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4TH EDITION

A B O

THE ESSENTIALS OF INTERACTION DESIGN

U T F

THE COMPLETELY UPDATED CLASSIC ON CREATING DELIGHTFUL USER EXPERIENCES

A C E

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*

WILEY

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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.

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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.

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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.

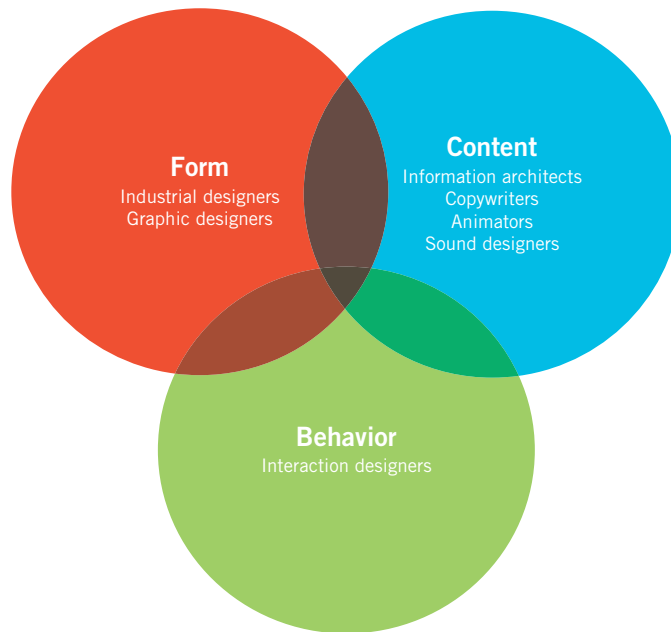


Figure 1: User experience (UX) design has three overlapping concerns: form, behavior, and content. Interaction design focuses on the design of behavior but also is concerned with how that behavior relates to form and content. Similarly, information architecture focuses on the structure of content but 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.

PART

I

Goal-Directed Design

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- CH 1 A Design Process for Digital Products
 - CH 2 Understanding the Problem: Design Research
 - CH 3 Modeling Users: Personas and Goals
 - CH 4 Setting the Vision: Scenarios and Requirements
 - CH 5 Designing the Product: Framework and Design Refinement
 - CH 6 Creative Teamwork

A DESIGN PROCESS FOR DIGITAL PRODUCTS

This book has a simple premise: If we design and develop digital products in such a way that the people who use them can easily achieve their goals, they will be satisfied, effective, and happy. They will gladly pay for our products—and recommend that others do the same. Assuming that we can do so in a cost-effective manner, this will translate into business success.

On the surface, this premise seems obvious: Make people happy, and your products will be a success. Why, then, are so many digital products so difficult and unpleasant to use? Why aren't we all happy and successful when we use them? Why, despite the steady march of faster, cheaper, and more accessible technology, are we still so often frustrated?

The answer, in short, is the *absence of design* as a fundamental and equal part of the product planning and development process.

Design, according to industrial designer Victor Papanek, is *the conscious and intuitive effort to impose meaningful order*. We propose a somewhat more detailed definition of human-oriented design activities:

- Understanding the desires, needs, motivations, and contexts of people using products
- Understanding business, technical, and domain opportunities, requirements, and constraints

- Using this knowledge as a foundation for plans to create products whose form, content, and behavior are useful, usable, and desirable, as well as economically viable and technically feasible

This definition is useful for many design disciplines, although the precise focus on form, content, and behavior varies depending on what is being designed. For example, an informational website may require particular attention to *content*, whereas the design of a simple TV remote control may be concerned primarily with *form*. As discussed in the Introduction, interactive digital products are uniquely imbued with complex *behavior*.

When performed using the appropriate methods, design can, and does, provide the missing human connection in technological products. But most current approaches to the design of digital products don't work as advertised.

The Consequences of Poor Product Behavior

In the nearly 20 years since the publication of the first edition of *About Face*, software and interactive digital products have greatly improved. Many companies have begun to focus on serving people's needs with their products and are spending the time and money needed to support the design process. However, many more still fail to do so—at their peril. As long as businesses continue to focus solely on *technology* and *market data* while shortchanging design, they will continue to create the kind of products we've all grown to despise.

The following sections describe a few of the consequences of creating products that lack appropriate design and thus ignore users' needs and desires. How many of your digital products exhibit some of these characteristics?

Digital products are rude

Digital products often blame users for making mistakes that are not their fault, or should not be. Error messages like the one shown in Figure 1-1 pop up like weeds, announcing that the user has failed yet again. These messages also demand that the user acknowledge his failure by confirming it: OK.

Digital products and software frequently interrogate users, peppering them with a string of terse questions that they are neither inclined nor prepared to answer: "Where did you hide that file?" Patronizing questions like "Are you sure?" and "Did you really want to delete that file, or did you have some other reason for pressing the Delete key?" are equally irritating and demeaning.

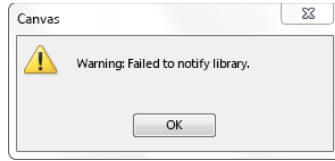


Figure 1-1: Thanks for sharing. Why didn't the application notify the library? Why did it want to notify the library? Why is it telling us? And what are we OKing, anyway? It is not OK that the application failed!

Our software-enabled products also fail to act with a basic level of decency. They forget information we tell them and don't do a very good job of anticipating our needs. Even the iPhone—generally the baseline for good user experience on a digital device—doesn't anticipate that someone might not want to be pestered with a random phone call when he is in the middle of a business meeting *that is sitting right there in the iPhone's own calendar*. Why can't it quietly put a call that isn't from a family member into voicemail?

Digital products require people to think like computers

Digital products regularly assume that people are technology literate. For example, in Microsoft Word, if a user wants to rename a document she is editing, she must know that she must either close the document or use the "Save As..." menu command (and remember to delete the file with the old name). These behaviors are inconsistent with how a normal person thinks about renaming something; rather, they require that a person change her thinking to be more like the way a computer works.

Digital products are also often obscure, hiding meaning, intentions, and actions from users. Applications often express themselves in incomprehensible jargon that cannot be fathomed by normal users ("What is your SSID?") and are sometimes incomprehensible even to experts ("Please specify IRQ.").

Digital products have sloppy habits

If a 10-year-old boy behaved like some software apps or devices, he'd be sent to his room without supper. These products forget to shut the refrigerator door, leave their shoes in the middle of the floor, and can't remember what you told them only five minutes earlier. For example, if you save a Microsoft Word document, print it, and then try to close it, the application again asks you if you want to save it! Evidently the act of printing caused the application to think the document had changed, even though it did not. Sorry, Mom, I didn't hear you.

Software often requires us to step out of the main flow of tasks to perform functions that shouldn't require separate interfaces and extra navigation to access. Dangerous commands, however, are often presented right up front where users can accidentally trigger them. Dropbox, for example, sandwiches Delete between Download and Rename on its

context menus, practically inviting people to lose the work they've uploaded to the cloud for safekeeping.

Furthermore, the appearance of software—especially business and technical applications—can be complex and confusing, making navigation and comprehension unnecessarily difficult.

Digital products require humans to do the heavy lifting

Computers and their silicon-enabled brethren are purported to be labor-saving devices. But every time we go out into the field to watch real people doing their jobs with the assistance of technology, we are struck by how much work they are forced to do simply to manage the proper operation of software. This work can be anything from manually copying (or, worse, retyping) values from one window into another, to attempting (often futilely) to paste data between applications that otherwise don't speak to each other, to the ubiquitous clicking and pushing and pulling of windows and widgets around the screen to access hidden functionality that people use every day to do their job.

The evidence is everywhere that digital products have a lot of explaining to do when it comes to their poor behavior.

Why Digital Products Fail

Most digital products emerge from the development process like a sci-fi monster emerging from a bubbling tank. Instead of planning and executing with a focus on satisfying the needs of the people who use their products, companies end up creating solutions that—while technically advanced—are difficult to use and control. Like mad scientists, they fail because they have not imbued their creations with sufficient humanity.

Why is this? What is it about the technology industry as a whole that makes it so inept at designing the interactive parts of digital products? What is so broken about the current process of creating software-enabled products that it results in such a mess?

There are four main reasons why this is the case:

- **Misplaced priorities** on the part of both product management and development teams
- **Ignorance about real users** of the product and what their baseline needs are for success
- **Conflicts of interest** when development teams are charged with both designing and building the user experience
- **Lack of a design process** that permits knowledge about user needs to be gathered, analyzed, and used to drive the development of the end experience

Misplaced priorities

Digital products come into the world subject to the push and pull of two often-opposing camps—marketers and developers. While marketers are adept at understanding and quantifying a marketplace opportunity, and at introducing and positioning a product within that market, their input into the product design process is often limited to lists of requirements. These requirements often have little to do with what users actually *need* or *desire* and have more to do with chasing the competition, managing IT resources with to-do lists, and making guesses based on market surveys—what people say they’ll *buy*. (Contrary to what you might suspect, few users can clearly articulate their needs. When asked direct questions about the products they use, most tend to focus on low-level tasks or workarounds to product flaws. And, what they think they’ll buy doesn’t tell you much about how—or if—they will use it.)

Unfortunately, reducing an interactive product to a list of a hundred features doesn’t lend itself to the kind of graceful orchestration that is required to make complex technology useful. Adding “easy to use” as a checklist item does nothing to improve the situation.

Developers, on the other hand, often have no shortage of input into the product’s final form and behavior. Because they are in charge of construction, they decide exactly what gets built. And they too have a different set of imperatives than the product’s eventual audience. Good developers are focused on solving challenging technical problems, following good engineering practices, and meeting deadlines. They often are given incomplete, myopic, confusing, and sometimes contradictory instructions and are forced to make significant decisions about the user experience with little time or knowledge of how people will actually use their creations.

Thus, the people who are most often responsible for creating our digital products rarely take into account the users’ *goals*, needs, or motivations. At the same time, they tend to be highly reactive to market trends and technical constraints. This can’t help but result in products that lack a coherent user experience. We’ll soon see why goals are so important in addressing this issue.

The results of poor product vision are, unfortunately, digital products that irritate rather than please, reduce rather than increase productivity, and fail to meet user needs. Figure 1-2 shows the evolution of the development process and where, if at all, design has historically fit in. Most of digital product development is stuck in the first, second, or third step of this evolution, where design either plays no real role or becomes a surface-level patch on shoddy interactions—“lipstick on the pig,” as one of our clients called it. The core activities in the design process, as we will soon discuss, should *precede* coding and testing to ensure that products truly meet users’ needs.

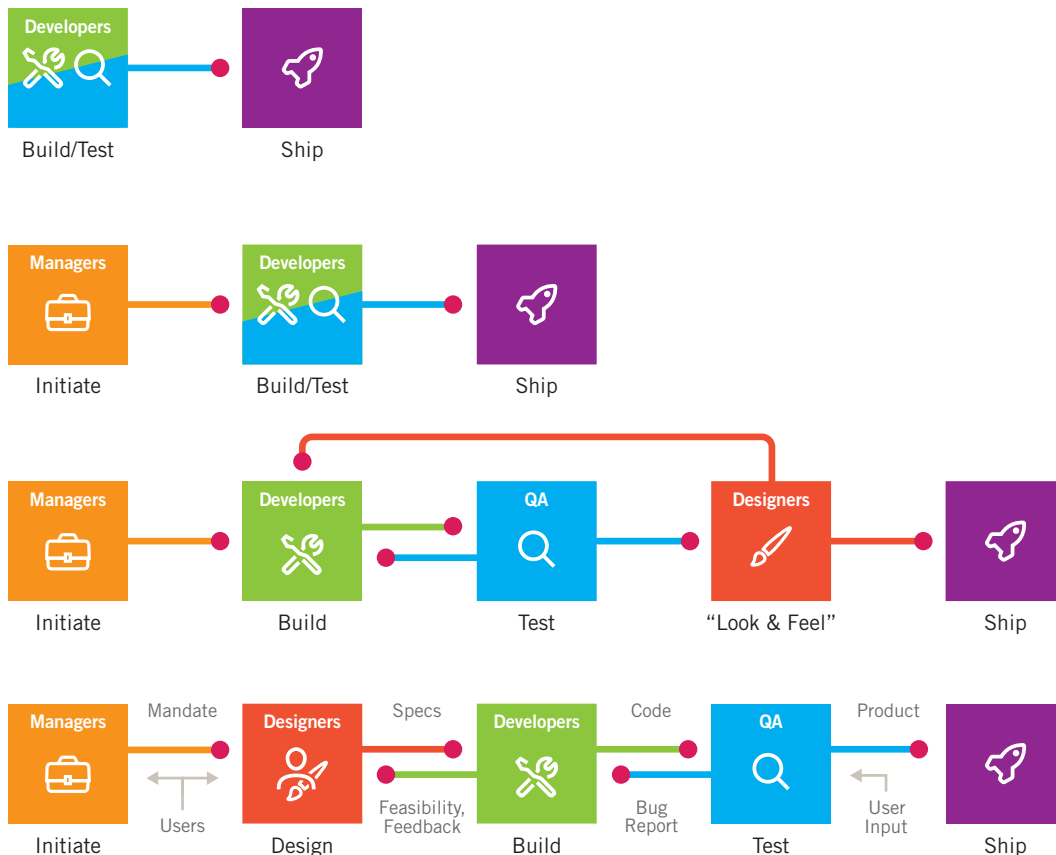


Figure 1-2: The evolution of the software development process. The first diagram depicts the early days of the software industry, when smart developers dreamed up products and then built and tested them. Inevitably, professional managers were brought in to help facilitate the process by translating market opportunities into product requirements. As depicted in the third diagram, the industry matured, and testing became a discipline in its own right. With the popularization of the graphical user interface (GUI), graphic designers were brought in to create icons and other visual elements. The final diagram shows the Goal-Directed approach to software development, where decisions about a product's capabilities, form, and behavior are made before the expensive and challenging construction phase.

Ignorance about real users

It's an unfortunate truth that the digital technology industry doesn't have a good understanding of what it takes to make users happy. In fact, most technology products get built without much understanding of users. We might know what *market segment* our users are in, how much money they make, how they like to spend their weekends, and what sorts of cars they buy. We might even have a vague idea of what kind of jobs they have and some of the major tasks they regularly perform. But does any of this tell us how to make them happy? Does it tell us *how* they will actually use the product we're

building? Does it tell us *why* they are doing whatever it is they might need our product for, *why* they might want to choose our product over our competitors, or *how* we can make sure they do? No, it does not.

However, we should not give up hope. It is possible to understand our users well enough to make excellent products they will love. We'll see how to address the issue of understanding users and their behaviors with products in Chapters 2 and 3.

Conflicts of interest

A third problem affects the ability of vendors and manufacturers to make users happy. The world of digital product development has an important conflict of interest: The people who build the products—developers—are often also the people who design them. They are also, quite understandably, the people who usually have the final say on what does and doesn't get built. Thus, developers often are required to choose between ease of coding and ease of use. Because developers' performance is typically judged by their ability to code efficiently and meet incredibly tight deadlines, it isn't difficult to figure out what direction most software-enabled products take. Just as we would never permit the prosecutor in a legal trial to also adjudicate the case, we should make sure that the people designing a product are not the same people building it. Even with appropriate skills and the best intentions, it simply isn't possible for a developer (or anyone, for that matter) to advocate effectively for the user, the business, and the technology all at the same time.

We'll see how to address the issue of building design teams and fitting them into the planning and development process in Chapter 6.

Lack of a design process

The last reason the digital product industry isn't cranking out successful, well-designed products is that it has no reliable *process* for doing so. Or, to be more accurate, it doesn't have a *complete* process for doing so. Engineering departments follow—or should follow—rigorous engineering methods that ensure the *feasibility* and quality of the technology. Similarly, marketing, sales, and other business units follow their own well-established methods for ensuring the commercial *viability* of new products. What's left out is a repeatable, predictable, and analytical process for ensuring **desirability**: *transforming an understanding of users into products that meet their professional, personal, and emotional needs*.

In the worst case, decisions about what a digital product will do and how it will communicate with users are simply a by-product of its construction. Developers, deep in their thoughts of algorithms and code, end up “designing” product behaviors in the same way

that miners end up “designing” a landscape filled with cavernous pits and piles of rubble. In unenlightened development organizations, the digital product interaction design process alternates between the accidental and the nonexistent.

Sometimes organizations do adopt a design process, but it isn’t quite up to the task. Many companies embrace the notion that integrating customers (or their theoretical proxies, domain experts) directly into the development process can solve human interface design problems. Although this has the salutary effect of sharing the responsibility for design with the user, it ignores a serious methodological flaw: confusing domain knowledge with design knowledge.

Customers, although they might be able to articulate the problems with an interaction, often cannot visualize the solutions to those problems. Design is a specialized skill, just like software development. Developers would never ask users to help them *code*; design problems should be treated no differently. In addition, customers who *purchase* a product may not be the same people who *use* it from day to day, a subtle but important distinction. Finally, experts in a domain may not be able to easily place themselves in the shoes of less-expert users when defining tasks and flows. Interestingly, the two professions that seem to most frequently confuse domain knowledge with design knowledge when building information systems—law and medicine—have notoriously difficult-to-use products. Coincidence? Probably not.

Of course, designers should indeed get feedback on their proposed solutions, both from users and the product team. But hearing about the problems is much more useful to designers—and better for the product—than taking proposed solutions from users at face value. In interpreting feedback, the following analogy is useful: Imagine a patient who visits his doctor with acute stomach pain. “Doctor,” he says, “it *really* hurts. I think it’s my appendix. You’ve got to take it out as soon as possible.” A responsible physician wouldn’t perform surgery based solely on a patient request, even an earnest one. The patient can describe the symptoms, but it takes the doctor’s professional knowledge to make the correct diagnosis and prescribe the treatment.

Planning and Designing Product Behavior

The planning of complex digital products, especially ones that interact directly with humans, requires a significant upfront effort by professional designers, just as the planning of complex physical structures that interact with humans requires a significant upfront effort by professional architects. In the case of architects, that planning involves understanding how the humans occupying the structure live and work, and designing spaces to support and facilitate those behaviors. In the case of digital products, the planning involves understanding how the humans using the product live and work, and designing product behavior and form that support and facilitate the human behaviors. Architecture is an old,