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4TH EDITION

ABOUT FACE

THE ESSENTIALS OF INTERACTION DESIGN

THE COMPLETELY UPDATED CLASSIC ON CREATING DELIGHTFUL USER EXPERIENCES

Alan Cooper, Robert Reimann, David Cronin, Chris Noessel

WILEY

About Face

The Essentials of Interaction Design

Fourth Edition

Alan Cooper
Robert Reimann
David Cronin
Christopher Noessel
with Jason Csizmadi
and Doug LeMoine

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For Sue, my best friend through all the adventures of life. —Alan

For Alex and Max, and for Julie. —Robert

For Jasper, Astrid, and Gretchen. —David

For Ben and Miles, for your patience and inspiration. —Christopher

And for all the designers and engineers in our industry who are helping to imagine and build a better future.

ABOUT THE AUTHORS

Alan Cooper has been a pioneer in the software world for more than 40 years, and he continues to influence a new generation of developers, entrepreneurs, and user experience professionals.

Alan started his first company in 1976 and created what has been called "the first serious business software for microcomputers." In 1988, he invented a dynamically extensible visual programming tool and sold it to Bill Gates, who released it to the world as Visual Basic. This accomplishment earned Alan the sobriquet "The Father of Visual Basic."

In 1992, Alan and his wife, Sue, cofounded the first interaction design consulting firm, Cooper. By 1997, Cooper had developed a set of core design methods now used across the industry. Personas, which Alan invented and then popularized in his two best-selling books, *About Face* and *The Inmates Are Running the Asylum*, are employed almost universally by user experience practitioners.

Today, Alan continues to advocate for more humane technology from his farm in the rolling hills north of San Francisco.

Robert Reimann has spent over 20 years pushing the boundaries of digital products as a designer, writer, strategist, and consultant. He has led dozens of desktop, mobile, web, and embedded design projects in consumer, business, scientific, and professional domains for both startups and Fortune 500 companies alike.

One of the first designers at Cooper, Robert led the development and refinement of many of the Goal-Directed Design methods described in this book. In 2005, he became the founding president of IxDA, the Interaction Design Association (`www.ixda.org`). He has led user experience teams at Cooper, Bose, frog, and Sonos, and is currently Principal Interaction Designer at PatientsLikeMe.

David Cronin is a Design Director at GE and a member of GE's Design and Experience studio leadership team. Prior to that, he was Director of Interaction Design at Smart Design's San Francisco studio and a former Managing Director of Interaction Design at Cooper.

David has helped design products to serve the needs of surgeons, museum visitors, investment portfolio managers, nurses, drivers, dentists, financial analysts, radiologists, field engineers, manufacturing planners, marketers, videographers, and people with chronic diseases. During his time at Cooper, he contributed substantially to the principles, patterns, and practices of Goal-Directed Design.

Christopher Noessel designs products, services, and strategy for health, financial, and consumer domains as Cooper's first Design Fellow. He has helped visualize the future of counterterrorism, built prototypes of new technologies for Microsoft, and designed telehealth devices to accommodate the crazy facts of modern health care.

Prior to working at Cooper, Chris cofounded a small interaction design agency, where he developed exhibitions and environments for museums. He was also Director of Information Design at marchFIRST, where he helped establish the Interaction Design Center of Excellence. In 2012, he coauthored *Make It So: Interaction Design Lessons from Science Fiction*. He publishes regularly to the Cooper Journal and continues to speak and teach around the world.

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Ever since Apple changed the landscape of consumer computing with its smartphones and tablet computers, Robert Reimann has been gently nudging me to update *About Face*. When I turned the tables on him, asking him to do the lion's share of the writing, he unhesitatingly agreed. Most of the changes in this book are his, along with most of the credit. Chris Noessel generously agreed to act as technical editor, and his contributions can be felt throughout the manuscript. The capable writing of Dave Cronin and Doug LeMoine added much to the depth and completeness of this new edition.

Visually, this edition is far advanced over its predecessors. Many individual members of the Cooper design staff contributed their talents. Supremely talented visual designer Jason Csizmadi led the effort, organizing and coordinating, not to mention drawing and Photoshopping late into the night. You can see the beautiful fruits of his labor on these pages, from (and including) cover to cover. Other designers whose work is featured herein include Cale Leroy, Christina Beard, Brendan Kneram, and Gritchelle Fallesgon, along with Martina Maleike, James Laslavic, Nick Myers, and Glen Davis.

Other Cooperistas contributed their care and talent at many points during the yearlong writing effort. In particular, big props to Jayson McCauliff, Kendra Shimmell, and Susan Dybbs, who helped immensely in keeping the project on track as work and life brought their distractions. Similarly, Steve Calde and Karen Lemen were always ready to help as the project evolved.

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As always, the most long-suffering contributors to a work like this one are the authors' families. We appreciate how much our partners and children have sacrificed so that we could create this book.

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FOREWORD

I began working on the first edition of this book 20 years ago. Fittingly, I wrote a manifesto—a challenge to frustrated practitioners to step forward and begin creating software that users would love. In those days, few designers and precious little software didn't make your head hurt to use. Strong measures were called for.

Today, the technology landscape is much different; consequently, this fourth edition is also much different. In 1994 the state of the art of personal software was an address book or spreadsheet. Today, the digitization of all forms of media has put consumers neck-deep in technology. Powerful handheld apps are now in the hands of amateurs and non-technical users—apps for music listening and production; for photography, video, news, and communications; for home security and environmental control; for health, fitness, and personal tracking; for games and education; and for shopping.

Over a billion people have a full-fledged computer in their pocket and access to millions of applications and websites. The value of making these user-facing products easier to understand and use is clear. We interaction designers have earned our seat at the table and are well established as an integral part of teams that produce successful, widely used digital products.

The primary challenge of the first two decades of interaction design practice was to invent the process, tools, roles, and methods needed to succeed. Now that we have demonstrated our success, our relationship to others in our organization is changing. Each of these best practices is now evolving as we integrate our skills more deeply into our teams. Specifically, we need to work more effectively with business people and developers.

Twenty years ago, developers too had to fight for inclusion and relevance. Although firmly embedded in the corporate hierarchy, they lacked credibility and authority. As

consumer digitization increased, developers grew dissatisfied as the agents of users' misery. They knew they could do better.

The agile movement and, more recently, the growth of lean practices are each efforts by software developers to have more influence on their own destiny. Developers were just as frustrated as designers at the sorry state of digital interaction, and they wanted improvements. They realized that the software construction process had been modeled after industrial archetypes that didn't suit the new digital medium.

A few brave developers began experimenting with unorthodox methods of creating software in smaller increments while maintaining closer contact with their clients. They wanted to avoid lengthy development efforts—"death marches"—that resulted in unhappy users. They also were motivated by a natural desire to find a process that more reliably resulted in better products that they could be proud of.

Although each variant has its adherents and detractors, the course of software development has been forever altered by these new approaches. The notion that the old ways weren't working well is now widely accepted, and the quest for new methods continues.

This new self-awareness in the development community is a huge opportunity for interaction designers. Before, developers saw designers as competing for scarce resources. Now, developers see interaction designers as useful helpers, able to contribute skills, experience, and viewpoints that developers cannot. As developers and designers have begun to cooperate instead of competing, they have discovered that their powers are multiplied by working side by side.

Every practitioner—developer as well as designer—wants to create a product they can be proud of. To improve outcomes, both groups have been rethinking the entire development process, demanding better tools, better guidance, and better access. Historically, though, developers and interaction designers have pursued their common goal separately, developing tools and processes that work in separate silos. The two practices are quite different in many ways, and neither will work in subservience to the other. The challenge, then, is to learn how they can work together, effectively, successfully, in mutual support.

At the most forward-looking companies, you can already see this happening: Developers and designers sit next to each other, working cooperatively and collaboratively. When designers and developers—and the many other practitioners working with them—collaborate fully, the result is far better than any other method we've tried. The speed with which the work gets done is much greater and the quality of the end product much higher. And users are more delighted.

On the business side, executives often misunderstand the role of interaction design. It sometimes seems that the only place where it is truly understood is in tiny start-ups. Although larger companies may have many interaction designers on staff, managers persistently fail to incorporate their design expertise into the process until it's too late.

All the design skill and process in the world won't succeed unless the corporate culture supports interaction design and its objectives. Apple isn't a paragon of user experience because of its employees' design skills, but because Steve Jobs, its former (and legendarily autocratic) leader, was a tireless advocate of the power of design.

Few companies have leaders as bold as Jobs. Those that do tend to be small start-ups. You will find it difficult to convince business people of the value of collaborative design work. But each year will see more success stories—more proof of the value of this new work paradigm. I remember when Apple and Microsoft, not to mention Google and Facebook, were tiny start-ups with many doubters.

The two opportunities that face interaction designers today are finding, or creating, advocates on the business side, and learning how to collaborate with the newly sympathetic development community.

What is indisputable is the awesome power of interaction design: giving technology users a memorable, effective, easy, and rewarding experience as they work, play, and communicate.

—Alan Cooper

INTRODUCTION TO THE FOURTH EDITION

This book is about **interaction design**—the practice of designing interactive digital products, environments, systems, and services. Like most design disciplines, interaction design is concerned with form. However, first and foremost, interaction design focuses on something that traditional design disciplines do not often explore: the design of *behavior*.

Most design *affects* human behavior: Architecture is concerned with how people use physical space, and graphic design often attempts to motivate or facilitate a response. But now, with the ubiquity of silicon-enabled products—from computers to cars and phones to appliances—we routinely create products that *exhibit* complex behavior.

Take a product as basic as an oven. Before the digital age, it was quite simple to operate an oven: You simply turned a single knob to the correct position. There was one position for off, and each point along which the knob could turn resulted in a unique temperature. Every time the knob was turned to a given position, *the exact same thing happened*. You could call this a "behavior," but it is certainly a simple one.

Compare this to modern ovens with microprocessors, LCD screens, and embedded operating systems. They are endowed with buttons labeled with non-cooking-related terms such as Start, Cancel, and Program, as well as the perhaps more expected Bake and Broil. What happens when you press any one of these buttons is much less predictable than what happened when you turned the knob on your old gas range. In fact, the outcome of pressing one of these buttons often depends on the oven's operational state, as well as the sequence of buttons you press before pressing the last one. This is what we mean by *complex behavior*.

This emergence of products with complex behavior has given rise to a new discipline. Interaction design borrows theory and technique from traditional design, usability, and engineering disciplines. But it is greater than the sum of its parts, with its own unique

methods and practices. And to be clear, interaction design is very much a *design* discipline, quite different from science and engineering. Although it employs an analytical approach when required, interaction design is also very much about synthesis and imagining things as they might be, not necessarily as they currently are.

Interaction design is an inherently humanistic enterprise. It is concerned most significantly with satisfying the needs and desires of the people who will interact with a product or service. These goals and needs can best be understood as *narratives*—logical and emotional progressions over time. In response to these user narratives, digital products must express behavioral narratives of their own, appropriately responding not only at the levels of logic and data entry and presentation, but also at a more human level.

In this book we describe a particular approach to interaction design that we call the Goal-Directed Design method. We've found that when designers focus on people's goals—the reasons why they use a product in the first place—as well as their expectations, attitudes, and aptitudes, they can devise solutions that people find both powerful and pleasurable to use.

As even the most casual observer of developments in technology must have noticed, interactive products quickly can become complex. Although a mechanical device may be capable of a dozen visible states, a digital product may be capable of *thousands* of different states (if not more!). This complexity can be a nightmare for users and designers alike. To tame this complexity, we rely on a systematic and rational approach. This doesn't mean that we don't also value and encourage inventiveness and creativity. On the contrary, we find that a methodical approach helps us clearly identify opportunities for revolutionary thinking and provides a way to assess the effectiveness of our ideas.

According to Gestalt Theory, people perceive a thing not as a set of individual features and attributes, but as a unified whole in a relationship with its surroundings. As a result, it is impossible to effectively design an interactive product by decomposing it into a list of atomic requirements and coming up with a design solution for each. Even a relatively simple product must be considered in totality and in light of its context in the world. Again, we've found that a methodical approach helps provide the holistic perspective necessary to create products that people find useful and engaging.

A Brief History of Interaction Design

In the late 1970s and early 1980s, a dedicated and visionary set of researchers, engineers, and designers in the San Francisco Bay area were busy inventing how people would interact with computers in the future. At Xerox Parc, SRI, and eventually Apple Computer, people had begun discussing what it meant to create useful and usable "human interfaces" to digital products. In the mid-1980s, two industrial designers, Bill Moggridge

and Bill Verplank, were working on the first laptop computer, the GRiD Compass. They coined the term *interaction design* for what they were doing. But it would be another 10 years before other designers rediscovered this term and brought it into mainstream use.

When *About Face* was first published in August 1995, the landscape of interaction design was still a frontier wilderness. A small cadre of people brave enough to hold the title user interface designer operated in the shadow of software engineering, rather like the tiny, quick-witted mammals that lurked in the shadows of hulking tyrannosaurs. "Software design," as the first edition of *About Face* called it, was poorly understood and underappreciated. When it was practiced at all, it was usually practiced by developers. A handful of uneasy technical writers, trainers, and product support people, along with a rising number of practitioners from another nascent field—usability—realized that something needed to change.

The amazing growth and popularity of the web drove that change, seemingly overnight. Suddenly, the phrase "ease of use" was on everyone's lips. Traditional design professionals, who had dabbled in digital product design during the short-lived popularity of "multimedia" in the early '90s, leapt to the web en masse. Seemingly new design titles sprang up like weeds: information designer, information architect, user experience strategist, interaction designer. For the first time, C-level executive positions were established to focus on creating user-centered products and services, such as chief experience officer. Universities scrambled to offer programs to train designers in these disciplines. Meanwhile, usability and human-factors practitioners also rose in stature and are now recognized as advocates for better-designed products.

Although the web knocked back interaction design idioms by more than a decade, it inarguably placed user requirements on the radar of the corporate world permanently. After the second edition of *About Face* was published in 2003, the *user experience* of digital products became front-page news in the likes of *Time* and *BusinessWeek*. And institutions such as Harvard Business School and Stanford recognized the need to train the next generation of MBAs and technologists to incorporate design thinking into their business and development plans. People are tired of new technology for its own sake. Consumers are sending a clear message that they want *good* technology: technology that is *designed* to provide a compelling and effective user experience.

In August 2003, five months after the second edition of *About Face* proclaimed the existence of a new design discipline called *interaction design*, Bruce "Tog" Tognazzini made an impassioned plea to the nascent community to create a nonprofit professional organization. A mailing list and steering committee were founded shortly thereafter by Challis Hodge, David Malouf, Rick Cecil, and Jim Jarrett.

In September 2005, IxDA, the Interaction Design Association (`www.ixda.org`), was incorporated. In February 2008, less than a year after the publication of the third edition of *About*

Face, IxDA hosted its first international design conference, Interaction08, in Savannah, Georgia. In 2012, IxDA presented its first annual Interaction Awards for outstanding designs submitted from all over the world. IxDA currently has over 70,000 members living in more than 20 countries. We're pleased to say that interaction design has truly come into its own as both a design discipline and a profession.

IxD and User Experience

The first edition of *About Face* described a discipline called software design and equated it with another discipline called user interface design. Of these two terms, user interface design has enjoyed more longevity. We still use it occasionally in this book, specifically to connote the layout of widgets on a screen. However, this book discusses a discipline broader than the design of user interfaces. In the world of digital technology, form, function, content, and behavior are so inextricably linked that many of the challenges of designing an interactive product go right to the heart of what a digital product *is* and *does*.

As we've discussed, interaction designers have borrowed practices from more-established design disciplines but also have evolved beyond them. Industrial designers have attempted to address the design of digital products. But like their counterparts in graphic design, their focus traditionally has been on the design of static form, not the design of interactivity, or form that changes and reacts to input over time. These disciplines do not have a language with which to discuss the design of rich, dynamic behavior and changing user interfaces.

A term that has gained particular popularity in the last decade is *user experience (UX) design*. Many people have advocated for the use of this term as an umbrella under which several different design and usability disciplines collaborate to create products, systems, and services. This is a laudable goal with great appeal, but it does not in itself directly address the core concern of interaction design as discussed in this book: how to specifically *design the behavior* of complex interactive systems. It's useful to consider the similarities and synergies between creating a customer experience at a physical store and creating one with an interactive product. However, we believe specific methods are appropriate for designing for the world of bits.

We also wonder whether it is truly possible to *design* an experience. Designers of all stripes hope to manage and *influence* people's experiences, but this is done by carefully manipulating the variables intrinsic to the medium at hand. A graphic designer creating a poster arranges fonts, photos, and illustrations to help create an experience; a furniture designer working on a chair uses materials and construction techniques to help create an experience; an interior designer uses layout, lighting, materials, and even sound to help create an experience.

Extending this thinking into the world of digital products, we find it useful to think that we influence people's experiences by designing the mechanisms for interacting with a product. Therefore, we have chosen Moggridge's term *interaction design* (now abbreviated by many in the industry as IxD) to denote the kind of design this book describes.

Of course, often a design project requires careful attention to the orchestration of a number of design disciplines to achieve an appropriate user experience, as shown in Figure 1. It is in these situations that we feel the term *user experience design* is most applicable.

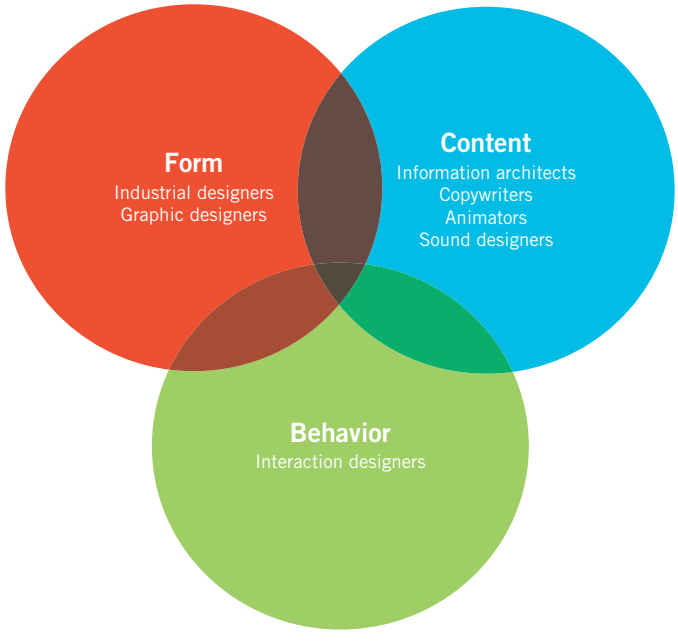

Figure 1: User experience (UX) design has three overlapping concerns: form, behavior, and content. Interaction design focuses on the design of behavior but also is concerned with how that behavior relates to form and content. Similarly, information architecture focuses on the structure of content but also is concerned with behaviors that provide access to content and how the content is presented to the user. Industrial design and graphic design are concerned with the form of products and services but also must ensure that their form supports use, which requires attention to behavior and content.

What This Book Is and What It Is Not

In this book, we attempt to give you effective and practical tools for interaction design. These tools consist of *principles*, *patterns*, and *processes*. Design *principles* encompass broad ideas about the practice of design, as well as rules and hints about how to best use specific user interface and interaction design idioms. Design *patterns* describe sets

of interaction design idioms that are common ways to address specific user requirements and design concerns. Design *processes* describe how to understand and define user requirements, how to then translate those requirements into the framework of a design, and finally how to best apply design principles and patterns to specific contexts.

Although books are available that discuss design principles and design patterns, few books discuss design processes, and even fewer discuss all three of these tools and how they work together to create effective designs. Our goal was to create a book that unites all three of these tools. While helping you design more effective and useful dialog boxes and menus, this book also helps you understand how users comprehend and interact with your digital product. In addition, it helps you understand how to use this knowledge to drive your design.

Integrating design principles, processes, and patterns is the key to designing effective product interactions and interfaces. There is no such thing as an objectively good user interface. Quality depends on the context: who the user is, what she is doing, and what her motivations are. Applying a set of one-size-fits-all principles makes user interface creation *easier*, but it doesn't necessarily make the end result *better*. If you want to create good design solutions, there is no avoiding the hard work of really understanding the people who will actually interact with your product. Only then is it useful to have at your command a toolbox of principles and patterns to apply in specific situations. We hope this book will both encourage you to deepen your understanding of your product's users and teach you how to translate that understanding into superior product designs.

This book does *not* attempt to present a style guide or set of interface standards. In fact, you'll learn in Chapter 17 about the limitations of such tools. That said, we hope that the process and principles described in this book are compatible companions to the style guide of your choice. Style guides are good at answering *what* but generally are weak at answering *why*. This book attempts to address these unanswered questions.

This book discusses four main steps to designing interactive systems: researching the domain, understanding the users and their requirements, defining a solution's framework, and filling in the design details. Many practitioners would add a fifth step: *validation*—testing a solution's effectiveness with users. This is part of a discipline widely known as *usability*.

Although this is an important and worthwhile component to many interaction design initiatives, it is a discipline and practice in its own right. We briefly discuss design validation and usability testing in Chapter 5. We also urge you to refer to the significant and ever-growing body of usability literature for more detailed information about conducting and analyzing usability tests.

How This Book Is Structured

This book is organized in a way that presents its ideas in an easy-to-use reference structure. The book is divided into three parts:

- Part I introduces and describes the Goal-Directed Design process in detail, as well as building design teams and integrating with project teams.
- Part II deals with high-level interaction design principles that can be applied to any interaction design problem on almost any platform.
- Part III covers lower-level and platform-specific interface design principles and idioms for mobile, desktop, the web, and more.

Changes Since the Third Edition

In June 2007, just two months after the third edition of *About Face* was published, Apple changed the digital landscape forever with the introduction of the iPhone and iOS. In 2010 Apple followed with the first commercially successful tablet computer, the iPad. These touch-based, sensor-laden products and the competitors that followed in their footsteps have added an entirely new lexicon of idioms and design patterns to the language of interaction. This fourth edition of *About Face* addresses these and other modern interaction idioms directly.

This new edition retains what still holds true, updates things that have changed, and provides new material reflecting how the industry has changed in the last seven years. It also addresses new concepts we have developed in our practices to address the changing times.

Here are some highlights of the major changes you will find in this edition of *About Face*:

- The book has been reorganized and streamlined to present its ideas in a more concise and easy-to-use structure and sequence. Some chapters have been rearranged for better flow, others have been merged, a few have been condensed, and several new chapters have been added.
- Terminology and examples have been updated to reflect the current state of the art in the industry. The text as a whole has been thoroughly edited to improve clarity and readability.
- Part I describes the Goal-Directed Design process in additional detail and more accurately reflects the most current practices at Cooper. It also includes additional information on building a design team and integrating with development and project teams.
- Part II has been significantly reorganized to more clearly present its concepts and principles, and includes newly updated information on integrating visual design.

Part III has been extensively rewritten, updated, and extended to reflect new mobile and touch-based platforms and interaction idioms. It also offers more detailed coverage of web interactions and interactions on other types of devices and systems. We hope you will find that these additions and changes make *About Face* a more relevant and useful reference than ever before.

Examples Used in This Book

This book is about designing all kinds of interactive digital products. However, because interaction design has its roots in software for desktop computers, and the vast majority of today's PCs run Microsoft Windows, there is certainly a bias in the focus of our discussions of desktop software. Similarly, the first focus of many developers of native mobile apps is iOS, so the bulk of our mobile examples are from this platform.

Having said that, most of the material in this book transcends platform. It is equally applicable across platforms—Mac OS, Windows, iOS, Android, and others. The majority of the material is relevant even for more divergent platforms such as kiosks, embedded systems, 10-foot interfaces, and the like.

A number of the desktop examples in this book are from the Microsoft Office suite and from Adobe Photoshop and Illustrator. We have tried to stick with examples from these mainstream applications for two reasons. First, you're likely to be at least somewhat familiar with the examples. Second, it's important to show that the user interface design of even the most finely honed products can be significantly improved with a goal-directed approach. This edition also contains many new examples from mobile apps and the web, as well as several more-exotic applications.

A few examples in this new edition come from now-moribund software or OS versions. These examples illustrate particular points that we felt were useful enough to retain in this edition. The vast majority of examples are from contemporary software and OS releases.

Who Should Read This Book

While the subject matter is broadly aimed at students and practitioners of interaction design, anyone concerned about users interacting with digital technology will gain insights from reading this book. Developers, designers of all stripes involved with digital product design, usability professionals, and project managers will all find something useful in this book. If you've read earlier editions of *About Face* or *The Inmates*

Are Running the Asylum (Sams, 2004), you will find new and updated information about design methods and principles here.

We hope this book informs you and intrigues you. Most of all, we hope it makes you think about the design of digital products in new ways. The practice of interaction design is constantly evolving, and it is new and varied enough to generate a wide variety of opinions on the subject. If you have an interesting opinion, or if you just want to talk, we'd be happy to hear from you. E-mail us at alan@cooper.com, rmreimann@gmail.com, davcron@gmail.com, or chrisnoessel@gmail.com.