DESIGNING FOR
THE DIGITAL AGE

HOW TO CREATE HUMAN-CENTERED PRODUCTS AND SERVICES

KIM GOODWIN

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This book is for Bené, my strength and inspiration,

my parents, who taught me I could do anything,

and everyone who believes that design should make the world a better place (today and tomorrow).

About the Author

Kim Goodwin is VP Design and General Manager at Cooper, where she leads both an integrated practice of interaction, visual, and industrial designers and the development of the acclaimed Cooper U design curriculum. Kim knows the design world from multiple angles; she started as an in-house and freelance designer and spent several years as an in-house creative director before joining Cooper 11 years ago. Kim has led projects involving a tremendous range of design problems, including Web sites, complex analytical and enterprise applications, phones, medical devices, services, and even organizations. Her clients and employers have included everything from one-man start-ups to the world's largest companies, as well as universities and government agencies. This range of experience and a passion for teaching have led to Kim's popularity as an author and as a speaker at conferences and companies around the world.

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Foreword

Designing the human-facing behavior of software-powered systems is a relatively new discipline. As any new discipline develops, even its own practitioners are unaware of its ultimate scope, and the breadth of expertise its application requires often comes as a surprise even to its most skilled experts. It certainly surprised me to see just how deep the craft really went as we explored it. The depth of knowledge and the extent of method required is significant, and it truly represents a unique discipline of some magnitude.

This book is the first I've ever read that covers the entire spectrum of interaction design practice as a craft, including visual design and industrial design. While interaction design is a wholly new discipline, visual and industrial design are older, pre-existing fields that have been wholly transformed by digital technology. All three are given full consideration here. Others have written scholarly work on the theoretical underpinnings of software behavior, or described the visually aesthetic component of the field. Some others have attempted to cover the entire ground, but at one point or another, all of them take leaps of faith, exhorting the budding practitioner to "be creative" or "make it easy to use."

But practitioners need to know *how* to make it easy to use, and *how* to be creative. Gaining mastery of these tiny, creative steps is precisely the sticking point that leaves the student of interaction design unable to proceed. Kim's comprehensive book never advocates such leaps without giving the reader detailed instructions on exactly how one goes about making them, and with real world examples. The primary reason why this book will change the way designers learn and practice their craft is because of the thoroughness with which it covers the great span of the field.

Unlike so many of the new disciplines ushered into being by the digital revolution, the design of digital artifacts isn't purely technical. While it is abundantly rationalist and demanding of rigor, it contains generous helpings of cognitive psychology, sociology, and ethnography. One of the reasons why it is a craft distinct from programming is simply because most programmers, who otherwise so value cross-discipline skills, are quite disinclined to include the skills of observation, interviewing, and analysis of the humans who will ultimately use their creations. Interaction designers need to learn the techniques and patterns that empower them to understand humans, as well as software.

The wisdom and methodology set forth in this book is the product of many minds working at my company, Cooper, while operating on many client engagements, over a span of 17 years. Here at Cooper we follow a Socratic method, where, although clever answers are valued, discriminating questions are valued more. The dialogue is what brings forth not just solutions, but also entire frames of reference for how to approach problems in any domain and deconstruct them for solution. And we keep on learning, constantly changing and growing the method and its toolset.

At times, each of us here has played the role of teacher, and each the role of student, and our attention is always on finding the underlying principles. The axiomatic nature of such fundamentals allows the practitioner to build his or her skill over time by seeing the common forces and patterns at work both in the man-machine interface and in the process used to create solutions for that interface. All great craft disciplines share this trait; while their essence can be expressed in a few simple aphorisms, the mastery required to put those aphorisms into practice can take years to learn and decades to master.

The firm foundation of the method doesn't take away from your creativity as a designer.

Kim Goodwin has been a prime participant in the dialogue at Cooper since 1997. She has been one of the major contributors to the development of our design methodology. She is an authority on design, problem scoping, engagement management, and design documentation. Kim has labored in the trenches in a broad variety of design segments, from clinical medicine to conceptual blockbusting. She has led groups of designers, coordinating their work, and synchronizing it with the needs of some very demanding clients.

And she has taught others to design. Many hundreds of people have gotten a taste of Kim's clarity, patience, thoroughness, and rigor by attending her presentations at conferences, her one-day field seminars, or her design courses. In fact, Kim has been the primary creator of training content for our very successful Cooper U classes. Over the years, her particular expertise at observation, synthesis, and communication while in charge of other design teams and honed in the classroom, led her naturally to write this book. Much of the content and wisdom gleaned from those classes is evident here.

Cooper's Goal-Directed Design is a unique and effective method. It is a collection of practices and principles that are used the way any craftsman uses his toolset. On any given project there are tools that are always used. Some tools are used regularly but not always, and some tools are used rarely, but when they are needed they are the only way to get it right. A big part of the skill of the designer is in knowing what tools are available and having the experience to know which one to apply for best effect. Kim provides the strategies for selecting and applying them in professional use.

The firm foundation of the method doesn't take away from your creativity as a designer. There are lots of easy design problems in the world, but there are also lots of very difficult ones. Glib cleverness may work for the former but will leave you afloat in a sea of confusing variables in the latter. The great value of a rigorous methodology is that it gives you a strategy for breaking down the really complex, tough problems into smaller, more familiar, and more manageable tasks that can be readily addressed. While personal creativity helps you create the right answer, mastery of the overarching process helps you address the right problem.

Clients regularly bring to us some of the hairiest, most complex problems set in the most politically demanding situations imaginable. While some agencies shy away from such apparent no-win propositions, we revel in them because of our confidence in our tools. When a software giant, for example, wants us to design a financial application

for millions of users, or when a medical services company wants us to design a clinical application for orthopedic surgeons to use during hip replacement operations, our designers put on their green eyeshades or hospital scrubs, and wade in with manic glee, knowing that observation, methodology, experience, and a comprehensive set of effective design principles will reveal the hidden forces at work and allow them to synthesize world-class design. The book you are now holding gives those tools—and that confidence—to you.

If you are just starting out in the world of designing digital products and services, this book will take you step by step through the process of interaction design, from initial ethnographic research, through ideation and design, all the way to final delivery and presentation. Even if you are an experienced designer, this book will help bring a new level of professionalism and efficiency to your practice.

This book is comprehensive in its scope, exhaustive in its depth, authoritative in its practice, and priceless in its wisdom. It will certainly become the anchor document for an entire practice. While I expect to see it on the bookshelves of every practicing designer, I further expect that it will spend the lion's share of its time off the shelf and at the elbow of hard-working designers. I've no doubt that this will become the most dog-eared, annotated, and worn-from-many-readings volume in your library. Most certainly, it will also reshape university curricula and inform the next generation of practitioners.

While my own books have served as either introductory or motivational, Kim's book is nothing less than a complete handbook for an entire profession. Kim's unique background in the practice, pedagogy, and epistemology of the design business has given her the experience needed to write the ultimate "how-to" book of technology design. Every step in this fascinating and multifaceted discipline is described in detail in simple, readable prose, richly illustrated with examples taken from real products, real clients, and real design problems. I know you will come to regard this book as indispensible.

This book is comprehensive in its scope, exhaustive in its depth, authoritative in its practice, and priceless in its wisdom.

Alan Cooper
Founder and Chairman, Cooper
San Francisco, California

Introduction

You've probably picked up this book because you are a designer, whether by profession or by inclination. Design is, arguably, something that every person in the world does—laying out the text in a school report, decorating a living room, and arranging plants in a garden are all acts of creation that can have both utilitarian and aesthetic value. However, most such acts consider a small set of idiosyncratic needs: the habits and preferences of an individual, or perhaps of the handful of individuals who make up a household.

Design *as a profession*—by which I mean everything from product design to architecture—exists to provide both utilitarian and aesthetic value on a large scale. Professional designers must define financially viable products, services, and environments that meet the practical, physical, cognitive, and emotional needs of a wide range of people. Like someone deciding what color to paint the living room, a professional designer can—and, to some extent, does—try something, decide that it doesn't work, and try something else. Yet designers must try, fail, and eventually succeed on a deadline, within a budget, and over and over again. Eventually, all experienced designers develop a set of implicit or explicit techniques to help them do just that, and to do it better and faster over time. This book aims to share a set of explicit process and practices that have worked for many designers over the course of hundreds of diverse projects; in other words, a *method*. An effective method, along with appropriate training and aptitude, is what distinguishes professional designers from anyone else who may perform individual, instinctive acts of design.

Why an Explicit Method?

This book offers an explicit, start-to-finish method for defining and designing the form and behavior of processes, services, and artifacts in our increasingly complex digital age. Some designers are hungry for an explicit method, while others may bristle at the thought, expecting that it will limit their creativity. However, there's nothing inherently good about chaotic or ad hoc approaches. The method described in these pages is not intended as a set of constraints or as a recipe to be unthinkingly followed in every situation; no method should be followed by rote.

Instead, think of the method as something akin to the harness and wire used in martial arts movies: simultaneously providing support, safety, and a powerful boost, but useless without the skill, creativity, and judgment of the practitioner. Or if that analogy doesn't work for

Professional designers must define financially viable products, services, and environments that meet the practical, physical, cognitive, and emotional needs of a wide range of people.

Certainly, good design can happen without an explicit method. However, in the words of Louis Pasteur, "Fortune favors the prepared mind."

you, how about this one: the designer's creative spark is the electricity, and the method is the power grid that channels it where it can do the most good.

Why does a designer's creative spark need to be channeled? Certainly, good design can happen without an explicit method. However, in the words of Louis Pasteur, "Fortune favors the prepared mind." Without the scientific method to structure his thinking, an accident with a spoiled culture would not have led him to the germ theory of disease (and yet the method alone didn't do the trick).

Design and science have something else in common: in each field, ideas are be subject to examination and judgment by others. If you have a method that explains how you got from point A to point B, people are more likely to judge in your favor than if you say, "Trust me—I'm a professional." I expect you'll find the methods in these pages useful if you've ever:

— Had to argue with a powerful CEO about why his personal preferences shouldn't drive the design

— Been uncertain whether design option A or B is better

— Had a group of hard-core engineers smell blood in the water when you used "because it looks cool" as a defense

— Had stakeholders repeatedly change their minds about what the product is

— Needed to convince stakeholders that no, really, people don't use your product that way

— Had a design meeting that resembled a rugby match

— Come up with a cool design concept that turned out to be unworkable a few weeks later

— Wondered how you could possibly learn enough about neurosurgery, stock portfolio management, or chemistry to design a product around it

— Had your design bomb a usability test

— Stared at a blank whiteboard, uncertain where to begin

Both as a consultant and as an in-house creative director, I've been in most of these situations, and I've observed other designers struggle with these and other challenges. An effective method removes much of the worry in these situations so you can instead focus on doing what designers do best: generating usable, desirable solutions.

Of course, no method is perfect, and no method should be engraved in stone. The methods in this book have evolved over the years and will continue to do so as designers try new things and share the successful ones as best practices—one reason I'll be sharing my latest experiences and resources (including materials to use for some of the exercises) at www.designingforthedigitalage.com; I hope you'll share your own experiences, too. However, I'll offer you the same suggestion I share with new hires at Cooper: try the techniques as described over the course of several projects so you can master them before you carve a new trail through the underbrush. You'll probably find that the core methods address a wider variety of situations than you expect and afford all the flexibility you could need.

Why This Book

Every designer has the power to improve or even preserve life for some segment of humanity. Unfortunately, even the best designers can't design everything, and good designers are in limited supply. I also know plenty of potentially great designers who simply don't have the tools they need to make sure their designs see the light of day. This is especially true in our current digital age, when many design problems require the application of multiple disciplines, including interaction design, visual and information design, information architecture, industrial design, and more. Users have only one experience of a product or service, though, so this book attempts to include the perspectives and activities of all of these disciplines. (However, given that industrial design and graphic design make use of long-standing, well-understood methods, I have not attempted to address those disciplines in the broad sense, but only as they relate to interactive products and services.)

Although I love the ability to influence lives through doing meaningful design, I learned long ago that I can influence even more lives by helping other designers be more effective. My aim with this book is to help as many designers as possible make a difference in the world. Because designers cover a wide range of experience and skills, experienced designers may find that some parts of the content (particularly Chapters 15, 17, and 21) are merely useful refreshers. However, each chapter of the book includes content that I hope will:

— Help experienced designers be both rigorous and persuasive in their practice, to ensure not only that they're doing great design, but that their design gets built

— Give designers from different disciplines a shared framework for collaborating on today's increasingly complex products, which often combine software, hardware, services, and environments

— Help design students understand not only a coherent design process, but also the essential practices—from collaboration and project management to leading stakeholder discussions—that make real projects successful

— Show consulting designers how to engage with clients for the long term

— Help in-house designers see how consulting practices can make them more effective

Design is not—and never will be—a science. It will also never be a cookie-cutter process that anyone can do with an appropriate checklist in hand—the method doesn't make the design, the designer does. This book cannot give you the imagination and aptitude for visualization, nor can it give you the judgment and mastery of craft that only come with experience. However, I hope what you'll take from this book will help you more reliably design the right product or service, design it well, and get the design out into the world where it can improve the quality of human lives.

Contents at a Glance