized by an improved understanding of its "nature" in the way that the mystery of intuition is threatened by too much self-consciousness. The designerly approach or perspective (i.e. design inquiry) taken in this text to gain a deeper understanding of design judgment is based on the conviction that it is possible, through intentional (intellectual) effort, to understand and improve our capacity and skill in making any judgments but particularly design judgments.

The ideas presented in this chapter are not about making 'true' judgments – but are about treating design as an aesthetic and purposive form of making the imagined real by utilizing our ability to make good 'adequate' judgments. They are concerned with making critical judgments ranging from reflexive off hand judgments to judgments emerging from our core being. They are about an appreciation of the whole and systemic relationships. To be more reflective in order to understand more about the activity of judgment will not interfere with the ability to make good or better design judgments. It will only help. This leaves us as designers fully responsible for our judgments and for our choices. There are no ways to escape from this responsibility. A designer in relationship with the client has complete responsibility and accountability for their designs since they have, based on their design judgments, chosen to make a particular conceptual design concrete reality without the protective cover of 'the truth'. Yet good design is possible to achieve and the process of achieving can be improved by learning to treat design as an informed process of intention and not chance or necessity.

9. Composition

To design is to compose. A design is a composition. To design is to create and innovate but most of all it is to cause things and/or people to stand together as a unified whole. Composing such a system of unification means bringing parts, pieces, functions, structures, processes, and forms together in a way that they carry a *presence* making an *appearance* of unity in the world. Composition is an integration of several strategies for creating unity that utilize protocols of relationships in the creation of compounds, functional assemblies, patterns, systems and wholes.

Visiting an exhibition or a museum where paintings and art objects are placed in a large room is an aesthetic experience. It is an experience in two ways. Of course each art objet creates an aesthetic experience. But there is also the experience of the exhibition itself as a design – as a composition. We are attracted to each individual object by the way it is related to, and under the influence of, the wholeness of the exhibition. In a similar way a new car consists of many parts, each with its individual function or purpose, structure and form. They all contribute to the design of the car in different ways. When we approach a new car we might have different tastes reflected in preferences for individual elements but we are affected and influenced by the composition of the car as a whole.

Individual elements of a composition are made to look similar to each other or to fit a certain style, maybe in the way they are shaped, their color or texture, or in the way that they behave. Sometimes they are made to contrast or create tensions in the overall design. In organizational design for example, this could be achieved by an introduction of creative change agents into a highly managed company with strong intrinsic stabilizing forces. Sometimes the elements of a composed whole blend, sometimes they stand in stark difference, but they are always part of a *composition*. Every intentionally formed design is given comprehensibility and meaning through a specific composition. A composition is the intrinsic *ordering system* of the ultimate design. A composition is not patterns of parts, but a whole that displays emergent

qualities transcending the qualities of elements in isolation or summation. It is composition as "substance" that gives a design a sense of integrity. This substance is reflected in many ways through the compositions function, structure and form.

Composing is pragmatic and inclusive. To compose is to realize and accept possibilities and restrictions governing the design challenge. This does not mean that a designer's work should be dictated by restrictions - real or imagined - nor directed by predetermined possibilities. Restrictions as well as possibilities must always be carefully examined and challenged. This is equally true of the needs and constraints presented by clients and other stakeholders to the designers in the initial contracting phase of the design process.

Composing is based on a thorough understanding of what can be done, what should be done but most of all, what is truly desirable. A composition should emerge in response to what has been found to be the client's most authentic desiderata. But composing is also pragmatic in the sense that it is an act of finding an *adequate* solution - an act of judgment. To compose is to engage in design judgment on a continuing basis.

To compose is not to search for the absolute solution or the true answer to a design challenge. To compose is to create a whole that adequately responds to the intentions of the client in relation to a particular context. Composition is an act of creating the *particular*. There are no universal, a priori compositions for generalized design challenges. There is only the specific in design composition. There is no necessity to copy or imitate earlier designs. There is no need to survey other designs with any other purpose than to stimulate creativity and to catch a sense of the mood of designing as an activity unless it serves the purpose of historical or critical interests. Even though there are no standard or universal solutions, studying earlier designs as case studies will help designers become aware of the specifics of each and every unique design situation, and of the design judgments made in response and the final outcome. This immersion in the totality of past design projects helps to develop a *sensibility* and *appreciation* in designers for the process of composing as an ultimate particular design but it does not provide pat answers for future designs.

Composing is an activity where judgments are made about aesthetic principles like balance and symmetry, about relationships between details and the whole, about how to best integrate a particular design into a specific context, about how to match a designs actual potential to the clients expressed desires. These are all creative acts. For many designs the expression of creativity is not that it consists of new innovations, like new materials or new functions. Rather creativity is expressed in the way things are brought together – how they are composed. With this understanding of design creativity as composition, many activities not commonly considered as such can be viewed as designing. When Rudolf Arnheim (###) writes that the goal in design is to create "a symmetrical, coherent, and well-balanced whole" he points to this important aspect of design.

Design processes in general have had many representations over time including the well known four stages of the alchemic process that is, interestingly, more representative of designing than many of the contemporary models of creativity developed by psychologists and creativity consultants (see Fig. 9-1). In addition to the fact that it is an interesting early metaphor for the design process is the additional metaphor of the attendant crucible or container. The process of going from unknowing to insight (i.e. from lead to gold) requires the presence of a strong crucible that holds the pressure and heat of such a dynamic process by defining the limits and therefore the space within which the process takes place. Without such a container it is impossible for the process to occur. This is certainly true in more pragmatic terms for real world design. Limits and space need to be defined through the presence of a design culture and the particulars of a design project.
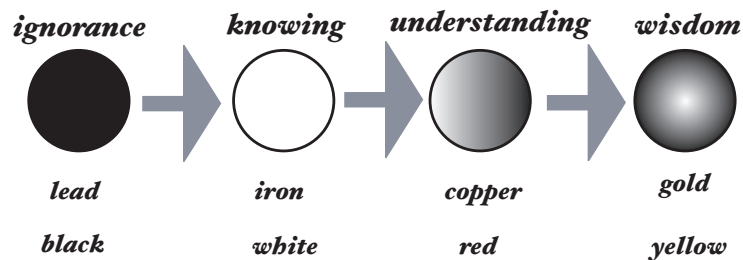
Fig. 9-1 Graphic Alchemical Process

The sudden appearance or *emersion* of an idea that represents a design *solution* or *parti* identifies that part of a design process that is characterized as creativity. Precipitation of parti occurs between two dramatically different composing activities and is often experienced as a sudden flash of insight, a break-through insight that is commonly referred to as the "ah-ha" experience – the explosive appearance of a simulacrum - a solution to a complex design challenge (see Fig. 9-2). This *emergence* phase in the design process is marked by the precipitation of a liquid seed of the formative ideal, the germ of an ideal form. The parti can emerge in a singular moment or in a drizzle of proximate moments with equivlant effect.

Fig. 9-2 Emersion – Breakthrough Insight

The phases in a design process that are of particular importance to composition begin with *emersion* and end with *innovation*. This involves transitioning from a *particular ideal (i.e. parti)* through the *particular real* and ending with the *ultimate particular* (see Fig 9-3).

emersion
particular ideal

parti

scheme development
particular real

design development
performance specifications
prescriptive specifications

design innovation
ultimate particular
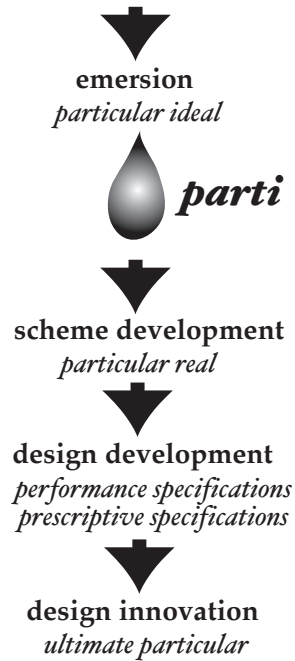
Fig. 9-3 Steps in the Design Process that are Related to Composition

This phase of the design process is marked by two very different forms of composition; one a subconscious 'uncontrolled' activity resulting in the spontaneous appearance of *parti* and one a conscious 'controlled' activity (see Fig. 9-4).

subconscious
"uncontrolled" composition

parti

conscious
"controlled" composition
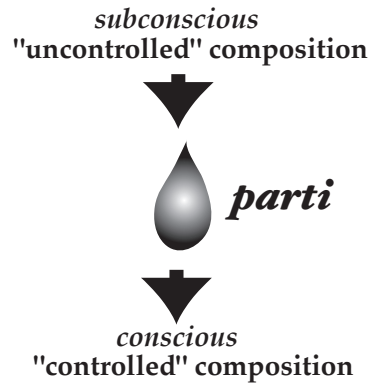
Fig. 9-4 Two Types of Composition

A parti is a compelling organizing template, guiding the designer in the succeeding design process steps. The parti as the germ or seed of an ideal compositional form is similar to the *logos spermaticos* (the seed idea) of the rhetorician's persuasive argument. In the case of design composition the parti is the *graphos spermaticos* (i.e. the seed image) of an ideal composition - to be used to form a real, particular design solution.

The parti is essential as a template enabling the designer to draw together – to compose – a complex set of elements into an integral whole. It is this binding ideal of the system as a whole that the designer is required to form into something which is real with accessibility and *presence* in the world.

In the process of design, a parti helps the designer to make many types of judgments and decisions in order to create a whole. A parti or "guiding image" is always "tentative, generic and vague" (Arnheim, 1995). But this is not a drawback, instead, it opens up a whole range of possibilities without commitment to any one of them. Arnheim writes, "Being undefined in its specifics it admits distortions and deviations. Its pregnancy is what the designer requires in the search for a final shape" (Arnheim, 1995).

The design process is typically misrepresented as a problem solving process and a design challenge is miscast as a design problem. Designing has a kind of problem solving phase but it is very different from what is commonly understood to be problem solving, even a

creative one. The parti represents the conceptual whole of an ideal design solution that, as an ideal form, is impossible to apprehend or communicate fully without transformation into images or schemes that are accessibly real as concrete particulars. A design problem is the perceived difference between the elusive ideal solution as represented in the parti and the concretized schemes developed to represent as closely as possible, realistic pragmatic solutions.

Designers "problem solve" utilizing a form of *design dialogue* or *diathenic graphologue* that involves the formulation of design schemes as *particular real* compositions. This is done through an iterative process of scheme formulation, comparison to the ideal parti, further scheme development and comparison to the ideal solution (see Fig. 9-5). This iterative process includes clients and other stakeholders who become intimate with the parti through the emergent concrete images of the schemes. The test of a good parti is when clients recognize that their desires and needs have been met and exceeded by the emerging design communicated through these images. This iterative design process is continued until a judgment is made to cut off the design dialogue and focus on the development of the scheme deemed an adequate representation of the ideal solution serving particular clients and stakeholders (see Fig. 9-5). This design dialogue is never terminated because of measurements like perfection, efficiency or comprehensiveness. The design dialogue is cut off because of judgments of adequacy, essentiality and significance.
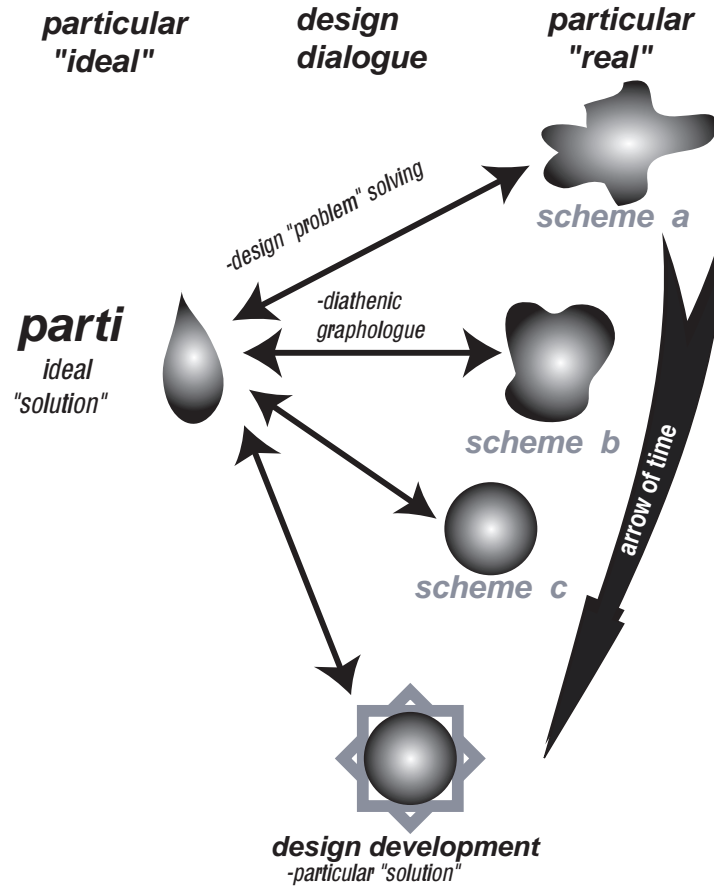
Fig 9-5 Design "Problem Solving"

Although the initial composition process that leads to the emergence of the parti is uncontrolled and takes place mostly at the subconscious level it is possible to prepare and facilitate the process through intentionality. Because of this there can be an expectation that the parti that emerges embodies all the attributes and qualities that were intentionally stirred into the super saturated solution that suddenly transformed itself into a crystallized insight. It also assures that the parti is not the random product of novelty-generating creative behavior focused only on indulgence and not purpose.

Design skill, especially skills in composition, can be developed through focused reflection and analysis of earlier designs. It is also possible to develop design skills by critiquing existing designs. Each time a designer formulates a critique, they further develop a sense of the particular, of the integration of details into the whole, of how the integrity of a design is manifested through its form and appearance – how all this holds together as a composition.

Skills of composition also include the ability to *envision* and *evaluate* a design that is not-yet-present but only imagined. That require a compositional foundation based on creativity and imagination, combined with a pragmatic sense of what is real, what is controllable and what is appropriately out of control. Learning these skills requires a different means of gaining competence than the traditional disciplinary educational designs. Design learning should be understood as learning how to fuse – to bring together or to compose.

The terminal composition process – the one that is controllable and that operates at the conscious level - can lead to schemes of excellence or mediocrity depending on the design skills, tools and competencies of the designers. In either case this is the compositional form – the design – that will become present in the world and that will represent, for good or bad, the parti's essence. The parti is held captive to the ability of designers to translate its potential into reality.

The terminal composition can be understood as the sum of fundamental *design principles as implemented* in the concretized design. However the composition is not the same thing as the design principles guiding the design process. Composition at this stage is not just about process – it is also about the actualization of such principles. Composition is to be understood as an intrinsic property of design.

Because something is a composition does not guarantee good quality or good design. We can find many low-quality, bad or even evil compositions in the world, in buildings, in products, in urban design, and in our organizations and institutions. We see this in all the things where we find the relations and the symmetry between structure, function and form to be inadequate or ugly or morally wrong. Although in some cases where we experience such impressions it might be because there is no composition. This is often the case when we find an artifact or system

incomprehensible as a whole, with no emergent qualities, without any sense of wholeness.

Although design compositions are consciously formed through the intentional actions of designers, compositions can also become realities as the consequence of discrete decisions, choices and actions not aimed at the creation of specific compositions – i.e. those informed by a parti – but ones that are formed by accretion. But even such accidental compositions are the consequence of agents acting, even unconsciously, as composers.

A design will not be recognized as an autonomous system, process or artifact, with integrity and unity, if the designer fails in transforming the parti into a composition that forms a viable addition to the real world. In other words, the terminal composition must be a conceptualization of the parti expressed in the experienced world, as an ultimate particular design. But there is yet another translation to be made. That is from final composition to *appearance*.

A composition can be given *presence* in the world and can be made to *appear* as a design in the real world as the designer deems appropriate. There is no single right or deterministic appearance for any composition. There is any number of appropriate ways to give a composition its appearance in the world, it is always a design judgment. Also a design's appearanc*e* can hide or reveal its true nature, its character and soul. The most immediate form of appearance is related to the design's nature*,* what its presenting features are - the qualities that inform the senses most directly. The nature of a design can be trivial and significant at the same time. Much of a design's apparent nature is superficial but much is significant in that it carries meaning through such qualities of meaning making as representation, association and information. For instance the difficulty of making authentic representations of appearance in virtual reality is compounded because of the separation, by definition, of stakeholders from sense data but with an increased ability to better represent the meaning making elements of a composition.

Looking at a face can give one a sense of skin tone, shape of face, color of eyes but it is the next level of appearance where one gets closer to the true nature of the person and that is in the appearance of *character* which comes from deeper sensing. "Looking" into the eyes of a person

gives access to another level of appearance, that of *soul*. Similar levels of appearance occur in designed wholes – i.e. compositions (see Fig. 9-6). These levels of appearance are levels of resolution that require intentionality from the designer if a design is to be fully realized. The appearance of a design can be treated superficially and its value to people may be no more than its superficial nature. Which levels of appearance are intentionally attended to is a design judgment.
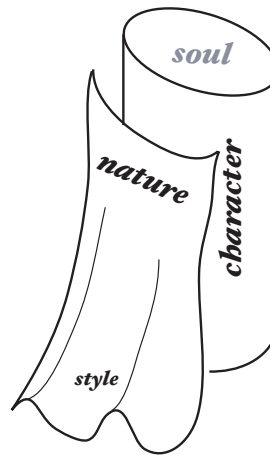
Fig. 9-6 Levels of Resolution of "Appearance"

Often artifacts or systems are recognized primarily by their *style* or *fashion*, the most immediately accessible level of presence. Style and fashion are characteristics of presence that appear across the compositions of the same designers or across eras of material culture. When particular design principles are used regularly together and consistently implemented in multiple artifacts or system designs – a style is created. Some traditional design schools have used the idea of style-specific compositions as their organizing strategy for their curriculum and pedagogy. On occasion these styles have become famous, e.g., the Bauhaus style in material culture. To anyone familiar with the Bauhaus style it is possible to recognize a design as that style without knowing the particular designer. However some styles are reflections of certain

cultures or societies without having been a consciously designed compositional trait of an individual. Most people can recognize Scandinavian furniture design, or Japanese home design. This recognition occurs because the characteristics of these general styles have become so well known and widely used. The same is true for organizational and social systems design such as represented by religions and cosmologies.

When a system is designed without a composition it can still serve a function, but it will be a simple cause-effect assembly or simple system without any unifying form, or with only local (or regional) organizing principles - a *tectonic* design. The old Rube Golberg cartoon assemblies and the Internet are examples of such designs. People have a difficult time trying to create an image of "the web" as a whole. In similar fashion other systems like the American "economy" is difficult to map or comprehend because it is not a composition.

If a composition is done well, it will give the resulting design a sense of wholeness, a sense of being formed as a whole. If well presented this whole gives users an overall comprehension of the design, where all details relate and where each detail contributes to the whole and helps fulfill the design's purpose and function. The design will have the presence of a teleological whole - an *architectonic* design. Architectonic should not be confused with "top-down" or deductive design – this is not synonymous with *compositional* design.

Working architectonically, the relationship between details and the whole is always taken into consideration, where every detail is important to the whole. This can quickly lead to a crisis of complexity however if a focus on details is not balanced with principles of organization – systems thinking - and order - i.e. parti. A systems approach allows complexity to be taken into account without leading to paralysis. Systems thinking provide a form of design logic for dealing with this kind of complexity.

"Reading" the elements of a composition is difficult and demands a certain kind of skill. A strong impression may be made by a certain design's presence, but reasons for this impression may be difficult to deconstruct from the whole. The composition can be subtle and elusive requiring a highly developed skill of discernment. Every scale of measurement including ethics and aesthetics are used to evaluate

compositions. Compositions can be considered to be efficient, effective, good, just, frightening, evil, beautiful or sublime. The ultimate evaluation is prophesized by the designers and verified by the real world. The real value of a composition is determined by its success in meeting the desires of the client and the intentions of the designers. Its intrinsic worth is determined even more by the unexpected presence the design exhibits on its own as it becomes an agent of influence and change in its own right – thus recreating its creators.

Composition as presented here becomes an almost overwhelmingly important aspect of design. At the same time it is the most inspiring and rewarding design activity it might intimidate people from doing design. To compose, to shape the world, is a great responsibility but it also makes you become part of the ongoing "big" creation of our reality. That might be frightening but it is also how we get in touch with the splendour of design.

10. Production and Caretaking

Design is dominated by the idea creativity. It is about imagining new ideas as compositions. It is easy to get carried away with creativity. Creativity is considered valuable and worthy of human striving. At the same time it is too easy to forget the other, more down to earth aspects of design. A new idea is not worth much if it is not made manifest in the world. It must be innovated, i.e. real. It must be crafted as a concretized product. Creativity, in the sense of novelty production, is only one albeit essential aspect of design. There are others dealing with bringing design concepts into the real world. We have chosen to call this *production*.

This is not a process defined by force, it is instead about *carefulness*. It is about the nurturing and maturation of a design. A design needs a caretaker, someone who lets a design mature thus reaching its full potential. The close relationship between caretaking and production means that the design can not be handed over to anyone who is not authentically involved in the design approach behind the design outcome. Production is not separated from design, for if it is, the design will not mature in line with the formative ideas underlying the design. This chapter explores the nature of the process of bringing a design into the world. This is a delicate process in which authentic attention - notitia - must be paid to the maturating of a design during times of vulnerability or sensitivity to external influences.

We will focus on two aspects of production; the care of the material of design and the management of this production process. The basic assumption is that both aspects need to be founded on an understanding of carefulness and caretaking.

Bringing a new concept into the world is a creative process relying on imagination. But design is also about pragmatics and practicalities. The practical partner of creativity is *innovation*. Innovation is defined as the actual realization of something new in the world, which becomes part of peoples' lives. As creativity is founded on imagination and inspiration innovation stands on ingenuity and skill. As creativity demands an open

mind and the ability to expand and across boundaries exploring new conceptual terrain, innovation requires experience, a sense of limits and a feeling for material.

Innovation is by nature sequential and episodic. The distinct nature of innovation makes it very different from creativity. When it comes to the actual making or production of designs – the manor and order in which things are done makes a critical difference. To produce a structure necessarily means that the material is already known. To produce a form presupposes both material and structure. Therefore there is a practical order to this process.

Material, as we use the word here, is not limited to physical materials such as iron, wood, paper, etc, it also applies to the abstract material used to compose the design of a process, symbol or system. Material is what a designer uses to put into compositional relationships. This is done in order to bring a design into the world to make it appear in a real sense.

The real world speaks back to the designer through the materials of design. Donald Schon found in studies that designers frequently use the material in the design process more or less as a design partner. When the designer chooses a material and starts to use it to bring the design to life - the "material speaks back". The material shows the designer limits and restrictions as well as opportunities impossible to imagine without having them manifested in some real way. A simple example is what happens when we begin to put our thoughts on paper. Our own words present themselves to us in a way that reveals our thoughts. When we read what we have written we usually want to re-write or even re-think our thoughts. The material speaks to us in a way that our minds cannot anticipate by its self. In this process carefulness is essential. How ideas are brought into the world, how they are given birth, will impact how they will mature developmentally. To care about material and how ideas are born is to care deeply for the final design.

How design ideas are brought into the world is therefore a critical and key part of the design process. The ability to produce good designs is based on building successful relationships with the material of the phenomenal world. As the world speaks back and in this designer world dialog we move out of the polarity between the objective and the

subjective into a wholistic relationship. That which is innovated becomes part of the process itself. When a design is brought out into the world through innovation there is no longer a distinction between "that-which-is" and the "not-yet-existing". In this conjunction we see the real nature of our designs and how they become a whole part of the world.

To make this wholistic relationship as strong and natural as possible is one of the most challenging aspects in design. Innovation is the phase in designing where this relationship can be experimented with in reality. Through the innovation process the designer has the opportunity to try new ways of realizing an imagined design. Prior innovation takes place the concepts of excellence or quality are just an abstraction.

This assures us that the production phase is not an afterthought to the design process. The design process does not end with the production of specifications. Design needs to be understood as a whole process that extends through the entire time that design is in use. Sometimes it goes even beyond that. The concept of evolving design as a never-ending design process is growing in popularity. This of course changes the basic relationships in the design process between the designer and the clients and end users. This has to be handled separately when responsibilities in the design are contractual.

The issues of excellence and quality come into focus because they make their appearance in the production phase of design. Many of the qualities that make a design complete are not created until the innovation process. There is no way to judge the overall quality and excellence of a design before it is made real. It is when the design is placed in its final setting that all of its qualities become apparent and visible.

In the production process the responsibility of caretaking takes on many roles. For each role there is a time and place where they have primary responsibility for the design. This is true for designers, leaders, end users, managers, and other stakeholders. The design itself will "travel" from one to the other who at the appropriate time will become its caretaker.

The production process is cared for by people with complex and contradictory demands, needs, and wants. The journey, from being conceived as a parti to the final and full presence in the world, is for the

young design both dangerous and long. To survive and develop in the anticipated way the design needs to be cared for at every step. For this to be done the design process has to be managed, thus there is need for design management.

If design is about bringing the new into the world then design management is *about* the careful handling of that process. Design management has to be based on a thoughtful understanding of the foundations and fundamentals underlying design thinking and practice. To care about the design process means to include all aspects of design even if they at first seem contradictory and incompatible. Design management needs to be done with the same understanding and appreciation for design that guide the creative design phase.

In the production process there is a tension between the need for being surprised by the outcome and the need to know with some certainty that the outcome will be on time and of the quality expected. The client and the designer want the design process to produce the expected unexpected, since that is the reason they have chosen a design approach from the beginning. At the same time they do not want to be surprised by something unacceptable. The process must be handled in a way that fosters both creativity and control. It is a process of managing tension.

Since creativity leads to the unexpected the process must be flexible in all aspects. The process has to be open to changes triggered by new insights and ideas, or in response to the "world speaking back", or by changing contextual conditions. In the same way the need for control demands some stability. If stability is not present there will be too many variables changing, too much information, too much richness and uncertainty. Stability makes it possible to reach some degree of certainty. At the same time stability and control pave the way for the expected outcome. When everything is under control there is nothing to surprise us.

In is not uncommon to portray these tensions as resultants of opposing "forces" that beg to be resolved (see Fig. 10-1). There is no way of escaping these tensions. It is not a matter of becoming more consistent or efficient. Design thrives on these tensions. Designers have to take care that the wholeness of the process is management as an inclusive process,

including tensional relationships.

attribute	process	
	creatuve	*controlled*
purpose	destabalize	stabalize
behavior	open	closed
outcome	unexpected	expected

Fig. 10-1 Examples of tensions in the design process

Tensions are best understood as symmetrical relationships. It is a relation in which one can not exist without the other. Design practice, and especially design management, is characterized by these dialectic, symmetric relationships of tensions. Design is always practiced in the midst of contradictory needs, demands, restrictions and realities.

One example of how to deal with these tensions is portrayed by CZ with the concept of "flow". CZ describes flow as "the optimal experience" (Csikszentmihali 1990). It is the feeling we get when we perform a tasks in a way that removes us from conscious deliberation with all the uncertainties and anxieties about doing "the right thing" in the "right way". When in flow we do not think about what we are doing, we just participate in it. Some of us might experience flow in our work, or when we are engaged in our favorite hobby or sports. To ski down a difficult slope, to let go of our planning and calculating mind, and still be in perfect control but also free to do whatever we desire is to be in flow. Being fully in the present and to lose relationship to time is to be in flow. CZ defines flow as a tension. It is a tension between the difficulty of the task and our level of skill. It is also a tension of being in control and letting go. Similar tensions can be found in design innovation. We need to recognize that flow will not emerge merely by letting go of the calculating mind – it is not just to "feel the force".

In each and every moment of the design process there are two dimensions that have to be dealt with. For convenience we refer them as the x and the y dimension (see Fig. 19-2). *The x dimension* has to do with order and temporal relationships of the activities in the process. It is about *how* to do things right. This dimension is related to the idea of "techné" in the writings of Aristotle (Dunne 1993).

Managing the x dimension a designer needs certain skills. For instance, the designer has to be able to see logical relationships, especially the relationship between cause and action. To make the design work flow the designer must have the ability to create a stable and creative environment for collaboration and dialogue.
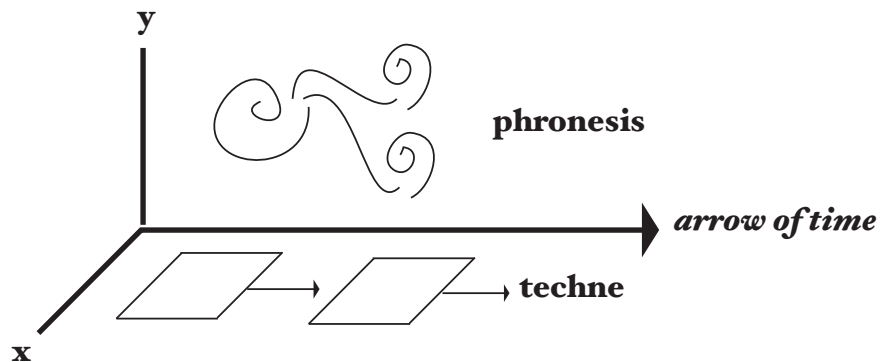
Fig. 10-2 The x and y of design

The y dimension is about the designer's ability to make design judgements. It requires a designer be prepared to take action, to have a well-developed intuition, a perceptive sense of the wholeness of the situation, and an ethical and aesthetic appreciation of the design situation. As the x dimension is related to "techne" then the y dimension is related to "phronesis" (Dunne 1993). As the x dimension is about doing things in the "right way", then the y dimension is about doing the "right thing". The y dimension is based on the value judgments of the designer.

The usual way to distribute flexibility and control in the design process is to assign flexibility to the phronesis dimension and control to the techne dimension. To most people this seems to be an intuitive and

commonsense way to contrast them. It is assumed that to be flexible, the phronesis dimension need to be weak, i.e. the designers own values and judgements must to be suppressed so as not to hinder the process of adaptive or adoptive change. The feeling is that designers with "strong" ideals and values are unable to adapt to changing situations and they will not be flexible. Stability and control, on the other hand, is assumed to be achieved by controlling the design process on the techne dimension. This is one reason why designers with a strong self-image of being innovative, creative or idealistic often resists being managed in any way.

Which dimension to focus on is a question of balance and symmetry, not of right or wrong or of dominance or equality. Symmetry is an aesthetic concept and is more in line with Wittgenstein's sense of "fit" in a situation. If the phronesis dimension of design is over-emphasized the techne will automatically be suppressed, and vice versa. We believe that either extreme, i.e. when only one of the dimensions is thought to be the one needed for good design, this leads to poor conditions for design management.

If only the phronesis dimension is emphasized we wind up with a self-centered designer, a designer who will be very individualistic and unpredictable, a designer difficult to collaborate with. If the techne dimension is emphasized we get an unselfish designer who focuses on how to do things technically, who focuses on the process objectively and who collaborates efficiently. Such a designer is without his or her own opinions but with a strong need to do things the "right way". Neither of these extremes are optimal for design management. Every design process needs both control and flexibility at the same time.

Every design process is itself designed. The overall relationship and symmetry between the two dimensions; the one of phronesis and the one of techne is the result of either conscious or unconscious design. Realizing the full potential of the design process requires both dimensions to be fully and equally present. This wholistic approach is built on the recognition of both the creative and open qualities of design and on its practical and disciplined aspects.

The design process is a composition itself. To design a process so that it facilitates good design work is a delicate task. The design of design must be based on a thorough understanding of design with all the

foundational and fundamental aspects taken into consideration. The design of design demands even greater insight into the nature of design than what it takes to perform design tasks. Design management is therefore a job for people with extraordinary experience and knowledge of design. To design design processes is fundamentally a leadership role. It concerns creating the right environment or culture for design. It is about bringing the right group of people together and to determine the best possible approach to the specific situation. It is the design of an ultimate particular design process. It involves leading people through a complex and risky process in order to evoke the full potential of all involved.

Production is a transition phase. At the end of the production phase there is a transfer of *ownership* from the design team to the client. That is when a design is accepted into the world and becomes part of it. The design begins to fulfill its purpose and intent. Up to this point in time, the design team has been responsible for the design. The design now becomes a responsibility of the client and end users.

Since innovation is about bringing things into the world it is dependent on the design skills and abilities of production. These skills and abilities are specific to the field of interest within which the design takes place. They even change over time since field specific technology and knowledge continuously is developed. Some aspects of the design process itself are influenced by field specific conditions. For instance, there is a significant difference in the type of detail and specification between an organizational design and an industrial design. As a consequence, without the skills and experience of the trade – the craft, you can not be a competent designer.

Despite the difference in skills and material there are foundations and fundamentals involved in design work that binds design thinking together. We believe this book to be an attempt at presenting a coherent picture of the some universal principles of design practice. The ability to hold universals and ultimate particular in the same crucible requires care and attention.

Bringing a design into the real world through innovation is a delicate process and it must not be defined by force. Production is about *carefulness*.

IV. METAPHYSICS

Besides the foundational and fundamentals aspects of design there is also the metaphysics of design. Every designer needs to reflect on the issues of the limits of design, of the good and evil, of quality and responsibility. The metaphysical aspects of design are not optional, the caring designer has an obligation to clients, stakeholders, and to the society at large to continuously reflect on the meaning and consequences of these aspects.

The metaphysical aspects we will cover are the guarantor of design, the evil of design, and the splendour of design.

These metaphysic considerations form the reflective limits of design.

11. The Guarantor of Design (g.o.d.)

Design is an act of world creation. As such it can be experienced both as inspiring and frightening. As a designer – a world creator – you can be overwhelmed by questions such as: Do I have the right to cause significant change to the world? What is the right approach to make changes? What kind of changes are good or just and for whom? 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?

Today we understand that our designs dramatically change the conditions of reality experienced by ordinary people. The world is becoming more and more a designed and man-made place. To be a designer today is therefore to be the creator of a compound and complex new world. It is a design task of enormous responsibility with its concomitant accountability. This is true even if each individual designer is involved in only a very small design act playing merely a part in the totality of the redesigning of an emerging new reality. Individual acts are still contributing causes to an overall composition that is an emergent new world.

What is the nature of this ever-renewing world that each designer is midwifing into existence through her/his contribution? Is it possible to know what the attributes of good design are and is it possible to be intentional about their presence in such a complex emergent design? We know for sure that it is impossible to predict if the realized designs will result in the good life for everybody and what the consequences of unintended outcomes will be and for whom. So, what is the responsibility of all these designers that today are co-creating this new world? Do they accept the responsibility for their part in world making and what does that mean for their accountability and liability?

Most designers would answer that they don't really have any responsibility for the whole, that they only take responsibility for their

small piece of the whole. Besides that, they are mere agents for the client doing only what they are told to do in exchange for fair compensation. But are these valid answers? Are there any valid arguments that make the case that as a designer you do not have responsibility of your design in the context of the whole? This is the topic of this chapter.

As a designer it would of course be comforting to know with certainty that you are doing good things for the right reasons, that your imagination and creativity have lead you to the right conclusions, solutions, ideas and designs within clearly delimitated bounds of responsibility. But how is it possible for you know all of that? Is it even possible that you can learn how to know in that way? Is there a *guarantor* for good dependable designerly judgments whether designing a life or an artifact or organization?

We will begin our response to these very difficult questions by distinguishing between at least two kinds of *guarantors* involved in design. First there is the *guarantor-of-destiny*. This is the guarantor of the emergent design process. The guarantor-of-destiny is of primary concern for those who are being served by the design process, i.e. the clients. It is the foundation upon which people place their belief that they can intentionally serve their best interests. The purpose of gaining access to a guarantor of destiny is to find security in humanities ability to deal successfully and intentionally with the bigger issues of life confronted in a design process. Is this a reasonable expectation to have? Do we have the right to expect this of others or ourselves? Destiny is the foremost issue for the clients of design. It is an implied contract between all of us and the realities of the human condition.

But many design questions are not at the level of questions of destiny. They are on the level of a particular design situation and a particular design process engaged at a particular place at a particular time with particular people and resources. Though at a less comprehensive level, these questions still cause difficult challenges for designers and have significant consequences for clients and other stake holders. Among the challenges reside the questions of responsibility, accountability and the *guarantor-of-design*.

We believe that it is common for designers, even at this level, not to be willing to accept full responsibility as designers for the

consequences of their designs. This is in many ways not surprising since taking responsibility is not only challenging but quite dangerous as well. In order to make the issue of responsibility in design more visible and open to reflective dialogue we will present some common ways used by designers to relieve themselves of any liability for responsibility and accountability for their design decisions. We will argue that these attempts are not justified and are unacceptable because of the accumulating affect of small designs on the larger design of society.

What is needed instead is an acceptance of design responsibility as something integral to a designer's character. The designer is someone who can be relied on, can be trusted to fulfill obligations to higher authority, who is concerned for the sake of others and who is answerable for their design decisions and design consequences. This is not meant to chill the designer's ability to design but to improve the designer's capacity to create better designs that have fewer unintended or undesirable outcomes. The negative consequences to the designer of accepting the responsibilities of design can be mitigated through better education and professional training, better forms of design praxis and better interrelationships with society who must also share in the responsibility for design outcomes.

When we act within the tradition of truth telling we do not have to take on any responsibility for unintended outcomes or for the larger emergent whole since we are only obeying principles which transcend our individual volition. The only thing we have to be concerned with is if we posses true knowledge and how we have come into its possession. In this tradition our focus is on appropriate methods of inquiry and controlled techniques or methods of observation and record keeping which guide us with certainty in our search for absolute truth. If we use this approach to design it becomes an approach similar to scientific inquiry.

But design does not reside in the realm of the true – it lives in the real. In the realm of the *real* and the *ultimate particular* we will never be able to find truths that can guide us in our design actions. This is because description and explanation do not prescribe action and predication and control do not justify action. As designers we cannot depend on a source of wisdom outside of ourselves for guidance that will relieve us of our responsibility. This is so because design decisions are based on judgment

and judgment is both personal and situational – design is always an act of faith.

Sometimes this situation can be difficult to handle. It gives the designer a lot of power and authority that can be both overwhelming and frightening. It can be overwhelming to realize that you act on the world in such a way as to create significant and irreversible change in other people's lives. It can be frightening when people hold you responsible for these changes, or perversely when they do not.

There are several routes designers can take to escape responsibility. These strategies are not necessarily chosen in a conscious and intentional way. And they are not necessarily tactics used by people who lack courage or ethics. These approaches are quite likely very natural reactions to situations where a designer come face-to-face with overwhelming complexity and uncertainty or when the designer is not in possession of enough resources, knowledge or skill to fulfill the task at hand.

The attempt to find some solid and dependable base for design actions can be labeled as the search for a *guarantor of design*. It is a search that can take many disguises and can be found in every design field. The search for a guarantor of design can be understood as a way to reduce the designers isolation in sole responsibility by constructing a guarantor of design that will lead the designer through the design process and also legitimize the outcome of the design process.

We are not arguing that every designer is trying to consciously escape responsibility. There are, of course, designers who embrace responsibility not only as something necessary even though problematic – but as a component that gives design a special quality, character and attraction. Responsibility means power; to be able to use your power to change the world is one of the real wonders of design. But even for those who do embrace responsibility we believe it is good to reflect on the source, place and nature of responsibility in design. Many design projects and design teams have communication problems around the issue of responsibility. Most of us have met statements like: "I don't think we have to do that, it is not our responsibility...", or "we can't do that, no one told us to do it....".

All designers need to reflect on what the concept of a guarantor of design means to them and also what it seems to mean to colleagues, employers, clients, and society as a whole. The purpose of this text is to make the guarantor of design question visible and thereby open to analysis and discussion.

The search for a guarantor of design can be divided into at least three approaches. First there is the approach of designers trying to *move responsibility*, secondly there is the approach of attempting to *hide responsibility* and finally the hope *to remove responsibility* entirely. We invite the reader to add other approaches to those we discuss here.

The most common approach dealing with responsibility is to try to restrict the degrees of freedom in the design process by *moving responsibility* to something outside the control of the designer. This can be done in many different ways. You can "move" responsibility to the design process itself or to other people, or to some other guiding principle.

A designer can, for instance, use a prescriptive method that guides him/her through the design process. The more detailed and prescriptive the method is the fewer degrees of freedom the designer has access to. A completely controlled and comprehensive method restricts the designer's degrees of freedom fully. It means that the method will be the sole bearer of responsibility. If a designer only follows the method he/she can not be blamed for not being rational or logical or whatever the criteria might be. The designer can show that the method was followed and if something is to be judged, it is the method, not the designer. At the same time the role of the designer changes from being a designer to an operator.

Another way to move responsibility is to turn to other people for help. A designer can always argue that he or she is only trying to make someone else satisfied. It can be a client, a customer, a stakeholder or a user. The designer can ask any one of these people for help in the process in a way that relieves him from responsibility. If the designer always lets other people decide on choices and solutions, responsibility will, by default, be removed from the designer. But at the same time the designer's skill and specific knowledge also disappears since the designer stops being the person that creates the new and the unexpected. When the

designer only produces what other people want or decides the designer becomes a mere facilitator.

There are of course other ways to move responsibility, for instance by letting a particular style or fashion of design rule over a particular design circumstance. To move responsibility by any of these means is not by itself problematic or necessarily bad. These strategies can be individually chosen as a conscious design decision. But in no case is it possible to practice design as an authentic designer if responsibility is removed by any of these options. When responsibility is removed from the designer, the role of the designer is also, by necessity, transformed into something else.

To move responsibility to another local still leaves a situation where responsibility is visible and open to judgments of accountability, the only purpose being to relieve the designer from the burden. Another approach is to *hide responsibility* or at least to hide it from inspection. There are many places where some try to hide responsibility. We will only discuss a few. We have named them: internal, spiritual, and administrative.

The internal: As an artist, a designer can argue that the design is a result of an internal "force", intuition, or a feeling that is beyond the control of the designer himself. A designer who uses this approach often trust the internal as a reliable source and uses it as his guarantor of design. Expressions such as "I trust my intuition", "let your feelings guide...", "follow one's heart…" are not uncommon. These internal sources of inspiration and intuition cannot, by definition, be inspected, by the designer or by anyone else. Based on this the designer can argue that he only did what he had to do in response to these internal sources. Since these internal sources are situated somewhere beyond the reach of our conscious reflective mind, we cannot analyze, inspect or influence them and therefore not judge them. The designer acts only as a conduit; a spokesman or a messenger.

The spiritual: By looking to the spiritual the designer can find external sources of guidance. A spiritual source can be used as a guarantor of design for almost any kind of design process. We can count on this source

to provide us with insights, ideas, and guidance and as a consequence—peace of mind. A spiritual approach is used to "see" things in a different way, or to be able to interpret reality in a more true or ideal way. To let yourself be a channel for a spiritual source hides the responsibility away from you as a designer and makes the rationality behind your design actions very difficult for anyone to inspect or analyze. In extreme cases this can lead to situations where the designer ceases to be an individual or independent entity and becomes essentially part of a something much larger, something not possible to hold as responsible or accountable to human agency.

The administrative: One of the easiest ways to hide responsibility is to embed all actions in a complex administrative web of responsibilities and authority relationships. When this web becomes complex enough it also becomes impenetrable. Then it becomes impossible to see what is a consequence of what cause, what decision results in what actions, and whose ideas are actually being manifested in a design. The administrative approach is more accidental than it is intentional. In many design processes we end up in an administrative situation no one really wanted or planned for and responsibility disappears into a complex web of relations. Within this approach the individual designer may still act as a piecemeal designer but in relationship to the overall design process it is impossible to know who is responsible.

As in the case with the different ways of moving responsibility, hiding it is not necessarily problematic or bad. Although the strategy of moving responsibility is often intentional – the hiding process seems to be more unintentional. It is more often a consequence of many diverse localized decisions on how the design process is carried out.

When a designer convincingly can show that the result of a design process is based on something that is not negotiable or subjective, but something truly universal, *responsibility is removed*. This can be done in many different ways but there are some approaches more commonly used.

The most predominant approach is to use the scientific method. Scientifically derived truth, as the guarantor of design is one way to say that the process could not end in any other way than the one prescribed by universal laws of logic and reason. When design is guided by scientific truth, the correct design will always be determined in relationship to nature and natural laws. Nature is the container of all answers and if we "obey" the rules dictated by nature we can not be accused of making the wrong kind of design decisions.

Another approach is to use the principle of ecological sustainability as the most appropriate guide for decision making. If nature's design is taken as a "given" – we humans have no right to question or change the natural order of things. Everything we design has to be in full accord with the way nature "requires" things to be. The only responsibility the designer has is to maintain or preserve nature's naturally ordered design.

Even in the absence of universal scientific truths or the template of nature's own design, as designers we can find ideologies or belief systems that provide the means to remove responsibility from the individual actor. In this case the designer only act in accordance with something larger, truer, nobler, or more ideal than any particular set of criteria that emerge from a specific client's expressed needs, wants or demands.

Sometimes as designers we use the logic of harsh everyday reality as an argument for not assuming any responsibility. We only do what we are constrained to do in any concrete real world situation; we claim that it is not a matter of choice or volition. We let destiny be our guarantor of design.

The choices discussed above can generally be seen as attempts to restrict the degrees of freedom in design practice or as attempts to hide them. But there are significant conceptual differences among these choices in how they operate in practice and how they are based on very different assumptions about the role of the designer's responsibility. There are no simple answers to the question: "who has or should have responsibility in design and how is this responsibility operationalized?". It is a matter of the difference between the particular and the true. We can never find a

generalizable or universally correct answer. But we will argue, based on our definition of what good design is, that if you want to be a 'good' designer – there are no justifiable ways to move, hide or remove responsibility from your own actions. As a designer you cannot "wash your hands" of responsibility.

In many situations in our lives we want to find ways to minimize our concentrated efforts and the energy necessary to accomplish things we need done, i.e. we try to find ways to make things happen without our complete attention. This is also true in design. Since design is very demanding and basically very personal – it takes a lot of intellectual energy. If we are afraid of doing the wrong thing in a design process it is only natural that we search for ways to reduce the need for energy and personal engagement while attending to this concern.

But there is no guarantor of design "out there" that allows us to conserve personal energy and minimize focused attention. None of the approaches described above are valid candidates for such a guarantor. Design is about creating a new reality and there are no givens in that process. There are no theories, methods, techniques or tools that calculate, predict or envision the true future reality. The true future does not exist as a predetermined objective fact. As humans we always have the possibility to create a different future – restricted only by our present reality and our imagination.

Responsibility can therefore not be escaped. It is not a part of design that is optional; instead it is at the core of design and can never be removed. So, where does this leave us? Can we find a guarantor of design anywhere? We argue that, in fact, it is possible only through the development of your own *design character*.

A designer's character is his or hers core. No judgment made by a designer can be made on a complete or comprehensive knowledge base but must depend heavily on core values. Design judgment, in this sense, is an act of faith. The designer has to believe in the capacity to make good judgments. In design we find many kinds of judgments with their roots grounded in the character of the designer. It is a question of a designer's whole being. As a consequence this leaves us in a place where we

consider the designer as a self-reflective individual with a fully developing character. A character that takes on design tasks and that through design manifests the designer's values, beliefs, skills, sensibility, reason, ethics and aesthetics.

How is it possible to reduce the worries about how to make good design decisions that in turn lead designers into trying to avoid responsibility? We believe that the more a designer understands the real nature of design, the better he/she can deal with the responsibility of design. This in turn actually enhances the joy of creating new designs. When a designer realizes her ability, skills and shortcomings, she can deal with the dilemmas of responsibility. But only in the way dilemmas can be dealt with – i.e. to live with them not to get them removed.

This is in line with the reasoning of Martha Nussbaum when she argues that we need education that liberates students. When this is done we get students that "have looked into themselves and developed the ability to separate mere habit and convention from what they can defend by argument" (Nussbaum, 1997). This is not just something we need to do to help students become more personally accountable in their creative work. It also helps them to "have ownership of their own thought and speech, and this imparts to them a dignity that is far beyond the outer dignity of class and rank". Nussbaum continues to argue that this is the only way to get students that will not be uncritical moral relativists. Her explanation for this is that ownership of one's own mind yields understanding that "some things are good and some bad, some defensible and others indefensible" (Nussbaum, 1997).

We argue that the same is true for designers who need to find a guarantor. They must develop their own dignity of mind in order to develop the necessary ability to make advanced design judgments, based on any unique situation and on their own skill level. In order for this to happen they need to develop a strong character. We believe it is possible to "teach them how to argue, rigorously and critically, so that they can call their minds their own" (Nussbaum, 1997).

Robert Nozick argue that to create character we have to live the *examined life* (Nozick, 1989). His basic argument is similar to that of Nussbaum. We read Nozick as if he argues against the idea of an external guarantor. He writes "when we guide our lives by our own pondered

thoughts, it is our life that we are living, not someone else's." (Nozick, 1989). If we want to be good designers we have, according to Nozick and Nussbaum, to base our design actions and judgments on our own core character.

We can do this by constantly examine our practice and our thoughts. Donald Schön describe this examination as two types of reflection; reflection-in-action and reflection-on-action (Schon 1983). It is an approach in line with the ideas of James Hillman when he discusses character and calling (Hillman 1996). Hillman argues that a person's character has a calling and to be able to fully live you have to live in accordance with your calling. In design terms this can mean that each individual is developing into a unique designer and has to form his/her design character in line with his/her calling. This can not be done if character development is neglected for the hope of discovering an external guarantor. Hillman's book on character presents an extremely rich picture on what developing a character can be understood as.

Again this leads us to the conclusion that there is no justification for an external guarantor of design even if there is a felt need. The basic agenda for a designer is, rather than trying to find an impersonal guarantor of design, to develop one's own design character. We have no room in this chapter to discuss in any detail how this can be done apart from recommending the authors mentioned above. However we will present one fundamental idea.

We believe that there is a big difference between knowledge *in* design and knowledge *about* design. To know how to design does not necessarily mean that the designer has a well developed understanding of design and of the role of being a designer. To have a good understanding *of* design is the first step towards a developed design character.

Reflecting on the place of responsibility in design, as we have done in this chapter, is one way of creating a better understanding of design over all. If this is taken seriously it will provide the designer with intellectual tools that can help to make the issues of responsibility visible in design and will trigger further dialogue.

With an understanding of how people can move, hide or remove responsibility we can start to evaluate our own habits and preferences.

Students or professional designers can easily do this while they engage in design on different projects. A close analysis of how responsibility is accounted for in every design project will show not only the complexity of the issue of responsibility, but it will also begin to reveal ways in which we can deal with responsibility in a serious and constructive way. Both Nozick and Nussbaum present ideas about character that can lead to methodological conclusions. They argue that character is something that we can develop through a close examination of our own thoughts and actions.

To do this self-examination we need intellectual tools, i.e. concepts and ideas, that can help us analyze ourselves as designers. The ways presented above of dealing with the guarantor of design is merely a first step in creating such tools. We need to attend to the development of the foundations and fundamentals of design in the same way as we have developed the basics of science.

There is also a need for a serious dialogue on design responsibility in a world where we are designing new technology that radically changes the foundations and realities of society, as we know it. Even if each individual designer's creation is not primarily responsible for the totality of the changes brought by new designs, the totality is an emergent consequence of each small design's contribution. We argue that each designer therefore plays an important and significant part in the overall responsibility for the designed world we all live in.

12. The Evil of Design

Design is paradoxical in many ways (see Fig. 13-1). The qualities of design that appear to be opposites or contradictions are really dimensions of a complex set of relationships that are difficult to apprehend from a single vantagepoint. Just as it is impossible to take in all dimensions of a building without moving around and through its architecture it is impossible to see the whole of anything from just one perspective. As one attribute is revealed another is hidden from sight but not from the composition as a whole.

> • Design is non-attachment and total engagement
> • Design is flux and permanence
> • Design is knowing and naiveté
> • Design is experience and fresh eyes
> • Design is collaboration and solitude
> • Design is process and structure
> • Design is cyclic and episodic
> • Design is control and uncontrollable
> • Design is unique and universal
> • Design is infinite and finite
> • Design is timeless and temporal
> • Design is splendor and is evil

Fig. 13-1 Paradoxes of Design

Paradoxical relationships are common. They are the essential nature of human experiences in life. Life is complex and tensional. The tensions between apparent opposites such as joy and sorrow are usually perceived as abnormal in the Western traditions that hold resolved truths, especially objectively resolved truths, as the highest value and only outcome worth seriously pursuing, at least in pragmatic situations. Tension is regarded as something to be resolved rather than held. Thus, paradoxes are looked upon as relationships that need to be resolved in favor of one or the other

member of a pair. When this is achieved successfully there is a loss of aesthetic quality and a sense of flatness, a lack of depth as a result. It is what we sense when we seriously contemplate utopias and master plans. The interest and excitement of difference held in tension is lost along with what is most exciting about engaging with life in its fullest.

One of the more interesting paradoxes in design is that it is both wondrous and evil. The outcomes of good design, whether as process or composition, display both immense splendors while at the same time giving off a sense of evil. This is not the same pairing of apparent opposites as the more common duality of good and evil. It is not 'Evil' with a capital E designating malevolent spirits or forces dedicated to the destruction of everything that is good in the material world or that is counter to the positive presence of God. It is true that design has been considered Evil in the way that some new designs have been attributed to the work of the devil or the influence of Evil spirits. For instance a European Bishop banned the use of rifled barrels on guns because the resulting superior accuracy over the old smooth bore muskets could only be due to the intervention of the devil.

This is not the evil in and of design that is considered here. The traditional definition of evil in this case is that which breaks unity and separates the eternal self from the ultimate prime causal principle of the All. Evil in a large number of spiritual traditions over time has been identified with a separation from the one, absolute and supreme Nature (Huxley 1944). Evil is any division of this Unity beginning with the concept of duality that is the first step in the deconstruction of the ultimate Whole. This separation can be detected in the dividing out of self through reasoning, will and feeling. All of these qualities of course are manifest in designing. Design is evil in the sense that that which is not desired or desirable, yet which is made manifest because of design activity whether by *chance*, *necessity*, or *intention* becomes part of the world. To a lesser degree evil is also something that disrupts balance, harmony, order and other meaning making attributes of human existence. In all cases evil is not merely the absence of something but is the presence of something.

The splendor of design is clearly apparent in good designs that bear witnesses to the best in human potential. However there are many

outcomes to design other than the expected good solution created for all the right reasons in service to the right people. Design can be considered evil by definition in many ways beginning with some of the very earliest definitions of evil such as breaking a taboo or going beyond the territorial boundaries of the tribe. Design is defined by more contemporary concepts of evil as well.

Unintended or unexpected systemic consequences of an innovated design always make themselves visible in both the near and long term. These are often the consequence of not knowing enough about the complexity of design contexts prior to designing and not understanding enough about the complexity of the dynamics of introducing a new set of relationships and variables into a complex environment. Designers in their rational persona imagine that this situation can be improved on by just learning more about the nature of complex realities. There are some outcomes however that cannot be mitigated through more knowledge or more information. There are qualities about design that can only be considered as evil in all the variety of ways that evil has been defined through the ages of humanity. There are also categories of evil outcomes that are considered to be necessary, not to be avoided.

We have developed three categories of evil that can be present in design which help build a conceptual framework for reflective consideration (see Fig.13-2).

Necessity – natural evil
Going beyond boundaries
Natural order of life – survival at any cost
Lost opportunities
Lost alternatives
Point of view i.e. evil of material or corporeal world
Natural force

Chance – accidental evil
Power without understanding
Cause without connection
Misfortune and accidents
Breakdown of nature

Intention – willful evil
Destroying life and life giving essence
Power without charity - atrocity
Agency without community
Collective dominance over individual
Individual dominance over collective
Individual dominance over individual
Using others as a means only
Separation from unity or godhead

Fig. 13-2 Categories of evil in design with examples

First there is *natural evil* which comes as an integral part of the process of change including the change wrought by design. This is a form of evil that is a necessary and unavoidable part of life's drama – the Shiva complex: "I am the creator and destroyer of worlds." In any creative act something new is brought into the world at the expense of the old that is destroyed. For any number of reasons there may be good and necessary reasons for the change brought on by design but that does not deny the real and painful experience of grief and emptiness brought on by the loss of that which is replaced by the new.

Any design is by definition an act going beyond boundaries, one of the first and oldest definitions of evil. In most cases everyday designing is not considered as boundary crossing since the boundaries crossed are not thought of in the traditional way that strong norms such as taboos are. They are often not even visible as boundaries or limits to behavior. But often enough those who are seen as causing changes that affect the normal routine of life are treated with irritation if not outright hostility because they have crossed the boundary of normal or typical everyday activity. This form of design evil is perilous to the designer because even if the change is for the benefit of those affected the designer is still cast as an enemy of the people.

A new design also brings with it its shadow. There are always unintended consequences associated with design, many of which are negative. This is related to another more obvious natural evil that is the loss of opportunities. When a design is created and brought into the world

and made real it by its very presence excludes other opportunities. The investment in a new design of mundane things such as money, energy, material, time, etc, also excludes other attempts to make a different or alternative design. This holds also true for more abstract investments, such as invested pride and status. This form of evil is closely related to the survival-at-any-cost strategy that, even though it appears to be the essence of nature or natural processes, in human terms carries the suspicion of being an evil that needs redeemed.

A new design also brings with it a specific point of view that defines it as evil because of human frames of reference. The material and corporeal world form the substance of design yet this realm is considered evil by many spiritual traditions. Humans are encouraged to avoid this realm of life yet it is the very material from which a designer forms the design palette. Associated with this perspective of evil is the very old and enduring notion that evil is a natural and eminent force in the affairs of people. One can only continually balance and compensate with positive force the affect of the unrelenting evil energy always at work in the natural order of things.

Second there is *accidental evil* (i.e. avoidable) such as: power without understanding, agency without connection, the misfortune of being in the wrong place at wrong time, bad luck, tragedy, accident, and other unearned losses. This form of evil happens out of ignorance, carelessness or inattention and is not the outcome of an intention to do harm. This form of evil can be modified or mitigated against by becoming more fully informed and aware when engaging in design. Good design judgments are dependent on having the right design knowledge, a necessary but not a sufficient condition. Design knowledge is not separate from the knower. In design, character counts in a similar fashion to the way that good character counts in making good decisions in the absence of a predetermined outcome, the concept of phronesis. Good design is dependent on good designers as much as good information.

And finally there is the category of *willful evil* in design that includes: power without charity, agency without community, collective dominance over individual or individual dominance of the collective, and dominance of one individual over another. The use of people as means only, and the destruction of human life and life giving essence. These are

just a few of the examples of intentional evil that can become a part of design. The history of human affairs is filled with designs that were evil by intention. Potent design theories and powerful design approaches can be used in the creation of things, concrete and abstract, that history will hold as evil in the most literal sense.

Becoming good at design or helping others to become good at design does not assure that good design will be the outcome. The theories and practices of design as presented in this book are still subject to the willfulness of the human being. We as humans are not bound to proscriptions of character that will guarantee if we become good at design that we will create good designs. That is a challenge beyond the realm and intentions of this book but it is necessarily an essential consideration.

How is it possible to become a designer and accept design as a legitimate human activity that ought to be supported and developed by the larger human enterprise when evil is intimate to the whole enterprise? A good next step is to accept the nature of design and prepare accordingly. This includes accepting the uncertain, contradictory, dangerous and yet promising challenges of design (see Fig. 13-3).

ACCEPT CHALLENGE OF DESIGN
no right answers
no givens
not comprehensive
•
ACCEPT POWER OF DESIGN
create real world
•
ACCEPT RESPONSIBILITY OF DESIGN
service to other
•
ACCEPT ACCOUNTABILITY OF DESIGN
evil of design
guarantor of design
artifact evokes own reality
•
ACCEPT PARADOXES OF DESIGN
both/and/neither

•
ACCEPT DISCIPLINE OF DESIGN
skill
authentic engagement
focus
limits
•
ACCEPT POTENTIAL OF DESIGN
begin with infinite possibilities
cause intentional reality
evoke the sublime
create the beautiful
secure the ethical and just
serve basic functional needs and expectations
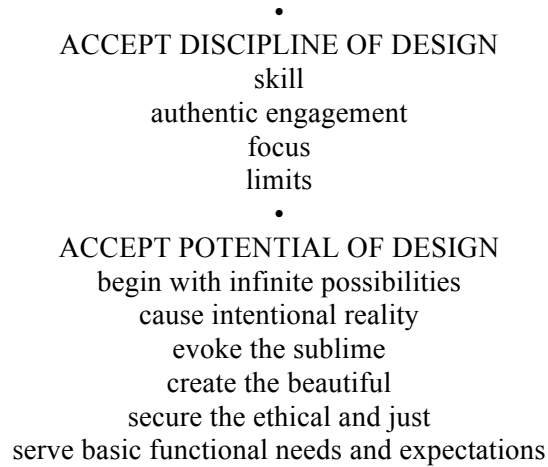
Fig. 13-3 Accepting Challenges of Design

The splendor of design outreaches the grasp of the potential and actual consequences of evil in design. Design can create the sublime despite imperfect designers and a dangerous world. Design can accommodate the hopes and aspirations of every human being despite limits and imperfections. Human nature is such that it is natural, not unnatural to take on the challenge of co-creating the world through full participation in the tension resulting from the struggle between good and evil in the real world.

13. The Splendor of Design

We live in a world of designed artifacts (things, systems, processes, and symbols), some concrete and some abstract. These designs together with the natural world make up our reality. It is a reality sometimes full of beauty and wonder. But it is also a world of ugly, bad and sometimes even dangerous designs. Every day we encounter many of these designs, we use them and struggle with them. We live with them. Some of them we love, some of them we hate. Most of them we never even notice. They just exist as a natural part of our lives.

But sometimes it happens – a design becomes a carrier of a *soul*. We may be struck by the power of such a design, by its beauty and integrity and of course by its usefulness. But also by the way it gives meaning and value to itself and its context. As a designer we should always strive to design things like that – designs with a *soul*. We should try to make our designs authentically part of something timeless.

We always consciously or unconsciously relate to the designs in our reality. What is not obvious is how we do this. What is the process by which we experience, evaluate and judge our designs? And what is it that makes us experience designs as ranging from bad and ugly to authentic and soulful? It seems as if we need a way to better understand how we relate to the world and especially the artificial world that we ourselves are responsible for having created.

James Hillman argues that one way to reach such an understanding is to accept the idea that our environment and our things are *ensouled*. Such a view has of course drastic consequences for everybody who sees themselves as designers. How is it possible as a designer to ensoul a design? And first of all, why is it important to talk about this by using such strong words as soul and ensouled? Is it not enough to talk about quality and good quality? We argue that is it not enough, at least not if we as designers have the ambition to create designs that have a real impact on our reality and how we will live in that reality. It seems as if the way people relate to designs can not fully be explained with concepts such as structure, organization, material, usefulness,

functionality, etc. We need other concepts that captures the richness in the relation, the love and hate, the way people sees the sublime and the beautiful in artifacts, or how they appreciate when a design fits perfectly in a specific context.

It seems as if functionality, efficiency, smartness, usefulness or whatever measurement we can come up with cannot fully capture the way people relate to a design. The way a design is valued and judged must instead be understood as a result of the experience *evoked* by the design and by an aesthetically judgment of the *whole*. It has to do with composition, with balance and relation between all possible aspects of a design.

This is not about superficial aestheticism. The meaning and value of a design is a feeling of complexity and of being *moved* – and as a consequence a feeling of being changed. When we face the soul of a design, our basic assumptions and our worldview are challenged. It may not be much, but something profound happens to us. Something that changes our understanding of the world and of our own place and role in that world.

When we, for instance, face the famous building that has survived over time and has become a symbol of culture and civilization, we may, if we pay attention, be overwhelmed by the depth and strength of its design. Or we might find ourselves in an organization so well designed that we enjoy just being part of it. Or when we touch the fine work of a skilled craftsman and feel the delicate balance between form, material of utmost beauty and quality. Sometimes in situations like this we get the feeling that this design could not have been different. We might even think that it is a perfect design. When we face good design, a design that has a soul, we get a glimpse of the *splendor of design*. We can for a moment realize that design is about the creation of a soulful world.

But even if this is a goal in design, we have to accept that most of the time we can not reach that far. We have to realize that under the circumstances and in the specific situation we have to design for everyday use and with everyday quality. We are under the pressure of restrictions, such as time, material, resources, and of course money. Still, we know that even in the most circumscribed and restricted design situation there might be a design that will turn out to have all the qualities we strive for.

There might be a composition, a change of material, a never used symmetry, a combination of human skills and non-human artifacts that will reveal a fundamental new understanding of the situation and open up the restrictions.

What is it that gives a design that special character of wholeness and integrity? We all know about the difficulties of discussing quality and taste. It is often assumed that quality is something fully subjective, i.e. "beauty is in the eyes of the beholder". And it is often agreed upon that taste can not be judged or defined in any general way. There is of course also the opposite assumption; namely that quality is possible to define without any reference to a specific evaluating subject. In some aesthetic and art traditions it is possible to find general definitions of what constitutes both good quality and good taste. This is all about the very old and engaging question where quality resides - in the object or in the subject?

There are, at least, three ways to answer this question. It is possible to define three stances toward value (Nozick, 1989). There is, according to Nozick, the egoistic stance, the relational stance and the absolute stance. Very short, the egoistic stance sees the primary location of value as within the self. Things are valued because they are beneficial to the self. The relational stance sees the primary location of value in relations or connections and primarily between the self and other things. Value is located between the self and something else. And the third stance locates value as an independent domain. Things have value independent of us.

We will not here elaborate on these three stances, only add that, as Nozick shows, when we take one stance we also decide how we ourselves as parts of reality will be valued. In the egoistic stance we will only be "means" in someone else's reality. And even in our own reality. Our self can not have a priority over other parts of reality. Also the other two stances have their merits and problems and Nozick is asking how it is possible to combine the stances.

For a designer, the situation is even more complicated, since we not only have to consider our own evaluation but also — and maybe even more — the evaluation of our client. We are as designers not standing in

isolation in front of a reality we will design; we are doing it in close relation to other people, maybe with completely different values and preferences. In this case it is obvious that none of the three stances will solve our problem in a simple way. Even if this examination of stances is not enough to solve the question of where quality resides, it at least gives us more foods for thought and eliminates the most trivial attempts to neglect its richness and complexity.

As a starting point in our examination of ensoulment we begin with the two concepts of *value* and *meaning*. These two concepts define two out of many dimensions that make up the notion of reality. In design, value and meaning can be related to two of the most important aspects - the intrinsic value of the design itself (value) and the value of the design in relation to something larger (meaning) (Nozick, 1989). It is important to remind us here that this is a distinction that from a philosophical point of view is very much discussed. Richard Rorty, among others, criticizes this kind of dichotomy when he writes, "there is no such thing as an intrinsic, nonrelational property" (Rorty, 1999). We will still use this distinction but not for a philosophical purpose but as a way to help designers think about design. It is in this context only a tool for thought - not a philosophical claim.

Some designs only have value in relation to something else that is valuable, but designs also have a value of their own, an intrinsic value. This intrinsic value is what you are taught to recognize and evaluate in for instance an art appreciation class, or a literature class, in wine testing, etc. When we are shown how different parts and components are interrelated, how structure, form, material, texture, smell, taste, etc. fit the overall theme or purpose of the thing we are supposed to evaluate, we are learning to see and appreciate the intrinsic value of the thing itself. To be a collector of something is a typical way of learning to discern, understand and appreciate subtleties in a design. A collector is slowly, by the guidance of colleagues, books and magazines, learning to pay close attention, to be *sensitive* towards the value of a design.

This value is made up by the integrated and unified whole sometimes called the *organic unity*. Nozick claims that "something has intrinsic value,..., to the degree that it is organically unified. Its organic unity *is* its value." The intrinsic value is one reason why we may actually

appreciate a specific building or organization even though we definitely not like what the thing stands for or how it is used. Even a pacifist may see and value the building of the military headquarters as a building, even if it can be difficult.

In the same way as the value of a design take time and energy to create so does the sincere *valuing*. To value something means to stand in a close relation to it. This is why people can react strongly against those who dismiss their favorite design (book, music, food, building, game, etc.) without any close examination and attention.

A straightforward way to define value is as a matter of the internal unified coherence of a thing. Of course, this thing can be abstract or concrete, a designed chair, an organization, a car, a journal, a curriculum, a logo, a formula, or more general: a thing, system, process or symbol.

As stated above, value is defined not dependent of context or a larger system. This is in reality a very specific and not very normal situation. As humans we do not only evaluate a design based on its intrinsic value. It is more often the opposite. We are usually bad at consciously evaluate things that make up the reality we live in only based on their value (as defined above). We often take a much more intentional or purpose oriented approach in the process of evaluating designs. We want them not only to have value but also to be meaningful. We want our lives to have meaning. Since we have defined value as defined within its own boundaries, meaning instead involves connection beyond these boundaries.

A thing has *meaning* when we can see how this thing is connected to something else that we value. This may lead to an infinite regress since we can always ask what is the meaning of each new thing or "level" we connect to. Nozick suggests two ways to stop this regress - one is religion which leads to a "thing" where we are not allowed to ask what meaning is ("what is the meaning of God?"). The other way is to connect to something that has intrinsic value and does not have to have meaning.

This leads us to a situation where *value* and *meaning* show a very intricate relationship. Meaning can be gained by linking with something of value and something of value can gain meaning by being linked to something else. What really makes the difference is the nature of the linkage.

"The greater the link, the closer, the more forceful, the more intense and extensive it is, the greater the meaning gotten. The tighter the connection with value, the greater the meaning. This tightness of connection means that you are interrelated with the value in a unified way; there is more of an organic unity between you and the value. Your connection with the value, then, is itself valuable; and meaning is gotten through such a valuable connection with value." (Nozick, 1989, 168)

This examination of value and meaning gives us a chance to see the difficulty and complexity of evaluating designs. We cannot evaluate a design only by its value or only by its meaning - there is a relation between them. It is also important to understand that the way these concepts are defined presupposes a static reality. In real life our perception of the reality and our knowledge constantly changes and thereby changes also our preconditions for both seeing and evaluating the value and meaning of a design.

Value and meaning as defined above does not fully explain what it is that makes a design "soulful". Maybe by adding some more concepts we could come closer, but at the same time it would carry us to far away from everyday thinking in design. Instead we can try to define the soul of a design as something emerging when the value and meaning of a design is in resonance with the particular situation.

A design with a strong connection between value and meaning is a necessary condition for our appreciation of it as carrier of a soul. In this sense, soul will not mean anything mysterious or religious. It only denotes a design that has a strong value and meaning. Soul is what we experience when we are faced with a design with a strong unified coherence related to something that gives it meaning. Such a design is sometimes described with words such as integrity, wholeness, rich, deep, authentic, etc. All these words point to the fact that such a design has a depth and a complexity that is not easily revealed. Value is, as we mentioned above, not something that anyone could see right away, it takes training and often experience to reach the skill to recognize and appreciate value. The same with meaning.

It is not necessary the case that a design, even if it has value and meaning, will be seen as a carrier of soul. If the design does not fit in the

specific situation we will probably not be able to see its soul. If the design is not at the right place at the right time we will, despite its value and meaning, not be able to appreciate it fully. We might be able to appreciate its value and to appreciate its meaning, but as a unified whole it will not have the emerging quality of soul. It has to resonance with the situation. What we encounter is a composition. It is when the design is composed into a specific setting.

In most design fields it takes a skilled designer to recognize and value a composition. But in other more everyday situations we can recognize the composition of, for instance, a building even if we are not architects. We can become very upset when someone tries to change the exterior of a building by replacing windows in a way that "destroys" the proportions and the "idea" of the building. The same thing can happen when the entrance of a building is changed so that the inviting space inside the entrance is removed, or when the command structure of an information system is changed by the latest update so that it no longer is uniform throughout the system. Most of us can easily recognize that kind of composition changes. Sometimes we do not object, since the composition will still hold together and give us a sense of the whole.

A composition is about details and relations, it is about wholeness and integrity – it is about soul. It is not easily visible. It is very much an emergent quality of a system. Every detail in the system contributes to the overall composition. The structure, the function and the form must be in a compositional relationship to the context and the purpose. The way a designer combines and composes all these aspects will determine whether the composition will be *strong* or *weak*, and if it will be successful or a failure.

It is not easy to find universal concepts that fully capture the qualities of compositions. But to describe a design with a strong composition we can use concepts such as *unity* and *integrity*. When a design evokes a sense of unity and integrity it is felt as a composition, i.e. as something holding together as a whole, with a purpose and intention. We feel that the design has an integrity that can not easily be changed. It influences our whole approach towards the design.

A strong composition makes it possible for almost anyone to "see" it, or at least to unconsciously be influenced by it and to adjust one's

approach to the design. A strong composition has also a strong influence on the people responsible for managing the design, since they will recognize the composition and maybe even feel compelled to adapt to a strong composition when making changes to the design.

On the other hand, a weak composition may invite any kind of changes — local, global, radical or small — without any consideration of the existing composition. This can easily happen since a weak composition is not easily detected and may not affect people responsible for managing the design. But there is always a composition, strong or weak, and to some extent it will influence the user's conception and usage of the design. And it might be the case that the strength of a design's composition can be measured in relation to the skill and effort needed to detect and understand it.

To decide if a composition is successful is difficult. A design with a strong composition but situated in a context for which it is not designed or in a context that has radically changed over time, can obstruct change. But if that design is situated in a suitable context, it may create stability in the midst of a complex and changing environment. This situation often appears in urban design where design judgments must always be made between the life and well being of each single building and the overall design of the area. It is always a matter of the ultimate particular, i.e. how the specific design fits into the specific context.

A very strong building can influence design possibilities in a large area around it. In an area of buildings with weak compositions, anything can be done, and at the same time the area will probably lack a sense of wholeness and stability. The same holds true for information systems and organizations.

Almost every composition will eventually have a *breakdown*. When changes are made to a design (artifact, process or system), it affects the composition. The composition will be affected by even the smallest changes over time and at a certain point, as a result of further changes, the composition will not hold. The design will have a composition break-down. This means that the composition will no longer have impact on the people using the system or managing the system; from that point almost any changes are possible.

When we reach the point of composition breakdown we have a very sensitive and unstable system to deal with. Even small changes will have dramatic effects — for instance, when the structure of a carefully composed learning process is constantly "attacked" by many small changes. These attacks may consist of minor changes in the outlined process that someone found difficult to implement in the existing structure and are therefore implemented as "temporary" solutions based on a different structure. If these temporary solutions grow, they will eventually threaten the basic structure, and ultimately the learning process will be difficult to understand as based on a pedagogical idea. This problem will effect the possibilities of handling the design as a whole, and it will radically change our perception of the design. The composition will be distorted or maybe even disappears.

But a breakdown is not inevitable. It is possible both to manage a composition and to replace it. A careful and dedicated understanding of a composition will guide new changes so as to preserve and maybe even develop the composition. If changes are made consciously, a composition can also be replaced by a new one. To succeed, composition replacement demands serious design effort and skill. And that is why it sometimes seems easier to let the old composition go and instead create something new from scratch.

One aspect of ensoulment, sometimes used as a measure of quality, is *timelessness*. A timeless design can be understood as a design not only appreciated at a specific time and place but also valued over time and by people from different times and places. Great pieces of art are often labeled as timeless design, so are famous buildings and constructions such as the pyramids, large cathedrals. But it is not the size that makes it. There are many artifacts, historical things from earlier cultures that we still admire and ascribe the quality of being examples of timeless design.

How is this possible if we have defined the soul of a design as the resonance between its value and meaning in the *specific* situation? One answer could be that the soul in a timeless design is not timeless because it resonates with a specific situation, it is instead soulful because it resonates with something larger, something more "eternal". There are several "things" that can function as that larger eternal reference. Some of

the traditional can of course be found in religion. If a design can be understood as related to the structure or content of religious beliefs it will probably have some of the stability of the religion itself. In today's society maybe we can also see the cultural heritage as a more general reference. Maybe the most powerful relation today that evokes some kind of timelessness is the notion of the "natural" or nature.

Timeless design can in this way be seen as a sign that a design has values and meaning that relates to something that in our society seems to be very stable over time. To conduct timeless design is something very difficult. A designer is usually too occupied and influenced by contemporary ideas and ideals. To both be able to understand contemporary ideals and to relate that to something that can serve as an "eternal" carrier is probably a task too complex to be done as an intentional act. The timelessness that we can see in some designs is maybe more or less a result of luck or exceptional skills.

In a designed society we probably need both timeless design and designs only fit for the present. We need timeless designs that remind us of our past and our history. Timeless designs bear witness of our culture and what has been valued. But we also need change and to be surprised by our contemporary creations. As a designer it is a lifelong challenge to create designs that some day might be labeled timeless. To ensoul designs and to do it in a way that can influence people now and in a far future is something to strive for.

It seems to be a complex combination of knowledge, skill, circumstances and luck to ensoul a design. But what is important when we encounter an already existing design. Can we "detect" the soul in a design? Is it important how we approach the design? Do we need any special knowledge, skill, procedures or preconditions to be able to see the soul in a design?

A pure analytical approach is probably not the best way. It seems as if soul in a composition is not easily analyzed into parts and functions. Instead the composition has to be understood as a whole. In the era of Romanticism the idea of the wholeness of reality was developed. In the Romantic tradition reality had to be understood as a whole and as *one* experience. Romanticism was not a unified philosophical or cultural

movement in the same way as many other "-isms". But it was built on some assumptions about reality that spread to many cultural and (some) scientific areas. These assumptions can be condensed into: (1) The "I" as fundamentally productive and creative, which gives art a unique position, (2) *reality* is a coherent unity and has to be understood as such, (3) this unity (reality) is created, developed, and therefore historic, (4) the goal of development is to unite nature and freedom, object and subject, since there is a original unity behind history.

Without adopting the whole tradition of Romanticism it is worthwhile to reflect on some of the assumptions in relation to design and the "soul". Some contemporary thinkers have kept some of these basic assumptions and developed them further, even if they can't be seen as advocates for the Romantic tradition. James Hillman has, for instance, richly developed the idea about unity and about the place of the soul. He claims that this unity is not only present in the natural realm of reality. "Not only animals and plants are ensouled as in the Romantic vision, but soul is given with each thing, God-given things of nature and man-made things of the street." (Hillman 1992).

According to Romanticism there is only one "method" to reach this original unity and that is through the *immediate experience*. To some the immediate experience was a way to reach an almost magic and hidden dimension of our everyday world. But there were also other ways of interpreting immediate experience, for instance, as a different form of rationality or knowledge. To see the world as a unity, as a whole, can easily lead to approaches to the world that have spiritual or supernatural traditions. Wholeness can be seen as the divine wholeness, where every single part of the totality also is part of, or even the same as, the divine. But there are ways of seeing the world as a unity and still see it as suitable for rational analysis and not only accessible through spiritual exercises.

James Hillman is convinced that things themselves can be understood as carriers of something we as observers and users actually experience — something similar to Nozick's definition of value. To Hillman it is not a question of simple projection. It is not a question of total subjectivism or relativism. A design carries something that affects us, something that "affects our imagination".

"This sudden illumination of the thing does not, however,

> depend on its formal, aesthetics proportion, which makes it
> 'beautiful'; it depends rather upon the movements of the
> *anima mundi* animating her images and affecting our
> imagination. The soul of the thing corresponds or coalesces
> with ours." (Hillman 1992).

It is not about the superficial surface of the design or artifact, neither is it about its depth. The surface and the depth create an emergent *image*. An image that is "created and developed and therefore historical". We experience an artifact as ensouled when its image shows a sufficient complexity. "An object bears witness to itself in the image it offers, and its depth lies in the complexities of this image." (Hillman 1992).

It is in this complexity we can see and experience the carefulness and the concern devoted to the composition and the production of the design. When Hillman writes "the soul of the thing corresponds or coalesces with ours." it is close to our notion of the resonance between the design and the specific situation in which we are part.

The idea of immediate experience tells us that designs have to be approached as a whole. They must be experienced as creators of complex and rich images. This does not mean that we can just wait for the design that "affects" us in the right way. To be able to "read" and see the soul in a design we have to pay the same kind of attention in our examination of the design as the designer did in the design process.

Carefulness and *concern* in details and overall composition are things we look for in designs and are what we will find in ensouled artifacts. To make an artifact soulful demands effort and time. We need to "put our soul" into the design. But what is also needed is a similar devotion from the beholder or user. There is symmetry between the carefulness needed from the designer and the user. A user that does not devote any time or concern in his/hers relation to a specific design will probably not be able to determine to what degree the design is ensouled. Hillman refers this careful attention and examination of artifacts to the concept of *notitia*. "Attention to the qualities of things resurrects the old idea of notitia as a primary activity of the soul. Notitia refers to that capacity to form true notions of things from attentive noticing. (Hillman 1992).

We all know the familiar situation when we have designed something and we have really "put our soul" into the work and our work is not taken seriously. Even good critique such as "that looks good" or "that is a nice design" is almost worthless if we suspect that it is not based on a careful examination or real concern.

There are no guidelines, no techniques, and no straightforward methods on how to ensoul. We know that it presupposes a lot of energy, time and carefulness. And it is obvious that it is not enough to focus on the surface, the visual shape or image of the artifact. It is about wholeness and composition, and it is about the value and meaning. It is about carefulness in details and in relations. To ensoul a design in a way that attracts attention and appreciation demands a respect for the materials used, the structure, the shape, the social dimensions, and it demands courage (Grudin 1990). To design is to create the not-yet-existing, to put something new into the world. It is an act that takes courage and demands responsibility. It is the responsibility of every designer to ensoul the designs that are a result of his/hers creative mind.

There is a need for *authentic attention* both from the designer and the user. Authentic attention means that we take the idea of ensouled designs as a serious and always present possibility. It also means that there is a process, in design and in use, that is maybe more demanding than we usually ascribe to our everyday activities. It is a kind of process we without problems usually perform in other fields such as art, music, or in our relation to nature or each other, but not usually in our relation to designs.

As designers we always need to strive for sensibility of the whole -- the "internal unified coherence", and how it relates to a specific situation and what makes it timeless. When we ensoul things we also make them *precious*. And when something is precious to us, we want to take care of it, and it gives us constant pleasure to use it or only to be in close relation to the design. This is true for all kinds of designs. The soulful organization, car, cup, toy, or learning process. They all become precious to us if we through authentic attention and notitia find them soulful.

> Once we recognize, however, that the need for beauty must
> be met, but that scenic, physical nature is not the only place it

> can be met, we would take the soul back into our own hands,
> realizing that what happens with it is less given and more
> made–made through our work with it in the actual world by
> making that actual world reflect the soul's need for beauty.
> (Hillman 1992).

The idea of ensouled design has another and maybe deeper meaning. We all live in a world of designed and artificial environments. Within this artificial world we have also designed our organizations, work processes, procedures, and rules. We are immersed in a designed world. To live in such an environment, especially if it changes fast and all the time, takes a lot of time and energy from us. If this environment is without soul it will make people tired, it will drain us of energy. An ensouled environment, on the other hand, *evokes life*. When we encounter ensouled designs and compositions we are energized. We might even say that our own souls are filled with new energy.

To take part in the ongoing design of our reality is therefore a task of great responsibility. It is not only a question of creating a functioning, ethical and aesthetic environment. To design means to take part in the creation of the reality that can give people energy and life.

To design in a way that evokes life is not only something for the designer to think about in relation to a user - it is also a question for the designer. To have the chance and ability to create design compositions with a soul also evokes life in the designer. To be given the opportunity to fulfill design intentions in a way that leads to soulful design is maybe the most desirable reward being a designer. At the same time, if you as a designer are forced or not able to work in a soulful way it drains your energy and the splendor of designing will disappear. What remains is merely a process of adapting and compromising to given conditions and determined outcomes. The full meaning of being a designer vanishes and the result will not be ensouled.

The ensouled composition is therefore not only a goal for designers and users; it is in itself part of the reward of doing design. The design process becomes itself a rewarding process if the designer has the possibility to strive for and focus on the ensouled design.

When we start to see design as a process of ensoulment and a way to evoke life into the world it also means that the designer participate in the creation of the world. Every design process and every composition will contribute to the larger design. To be part of the large design is a wonderful opportunity but also scaring. It means that every design, however small will either add to that wholeness or make it less whole. The responsibility is there. What all design should aim for is therefore to make life more whole.

When we create ensouled designs we also add to our overall ability to take care of the world. Ensouled design lead to precious things and precious thing has the specific character of making us wanting to take care of them. Ensouled design therefore is a way to make people caring. It also means that we need caring designers - and careful design thinking.

V. CHARACTER

In the previous parts of this book we have presented what we see as a basis for a design culture. It has been an attempt to help forge the crucible for design competence. Designers need an environment that is supportive of their design work. The design process requires defined limits and space within which to unfold i.e. a crucible. Having a welcoming, protective and enabling environment in place is not enough however. The design tradition requires that both a design culture, that defines the general limits, and a design context, that defines the particular limits, for any design effort, be securely in place if design is to be successful. Our intention is that the composition of ideas presented so far will, through different reflected images, evoke an understanding of the very substance – of what is at the heart of design and being a designer.

The previous chapters as mere reflective images of something much deeper and more profound, provide only one perspective at a time of the substance of design. This is not enough. Building on the material presented so far we believe it is both possible and necessary for the individual designer to move on to a more personal understanding of design. In this chapter we want to comment, at least briefly, on what it means to think and practice in a designerly way, or more correctly, what it takes to *become* a designerly designer.

The seminal quality for assurance of excellence in design is the presence of design *character*. The basic reason for this is that the different aspects of design presented earlier contribute to an understanding of design only when the core values of design resides in the designer's character. Design takes place in the real particular, which means there are no universal truths, no generalized solutions, design resides in the realm of the ultimate particular. Design is about handling complexity and richness, tensions and contradictions, possibilities and limits, all of which makes design a matter of judgment. Judgment is knowing based on knowledge

inseparable from the knower. Design is about composition, which is about relationships and the whole. Composition does not emerge from proscriptive rules or principles, it is an act of judgment. The notion of ensoulment in design points to core values that are embodied in the design competent person. All in all, design as described here emanates and points to the individual designer's core of being – their character.

This does not mean that design is an individualistic process in the heroic tradition of the lone wolf. Design is always a collaborative process even if it only includes the designer and the client. Design is typically carried out in groups and teams with many roles involved in complex relationships. Design is about relationships with all its difficulties of contracting and collaborating including both agreements and disputes. Still, the bearer of cultural norms and the source of design imagination and agency will always be the individual. It is the individual designer that has the responsibility to act in a designerly way, to initiate and develop a design culture, to foster design behavior in other stakeholders and in society at large, to mentor design colleagues and to form design contexts in the particular.

This brings us again to the core of the designer. The core, the design character, acts as a guide for design judgment both in the design process and in the care taking of designed outcomes. The question is; how to develop the core in order to become a good designer capable of doing good design (two different challenges).

Design learning is different from most of the other traditional forms of education based on academic disciplines or professional areas of expertise. Designers are educated with the understanding that they are expected to produce unexpected outcomes. This is quite different from the education and training given to most change agents where the expectation is of producing individuals who are guaranteed to produce expected outcomes because of an assumed logical relationship between educational input and predetermined performance competence. This is important to many human endeavors but this is not the expectation of design or designers.

It is important to remember that every designer has a specific field of expertise. This is the field where the designer has a basic and advanced education and training in the craft, skill, material, principles, language,

styles, traditions, methods, techniques specific to the field.. These fields are usually defined as a professional area or discipline, such as: industrial design, architecture, information design, software design, urban design, organizational design, educational design, instructional design, etc but can also be self organized communities of practice as well. The ideas about design presented in this book do not change the need for this kind of skill expertise and factual knowledge. Field specific professional competence is always necessary. However it needs to be kept in the context of deeper more abstract understandings of design that are appropriate across the diverse fields of application.

The intention of this book is not to introduce or elaborate on the development and learning of field specific information and skills. The design of a learning process relevant for the particular demands and conditions in a specific design field is something that needs to be done within the particular context of each field or community of interest. It should be done in relationship to a specific tradition and culture, and in relationship to the educational system already in place. But even if the specifics of a particular design field or domain of application are important, the more universalized and generalized ideas associated with the development and maintenance of a culture of design presented here have significant consequences for design learning and requires its own particular approach. Rather than offering specifics it constructs a platform for reflection and action that cross the boundaries of the particular.

To be a designer is not a genetic gift. Design can be learned and taught. As in many other areas of life, talent and personality play a role, but education, training and motivation can contribute significantly to anyone becoming a good designer. The effort and time required may differ in the same way as in any other area of life but the possibility is open to everyone.

There is a hierarchy of designer qualities (see Fig. V-1). These *7 c's* portray what a designer needs to develop to be a good designer. Each of these qualities are accepted as necessary in the development of a good designer. They need to be constantly examined and reflected upon, and intentionally developed by the individual designer. To each designer different qualities will be more or less well developed, appearing more or less in need of attention. A simple examination and exploration of these

design qualities by the designer in relation to their professional goals will distinguish were further development is required. This kind of reflection provides the designer clarity around ones own design strengths and weaknesses.

Character   *strive for wholeness of person – intention*

     Connection   *to be interrelated and interrelating - meaning*

       Courage   *to be creative and innovative - purpose*

         Capacity   *to learn – to not know, to know*

           Capability   *to make/produce - excellence*

             Confidence   *to do/act - change*

               Competence   *know facts*
                                 possess skills
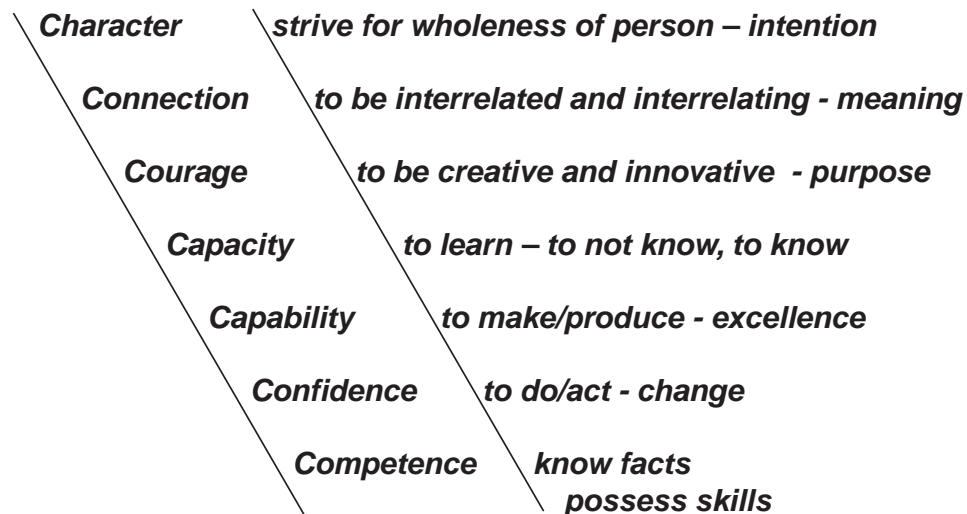
Fig. V-1 Hierarchy of Designer Qualities–the 7 c's

To become a designer requires you to learn to make compositions. This is a fundamental in design but not something that is typically at the core of traditional professional learning models. Most of the learning models prevalent today are based on the analytic approach to knowing that is pursued by taking reality apart. Reductive, analytic and logical skills are held as core competencies and are expected to be both trainable and testable. Even within traditional design fields, the focus of learning may not be on composition but on material or craft skills. To become a designer however, learning must be focused on the act of composition. It is about the creation of wholes. The need for *fusion learning* in addition to critical or analytic learning. Fusion learning is learning to unify and compose so as to create intentional emergent properties.

Design learning takes place in different settings, in different ways based on different expected outcomes. Design knowing can be distinguished as either focused on the universal or particular, or as a relationship between the personal and the organizational (see Fig. V-2). Within these different settings it is possible to construct different approaches to design learning. On the organizational side in combination with the universal we find the more traditional approach to education where generalizable knowledge and skills are presented to a group of people at the same time, usually through lectures and demonstrations. In the organizational and particular quadrant we find approaches to design action suitable for a specific environment, organization or group. This is often labeled as training in the workplace. Within the personal and the particular quadrant we find design judgment. When a person is focused on the particular, there are no general rules or guidelines that are applicable. No general or abstract universal knowledge fits exactly or often even closely. In dealing with the ultimate particular judgment needs to be brought in. This is where design judgment is developed through coaching and mentoring. In the final quadrant of the personal and the universal the focus is on the universality of being a person. This is where your fundamental design character is challenged by new insights, new ideas, and new experiences in relationship to other peoples' experience.

Universal

character   knowledge & skills

Personal ——————————————— **Organizational**

design judgment   design action
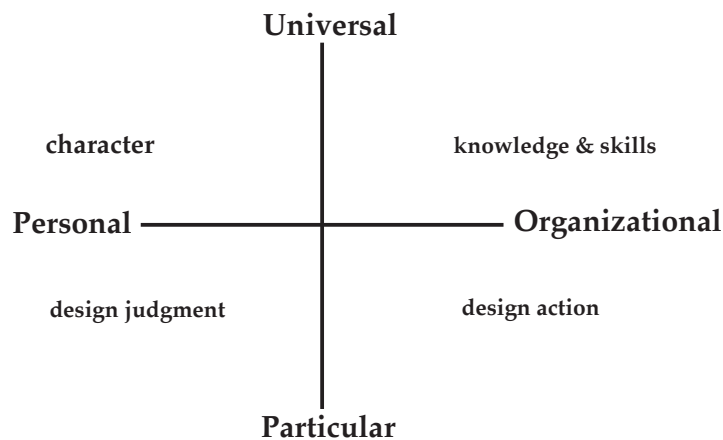
Particular

Fig. V-2 Approaches to Development of Design

As with any design project each attempt to develop design character must be done in relation to the particular requirements and circumstances. There is a time and place for all four approaches. Design development must be done through the universal and particular, and through the personal and organizational.

Character is the designer's form, that which stays recognizable over time. The development of a character demands a careful attention over time. Character is not something that can be changed quickly. A person's character is a blend called the *daemon*. The daemon is the soul that we are born with, it bring our calling in life. It constitutes who we are from the beginning. The idea of everyone being born with a soul and the soul as a carrier of our calling is developed by James Hillman (Hillman 1996).

Hillman presents a way to understand the complex relationship between who we are when we are born and how we change over time. Hillman shows that a careful reflection on who we are in our souls is a lifelong exercise. It is an exercise that is both painful and rewarding. It is through such a continuous reflection on who we are, what our calling is, what we can do with our life, that creates the very basic foundation for who we are and can be. It is the basis of our character. For Hillman our character is, even when stable and deeply rooted, open to change in an intentional way.

Learning how to be a designer occurs at several orders or levels (See Fig V-3). Each order has its own form of reasoning and logic, cognition and perception and skill development. The approach to learning, the kind of knowing and understanding that emerges and the time and effort required changes with each level or order. The disciplinary academic traditions focus primarily on the first order of learning as presented in this model. There are higher orders of learning appropriate to each tradition but the ones presented here are unique to the tradition of design. Very few formal design curriculums encompass more than two or three of the basic levels. A learned designer however engages in them all which requires that they become a self directed life long learner.

1st order—pallet/palette
truths
facts
foreground – context
background – environment

2nd order--systems
patterns
assemblies
archetypes

3rd order—protocols/limits/space
ordering principles
organizing dispositions
frames – boundaries
containers
crucibles

4th order—emergence/form
compounds
compositions
wholes

5th order—guarantor of design
telos
g.o.d.

6th order—guarantor of destiny
G.O.D.

Fig. V-3 Hierarchy of Learning

As we have stated many times, to design is to change the world intentionally. Thus every designer is a leader in the fullest sense, since every design process is about leading the world into a new reality. A place we have never seen before. Design is always moving into unknown places and we can never undo a design. Even if the specific artifact or design is removed the design has already made imprints in the world. People have been changed, probably in both their thinking and their actions. Material and energy have been used in a way that is never

recoverable. To be a designer is be the person that opens up new realites, as one who provokes the world into the unknown. Design is about leadership.

Accordingly, a leader is always a designer – since a leader's role is, by definition, to lead people into a new reality. To be a good leader means to be able to be a good designer. To be a good designer also means to be a good leader. This is a relationship that holds true even when a designer acts in service of a client. The designer still has the obligation to open up new ideas, new realities, based on the desiderata of the client. And since there is no guarantor of design except the character of the designer there is no way to escape the role of also being a leader. This relation leader-designer is very important for any designer to accept. It both reveals the nature and consequences of being a designer and it also puts demands on what it means to be a leader.

To be a designer is to take on the role of all that is expected by a designer. But it is not a passive acceptance of something predefined. There is no true role for design – there are no fixed meanings of what constitutes a good designer. Every designer is a unique person with unique qualities that has to be embraced, attended to, and carefully developed. All this must be done with respect to the designer's talent, calling and character.

VI. DESIGN COMPETENCE

This book is about forging the crucible for a design culture. Design and design activity need to be held in a cultural container that nurtures, supports and protects the work of designers and all those who benefit from design activities. The crucible as a container of creative and innovative work is not something that occurs naturally but that needs to be cared for and continuously renewed and replaced. Within a healthy design culture this is attended to by designers, their champions, clients and other stakeholders.

Design is a choice, one among many triggers that drives intentional behavior (see Fig. VI-1). Depending on the choice made purpose, outcomes, and consequences vary significantly and have major influences on what can be accomplished. Choosing design requires from the very beginning that a context and environment congruent with design behavior is in place, i.e. a design crucible must be formed. Within this space which defines the limits and possibilities of design activity, design competence becomes an essential and pragmatic content of the crucible.
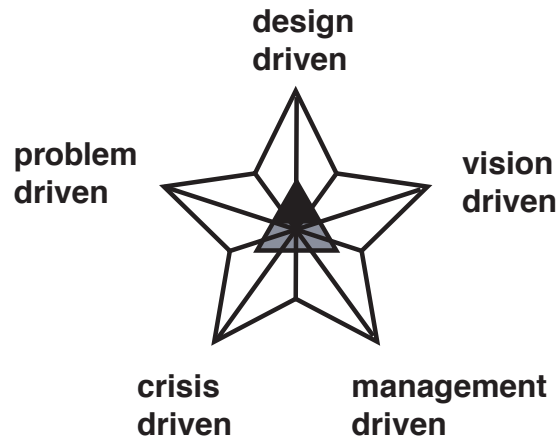
Fig. VI-1 Drivers of action

Part of the consequences of choosing design means that there is a "buy-in" into design as its own tradition. Without an awareness of this initial qualification any creative and innovative actions upon the world will lack the accountability and responsibility that comes with a design contract. Through the enabling presence of a design culture and the presence of a design crucible within which designers are legitimized, design becomes a recognized and valued approach to change by society at large.

In the absence of a culture of design – a robust language, theoretical concepts, methods and tools are not well developed. In this absence of a design tradition designers are forced into other traditions in order to find instrumental support for their work. There is a growing awareness that this borrowing does not serve the essential nature of design and that the core of design is not supported enough. Design and designerly behavior becomes unnecessary limited and restricted because of this.

The presence of a design culture allows us to become conscious and reflective world creators. Design competence is not a question of summation but of emergence. What we advocate throughout this book is

the emergence of such a design culture. Implications of this extend beyond the foundations and fundamentals presented in this book, even if these are not elaborated on here. Among such implications is the recognition of a new form of democracy, based on designerly relationships of service. Another implication is that of inclusiveness which embraces diversity, complexity and contradiction. The design tradition is inclusive of other traditions of inquiry and action. In design there is no "science war" or "war of the cultures". Design deals with the real, which by definition includes all possible aspects of reality.

Design competence is essential for the individual, team, and organization. Together they form a design culture. Design competence allows individuals to become causal agents of the real world. Design competence is an embodiment of the foundations and fundamentals presented in this book as enacted through praxis congruent with the values and principals of a design culture. Anyone who so chooses can become design competent as can any collective of like-minded individuals. Design competency asserts the capacity to create a design crucible through the enabling presence of a design culture–a cross catalytic cause and affect.

Design competence is the ability to imagine, that-which-does-not-yet-exist, to make it appear as a new, purposeful addition to the real world.

Design touches nearly every aspect of our real world. We design to be human and we can design because we are human. It is an important capacity not only for those who desire to be designers but to those who are served, and to those who champion design. Things that really count and are highly valued come from design. When a design is cared for it becomes an ensouled and precious addition to the human realm.

Design is a powerful way of working and being. The competence to create the world that people experience and that becomes the very fabric of what they believe to be reality is beyond full comprehension. This competence to design can and has done great service to humanity as well as great harm. Possessing design competence, the ability to engage so powerfully in the world, is the essence of being a designer, to become a designer in a life-long design – the design of a life.

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