1 | Introduction

We live in an artificial world. It is a world made up of environments, systems, processes, and things that are imagined, formed, and produced by humans. All these things have been designed, and all new things have to be designed. Someone has to decide their function, form, and structure, as well as their ethical and aesthetical qualities. In this artificial world created by humans, information technology is increasingly becoming not only a common but also a vital and fundamental part. Our designed world is full of *digital artifacts,* that is, designed things built around a core of information technology. We can find them in our workplaces, in our meeting and public spaces, and in our homes. Digital artifacts have a direct impact on our everyday lives.

Even if digital artifacts are based on technical systems, they influence our lives at individual as well as social levels. In the artificial landscape, digital artifacts constitute the environment and "nature" in which we live. They help or hinder us in almost all of our professional and everyday activities, and they influence our individual and social developments. This means that IT professionals and others involved in the design of this new environment take on a huge responsibility. To design digital artifacts is to design people's lives.

All design work results in a product of some kind. The product can be abstract or concrete. It can be something small or big, something seemingly important or unimportant. Irrespective of its constitution, the outcome of a professional design process is the result of a conscious action of a designer. This does not mean, however, that all properties and characteristics of the design process outcome are the results of intentional design decisions. Many qualities of a designed artifact are more or less unintended side effects or consequences of mistakes or lack of knowledge. The complexity of design situations prohibits completely rational approaches, which means that there can never be a perfect design process with a perfect outcome. Every digital artifact designed by an interaction designer is in some respects imperfect. Using imperfect technical artifacts causes frustration and stress, and people today are frequently dissatisfied with the digital artifacts they want to use or have to use.

It seems as if the whole business of designing digital artifacts suffers from a lack of knowledge or some kind of limitations that lead to designs that people are not happy with. Why is this? This book is built on the assumption that interaction design—which we shall define in what follows as the shaping of use-oriented qualities of a digital artifact for one or more clients—is in itself an extremely complex and difficult task. It is a unique process that cannot be prescribed or even described exhaustively. There are many books in the field purporting to address the problem by introducing methods and techniques for creating better designs. We maintain, however, that normative approaches are not enough. In order to handle the complexity of interaction design, there is a need for a reflective mind—what we would label a *thoughtful designer.*

Thoughtful interaction design is built on a thorough understanding of the design process, design ability, the designed product, and design as part of a larger context. Being thoughtful is about being reflective. To reflect means that you use your critical mind to examine your role as a designer; it requires you to examine the purpose, outcomes, and benefits of doing design in different ways, and using different methods, tools, guidelines, or theories. Being thoughtful is about caring for your own design ability, the designs you produce, and how the world will be changed by your design ideas and decisions. A thoughtful designer is someone who takes on design as a serious and important task and who tries to become a designer with the ability to create fascinating, authentic, and useful digital artifacts.

A thoughtful designer is part of a larger culture, which we call *design as knowledge construction.* In many design disciplines, emphasis has been firmly placed on the produced artifacts. The professional knowledge of design, on the other hand, has been considered more or less tacit, which is reflected for instance in the traditional design school structures of master-apprentice learning and the importance of portfolios and exhibitions. We agree that design practice and design learning are strongly dependent on these elements; however, we want to introduce the notion of a complementary perspective in which the main "products" are not artifacts, but knowledge. Design knowledge is primarily intended for other members of the knowledge construction culture—including not only designers, but also critics, clients, users, and so on—to share, debate, challenge, extend, reject, and use. This requires *articulation,* not necessarily in the form of written or spoken words, but in forms that can be appropriated and assessed by others. Parts of this book illustrate possible forms of articulation; other parts discuss the issues of what it means to be a thoughtful designer in a knowledge construction culture.

Being thoughtful is not easy, however. Interaction design is a complex process full of dilemmas and contradictions. One of the most challenging aspects is that interaction

design is concerned with *digital* artifacts. The technology constituting our design material is changing so rapidly that there never seems to be time for reflection or for a more thoughtful approach. Why reflect when the things you work with are gone tomorrow and you have to deal with new technology? To a certain extent, this is a valid objection, but at the same time the core of being a designer does not necessarily change as rapidly as the material. We believe not only that there is a possibility to find a reflective position in the midst of changes created by evolving technology, but also that it is essential.

When dealing with material we know well, it is possible to work with the qualities of that material. Knowing a material well also entails knowing the drawbacks. For instance, we know that wood rots, iron rusts, and that concrete is inflexible once molded. However, we do not always have such detailed knowledge of the materials we use. Design becomes more complex when we combine different materials that each have specific qualities. It becomes very difficult when the material is a composition of both technical artifacts and social systems. If a design process aims to create an information system in an organization, then individuals, groups, and teams can be seen as kinds of material. The challenge is to design the social "components" together with the technical components as a systemic whole. Such situations challenge our design ability through their nearly infinite complexity.

Designers of digital artifacts face a particular difficulty. The material they use—that is, the digital technology—can in many ways be described as a *material without qualities*. It is certainly true that the basic technology itself has some fundamental properties. For example, it is based on electricity and on a specific kind of logic, and it normally has quite well-known features, such as a gray desktop box with a screen and keyboard attached to it. On a more general level, there are qualities we might now think of as inherent in digital material. Examples include the facilitation of many-to-many communication and the medium's dualistic nature as spatial and temporal. However, history demonstrates that most of these material qualities of digital material are constantly challenged by new technological breakthroughs and new innovations in how to use the material. Over the years, we have learned to be open to new understandings of the major defining qualities of this specific technology. So, to some extent we have to consider it a material without qualities. As a consequence, the design process becomes more open, with more degrees of freedom and therefore more complex.

Our thoughts on digital technology as a design material and its qualities, including the rhetorical notion of information technology as a material without qualities, have been stimulated by many sources, including the classic novel *The Man without Qualities* by Robert Musil. In this book, Musil discusses the relationship between thinking and

creativity. Of course, Musil had no knowledge of our modern information technology when he wrote the book in the 1920s and 1930s, but his general ideas are still valid. We believe that his work has helped us formulate certain aspects of design that are traditionally not well developed in our field. In chapter 7, we further develop this relation to Musil's work.

If we accept the idea that information technology is difficult to grasp as a design material, then certain design issues come to the fore. As designers of digital artifacts, we might be closer to the conditions of the author and the writer than we are to designers working with more traditional materials. The material of the author and writer is language. Language is a material nearly without inherent qualities, perhaps similar to information technology in that respect. It is possible to create almost anything with language as a material: novels, manuals, instructions, prayers, fantasy worlds, poems, and constitutions. The responsibility for what is created is fully in the hands of the creator—the designer. Similarly, the design of digital artifacts is largely open and unbounded. This leaves us with a situation where the designer wields significant power, and with such power comes responsibility. It becomes important to ask questions about what is good and what is bad design, and about the goals to which an interaction designer should lend her skills.

1.1   What Is Good Design?

A book on design of digital artifacts is, of course, about the design of *good* digital artifacts. But what does good mean? Can it be measured or analyzed? Our basic assumption is that good is determined by many factors. To begin with, the digital artifact has to be evaluated in relation to a situation. Even though certain aspects of a digital artifact might be independent of the context, its most crucial qualities are always deeply context-dependent. An extremely fast and efficient digital artifact is hardly good design if it is not understood by its users. Outstanding user interface intelligibility is pointless if the basic functions of the artifact fail to satisfy the users' needs. An intelligent and adaptive artifact with exceptional problem-solving capabilities is worthless if it is too slow.

The good of a particular digital artifact also has to be judged in relation to the intentions and expectations present in the specific situation. This means that the artifact users' competence and skills in judging quality has a great impact on how the artifact is assessed. With a group of novice users, a sophisticated and complex artifact might be seen as bad, while a simple one might be seen as very useful.

"Good" is also defined in relation to societal laws, regulations, agreements, and contracts, and in relation to ideological considerations such as democratic, cultural, and

environmental ideals. It is therefore obvious that we cannot reach a simple definition of what constitutes "good design." Such a definition is too complex to formulate once and for all. This is, however, not an argument for refraining from trying to come up with a definition. Working with design means that you continuously need to define and redefine what you think of as good design. It is a never-ending process of thoughtful reflection.

Thinking about good design is also essential for any designer who wants to improve her design ability. Since there can never be checklists or guidelines capable of determining what good design is, the designer needs highly developed *judgment* skills. This enables the designer to approach each situation in the unique way it demands. What ultimately determines the goals to strive for in a design process is formed by the individual designer's judgment—there is no other way. It might be possible to interpret this as a way to avoid the question of what good design is. Our hope, though, is that a thorough reading of this book will provide a basis for a designer who wants to enter the ongoing process of attempting to answer the question. We cannot offer any shortcuts.

A designer's most important task is to develop her judgment, by critically and independently formulating her own assumptions and beliefs. This does not mean that a designer is left all alone with all the work. There are ways to support the development of design ability.

The way we have chosen to help the designer is to present ideas and concepts that can be used for intentional reflection. We consider this to be the way of the thoughtful designer. It is a critical and reflective approach. The thoughtful designer sees her own ability as something that has to be designed. The thoughtful designer understands that theories, concepts, and ideas about design are practical intellectual tools. The thoughtful designer dares to challenge her own thinking and assumptions as a way to develop her competence and design ability.

1.2   Core Concepts

In our text, we try to keep the number of core concepts low. We have also tried to stay close to an everyday understanding of the concepts by avoiding advanced and complex definitional procedures. However, there are a few core concepts that require short introductions, since they are used throughout the book. These concepts are: interaction design, design process, design situation, and digital artifact.

Interaction design refers to the process that is arranged within existing resource constraints to create, shape, and decide all use-oriented qualities (structural, functional, ethical, and aesthetic) of a digital artifact for one or many clients.

This definition will be elaborated in connection with our discussion of design ability in chapter 3, but we may note here that it implies a rather broad scope. The words *create, shape, use-oriented,* and *digital artifact* provide hints on how the intellectual tradition of interaction design is composed. First, it is a design discipline, which means that concepts and theories from other design disciplines and from the transdisciplinary academic field of design studies are relevant in understanding and developing interaction design. The main overall motivation for this book is the need for an elaboration of what it means to assume that interaction design is a design discipline. Secondly, interaction design has a strong relation to the academic field of human-computer interaction, where the human use of digital artifacts has been studied and enhanced for over thirty years. Finally, the concentration on digital artifacts implies that all fields concerned with constructing and developing digital material contribute to the intellectual tradition of interaction design in various degrees. These fields include computer science, information systems, and software engineering.

To treat all of these fields as parts of the intellectual tradition of interaction design means that they provide concepts, ideas, and perspectives for our presentation. Our contribution lies in the selection of what material to appropriate and how to fashion it into a more or less coherent whole.

The *design process* begins when the initial ideas concerning a possible future take shape. The process goes on all the way to a complete and final specification that can function as a basis for construction or production. In some cases, the final specification is identical to the final product. We do not distinguish between processes that lead to construction of new technology and processes that lead to the composition of an artifact by assembling readymade components or configuring an off-the-shelf product. In both cases, the work constitutes a design process.

Design is always carried out in a context. The concept *design situation* refers to the situation that is both the reason for the design process to be initiated and the context within which the design work is carried out. One simple case is when an organization perceives the need for new information technology support. They ask someone to act as a designer and work with the people in the organization. In this scenario, the organization more or less becomes the design situation. In other cases, the limits of the design situation are not as clear-cut. For instance, when design is performed for a mass market on the Internet, the delimitation of the design situation becomes more complex. Another example is when design is carried out for products that people will use in their homes, their cars, or carry in their shirt pockets. A designer is always charged with figuring out the situation at hand, what should be considered to be part of the design situation, and what can be left out. The design

situation therefore becomes a core concept in interaction design. The situation is the starting point for the design, as well as the more or less malleable target for interventions through design. In other words, the design situation evolves along with the design process. The "now" that exists when the design process starts is not unaffected by the design work and its outcomes. Design amounts to standing in the "now" with the task of studying possible futures, or ways in which the design situation might evolve due to our intervention.

The result of an interaction design process is what we choose to call a *digital artifact.* An artifact refers to "something made by humans." This concept is normally used to denote physical objects, but it can be used in a broader sense as well. We use "digital artifact" in this book to refer to artifacts whose core structure and functionality are made possible by the use of information technology. Moreover, we limit our studies to digital artifacts that operate in rather close relations with humans in social contexts. For instance, we will not address automated processes or fully embedded components unless they have a direct relation to users. This follows from our focus on interaction design and use-oriented qualities as opposed to information technology design in general.

Digital artifacts are commonly referred to by such terms as systems, programs, or products. In our text, we will occasionally use these terms in order to reflect the common language in the domain we happen to be discussing. They are, in general, to be regarded as synonyms to digital artifacts without any more precise connotations intended.

There are many roles and many people involved in design. The ones we will be mentioning most frequently are the designer, the client, and the user. We have tried to keep the meaning of these roles as simple as possible. A *designer* is any person who actively takes part in the shaping of the digital artifact. A *client* is a person or an organization contracting with the designer. The client typically pays for the design work and makes final decisions about whether the results are acceptable. A *user* is a person who will be using the digital artifact when it is implemented.

Of course, more elaborate schemes of roles are prevalent in professional IT practice. There, we typically find that our generic "designer" role is divided into a number of specializations, such as information architects, graphic designers, interface programmers, and so on. Similarly, our generic categories of "clients" and "users" are often refined to include, for example, legislators or user organization representatives. The intention behind our using a more simple set of roles is that the arguments we present reside on a more generic level, and are therefore applicable to several specialized roles after suitable appropriation and adaptation.

1.3   What Is Design Theory?

This book can be viewed as an attempt to contribute to a design theory; that is, it contains ideas about the essence and nature of design work that are intended to support designers in becoming more proficient. But what is design theory and to what extent can it be of any practical use? These questions can only be answered in relation to some basic assumptions about design work.

Our basic assumption about the design process is that its form, structure, and qualities are not given or ruled by laws of nature. Design work is given form and structure by designers' own thoughts, considerations, and actions. Its character is influenced by people's habits, traditions, and practice. This means that *knowledge for design* should, to a large extent, be thought of as *knowledge about design.* Knowledge about design concerns differences in design traditions and practices, limitations in the design process, and the nature of design thinking.

Design theory can be seen as knowledge that can liberate the designer from preconceived notions and conceptions of how the design process can and should be performed.

Liberation is not enough, however. As a designer, you might also need help in creating order and meaning in a complex world. This can be done by making the complex less complex by organizing, structuring, and categorizing. Hence we identify a second purpose of design theory—to function as a conceptual tool that will help us create some kind of order in a chaotic world of practice.

Design theory is also knowledge focused on creating new conditions for design, different patterns of thinking and acting, new design examples, and a general understanding of the conditions for creative and innovative work.

There are, of course, many different definitions and understandings of what design theory is and what it should be. In some cases, design theory is seen as a way to specify the outcome of the design process. For instance, there are several design theories advocating an environmental approach. They are formulated with the goal of influencing design work in the direction of more environmentally sound products. Other theories are based on ideological foundations, oriented, for instance, toward making the design process more democratic. Every theory is formulated with an intention and a purpose. This makes it impossible to assess them by simple comparisons. Theories might all be good at supporting their specific purposes, but still be exceptionally different in character and nature.

Our definition of design theory is based on our intention to discuss design in a way that helps interaction designers improve their design ability by exercising thoughtful design. The definition is therefore focused on design as skill, knowledge, and competence. Our definition of design theory is also process-oriented, with an emphasis on design thinking and design action.

1.4   A First Sketch of the Design Process

To design is to create something new. Design is not the same as problem solving in the mathematical or logical sense. Based on the actual meaning of the words *problem* and *solving,* problem solving implies that certain problems exist and that they are solvable. In most areas, problem solving also implies that it is possible to determine if a problem is solved or not. Most important, problem solving implies that a solution is either right or wrong. However, in design there are no correct answers. Every design proposal is formulated in a close relationship with a changing and growing understanding of the situation (the *problem*). Since this is an ongoing process, it is never possible to determine whether a design proposal is right or wrong. Still, we may note that a designer's current understanding of a design situation is commonly referred to as the "problem," and her ideas on how to proceed are called "solutions." We will adhere to this convention, but we would like to emphasize that the words mean different things in design than they do in formal logic.

Every design process is unique. The preconditions for design work change from one occasion to the next. This means that design work is impossible to predict. If the outcome *can* be predicted, it is by definition not a design process. Every design process is affected by the people responsible for carrying out the work and by existing conditions, such as available staff, tools, and time. The process is also a consequence of the specifics of the design situation at hand. The combination of these three elements—the designer, the resources, and the situation—is always unique, which makes every design process an *ultimate particular* (Nelson and Stolterman 2003), that is, an ultimately unique instance of a design process. Even though this process might have a lot of characteristics in common with other design processes, it is still never possible to fully prescribe or predict. Ultimately particular processes create specific conditions for the designer.

For instance, design is about uncertainty. To participate in design work means that you, as a designer, play a part in a venture that involves great risks. Design involves chance; it forces you to challenge the unknown and to create the not-yet-existing.

Design is very much an ethical activity. Every design process is a combination of actions, choices, and decisions that affects people's lives and possible choices for action.

As such, design is deeply influenced by values and ideals. In every design, no matter how small, there are always choices that in different ways will lead toward or away from those values. There is an ever-present ethical dimension in design, manifested in the most practical choices and decisions.

Design is also an aesthetical activity. Design processes fill our world with artifacts that influence our lives not only by their functionality but also by their form and the way we experience them in use situations. The importance of aesthetical aspects in design cannot be overestimated. We are all living in a world almost completely artificial and designed, and every new addition, every new design adding to this world, has an impact on how we experience the whole. Every design is a change of our life world; the designer influences our overall experience of the world as a pleasant or ugly place to spend our lives in.

Design is also a political and ideological activity. Since every design affects our possibilities for actions and our way of being in the world, it becomes a political and ideological action. With designed artifacts, processes, systems, and structures we decide our relations with each other, society, and nature. Each design is carrying a set of basic assumptions about what it means to be human, to live in a society, to work, and to play. When looking at large infrastructural designs, such as the way we organize society and companies or large technical systems, most people realize how they affect the way we can live our lives. We would like to point out that the same also holds true in a small-scale perspective. Every digital artifact restricts our space of possible actions by permitting certain actions, promoting certain skills, and focusing on certain outcomes. To some extent, the user has to adapt to the artifact. Since all designs influence our lives, they become manifestations of political and ideological ideas. People often dismiss the relation between ideology and design as insignificant, in terms of impact as well as importance. We believe this to be a mistake. The role of digital artifacts has to be recognized and measured in relation to the way they have a real impact on our lives.

This view of design, this first sketch, leads to a realization that design includes *responsibility.* Since design is unique, ethical, aesthetical, political, and ideological, it puts pressure on the designer. Even if we, as designers, think that we are only designing artifacts that are extremely small in relation to an almost infinitely complex reality, we cannot escape our responsibility. The most minute, seemingly insignificant, change of the whole can have large and unexpected consequences. Someone might argue, "As a designer I am only satisfying my client, so the client has the responsibility." It is a common situation that a client hires a designer to get help with difficult decisions in a design process. The client has the overall responsibility for the outcome, but a designer is still responsible for the result she produces and hands over to the client. It is important to

acknowledge the complex relationships between the client, the designer, and the user in the design work.

1.5   The Amazing Design

In every design process, there are situations when the designer is "forced" to be creative—to be able to see people, things, and situations in a new way, and to be able to handle contradictions, dilemmas, and conflicts. At the same time, the designer needs the ability to cooperate, understand other people's views, and present and argue for her own ideas and proposals. Given all of these considerations design is challenging and exciting, but also difficult enough to induce anxiety and stress.

Personal engagement and personal expression are vital aspects of good design. A designer has to be prepared to engage in the process not only as a skilled professional, but also as a creative individual. A job where you have to be engaged and where you have to find ways to express your own ideas is stimulating, of course, but it can also be highly demanding.

In most cases design is a very practical and concrete activity, or at least an activity that will have very practical consequences. Design is about shaping the world we live in by creating the conditions, opportunities, and restrictions that will make up that world. Design means that you influence people's work, leisure, and everyday life (including travel, economy, communication, entertainment, and so on). From this perspective, design is an amazing activity—it enables people to engage in creating the reality in which they spend their lives. A designer has a chance to do something of importance.

Design is also amazing since it deals with profound and existential issues in a very tangible way. As a designer, you have to think about the relation between what *can* be done and what *ought* to be done. Design reveals, in its very practical activities, deeply philosophical questions concerning how people can and should live their lives, as well as questions about the environment in which we live. A designer has to think about how the artificial environment where we spend most of our time should be designed. Design forces us to challenge the present and makes us think about the basic conditions of our society. This holds for interaction design as well as for any other design field. Digital artifacts contribute to shaping the way people can live their lives; they become important parts of people's everyday environment.

Design is about will and desire. It is driven by a will for change. Almost any attempt to make a change will face some kind of resistance. This means that the person who pushes for change must be brave and prepared to take on the resistance in a suitable way. To do this, the designer needs to be convinced of the strength of her proposal

and to trust her judgment. Facing this kind of resistance can be exciting since it leads to ongoing learning and development, but it can also be frustrating and create doubt and insecurity.

On the whole, design is a diverse and complex activity, full of contradictions and dilemmas. Being a designer is demanding, but it is also something that can be extremely fascinating, exciting, and rewarding.

1.6 Everyday Practicalities of Design

In this introductory chapter, we have stated that design can be both amazing and frustrating. The frustration is not only a consequence of the fact that fundamental ethical, aesthetical, and functional considerations in a design project might seem overwhelming. Design is also carried out within social and organizational contexts that have particular limitations and restrictions. On a practical level, there is only a certain amount of resources and time at the designer's disposal. There will always be demands and preconditions that cannot be changed. There might be an unpredictable client or decision maker. There are an infinite number of conflicting wishes, requests, and demands. There can be power struggles and conflicts. All of these considerations belong to the *everyday practicalities* of design. Situations where a designer can choose and create the most ideal way to carry out the design work are extremely rare, to say the least.

To be a designer does not mean that you have to get rid of all obstacles. The real task for the designer is to develop something of lasting quality in the most suitable and creative way given the existing conditions. To do this, the designer has to challenge existing conceptions and restrictions that are based on false assumptions. Blaming a poor design on the preconditions and the situation is not a way to avoid responsibility, even though it may be a way to explain certain decisions and results. Having limited resources and time can sometimes even stimulate creative and innovative thinking. Being successful in design means being able to handle the everyday practicalities, and to deal successfully (or at least adequately) with difficult technical and social contexts.

1.7 Design and Society

Every design, however small, is a part of what can be seen as the largest design project of them all—the joint design of the world as a place for human life. Design is one of the more active processes in this attempt to make the world a better place. As we have stated earlier, in the light of these dynamics, every design has technical, social, ideological, and political consequences.

So what is expected of a designer? The client who contracts with a designer is driven by needs and wishes. The designer, however, has other considerations as well. For a professional designer, it is not enough to make the client happy. A designer is also a citizen in a society and a member of a group that possesses specific professional knowledge. Consequently, the designer has the power to change and influence the development of society, which implies significant responsibility. It is a responsibility that transcends the particular conditions of the project and the contract with the client. For instance, an architect who only considers the wishes of the client without caring for other societal goals, such as an overall city plan, or the character of the surrounding environment, will be subject to severe criticism.

An interaction designer participates in this ongoing discussion about the development of information technology and its role in the society. Participation does not have to be in the form of public appearances and debates, but it is unavoidably manifested in the digital artifacts that are designed and produced. Every profession has its own internal debates about and control of what constitutes proper professional behavior and good quality. In many cases, the most knowledgeable and severe criticism of a design project may come from colleagues.

To be the designer of the city library information system can be exciting but also revealing, since your work will be open to inspection by anyone who visits the library. Criticism of digital artifacts is not an established practice, as is the case in architecture, industrial design, and other more visible and established design fields. This may change since interaction design is gradually becoming one of the most influential design fields in contemporary society. Interaction design is the source of an increasing number of products that make up people's everyday lives. A more developed discipline of interaction design criticism may appear in the near future. We would welcome such a development.

Whether design is seen as amazing or frustrating, or from a narrow or a broad point of view, any designer has to develop her own understanding of its essence and character. Difficult questions have to be posed; dominant conceptions have to be challenged. This is something every thoughtful interaction designer has to do. We hope that this book offers some of the necessary tools for this critical and reflective venture.

1.8   Book Overview

As we have stated, this book primarily addresses the IT industry and IT academia. Its purpose is to introduce a design perspective to familiar materials and processes and to provide conceptual tools to help the reader ponder the implications of this perspective.

One of our basic assumptions is that many of the important aspects and questions on design are generic and therefore applicable to most design fields. This assumption plays out in the text in several ways. In many cases, we discuss theories and philosophical dimensions of design without clearly stating *what* is being designed. The connection to interaction design is mostly expressed in the examples we use, which are all about the design of digital artifacts. In this way, we hope to create a broad general understanding of design and a more specific preparedness for interaction design.

Chapter 2 is about the design process, its nature and character. We outline a view of the process that differs somewhat from the typical assumptions underlying the literature on methods and techniques in the IT field. The chapter covers the development from initial idea to final specification. The design process is also discussed as a social process where the role of the designer in relation to other participants and stakeholders is examined.

At the very core of interaction design is the designer herself. Chapter 3 considers what constitutes a thoughtful designer. We also discuss some ways for a designer to develop her design ability.

In chapter 4 we examine a selection of methods and techniques for interaction design. The chapter is meant to support critical reflection on design methods and techniques rather than to provide how-to guidelines. We have selected methods and techniques for consideration based on their correspondence with our general perspective on design, which means that they represent contributions from several academic fields involved in the intellectual tradition of interaction design.

Chapter 5 moves on to the outcome of the design process, that is, the digital artifacts as designed products with certain qualities. The view of the design process and the designer's ability that was outlined in previous chapters hinges on a repertoire of exemplars, a sense of quality, and a language for articulating the use-oriented qualities of digital artifacts. Chapter 5 illustrates how these requirements can be met.

The preceding chapters are largely oriented toward an insider's perspective on interaction design. In chapter 6, we zoom out to consider the large-scale conditions for design. We relate interaction design to other design disciplines, design history, and the technological developments in our field.

In the last chapter, chapter 7, the basic ideas of the book are revisited. We return to Robert Musil and his novel *The Man without Qualities* in order to draw out the main themes of our exposition.

Interaction design is a heterogeneous field drawing on several academic disciplines. The amount of potentially relevant literature for a thoughtful interaction designer is overwhelming. Consequently, we conclude the book with an annotated bibliography, which is intended to provide some useful guidance in the diverse literature of interest to our field.