



THE MOBILE FRONTIER

A Guide For Designing Mobile Experiences

by **RACHEL HINMAN**

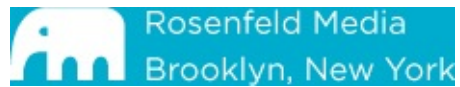
foreword by Larry Keeley

 **Rosenfeld**

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A GUIDE FOR DESIGNING MOBILE EXPERIENCES

Rachel Hinman



The Mobile Frontier: A Guide for Designing Mobile Experiences

By Rachel Hinman

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DEDICATION

To my mother, Patricia Tiffany-Hinman. Thank you for your unwavering support and love—and for raising me to believe a woman can do anything she sets her mind to.

HOW TO USE THIS BOOK

Who Should Read This Book?

This book was written for anyone curious about creating compelling mobile experiences. While it is primarily targeted at those who call themselves “designers” or “user experience practitioners,” it should prove helpful to engineers, project managers, students, and anyone interested in designing for mobile.

To be clear, this is not a technical book. It does not contain code snippets or provide the ins and outs of designing an application for any particular mobile operating system. There are lots of great books out there that will help you do that—but this is not one of them. Instead, this book has been designed to help you understand what makes mobile user experience unique and fundamentally different than other design spaces. It outlines what I believe is important about mobile user experience while providing frameworks, design exercises, and interviews with mobile experts. My hope is that this book will help you navigate the unfamiliar and fast-changing mobile landscape with grace and solid thinking while inspiring you to explore the possibilities that mobile technology presents.

What’s in This Book?

Section One: What Makes Mobile Different?

The first part of this book will introduce you to the key characteristics that define mobile user experiences today. [Chapter 1, “Casting Off Anchors,”](#) is an introduction to the mobile frontier. [Chapter 2, “The Emergent Mobile NUI Paradigm,”](#) [Chapter 3, “Peanut Butter in Denver,”](#) and [Chapter 4, “Shapeshifting,”](#) are dedicated to providing you with information on what makes mobile user experience and design different than other design spaces.

Section Two: Emergent Mobile Patterns

[Chapter 5, “Mobile UX Patterns,”](#) will discuss what people who have begun to settle the mobile frontier are currently doing. This chapter will discuss five emergent mobile UX (user experience) patterns you can lean on as you begin to craft your own mobile experiences.


Section Three: Crafting Mobile Experiences

[Chapters 6, “Mobile Prototyping,”](#) [7, “Motion and Animation,”](#) and [8, “Awakening the Senses,”](#) in this section will give you design exercises, prototyping methods, and design guidelines to try once you begin crafting mobile experiences.

Section Four: The Future of Mobile UX

Finally, [Chapter 9, “New Mobile Forms,”](#) is all about the edge of the mobile frontier. It’s the “deep space” stuff that a few brave souls have already begun to explore and pioneer. It’s the stuff that will likely become our future very soon.

What Comes with This Book?

This book's companion Web site ( rosenfeldmedia.com/books/mobile-design/) contains some templates, discussion, and additional content. The book's diagrams and other illustrations are available under a Creative Commons license (when possible) for you to download and include in your own presentations. You can find these on Flickr at www.flickr.com/photos/rosenfeldmedia/sets/.

FREQUENTLY ASKED QUESTIONS

Why is mobile UX such a hot topic right now?

For what felt like the longest time, mobile UX was considered a small and obscure design space that most designers felt obliged to learn more about but loathed participating in because of all the inherent design constraints. The release of the first iPhone in 2007 changed all that. The iPhone demonstrated to the mobile industry and the world what was possible when innovative mobile technology was paired with a stellar user experience. The iPhone was more than an innovative product; it was the first mobile device that got people—regular, everyday people (not just the geeks)—excited about using a mobile phone. Now, as increasingly more people are experiencing what it's like to access and interact with information from nearly anywhere, through devices that are beautifully designed, mobile is no longer a niche topic. There's never been a better time to design mobile experiences. See [Chapter 1](#) for more.

What makes mobile user experience and design different?

Practitioners of mobile UX design often cite context as the biggest difference between designing for mobile experiences and other design spaces. Developing an understanding and empathy for the depth, breadth, and design implications of the mobile context is quite possibly the most essential skill necessary in creating great mobile experiences. If you're a practicing designer, chances are that *context* is your design blindside. Most designers have been steeped in a tradition of creating experiences with few context considerations, although they may not realize it. Books, Web sites, software programs, and even menus for interactive televisions share an implicit and often overlooked commonality: use occurs in relatively static and predictable environments. In contrast, most mobile experiences are situated in highly dynamic and unpredictable environments. See [Chapter 3](#) for more information on designing for the mobile context.

What modifications to my existing design processes do I need to make to create good mobile experiences?

Mobile UX professionals use many of the same tools and processes as other UX professionals. Designers new to mobile UX must learn to calibrate their design decision-making skills to a new medium—and prototyping is essential in developing those decision-making skills. Although prototyping is considered a luxury for many PC-based experiences, it is an absolutely *essential* part of creating compelling tablet and mobile experiences. The reason is simple. Chances are, if you are new to mobile, your design experience and instincts aren't very well tuned to mobile. Unlike the PC, the mobile design space is relatively new, and design patterns have yet to be formally codified. In lieu of experience and heuristics, the best way to develop these skills is to practice turning the brilliant ideas in your head into tangible experiences you and other people can engage with.

Prototyping can become your saving grace in this regard. See [Chapter 6](#) for tons of info on prototyping methods.

How do I design for touchscreen experiences?

One of the issues that makes designing for touchscreen experiences challenging for designers is that most of us have been steeped in a tradition of creating experiences using GUI (graphical user interface) principles. With the widespread uptake of mobile phones and tablets outfitted with touchscreens, we're currently in the midst of a UI paradigm shift. Designers and UX professionals must now learn to create experiences that leverage NUI (natural user interface) principles. This includes learning the key differences between GUI and NUI, as well as understanding how to optimize experiences for touch. [Chapter 2](#) will help you understand what makes NUI interesting and different, and [Chapter 8](#) will give you valuable info on how to optimize screen-based experiences for touch UIs.

Should I design a native mobile app, a mobile Web app, or a mobile Web site?

Many experts in the mobile industry have deeply held philosophical viewpoints on this question and have been willing to fight verbal cage fights with those whose opinions differ. The short answer is: “It depends.” [Chapter 4](#) covers some of the pros and cons of each approach. A word of caution: While this is an important implementation question to answer, it's not necessarily the first question you should be asking at the beginning of a mobile user experience project. Ultimately, your goal should be to create a great user experience. Technology and implementation choices can help guide your design and decision-making process—but they should not dictate it. More on identifying mobile needs in [Chapter 3](#).

What does the future hold? What's next for mobile user experience?

In the near future, many designers and UX professionals will focus on pioneering the parts of the mobile frontier that have already been discovered. And that is a good place to be. But there's a vast space just beyond what's been discovered that some brave souls have already begun to explore. There are three mobile trends I've been tracking that I believe will have a profound impact on the future. These themes will not only redefine mobility, but they'll also irrevocably alter the relationship we have with computing. They are: the shifting boundary between computers and the human body, the shifting boundary between computers and the environment, and mobile experiences for emerging markets. These topics will all be covered in [Chapter 9](#).

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FOREWORD



So here's a little fact that feels surprising: Today on our small blue planet, more people have access to cell phones than to working plumbing. Think about that. Primitive plumbing has been around for over a thousand years. Modern working plumbing has been around for at least 200 years longer than the fleeting few years since 1984 when Motorola first ripped the phone off the wall and allowed us to carry it around. Most people find plumbing useful. Apparently, many millions more find cellular phones indispensable. Whenever big parts of modern life—the Internet, video games, search engines, smartphones, iPads, social networking systems, digital wallet payment systems—are so useful that we can no longer imagine life without them, we act as if they will forever be the way they are now. This childlike instinct has its charms, but it is always wrong and particularly dangerous for designers. People who think deeply about the built world necessarily must view it as fungible, not fixed. It is the job of thoughtful designers to notice the petty annoyances that accumulate when we use even devices we love—to stand in the future and think of ways to make it more elegantly functional, less intrusive, more natural, far more compelling. In the best such cases, designers need to surprise us—by radically altering what we think is possible. To create the futures we cannot even yet imagine.

But the future is a scary place replete with endless options, endless unknowns. Of course, like everyone else, designers don't have a crystal ball. There is a constant risk that we will make assumptions that turn out to be either too bold or too timid. Designers must rely instead on methods to think through which evolutionary and revolutionary shifts are most likely—among an infinite array of possibilities.

In *The Mobile Frontier*, Rachel Hinman has tackled one of the most vital issues in the future of design: *How will our lives change while we are on the go?* She has used her vast prior experience in working to shape the future for Nokia, then added disciplined methods to do us four vital favors:

Reveal the structures of current and coming mobile interfaces...

Just as cars have gone through several design eras (remember tailfins?), *The Mobile Frontier* has clarified four waves of successive strategies that make a device successively easier and more pleasant to use. Whether you are a designer or simply an enthusiast, this is a revelation. It shows how the metaphors and strategies for how to use a device evolve as there is more processing power, memory, and display capabilities available to make a device better behaved.

Uncover patterns in how we behave when we are mobile...

When you observe people deeply enough, you discover something fundamental. While there are an infinite number of things people theoretically might do with mobile devices, inevitably the real activities we choose to do can be distilled into clear patterns with a few themes and variations. *The Mobile Frontier* has made these clear, so that the challenge of thinking about mobility becomes vastly more interesting, more tractable, and far easier to either improve or reinvent.

Provide strategies for designing better mobile experiences...

Whenever we want to improve or reinvent a category, there are some methods that are better than others. *The Mobile Frontier* helps lay out active design and prototyping strategies that make the otherwise daunting task of building new interface alternatives likely to succeed instead of fail. This allows designers to proceed with courage and confidence, knowing they can reliably imagine, develop, and test alternative interfaces, in order to get the future to show up ahead of its regularly scheduled arrival.

Speculate about what will come next...

Finally, *The Mobile Frontier* bravely peers down a foggy windy road to guess what lies around the corner. This is a task always doomed to failure in detail, but Rachel does a brilliant job of giving us the broad outlines. This is essential for helping us get past the trap of merely filigreeing around the edges of the known, to instead imagine the breakthroughs still to come.

Collectively, these four deep insights advance the known boundaries of understanding today's mobile devices and experiences. Thus, they help usher in the vastly new ones sure to emerge soon. Here's what that matters: We are only three decades into one of the most important revolutions the world has ever seen. In design development terms, that is a mere blink. Just as the mobile device world has zipped past plumbing like a rocket sled would pass a slug, we simply must see ourselves at the very beginning of this revolution. With mobile devices, we are today where automobiles were when the Model T was the hottest thing on wheels. We will see vastly more change than most of us can possibly imagine. Through our mobile devices, we will find new advances in learning, security, community, interaction, understanding, commerce, communication, and exploration.

Rachel Hinman is helping us make all that come along a little sooner, a lot easier, and far more reliably. See for yourself. Better yet, join in. Get a move on. *Oh, and bring your devices. Let's make 'em more amazing.*

—Larry Keel
President and Co-Founder, Doblin, Inc.

Casting Off Anchors

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Whenever I think of mobile user experience, I think of frontiers rather than the latest mobile app, the hottest mobile operating system, or debates over mobile apps versus mobile Web. Instead, for me, images of astronauts exploring lunar landscapes or the brave pioneers who settled the Wild West come to mind. Much like outer space or the western half of the U.S., I picture the mobile design space as a frontier that people can explore and invent new and more human ways for people to interact with information.

By definition, a *frontier* is simply the term used to describe the land that lies beyond a settled geographic region. Unlike similar words such as *wilderness*, *sticks*, or *outback*, the term *frontier* is subtly but significantly different in that it conjures up romantic notions that have long held the human imagination. A frontier represents more than a piece of land—it's a word that symbolizes optimism, unlimited opportunity, and the shedding of current restraints. Frontiers inspire in us the sense that anything is possible.

In reality, thinking of the mobile user experience as an unsettled frontier is a romantic notion that at times can be difficult to sustain. Instead of an idyllic landscape of unfettered land, today the mobile industry looks a lot more like [Figure 1.1](#).



FIGURE 1.1 Iconic image of the Oklahoma Land Rush of 1889.

On April 22 of 1889, an estimated 50,000 people lined up on the edge of an unsettled frontier in the United States to participate in a land run, later known as the Oklahoma Land Rush. On that day, the two million-acre restricted frontier known as the *Unassigned Lands* was opened for settlement by the U.S. government. In essence, the government gave away the land for free; all that settlers had to do was grab it. So picture 50,000 men and women mounted on their horses waiting for hours for a symbolic gunshot to be fired. Once that shot was fired, the race was on. They were free to claim their land. I've long loved this image because it captures what I imagine those settlers felt on that day—the frenetic energy of unbounded optimism.

Right now, the mobile industry feels a lot like this picture. Just like the Unassigned Lands, the mobile industry is a frontier that people want to talk about, hear about, speculate about, and grab a piece of for their very own. Mobile feels like an unsettled landscape that is there for the grabbing.

The design and user experience community is not immune to this sense of boundless opportunity. Everyone wants to get in on the action! Designers and user experience (UX) professionals are clamoring to get up to speed on designing for the latest mobile operating systems, while technologists fight holy wars over which mobile OS is superior. Philosophical debates rage over which design approach is superior: mobile Web sites or native applications. When it comes to mobile user experience, the design and UX community feels a lot like that picture: Mobile is where the action is.

Maybe you've been swept up in that energy already. Perhaps you picked up this book because you're simply chomping at the bit to build a mobile application. Or maybe you hope this book will tell you how to tailor your existing Web site to a mobile device. Yes, this book will offer some insight into how to do those things, but there are other things I think you need to know first. It's easy to get caught up in the mobile land rush and reduce the mobile experience to a new method or tool you need to learn or a technical platform you need to get up to speed on. Allowing the hype to reduce the mobile

experience to just one of these areas puts you at risk for losing sight of quite possibly the most important and exciting part of what's currently happening.

Those simple mobile devices you hold in the palm of your hand are offering a new way to think about computing. Unfettered from the keyboard and mouse, mobile devices give you the opportunity to invent new and more human ways for people to interact with information, and with each other.

You may wonder, "Why now? Mobile phones have been around for a long time. Why has mobile become this frontier of opportunity now?"

For what felt like the longest time, mobile UX was considered to be a small and obscure design space that most designers felt obliged to learn more about but loathed participating in because of all the inherent design constraints. Widespread adoption of new and more intuitive mobile devices has changed all that. Now, as increasingly more people are experiencing what it's like to access and interact with information from nearly anywhere, mobile is no longer a niche topic. There's never been a better time to design mobile experiences.

The Golden Age of Mobile

When I began working in the mobile industry seven years ago, mobile experiences truly stunk (as evidenced by [Figure 1.2](#)). At that time, a common industry credo was the more features, the better. Subsequently, mobile user experiences were abysmal. They were bloated with features, their user interfaces were confusing and unintuitive, and most users struggled to figure out how to make a simple voice call. There was no joy of use for mobile phones in those days. It was the age of the "Frankenphone." Device experiences were truly miserable



FIGURE 1.2 Before the iPhone was the age of the Frankenphone. Mobile phones were so bloated with features that users struggled to figure how to make a simple voice call.

But one little product changed all that. That product was the iPhone.

Steve Jobs, then CEO of Apple, Inc., unveiled the iPhone, as seen in [Figure 1.3](#), to the public on January 9, 2007. The phone was not available in the United States until June of that same year. Throughout the United States, thousands of customers lined up outside Apple stores waiting to purchase the device, as shown in [Figure 1.4](#). It was something the mobile industry had never seen before.



FIGURE 1.3 The passionate reaction to the launch of the iPhone resulted in sections of the media christening it the “Jesus phone.”

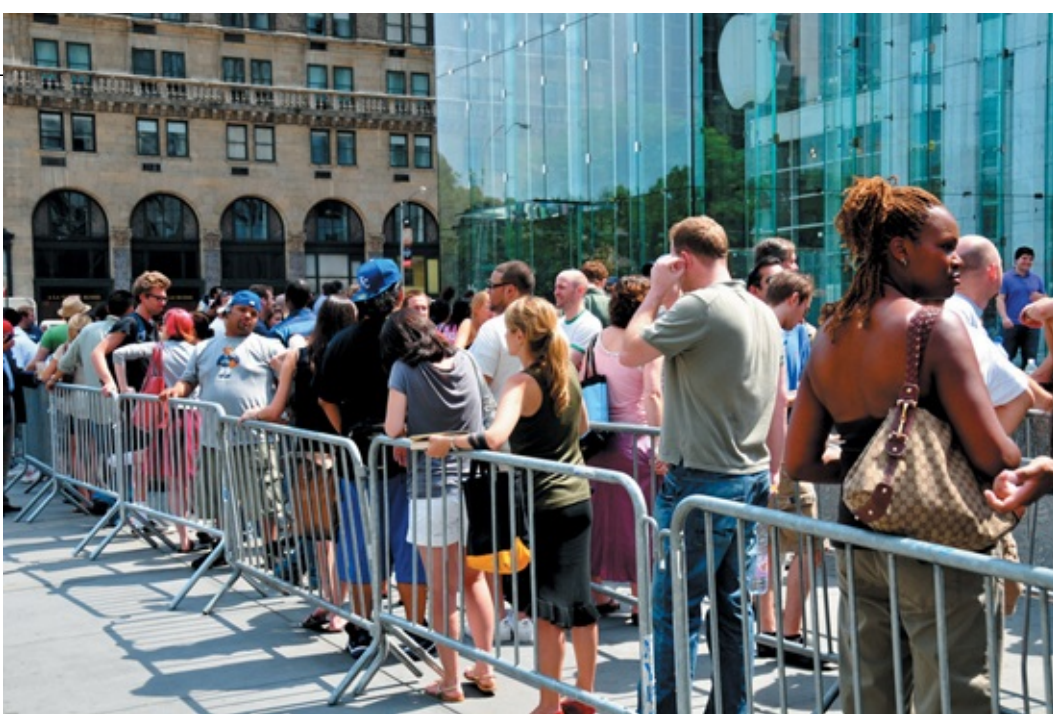


FIGURE 1.4 People in New York City waiting in line for the first iPhone in 2007.

Unlike its predecessors with bloated feature sets, the iPhone was a mobile device with a simplified bundle of truly useful applications. Instead of confusing hard keys and buttons, the iPhone had a seductive touchscreen paired with a visually elegant and intuitive interface. Not only was the iPhone a gorgeous product, but it also had something previous mobile devices did not have: The iPhone had a great user experience. The iPhone demonstrated to the mobile industry and the world what was possible when innovative mobile technology was paired with a stellar user experience. The iPhone was more than an innovative product; it was the first mobile device that got people—regular, everyday people (not just the geeks)—excited about using a mobile phone. The iPhone grew to symbolize the shedding of current restraints, newfound innovation, and a sense of unlimited opportunity in the mobile industry.

Much has happened since the iPhone's release in 2007. Unlike other industries that are shrinking or flat, the mobile industry has experienced explosive growth and interest. There are now a plethora of tools and resources available that make it relatively easy for people from almost any walk of life to develop mobile applications. From tiny devices worn on the body to tablet-sized devices such as the iPad, people are pushing the boundaries of scale and form, constantly challenging what constitutes a mobile device. Since the iPhone was released, touchscreens on smartphones have become standard, clearing the path for designers to direct their creative energies toward developing new and emergent interface paradigms.

Unlike the Frankenphone days when little to no attention was paid to user experience, people now care and even talk about mobile user experience and its importance. Basically, the iPhone ushered in the golden age of mobile, when almost anything seems possible. The mobile space has entered into a new era of fast-moving innovation, investment, and creativity. There has never been a better time to begin exploring this new and exciting design space.

The iPhone is the product that opened up the mobile frontier for the rest of us.

Casting Off Anchors from the Past

Humans have two legs, making us inherently mobile beings. Yet for the past 50 years we've settled into a computing landscape that assumes a static context of use. While the wildly successful desktop paradigm enabled more people to interact with computers than its predecessors, it came with its own set of limitations. For example, countless design details—from input mechanisms and device form factors to assumptions about user engagement and interface design—have been made with a common and unfortunate assumption: That users have their butts in chairs and their eyes glued to computer screens. For all its success, the desktop paradigm was never designed to accommodate our pesky human desire to move and roam around the world. Mobility, which involves the ability to compute in mobile contexts, is an inherent human need that has been largely unaddressed for a very long time.

Mobility is an exciting concept, but busting out of this current desktop computing landscape isn't as easy as it may sound. Like any frontier pioneered and settled before, the land of desktop computing has some advantages that are difficult to leave behind. Widespread acceptance and understanding of the paradigm, common and well-documented UI conventions, standard input mechanisms, or the vast bodies of academic research and design heuristics—those benefits of the desktop computing world don't exist for mobile yet. Instead, mobile user experience is a nascent and largely unexplored field. Participation requires designers to explore a largely unsettled frontier with few familiar guideposts. It requires the casting off of many anchors and conventions we've inherited from the past 50 years of computer science and traditional design.

So why do it? Why leave all this established stuff behind and risk it? Much like the lure of creating a new life in the western frontier or discovering new worlds in deep space, humans have an uncanny drive to discover new ways of doing things. Mobile user experience is no exception. Mobile experiences offer the opportunity to break free of the current constraints of the desktop paradigm and define a new way to experience information. These experiences provide an opportunity to acknowledge and accommodate the human desire to physically move. Instead of being trapped behind a desk, mobile devices give people the ability to compute while participating in the world around them.

The only way to truly recognize this opportunity is to take a journey into the mobile frontier. And that is why I wrote this book. It's a guidebook that will help you explore the mobile frontier that lies ahead.

As with any journey, there are some things you need to know before you begin. I've organized this book into four sections.

Section One: What Makes Mobile Different?

Like a cultural book you buy before visiting a foreign country, the first section of this book will introduce you to the key cultural dimensions that define mobile user experiences. [Chapter 2, “The Emergent Mobile NUI Paradigm,”](#) [Chapter 3, “Peanut Butter in Denver,”](#) and [Chapter 4, “Shapeshifting,”](#) are dedicated to providing you with information on what makes mobile user experience and design different than other design spaces and include the following:

- Information about the NUI mobile paradigm
- Tips for how to design for the mobile context
- Emergent patterns for multidevice experiences

Section Two: Emergent Mobile Patterns

Similar to the first pioneers who began to settle a frontier, [Chapter 5, “Mobile UX Patterns: Designing for Mobility,”](#) will give you insight into what people who have begun to settle the mobile frontier are currently doing. This section will discuss five emergent mobile UX patterns you can lean on as you begin to craft your own mobile experience:

- Coverage of the two natural set points for mobile experiences
- A set of emerging application types
- How to make content become the interface
- Information on uniquely mobile input mechanisms
- Tips for how to leave tasks behind and say “goodbye to done”

Section Three: Crafting Mobile Experiences

Section three of this book will cover the “stuff to see” and “things to do” part of this guidebook. The three chapters ([Chapter 6, “Mobile Prototyping,”](#) [Chapter 7, “Motion and Animation,”](#) and [Chapter 8 “Awakening the Senses”](#)) will give you design exercises, prototyping methods, and design guidelines to try once you begin crafting mobile experiences, and cover the following topics:

- Information on how to leverage senses other than sight when creating mobile experiences
- Tactical and experiential prototyping tools and methods
- A set of animation principles that will help breathe life into your mobile design work

Section Four: The Future of Mobile UX

Finally, [Chapter 9, “New Mobile Forms,”](#) is all about the edge of the mobile frontier. It’s the “deep space” stuff that a few brave souls have already begun to explore and pioneer. It’s the stuff that will likely become our future very soon, as shown by these areas:

- Information about the shifting boundary between computers and the body
- Information about the shifting boundary between computers and the environment
- Mobile experiences for emerging markets

So throw on your space suit or circle your wagons (whichever frontier exploration metaphor you identify with most), because the mobile frontier awaits.

The Mobile Sinners

Excerpt from science fiction writer and author of the seminal design book, Shaping Things, Bruce Sterling, who is seen addressing the crowd at a Mobile Monday in Amsterdam in 2008 (Figure 1.5).

The rapid development of cell phones is killing early cell phones much faster than it’s killing any of the early, older legacy technologies.

I think that is a real principle...something you have to understand if you’re going to be in this line of work. It’s very romantic. It’s very fast moving.

You are building dead lumps of plastic.

When people come out and they show you an iPhone, or an Android, they are showing you larval versions of something much more sophisticated. Both those devices are going to be dead. Deader than hammers, deader than anvils. You can use a hammer and an anvil; those two devices will have no use.

The world you are building right now is the ground floor for something much larger—and the soil beneath that ground floor is violently unstable.

You're really like people building on Vesuvius.

These things you are putting into people's hands—they are not phones. I want you to stop talking about that. You're putting banks into people's hands. You're putting health clinics into people's purses. You're putting consumer encyclopedias onto everything that has a bar code.

That is not a phone...even with an "i" in front of it. That's not what you are doing. You're allowing people—even small children—never to get lost again. Ever. That's a transformed society.

And what will be built on top of that is much weirder than the transformation you are forcing onto other people right now.

If you live close to the volcano, I want you to think hard about the values you want to save and stop worrying about the plastic ware.



FIGURE 1.5 Bruce Sterling, science fiction writer and author of the seminal design book, *Shaping Things*.

The Emergent Mobile NUI Paradigm

Traversing the GUI/NUI Chasm

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I have long had a love–hate relationship with the 38 Geary bus in San Francisco. Every ride is an uncensored snapshot into the underbelly of humanity. Crowded, smelly, and always driven by a seriously pissed-off Muni driver, it’s the only public transportation option to downtown San Francisco from my old neighborhood, the Outer Richmond.

While the 38 Geary has been the backdrop for some of my most interesting urban stories, I’ll remain forever in debt to that bus line for the observational fodder of mobile technology use it has provided.

Nothing will drive people into the world of their mobile devices faster than a stinky, slow-moving, and insanely crowded bus. Just like Alice falling into that rabbit hole to escape the injustices of her life, it was my daily rides to work on the 38 Geary that made me realize mobile phones aren’t just communication devices, they’re portals into another world. They are a tiny world that people can escape into until they reach their destination (see [Figure 2.1](#)).



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