

# Pervasive Information Architecture: Designing Cross-Channel User Experiences

**Andrea Resmini and Luca Rosati**



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# Foreword

I knew the Internet before it got famous. There were places but no paths, no maps, no search engines. Entry required a key in the form of an IP address and an incantation in the language of UNIX. It was a small world that felt big because it was so easy to get lost in the shadowy realm of texts and data, completely devoid of color. And yet, the Internet in the early 1990s was a friendly place because it was also made up of people who served as mentors and guides, helping one another find their way. This pioneering community of geeks and wizards, teachers and students, scientists and librarians was radically global and breathtaking in its diversity, and yet there was one thing we all held in common: a fervent belief that the Internet was about to change the world.

Now I've got that feeling once again. But this time there's no single protocol or portal to point to as evidence of what's to come. We're creating multichannel, cross-platform, transmedia, physiodigital user experiences that tear down the walls between categories. We can call it ubiquitous computing, the Internet of Objects, Web Cubed, or the Intertwingularity. We can talk about smart things, sensor Webs, product-service systems, and collaborative consumption. But none of these labels begins to describe the extraordinary diversity of the ambient, pervasive, mobile, social, real-time mashups unfolding before our very eyes. No word or phrase can possibly bind together the 21st-century success stories of iTunes, Nike+, Netflix, Redbox, Zipcar, iRobot, Freecycle, and CouchSurfing with the emergent phenomena of augmented reality, urban informatics, and plants that tweet. But as we wander blindly in this landscape of vernacular chaos, one thing is clear: we need a new map.

In 1998, Louis Rosenfeld and I coauthored the first edition of *Information Architecture for the World Wide Web*. The "polar bear book" as it came to be known helped a generation of information architects and user experience designers make sense of the Web through structure, organization, navigation, and search. Today, much of what we wrote remains relevant, and yet new questions arise as the world and the Web intertwine. How will we decide which features belong on which platforms? How should we strike a balance between

cross-channel consistency and platform-specific optimization? How do we rise to the new challenges of creating paths and places that bridge physical, digital, and cognitive spaces?

That's why I'm so excited by *Pervasive Information Architecture* and the heroic efforts of Andrea Resmini and Luca Rosati to explore, uncover, and chart the new, new world that's surrounding us all. This refreshing book about the design of ecosystems for wayfinding and understanding promotes a holistic approach to information architecture and user experience that draws insights from multiple disciplines and historical contexts. And it leads us bravely into the future with an ingenious collection of medium-independent heuristics to guide the complex decisions that lie ahead. In short, Andrea and Luca have sketched a map to the future of cross-channel design that will in turn inspire the next generation of mapmakers to improve usability, findability, and desirability and to make the world/Web a better place.

**Peter Morville**  
Ann Arbor, Michigan  
2011

# Attribution

This book is the result of a collaborative effort: the authors have discussed together each aspect of it. However, Andrea Resmini has written Chapters 2, 3, 4, 8, 9 (first half) and revised Luca's work; Luca Rosati has written Chapters 1, 5, 6, 7, 9 (second half) and revised Andrea's.

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# Introduction



**FIGURE 1**  
Photo: B. Ostrowsky.  
Source: Flickr.

## **PERVASIVE**

“But I like maps. I’ve got maps all over my house. I’m going to suggest to you that the skills and knowledge we have all been developing in our work—especially pertaining to the Internet—have application out here.” He taps the whiteboard. “In the real world. You know, the big round wet ball where billions of people live”

(Stephenson 1999).

This is a book on design.

This is also a book on information architecture, as we research and practice information architecture as a design proposition, but it’s not about Web sites. Or better, it’s not only about Web sites. The reason for this is because the way we interact with information is changing.

Imagine a pendulum. It swings right. Then it swings back. And that’s what we are doing, we are swinging back. Fifty years ago, if you wanted to know something, you asked a friend, a teacher, your parents, your siblings, or your spouse. Or you read a book. Physical entities. Then, technology made the desktop computer our interface of choice to access information, with a dedicated

place in the house, the office, and the school. Now we are swinging back to the real world, but we are bringing the computers along, and they are restless, smaller, faster, connected.

Information is going everywhere. It is bleeding out of the Internet and out of personal computers, and it is being embedded into the real world. Mobile devices, networked resources, and real-time information systems are making our interactions with information constant and ubiquitous. Information is becoming pervasive.

More and more of what we do every day requires us to move among different media, channels, and environments, with no distinction between what is physical and what is digital. We still visit Web sites, but we also use mobile applications, interact with intelligent devices, and connect with people through a variety of computer-mediated technologies. And we move on and off: check something out on the Web, get updates via text messages, go to the shop, bring the thing home, use it, connect it, or get more services online.

We call these new sprawling information spaces—in which we interact with both digital and physical entities—ubiquitous ecologies: they are systems connecting people, information, processes, and they are everywhere. They are pervasive information architectures. They are the structuring layer that runs across the different media, channels, and processes in which we express our expanded self, socially. The boundaries are blurring.

How do these changes affect the design of these information spaces then? Can we still be satisfied with designing our Web site, our mobile application, our customer-facing way-finding signage, or our kiosk system, in splendid isolation? Single, fully-realized artifacts we offer for use? We believe not.

We believe that we have to start designing these as the seamless, cross-channel holistic journeys we are experiencing them as. Traveling, shopping, taking care of our health, or enjoying ourselves: even when we design but a small part of these, as it often happens, knowing it does not end there, with just a ticket, an online shopping cart, or some info received on a mobile phone. Knowing that our loose piece is part of a larger, complex ubiquitous ecology: that is going to make the difference. Changes everything, actually.

## **STRUCTURE OF THE BOOK**

The book is divided into three parts. Because we like big words that require a dictionary just to be spelled correctly, we didn't call these Parts 1, 2, and 3 originally. That would have been too easy. We called them Foundations, Heuristics, and Synthesis, which is a bit like saying "A few facts and knowledge we rely on" (Foundations), "Guidelines we use when designing" (Heuristics), and "Putting it all together" (Synthesis), but in fewer words. You never know. Our editors

suggested that we could compromise: they could be persuaded into leaving those names around if we added Parts 1, 2 and 3 somewhere so that readers could understand that they were dealing with different parts of the book even without a dictionary. We agreed; it seemed wise.

These parts have a different structure and serve different purposes:

- Part 1, *foundations*, simply introduces the book, provides an overview of the problem space, and offers a historical read of information architecture as both a field of practice and a research discipline. Part 1 contains this *Introduction* and two more chapters, *From Multichannel to Cross-channel* and *Toward a Pervasive Information Architecture*.
- Part 2, *heuristics*, provides an initial overview of what designing pervasive information architectures means, what it tries to address, and illustrates the five guiding design principles of place-making, consistency, resilience, reduction, and correlation in detail. Part 2 deals mostly with the conceptual model and with its practical impact on the design process when dealing with cross-channel user experience and contains six chapters: *Heuristics for a Pervasive Information Architecture*, *Place-making*, *Consistency*, *Resilience*, *Reduction*, and *Correlation*.
- Part 3, *synthesis*, recomposes these principles or heuristics into a design process and shows how to apply this pervasive information architecture methodology to a real-life project with the help of a sample case study. Part 3 contains the chapter *Designing Cross-channel User Experiences*, which brings all the elements of Part 2 together into a single design framework.

A complete and rather eclectic reference section concludes the book.

## STRUCTURE OF THE CHAPTERS

All chapters share a common narrative tone; the central chapters which deal with the heuristics (Part 2, chapters 3–8) also share a common structure. They start out with a *short story*, which introduces the central theme, and then move on to tackle the most relevant issues connected to that theme, either by using examples or by referring to literature. Once all the pieces are in place, they position the *theme* in the context of pervasive information architecture. A short recap, in the form of *lessons learned*, follows. This is usually a short bullet list of things we have learned and things we should do when designing. One or more detailed *case studies* cap the chapter. Finally, we wrap it up with a *list of articles, books, and videos* for those who want to track down some of the specific ideas exposed in the text. Chapters in Part 2 and Part 3 also include contributions from a number of international authors, researchers, and practitioners. These usually pinpoint specific concepts or provide examples and case studies that illustrate a relevant application of the theoretical principles enunciated in the text.

## NAVIGATING THE BOOK

We are information architects. Even though reading on paper has its rules and a certain degree of sequentiality cannot be avoided, we wanted to be able to give readers some freedom in the way the book can be browsed, which is usually the purpose of the index and table of contents, and books are usually good at this: we just decided to push the envelope a little. You will find that you can actually just jump from image to image and find out that the core ideas from the various chapters are there, easily recognizable. Then, as many other books from Morgan Kaufmann, we have small side boxes that highlight or explain some important concepts we are dealing with in the main text. We tried to give them some pace and turned them into a bookmarking or navigating system that you can use to check out the most important concepts more easily or to find your way through the book faster.

## ON BEING LEAN

We think we gave our editors and our publisher some headache while trying to accommodate design talk, a narrative approach, and wayward references to a thousand apparently unrelated facts and notions inside the rather rigid structure of one single book. We jumped the fence into more than one neighbor's backyard and more than once: cognitive psychology, architecture, industrial design, service design, linguistics, game design and theory, interaction design, cinema, art history, economics, library science, and informatics. These all have some stage time in the book, but they serve one single purpose: make you understand where those simple design principles we want to make clear for you come from and how they fit together.

As a result, you will encounter a few names and acronyms throughout the book, but apart from very brief descriptions and explanations to introduce the odd new concept or a particularly obscure reference (and mostly off-text, using side boxes), you will not find much in-depth information in the book about these other practices, fields, and disciplines. You might read the term service design a couple of times, spot an occasional reference to interaction design, or witness a few mentions of user experience here and there, but you will never find an entire chapter dedicated to explaining what they are or what you should do with them.

The reason is simple: we didn't think this was what the book was being written for. We wanted Pervasive Information Architecture to be focused: we wanted you to have a lean, straight-to-the-point guide to the design of these pervasive, cross-channel user experiences in your hands. We wanted to explain why we think information architecture is an important piece of this new holistic

view of design. Why thinking of cross-channel user experiences in terms of information spaces is important. Why the shaping of the process is more important than the single interaction. And we wanted this to get through, to seep down.

That meant sacrificing side threads when not strictly on topic and, as a consequence, drop a few interesting opportunities. We still have more than a couple of folders stuffed full with sketches, ideas, links, drawings, and case studies that investigate some of these connections and overlaps. We are those kind of guys who say “you have five seconds, we can explain” and then go on pontificating for hours. It might very well be that you still find that we could have indulged on these walks in the woods a little more. It might be, but it felt wrong, like adding too much water to your coffee or too much milk to your tea. Instead, each chapter will paint the big picture, provide you with the core ideas, and leave everything else to the references you will find waiting at the end of each of them and on the Web.

## **THE WEB SITE**

This book has a companion Web site, Pervasive Information Architecture, which you can visit at <http://pervasiveia.com/>. We cannot update the book you just bought, but we sure can update the Web site, and we will. A few ideas that didn't make it to the final cut for reasons of pacing and length are already available there, so pay us a visit if you want more of this pervasive stuff. Plus, we will be around, so feel free to drop us a note, ask a question, or leave a comment. We'd love to hear from you.

## **EXPERIENCING THE BOOK**

Andrea's background is in architecture and design; Luca's is in linguistics and semiology. We have been working, researching, and teaching information architecture for more than 10 years. Andrea lives in Sweden, Luca in Italy. Luca is a gourmet and a connoisseur of wines. Andrea not so much, but he can deliver a mean glögg when it's Christmas time. The best thing we can say about this book is that it has thrived on diversity and complicity and on many years of work, research, digressions, dead ends, and reboots. That has surely helped, as complexity is richness, as you will read later on.

The only place where this rule has been broken, where there could be no agreement, no compromise, is in the kitchen. There is no way you can come to terms with making a recipe a democratic, social process, or a menu a collective resolution. When we are at conferences, Luca looks for the quiet places with good food the locals go to, whereas Andrea looks for the places where the action is. We might need a little help from you here.

If you want to experience how Luca has been working his way through the text you are reading, make the book a part of a Saturday evening with friends and make it your main course: it goes well with pasta of Gragnano and some green pepper filet, generously drowned with some Rosso and Sagrantino di Montefalco.

However, if you want to experience how Andrea has been typing away at his desk, make it part of a cold afternoon when it's good to be inside after a long walk: get a comfy chair by the window, a generous cup of black hot coffee, and some pastry. Swedish kanelbullar is a good choice. Light a reading lamp for maximum effect. Then go the Web site, cast your vote, and tell us what the book feels like.

## ACKNOWLEDGMENTS

What you have in your hands right now simply wouldn't have been possible without a lot of coffee. Gorging down gallons of hot black tar-like liquid certainly helped. But many, many talented individuals helped us make best use of the lucidity those outrageous and possibly dangerous quantities of caffeine gave us. In no particular order, our deepest, most heartfelt thank you goes to:

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One special mention goes to Eric Reiss and Jim Kalbach, who in 2006 decided it was worth listening to us and who helped us shape up the idea that would become this book. Thank you.

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