
Defining Information Architecture

We shape our buildings; thereafter they shape us.
—Winston Churchill

What we'll cover:

- What is (and isn't) information architecture
- Why information architecture is important
- The value of explaining and illustrating IA concepts

What is it about buildings that stirs us? Whether we're architectural connoisseurs or just plain folks, we are all emotionally engaged by the physical structures we experience throughout our lives.

Each building serves a different purpose. A bustling café with hardwood floors and large windows facing Main Street provides the ideal place for a quick breakfast meeting. A steel-and-glass high-rise with its mix of cubes and offices envelops inhabitants in a collaborative, high-energy work environment. A dark, smoky bar with tin ceilings and exposed brick walls becomes a sanctuary from the whirl of modern life. And a medieval Gothic cathedral adorned with granite sculptures, stained-glass windows, and towers that reach for the heavens provides an experience both humbling and inspirational.

Each building serves its purpose uniquely. Architecture, design, construction, furnishings, inhabitants, and location all play major roles in shaping the overall experience. All elements must work together. In successful buildings, the whole is greater than the sum of its parts.

Why begin a book about web sites by writing about buildings? Because the architectural analogy is a powerful tool for introducing the complex, multidimensional nature of information spaces. Like buildings, web sites have architectures that cause us to react.

Some web sites provide logical structures that help us find answers and complete tasks. Others lack any intelligible organization and frustrate our attempts to navigate through them. We can't find the product we need; we can't locate the report we found last week; we're lost inside an online shopping cart. These web sites may

remind us of buildings that fail: houses with flat roofs that leak, kitchens with no counter space, office towers with windows you can't open, and mazelike airports with misleading signs.

Bad buildings and bad web sites share similar architectural roots. First, many architects don't inhabit the structures they design. They don't fully understand the needs of their customers, and they're not around to suffer the long-term consequences of poor decisions. Second, creating structures to stand the test of time is really difficult. Needs change. Surprises are the rule. The desire for stability must be balanced against the value of flexibility and scalability. Architects are often faced with complex requirements, competing goals, and high levels of ambiguity. Transforming this chaos into order is extremely hard work that requires rare vision and perspective.

However, as designers of web sites, we should not become trapped by the metaphor of building architecture. Throughout this book, we'll also talk about information ecologies, knowledge economies, digital libraries, and virtual communities. We learn what we can from each analogy, and we leave the baggage behind.

A Definition

If you're new to the field, you may still be wondering: what exactly is information architecture? This section is for you.

in•for•ma•tion ar•chi•tec•ture n.

1. The structural design of shared information environments.
2. The combination of organization, labeling, search, and navigation systems within web sites and intranets.
3. The art and science of shaping information products and experiences to support usability and findability.
4. An emerging discipline and community of practice focused on bringing principles of design and architecture to the digital landscape.

Were you expecting a single definition? Something short and sweet? A few words that succinctly capture the essence and expanse of the field of information architecture? Keep dreaming!

The reason we can't serve up a single, all-powerful, all-purpose definition is a clue to understanding why it's so hard to design good web sites. We're talking about the challenges inherent in language and representation. No document fully and accurately represents the intended meaning of its author. No label or definition totally captures the meaning of a document. And no two readers experience or understand a particular document or definition or label in quite the same way. The relationship between words and meaning is tricky at best.*

* For a humorous perspective on the trickiness of the English language, see Bill Bryson's *The Mother Tongue: English & How It Got That Way* (William Morrow).

We'll now descend from our philosophical soapbox and get down to basics. Let's expand on our definitions to explore some basic concepts of information architecture.

Information

We use the term *information* to distinguish information architecture from data and knowledge management. Data is facts and figures. Relational databases are highly structured and produce specific answers to specific questions. Knowledge is the stuff in people's heads. Knowledge managers develop tools, processes, and incentives to encourage people to share that stuff. Information exists in the messy middle. With information systems, there's often no single "right" answer to a given question. We're concerned with information of all shapes and sizes: web sites, documents, software applications, images, and more. We're also concerned with *metadata*: terms used to describe and represent content objects such as documents, people, processes, and organizations.

Structuring, organizing, and labeling

It's what information architects do best. Structuring involves determining the appropriate levels of granularity* for the information "atoms" in your site, and deciding how to relate them to one another. Organizing involves grouping those components into meaningful and distinctive categories. Labeling means figuring out what to call those categories and the series of navigation links that lead to them.

Finding and managing

Findability is a critical success factor for overall usability. If users can't find what they need through some combination of browsing, searching, and asking, then the site fails. But user-centered design isn't enough. The organizations and people who manage information are important, too. An information architecture must balance the needs of users with the goals of the business. Efficient content management and clear policies and procedures are essential.

Art and science

Disciplines such as usability engineering and ethnography are helping to bring the rigor of the scientific method to the analysis of users' needs and information-seeking behaviors. We're increasingly able to study patterns of usage and subsequently make improvements to our web sites. But the practice of information architecture will never be reduced to numbers; there's too much ambiguity and complexity. Information architects must rely on experience, intuition, and creativity. We must be willing to take risks and trust our intuition. This is the "art" of information architecture.

* *Granularity* refers to the relative size or coarseness of information chunks. Varying levels of granularity might include: journal issue, article, paragraph, and sentence.

Tablets, Scrolls, Books, and Libraries

Humans have been structuring, organizing, and labeling information for centuries. Back in 660 B.C., an Assyrian king had his clay tablets organized by subject. In 330 B.C., the Alexandria Library housed a 120-scroll bibliography. In 1873, Melvil Dewey conceived the Dewey Decimal System as a tool to organize and provide access to the growing number of books.

In modern times, most of us become familiar with the basics of information organization through our experiences with books and libraries. Table 1-1 shows how the concepts of information architecture (IA) apply to the world of print and the World Wide Web.

Table 1-1. Differences between books and web sites

IA concept	Books	Web sites
Components	Cover, title, author, chapters, sections, pages, page numbers, table of contents, index	Main page, navigation bar, links, content pages, sitemap, site index, search
Dimensions	Two-dimensional pages presented in a linear, sequential order	Multidimensional information space with hypertextual navigation
Boundaries	Tangible and finite with a clear beginning and ending	Fairly intangible with fuzzy borders that “bleed” information into other sites

As we go beyond books to collections of books, the comparisons become even more interesting. Imagine a bookstore with no organization scheme. Thousands of books are simply tossed into huge piles on table tops. Such a bookstore does, in fact, exist: Gould’s Book Arcade in Newtown, Australia. It’s shown in Figure 1-1.



Figure 1-1. Gould’s Book Arcade (image courtesy of Seth Gordon)

From a philosophical perspective, you might feel that this casual jumble of books represents a refreshing break from the rigid structures of everyday life. And this bookstore really can provide a wonderful browsing experience filled with adventure and serendipity. But if you arrive seeking a specific book or if you have a particular author or topic in mind, you're almost guaranteed to have a long and painful needle-in-the-haystack experience.

Compare the chaos of this bookstore to the order of a library (see Figure 1-2). Even on the surface, the contrast is like night and day. But look deeper and you'll see that a library is more than a warehouse for books, magazines, and music. There are complex systems and well-trained professionals operating behind the scenes to select, evaluate, label, describe, structure, and organize the collection so that users of the library can find what they need. And though the library's information environment is highly structured, the subject-oriented approaches of the Dewey Decimal and Library of Congress classification schemes also support exploratory browsing and serendipity.



Figure 1-2. Browsing in a library (image courtesy of <http://intergate.sdmesa.sdccd.cc.ca.us/lrc/stacks.jpg>)

In short, a major way that libraries and librarians add value to printed materials is by placing them within the framework of an information architecture that facilitates access to those materials. Information architects perform a similar role, but we typically do it within the context of web sites and digital content. Of course, there are major differences between libraries and web sites. Table 1-2 shows just a few.

Table 1-2. Differences between libraries and web sites

IA Concepts	Libraries	Web sites
Purpose	Provide access to a well-defined collection of formally published content.	Provide access to content, sell products, enable transactions, facilitate collaboration, and on and on...
Heterogeneity	Diverse collections with books, magazines, music, software, databases, and files.	Huge diversity of media types, document types, and file formats.
Centralization	Highly centralized operations, often within one or a few physical library buildings.	Often very decentralized operations, with subsites maintained independently.

Developing an information architecture for a library presents many challenges, but a library is a relatively well-defined environment, and there is much collective experience and wisdom to draw upon. Web sites, on the other hand, present an array of new challenges. Virtual spaces are more flexible than physical spaces and can therefore be more complex. And at this point, we have precious few guidelines for creating information architectures for digital spaces.

Obviously, we've made some gross generalizations in these comparisons, and have oversimplified to illustrate key points. As you try to communicate information architecture concepts to others, you'll probably have to do the same.

Explaining IA to Others

One of the most frustrating things about being an information architect is the fact that most of your family members and neighbors will never have a clue what you do. The more you try to explain it, the more confused or bored they become. Their eyes glaze over. They nod politely. Then comes the desperate attempt to change the subject. "Hey, speaking of information architecture, did you hear tomorrow's weather report?"

Friends and relatives aren't the only tough audience. Sometimes you have to sell the concept to colleagues, clients, or managers. Each audience presents its own set of challenges. There's no magic bullet, but it's helpful to be prepared with an "elevator pitch" and an analogy suited to your particular audience.

The elevator pitch explains what you do in a sentence or two of plain language. If you can combine an analogy that resonates with your audience, even better!

Here are a few approaches to try out:

- "I'm an information architect. I organize huge amounts of information on big web sites and intranets so that people can actually find what they're looking for. Think of me as an Internet librarian."
- "I'm an information architect. I help my company by making it easy for customers to find our products on our web site. I'm a kind of online merchandiser. I apply one-to-one marketing concepts on the Internet."
- "I'm an information architect. I'm the one who takes on that information overload problem that everyone's been complaining about lately."

Sometimes we're too close to what we do. That's when it's a good idea to call for help. Ask someone who's familiar with you and your job to describe what you do in one or two sentences. Often you'll be amazed by how well they nail it, and grateful for their clarity and brevity.

What Isn't Information Architecture?

One of the most effective ways to define something is to identify its boundaries. We do this all the time. This is my property. That's your property. This is England. That's Scotland. She's a brain surgeon. He's an ophthalmologist.

Sometimes it's very easy to explain the differences. Mammals breathe with their lungs and give birth to live young. Dogs, cats, dolphins, and humans are all clearly mammals. Fish live in water, breathe with their gills, and lay eggs. Salmon, bass, and guppies are all clearly fish.

But as with many classifications, you quickly run into problems. What about fish with lungs? What about fish that don't look like fish? Are sharks, skates, eels, and sea horses really fish? (Yes, they are.) And where do we put that darned platypus? Biological taxonomists have argued about these classification issues for centuries.

Mapping the boundaries of information architecture is even more slippery. Some things are clearly not information architecture:

- Graphic design is NOT information architecture.
- Software development is NOT information architecture.
- Usability engineering is NOT information architecture.

Makes sense, right? But as soon as you start working within the messy reality of web site design and construction, you find yourself in the gray areas between disciplines. For example, consider the ubiquitous global navigation bars in Figure 1-3.



Figure 1-3. Top and bottom navigation bars on the United Nations web site

The navigation bars feature labels and links that lead to other sections and pages within the web site. These labels are dependent upon the underlying structure and categorization of the site. The creation of categories and choice of labels fall clearly inside the domain of information architecture.

* To find out, read *The Platypus and the Mermaid: And Other Figments of the Classifying Imagination*, by Harriet Ritvo (Harvard University Press).

But wait a second. What about the look and feel of the navigation bar? What about the choice of colors, images, font styles, and sizes? Now we enter the realms of graphic design, interaction design, and information design. And what if a designer challenges the labels proposed by an information architect? Perhaps those labels are too long to fit on the navigation bar. What happens then?

What if the information architect wants a search link on the navigation bar, but the software developer says that adding a search capability to the web site is too expensive and time-consuming? And what if the usability engineer says that user tests indicated there are too many options on the navigation bar? What happens then?

These are the questions and challenges that live in the gray areas between disciplines. These gray areas drive some people crazy. Lots of heated arguments have resulted from attempts to draw clear lines. We believe the gray areas are necessary and valuable. They force interdisciplinary collaboration, which ultimately results in a better product.

Gray areas and caveats aside, here is our attempt to draw some boundaries between information architecture and a number of closely related disciplines.

Graphic design

Traditionally, a graphic designer was responsible for all aspects of visual communication, from the design of corporate logos and identities to the layout of individual pages. On the Web, we're seeing increasing specialization due to the complexity of the environment. Even so, many graphic designers do a great deal of information architecture as part of their work.

Interaction design

Interaction designers are concerned with the behavior of tasks and processes that users encounter in software and information systems at the interface level. They often have a background in human-computer interaction, and are focused on helping users successfully achieve goals and complete tasks.

Usability engineering

Usability engineers understand how to apply the rigors of the scientific method to user research, testing, and analysis. Their background in human-computer interaction and their experience observing users provide them with useful insights into design. They are often concerned with testing all aspects of the user experience, inclusive of information architecture and graphic design.

Experience design

Experience design is an umbrella term that encompasses information architecture, usability engineering, graphic design, and interaction design as components of the holistic user experience. You'll find relatively few "experience designers," as there aren't many people with skills in all these areas. The term is useful insofar as it encourages cross-disciplinary awareness and collaboration.

Software development

People rarely confuse software development and information architecture, but the two fields are highly interdependent. Information architects rely on developers to

bring our ideas to fruition. Developers help us understand what is and isn't possible. And as the Web continues to blur the distinction between software applications and information systems, these collaborations will become even more important.

Enterprise architecture

In the 80s and 90s, a movement calling itself *enterprise architecture* arose in the information systems discipline. While the early stages of this movement were focused on data and system integration, later definitions have encompassed business, process, information, and technology architecture.

Content management

Content management and information architecture are really two sides of the same coin. IA portrays a “snapshot” or spatial view of an information system, while CM describes a temporal view by showing how information should flow into, around, and out of that same system over time. Content managers deal with issues of content ownership and the integration of policies, processes, and technologies to support a dynamic publishing environment.

Knowledge management

Knowledge managers develop tools, policies, and incentives to encourage people to share what they know. Creating a collaborative knowledge environment means tackling tough issues surrounding corporate culture such as “information hoarding” and “not-invented-here syndrome.” Information architects focus more on making accessible what has already been captured.

Why Information Architecture Matters

You now understand what information architecture is and what it isn't. So, why is it important? Why should you care? Why should your company or your clients invest time and money in the design of their information architectures? What is the return on investment (ROI)?

We'll tackle these tough questions in detail later in the book, but for now, let's hit the highlights without getting bogged down in subtleties. When you calculate the importance of information architecture to your organization, you should consider the following costs and value propositions:

The cost of finding information

What does it cost if every employee in your company spends an extra five minutes per day struggling to find answers on your intranet? What is the cost of frustrating your customers with a poorly organized web site?

* Jakob Nielsen deserves credit for publicizing the fact that the costs of poor navigation-system design in a large enterprise can add up to millions of dollars of lost employee productivity.

The cost of not finding information

How many bad decisions are made every day in your organization because employees didn't find the information they needed? How much duplication of effort results from this disconnect? How many customers do you lose because they can't find the product they want on your web site? How much do you spend every day providing telephone support to existing customers because they hate navigating your online technical-support database?

The value of education

What is the value of educating your customers about new products and services related to the ones they're actively seeking on your web site?

The cost of construction

What does it cost to design and build a web site? How much does it cost to redo it six months later because it doesn't support findability or doesn't scale?

The cost of maintenance

Similarly, what does it cost to ensure that good designs don't crumble over time? Will the people who maintain your site know where to put new content and when to remove outdated content?

The cost of training

For internal, mission-critical information systems that support call centers, for example, what does it cost to train employees to use that system? How much could you save if it wasn't so complicated to use?

The value of brand

No matter how beautiful your web site is, if customers can't find what they need, your brand loses value in their eyes. How much did you spend on those brand-building TV commercials?

And the list goes on. In your particular situation, there are sure to be a whole slew of opportunities to make money, save money, improve employee or customer satisfaction, or just plain make the world a better place. Figure out what they are and communicate them as clearly and directly as possible.

We're not saying this is easy. In fact, it's very difficult to calculate an exact return on an information architecture investment—there are simply too many variables. This is really no different from most other areas of activity within the business world. It's just that people in more traditional areas like sales, marketing, engineering, human resources, and administration have had more time to get their stories straight.

Bringing Our Work to Life

Information architecture lives beneath the surface. Users rarely look at a web site and exclaim, "Wow, check out this brilliant classification scheme!" In fact, much of our work is intangible; many people who are directly involved in web design have only a superficial understanding of information architecture. They may recognize the need

for clear labels in a navigation bar, but have no clue how a controlled vocabulary could improve the search experience. If you can't see it, touch it, taste it, or smell it, it doesn't exist.

This invisibility is fine with respect to users. We don't want to force users to see our hard work; we want them to complete tasks and find information in blissful ignorance of our labors. But invisibility is a major problem when it comes to justifying our existence to colleagues and making the case for investments to decision makers. We must constantly work to help people see the complexity of the challenges we face and the long-term value of our solutions.

We must find ways to articulate the key concepts of our craft, helping people to understand the sophisticated nature of user needs and behavior. We must show the interconnections between people and content that underpin knowledge networks, and explain how these concepts can be applied to transform static web sites into complex adaptive systems (Figure 1-4*).

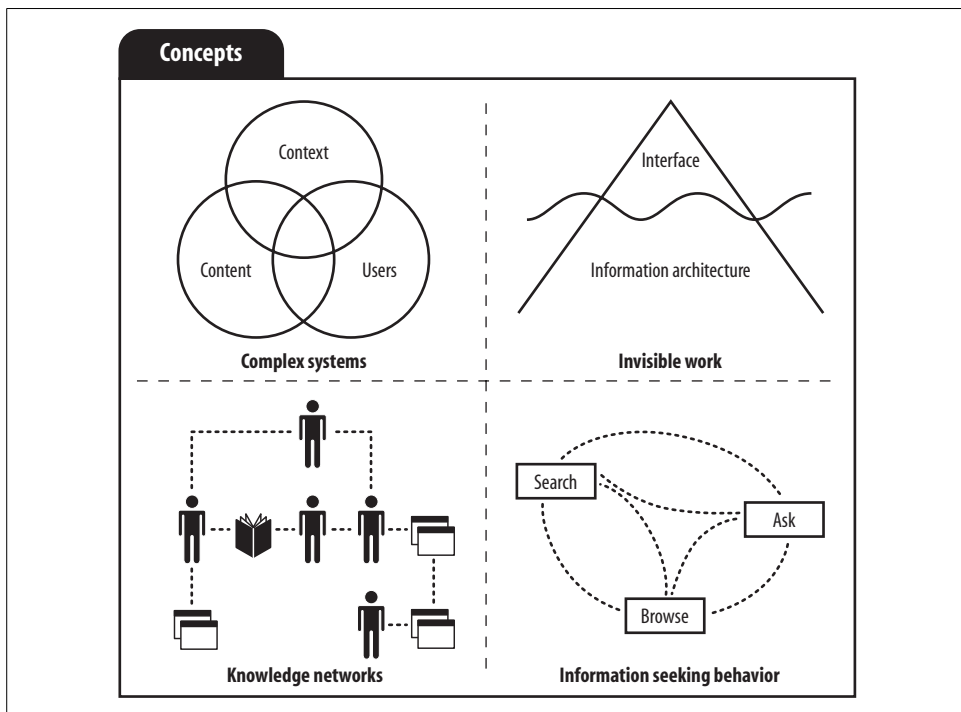


Figure 1-4. Information architecture concepts

* This series of images was designed by Myra Messing Klarman of Studio Mobius (<http://studiomobius.com>).

We must be prepared to dive into detail, identifying and defining the component systems that support our sites (Figure 1-5). We must show how semantic networks can provide a foundation for fluid navigation. And we must convince our clients and colleagues that an effective searching experience requires not just a good engine or a nice interface, but a carefully integrated system of interdependent parts.

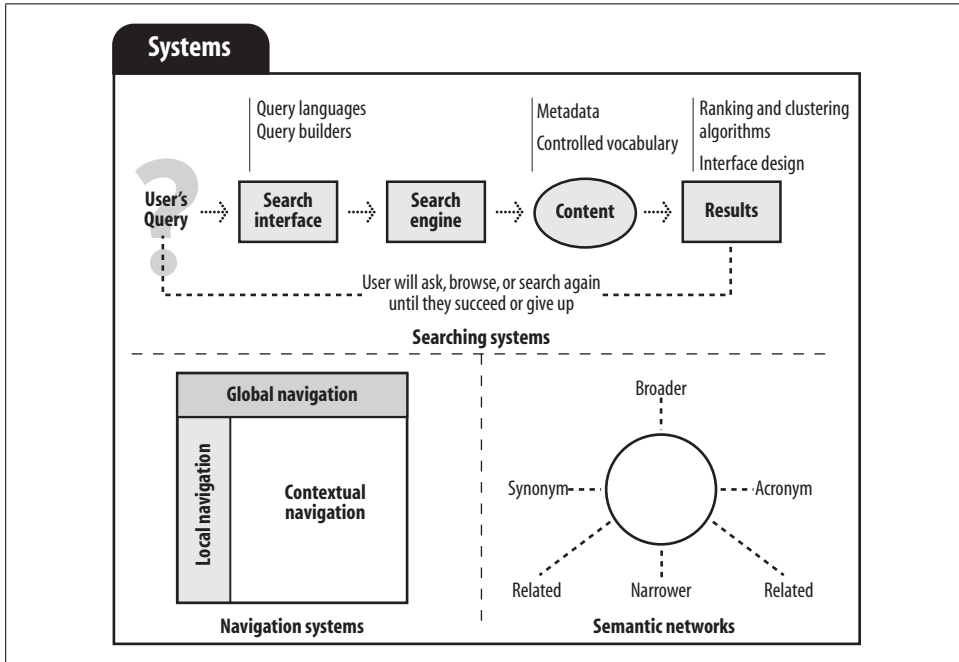


Figure 1-5. Information architecture systems

Finally, we must be ready to produce concrete deliverables (Figure 1-6). We must learn to render our constructs of semantics and structure in clear and compelling ways. In short, we must help people to see the invisible.

In this book, we explain the concepts, systems, and deliverables of information architecture. By drawing upon words, stories, metaphors, and images, we've done our best to bring our work to life. However, no single collection of words and images can serve all purposes. A key to the craft of information architecture is understanding how to shape your message for your audience. This requires some sense of what your managers, clients, and colleagues want to hear and how they want to hear it.

Did we mention that information architecture involves a little magic? How else would you read minds and make the invisible visible? So put on a black hat, bring along your sense of humor, and prepare to enter the secret society of information architects.

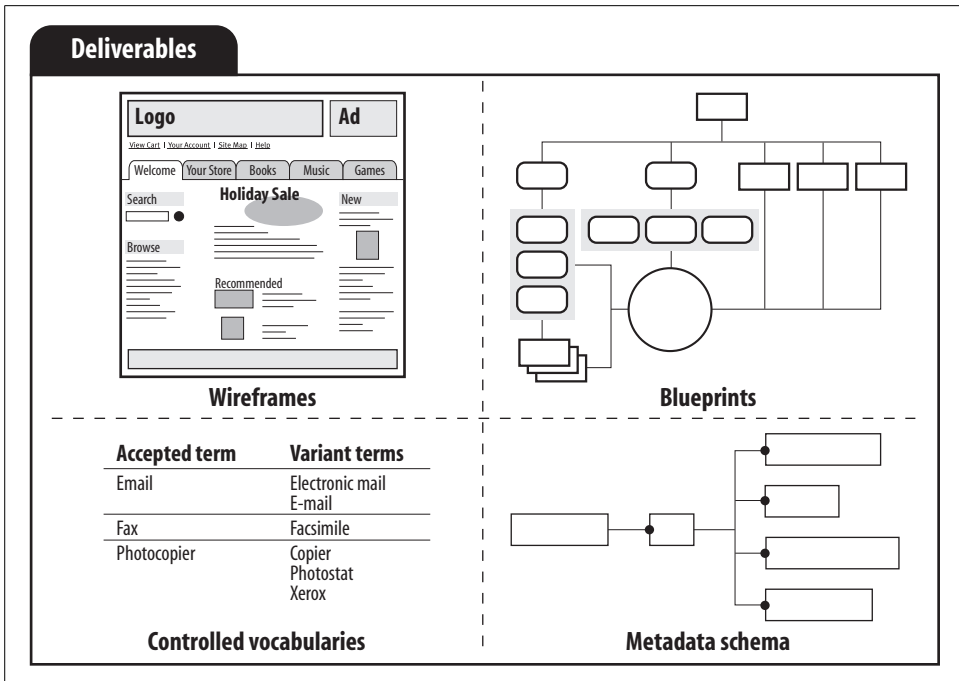


Figure 1-6. Information architecture deliverables

CHAPTER 2

Practicing Information Architecture

What we'll cover:

- Information architecture is everywhere
- Whether the world needs information architects
- Qualifications and source disciplines for information architects
- Information ecologies and their impact on the practice of information architecture

What is information architecture? Is it an art, a science, or a craft? Who should do this work? What qualifications are required? These are the questions we grapple with as a community of information architects. We write articles and publish books. We debate on discussion lists and argue passionately at conferences. We pull out our hair. We lose sleep. This is serious stuff.

And yet, independent of our intellectual theories and existential agonies, something very powerful is taking place. We are being surrounded, quite literally, by information architecture.

Have you ever walked through Times Square in New York City at night? It's quite a spectacle. You're on the corner of 42nd and Broadway. The glassy facades of buildings are pulsing with real-time information, courtesy of the latest in flat-panel display and projection technologies. Business news, financial data, corporate logos, and URLs are lit up in neon. Taxicabs sport billboards on their roofs as they honk their way through traffic. Pedestrians (or shall we say "users") hustle past one another, chattering into their cell phones or stopping on the corner to check email or get directions on their wireless PDAs. This is William Gibson's cyberspace turned inside out, physical architecture meets information architecture, a world of content, labels, and metadata all competing for your attention.*

* See the Flickr photo pool "Everyday Information Architecture": <http://www.flickr.com/groups/everyday-information-architecture/pool>.

And that's nothing compared to the real cyberspace, a new reality where we spend increasing amounts of time. How many hours do you spend staring at a computer monitor each day? How often do you check email or pop open your web browser? When your Internet connection is broken, how do you feel?

The World Wide Web has lived up to its name. It has connected and transformed the world. Want to know what's going on? Check out nytimes.com, bbc.co.uk, or your favorite blogs. Planning a trip? orbitz.com and kayak.com will meet your every need. Having trouble with your green iguana? No need to leave the house. You'll find the answer at iguana.com.

Billions of web pages have sprung up since the Web began. And guess what? Information architects played no role in designing most of them. This has been an emergent, bottom-up, grass-roots phenomenon. But every single web site that exists does have an information architecture. They're riddled with labels and taxonomies, vocabularies and metadata, sitemaps and indexes. There are portals linking to portals linking to search engines. Pure navigation. Some is good. Much of it isn't. We can critique it and we can make fun of it, but we can't stop it. Information architecture happens!

Do We Need Information Architects?

Since information architecture happens anyway, does the world really need information architects? If you've attended any of the IA Summits* in recent years, you know this has been a hot topic. A few speakers in particular have stirred the pot. Andrew Dillon is fond of saying, "I know we need information architecture. I'm not so sure we need information architects." And Peter Merholz suggests that "we need to teach everyone to do information architecture, rather than isolating the practice to a handful of professionals."

We have to give credit to the information architecture community for having the guts to ask these questions in public. But we'd like to respond with a firm assertion that *we absolutely do need information architects*. We're not too particular about the specific job title; if you prefer to call them user-experience designers, knowledge managers, or findability engineers, that's fine with us. What we're focused on is the need for professionals with specialized skills and experience, who know how to create useful, usable information systems within massively complex environments.

Programmers and graphic designers are great at what they do. They're not great at what we do. And information architecture design is not a skill you can pick up by taking a half-day seminar. There's real depth to the discipline. Information architecture resembles the games of *Othello* and *Go*. A minute to learn, a lifetime to master.

* Sponsored by the American Society for Information Science & Technology, the Information Architecture Summit is held in February or March each year. Learn more on the IA Summit web site: <http://iasummit.org>.

Does this mean that all web developers will need a licensed information architect on board before they write their first line of code? Of course not. Information architecture happens, with or without information architects, and that's just fine with us. That's why Peter Merholz is right to emphasize the vital role information architects must play in education. We can have a major positive impact on the world by sharing what we know with all those people who do information architecture in the course of doing something else.

But the most important and complex information environments already rely on professional information architects. Large organizations like IBM, Microsoft, and Vanguard already have teams of information architects dedicated to the long-term strategy and design of their web sites and intranets. Smaller organizations tend to involve information architects in a consulting capacity during a site redesign. This allows the information architect to make a major contribution without breaking the bank.

This selective use of expertise is not isolated to the field of information architecture; in fact, it is quite common. Consider, for example, the practice of law. A huge percentage of legal decisions are made every day by business managers rather than by their lawyers.

Manager #1: "Should we approve this nondisclosure agreement?"

Manager #2: "Yes, that's fine. It's no big deal. Let's move on."

Most companies don't have lawyers on staff. They get lawyers involved when the situation is particularly messy, complex, or important. The same happens and will continue to happen with information architects.

In fact, as web sites and intranets become more sophisticated and mission-critical, the demand for information architects will only rise. This demand will be partly offset as other professionals learn the basics of information architecture. Our responsibility as information architects will be to continue to push the envelope, to learn how to do what we do faster and better, and then to share our knowledge and experience with those around us. We all have so much to learn and so much to do. We fully expect information architects to be very busy for at least the next few hundred years.

Who's Qualified to Practice Information Architecture?

Unlike medicine and law, the field of information architecture has no official certification process. There are no university consortia, boards, or exams that can prevent you from practicing information architecture. As we explain in Chapter 13, a number of academic programs are emerging to serve the needs of prospective information architects, but for now very few people have a degree in information architecture.

Disciplinary Backgrounds

As you look over this list, you might not find your home discipline listed. Don't be daunted: any field focused on information and its use is a good source of information architects. And the field is still young enough that just about anyone will have to rely on experience from the School of Hard Knocks to practice IA effectively and confidently.

If you're looking for IA talent, keep in mind that, because the field is relatively new and because demand for information architects continues to explode, you can't just post a job description and expect a flock of competent and experienced candidates to show up on your doorstep. Instead, you'll need to actively recruit, outsource, or perhaps *become* the information architect for your organization.

Of course, if you are looking for someone else to fill this role, you might consider the following disciplines as sources for information architects. If you're on your own, it might not be a bad thing to learn a little bit about each of these disciplines yourself. In either case, remember that no single discipline is the obvious source for information architects. Each presents its own strengths and weaknesses.

OK, on to the list:

Graphic design and information design

Many of the people who have written about and practice information architecture are graphic designers by training. This is not surprising, as both graphic design and information design involve much more than creating pretty pictures. These professions are geared more toward creating relationships between visual elements and determining how those elements can be integrated as a whole to communicate more effectively.

Information and library science

Our backgrounds in information science and librarianship have proven very useful in dealing with the relationships between pages and other elements that make up a whole site. Librarians have a long history of organizing and providing access to information and are trained to work with searching, browsing, and indexing technologies. Forward-looking librarians understand that their expertise applies in new arenas far beyond the library walls.

Journalism

Journalists, like librarians, are trained at organizing information, but in a setting that places special emphasis on timeliness. If your web site is geared toward delivering dynamic information, such as a news service or online magazine, someone with a background in journalism might have a great sense of how this information could be best organized and delivered. Because of their writing experience, journalists are also good candidates for architecting sites that will have high levels of edited content.

Usability engineering

Usability engineers are experts at testing and evaluating how people work with systems. These human–computer interaction professionals measure such criteria as how long it takes users to learn how to use a system, how long it takes them to complete tasks and find answers, and how many errors they make along the way. Of all the disciplines we list, usability engineering is probably the most scientific in its view of users and the quality of their experiences.

Marketing

Marketing specialists are expert at understanding audiences and communicating messages effectively. They are particularly valuable in the design of customer-facing web sites, where product sales and brand are critical to success. Marketing expertise can ensure that the message is presented in the language of the target audience. We’ve run into a number of “online merchandisers” who have become expert information architects.

Computer science

Programmers and software developers bring important skills and sensitivities to information architecture, especially to “bottom-up” processes. For example, developers are often excellent at modeling content and metadata for inclusion in a database or content management system. They’re also great at figuring out how all of the component systems and technologies of an information architecture fit together.

Technical writing

Professionals who have spent time writing technical documentation or developing online help systems are often well-sensitized to both the needs of users and the potential for structuring, labeling, and describing textual content.

Architecture

While the transition from bricks and mortar to bits and bytes is obviously a big move, we actually know quite a few building architects turned information architects. These folks tend to have a great deal of experience studying people’s needs and seeking behaviors, and an excellent foundation in the concepts and challenges surrounding strategy and design.

Product management

Many information architects play the role of “orchestra conductor.” They understand how to tap the motivations and talents of a diverse group of professionals, creating a whole that’s greater than the sum of its parts. People with a background in product, program, or project management can become very effective information architects, particularly in the areas of strategy formation and interdisciplinary team management.

...And many more

This list is far from comprehensive. There are dozens of established fields from which we can learn (see Figure 2-1). No list or picture will ever capture the true diversity of practicing information architects.

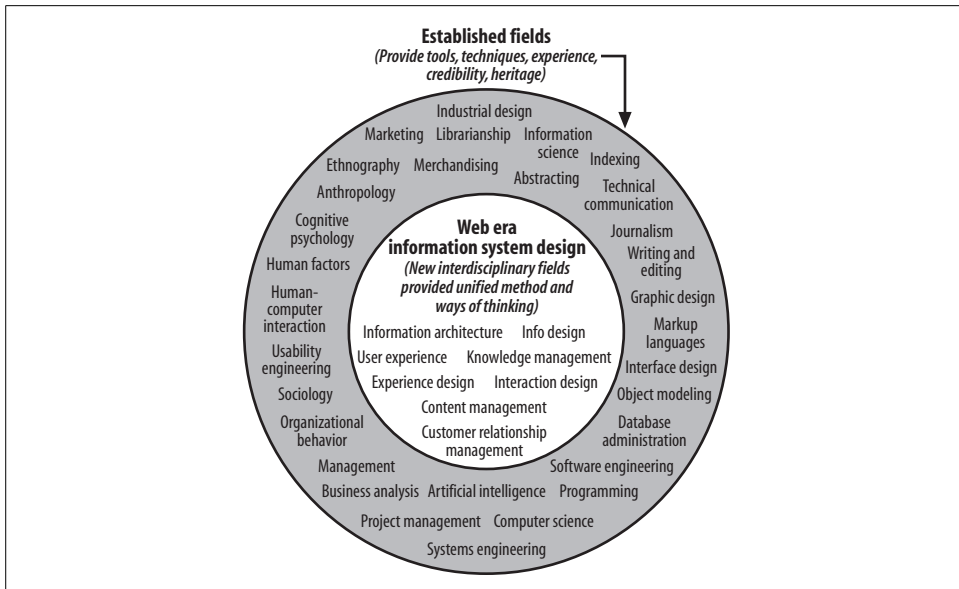


Figure 2-1. Information system design in the Web era (designed with help from Jess McMullin)

Innies and Outies

When staffing an information architecture project, it’s also worth considering trade-offs between insider and outsider perspectives. On one hand, there’s value in having an information architect who can think as an “outsider,” take a fresh look at the site, and be sensitive to the needs of users without being weighed down by internal political baggage. On the other hand, an “insider” can really understand the organization’s goals, content, and audiences, and will also be around for the long haul, helping to design, implement, and manage the solution.

Because it’s difficult to choose between these two perspectives, many intelligent organizations put together a balanced team of consultants and employees. The consultants often help with major strategy and design initiatives, and provide highly specialized varieties of IA consulting, while the employees provide continuity as projects transition into programs. Even if you’re the lone in-house information architect, you should seek to work with outies—whether by convincing management to hire consultants or specialists for you to collaborate with, or simply by hanging out with and learning from other IAs at local meetups and conferences.

Really, the fact that both innies and outies are flourishing is a sign of the field’s maturation: in IA’s early years (coinciding with this book’s first edition), most practitioners were outies, working at agencies and consultancies. After the bubble burst (see the second edition), many of us ran for cover in the security of working in-house, often assisting with the implementation and customization of large applications like CMS and search engines. And now, as our third edition comes out, the field is in balance—there

is room for both innies and outies, and a symbiotic relationship exists between them. It's truly indicative of a healthy profession, and good insurance against the vagaries of the next sudden economic downturn. We're not going away.

Gap Fillers and Trench Warriors

IA's early practitioners got their jobs by taking on work that no one else wanted or realized existed. Structuring information? Indexing it? Making it findable? Even if these tasks sounded appealing, few had the vocabulary, much less the skills, to address them. So stone-age information architects were, by definition, natural gap fillers who often tackled these tasks out of opportunism or simply because *someone* had to.

Over the past five or seven years, the field has matured and the practice of IA has solidified. What an information architect does is now much better understood and documented; you'll even detect a whiff of standardization among job descriptions. In effect, IA has moved from the exotic to the everyday, and more and more the people filling those roles are heads-down crack experts in the nuts-and-bolts of IA practices. These are the information architects that you'll want and need down in the trenches, grinding out an information architecture amid the guts and gore of your organization's users, content, and context. These trench warriors aren't pioneers, but providers of an important commodity service.

Of course, as trench warriors began to take over, gap fillers didn't disappear. They saw other opportunities that needed filling—only this time, the gaps popped up in the field of IA itself, rather than within specific teams or organizations. Information architects are now making livings as independent consultants, often working in such specialized areas such as taxonomy development, or as user experience team leaders, or as teachers and trainers for in-house IAs. Increasingly, many of us have become independent entrepreneurs who are developing own IA-infused products and services; there are always new gaps to be filled.

As the field continues its healthy evolution, gap fillers and trench warriors will continue to fill changing roles. Whether you're looking to staff your team, hire a consultant, or determine if IA is in your future, it's important to know that the field is now large and healthy enough to accommodate many personality types.

Putting It All Together

Whether you're looking to become an information architect or hire one, keep this in mind: everyone (including the authors) is biased by their disciplinary perspective. If at all possible, try to ensure that various disciplines are represented on your web site development team to guarantee a balanced architecture.

Additionally, no matter what your perspective, the information architect ideally should be responsible solely for the site's architecture, *not* for its other aspects. It can be overly distracting to have to deal with other, more tangible aspects of the site, such as its graphic identity or programming. In that case, the site's architecture can

easily, if unintentionally, get relegated to second-class status because you'll be concentrating, naturally, on the more visible and tangible stuff.

However, in the case of smaller organizations, limited resources mean that all or most aspects of the site's development—design, editorial, technical, architecture, and production—are likely to be the responsibility of one person. Our best advice for someone in this position is obvious but still worth considering. First, find a group of friends and colleagues who are willing to be a sounding board for your ideas. Second, practice a sort of controlled schizophrenia in which you make a point to look at your site from different perspectives: first from the architect's, then from the designer's, and so on. And look for company among others who are suffering similar psychoses; consider joining the Information Architecture Institute* and attending the annual ASIS&T Information Architecture Summit.

Information Architecture Specialists

These general discussions about the role, value, and qualifications of information architects are worthwhile but incomplete. The community of information architects is experiencing what evolutionary biologists call a period of “punctuated equilibrium,” marked by rapid change and specialization.

Particularly in large organizations, people who began as all-purpose information architects are gravitating towards specialized niches that match their strengths to their organization's needs. Here are just a few of the titles that already exist:

- Thesaurus Designer
- Search Schema Content Editor
- Metadata Specialist
- Content Manager
- Information Architecture Strategist
- Manager, Information Architecture
- Director, User Experience

There are so many possible variations and so many different facets. For example, information architects can specialize by:

- Industry lines (e.g., financial services, automotive)
- Functional department (e.g., human resources, engineering, marketing)
- Type of system (e.g., intranets, web sites, extranets, online magazines, digital libraries, software, online communities)
- Audience (e.g., small business owners, elementary school teachers, rocket scientists, teenagers, grandparents)

* Information Architecture Institute: <http://www.iainstitute.org>.

Finally, much IA work is centered on making large-scale applications work as advertised. So many information architects find their specializations centered on a variety of tools, most commonly:

- Content management systems
- Search engines
- Portals

As our use of networked information environments grows, the possibilities for specialization are unlimited and unpredictable. We're watching evolution in fast-forward. This is part of what makes it so much fun to be part of the information architecture community.

Practicing Information Architecture in the Real World

Users. Content. Context. You'll hear these three words again and again throughout this book. They form the basis of our model for practicing effective information architecture design. Underlying this model is a recognition that you can't design useful information architectures in a vacuum. An architect can't huddle in a dark room with a bunch of content, organize it, and emerge with a grand solution. It simply won't hold up against the light of day.

Web sites and intranets are not lifeless, static constructs. Rather, there is a dynamic, organic nature to both the information systems and the broader environments in which they exist. This is not the old world of yellowing cards in a library card catalog. We're talking complex, adaptive systems with emergent qualities. We're talking rich streams of information flowing within and beyond the borders of departments, business units, institutions, and countries. We're talking messiness and mistakes, trial and error, survival of the fittest.

We use the concept of an "information ecology" composed of users, content, and context to address the complex dependencies that exist. And we draw upon our trusty Venn diagram (see Figure 2-2) to help people visualize and understand these relationships. The three circles illustrate the interdependent nature of users, content, and context within a complex, adaptive information ecology.

In short, we need to understand the business goals behind the web site and the resources available for design and implementation. We need to be aware of the nature and volume of content that exists today and how that might change a year from now. And we must learn about the needs and information-seeking behaviors of our major audiences. Good information architecture design is informed by all three areas.

* For more about information ecologies, read *Information Ecology* by Thomas Davenport and Lawrence Prusak (Oxford University Press, USA) and *Information Ecologies* by Bonnie Nardi and Vicki O'Day (MIT Press). Nardi and O'Day define an information ecology as "a system of people, practices, values, and technologies in a particular local environment."

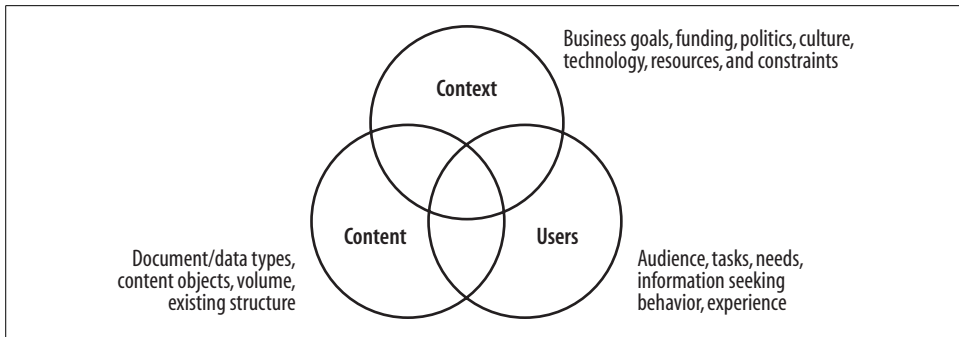


Figure 2-2. *The infamous three circles of information architecture*

Is this an oversimplified view of reality? Yes. Is it still useful? Absolutely. We’ve been using this model for over 10 years. It’s held up well in all sorts of environments, from global web sites of Fortune 100 corporations to standalone intranet applications within small nonprofits. More importantly, we find these three circles incredibly helpful whenever we’re confronted by a difficult question. After mouthing the trusty phrase “It depends”—as all smart information architects do—we develop our answer by deconstructing the question into three parts that coincide with our three circles. For example, when asked what are the most important qualities that an information architect should have, the answer becomes quite simple: some knowledge of users and their needs (which might come from exposure to human–computer interaction and a variety of other fields), content (think technical communication and journalism), and context (read a book on organizational psychology).

The three circles help with other tough questions, too, such as:

- What research and evaluation methods should information architects be familiar with?
- What’s the ideal education for an information architect?
- What kinds of people should be part of an information architecture team?
- What kinds of books and blogs should I read to keep up with the field and its practice?
- What should go into the IA strategy that I propose to my new prospect?

The answer to each starts with a balance among the three areas: users, content, and context.

Should technology have its own circle? Maybe. But we find that technology usually gets too much attention—and it would look silly to add a fourth circle.

Incidentally, we think it’s important for information architects to have a good sense of humor. Perhaps you’ve already figured this out. The work we do involves high levels of abstraction, ambiguity, and occasionally absurdity, and to some degree we’re all still making it up as we go along. A good information architect knows how to get the work done while having some fun along the way.

If there's one thing that many years of information architecture consulting has taught us, it's that every situation is unique. We don't just mean that web sites are different from intranets or that extranets should vary by industry. We mean that, like fingerprints and snowflakes, every information ecology is unique.

The DaimlerChrysler intranet is vastly different from that of Ford or GM. Fidelity, Vanguard, Schwab, and Etrade have each created unique online financial-service experiences. Despite all the copycatting, benchmarking, and definitions of industry best practices that have surged throughout the business world in recent years, each of these information systems has emerged as quite distinctive.

That's where our model comes in handy. It's an excellent tool for learning about the specific needs and opportunities presented by a particular web site or intranet. Let's take a look at how each of our three circles contributes to the emergence of a totally unique information ecology.

Context

All web sites and intranets exist within a particular business or organizational context. Whether explicit or implicit, each organization has a mission, goals, strategy, staff, processes and procedures, physical and technology infrastructure, budget, and culture. This collective mix of capabilities, aspirations, and resources is unique to each organization.

Does it then follow that the information architecture of each organization must be unique? After all, companies buy generic office furniture. They invest in standard technology platforms. They even outsource important activities to vendors that service their competitors.

Still, the answer is a resounding yes. Information architectures must be uniquely matched to their contexts. The vocabulary and structure of your web site and your intranet is a major component of the evolving conversation between your business and your customers and employees. It influences how they think about your products and services. It tells them what to expect from you in the future. It invites or limits interaction between customers and employees. Your information architecture provides perhaps the most tangible snapshot of your organization's mission, vision, values, strategy, and culture. Do you really want that snapshot to look like that of your competitor?

As we'll explain later in more detail, the key to success is understanding and alignment. First, you need to understand the business context. What makes it unique? Where is the business today and where does it want to be tomorrow? In many cases, you're dealing with tacit knowledge. It's not written down anywhere; it's in people's heads and has never been put into words. We'll discuss a variety of methods for extracting and organizing this understanding of context. Then, you need to find ways to align the information architecture with the goals, strategy, and culture of the business. We'll discuss the approaches and tools that enable this custom configuration.

Content

We define “content” very broadly to include the documents, applications, services, schema, and metadata that people need to use or find on your site. To employ a technical term, it’s the *stuff* that makes up your site. Our library backgrounds will be evident here in our bias toward textual information, and that’s not such a bad thing, given the heavily textual nature of many web sites and intranets. Among other things, the Web is a wonderful communication tool, and communication is built upon words and sentences trying to convey meaning. Of course, we also recognize the Web as a tool for tasks and transactions, a flexible technology platform that supports buying and selling, calculating and configuring, sorting and simulating. But even the most task-oriented e-commerce web site has “content” that customers must be able to find.

As you survey content across a variety of sites, the following facets bubble to the surface as distinguishing factors of each information ecology.

Ownership

Who creates and owns the content? Is ownership centralized within a content authoring group or distributed among functional departments? How much content is licensed from external information vendors? The answers to these questions play a huge role in influencing the level of control you have over all the other dimensions.

Format

Web sites and intranets are becoming the unifying means of access to all digital formats within the organization. Oracle databases, product catalogs, Lotus Notes discussion archives, technical reports in MS Word, annual reports in PDF, office-supply purchasing applications, and video clips of the CEO are just a few of the types of documents, databases, and applications you’ll find on a given site.

Structure

All documents are not created equal. An important memo may be fewer than 100 words. A technical manual may be more than 1,000 pages. Some information systems are built around the document paradigm, with the fully integrated document as the smallest discrete unit. Other systems take a content component or digital asset approach, leveraging some form of structural markup (XML or SGML, for example) to allow management and access at a finer level of granularity.

Metadata

To what extent has metadata that describes the content and objects within your site already been created? Have documents been tagged manually or automatically? What’s the level of quality and consistency? Is there a controlled vocabulary in place? Or have users been allowed to supply their own “folksonomic” tags to the content? These factors determine how much you’re starting from scratch with respect to both information retrieval and content management.

Volume

How much content are we talking about? A hundred applications? A thousand pages? A million documents? How big is your web site?

Dynamism

What is the rate of growth or turnover? How much new content will be added next year? And how quickly will it go stale?

All of these dimensions make for a unique mix of content and applications, which in turn suggests the need for a customized information architecture.

Users

When we worked on the first corporate web site for Borders Books & Music, back in the mid-90s before Amazon became a household name, we learned a lot about how customer research and analysis was applied towards the design and architecture of physical bookstores.

Borders had a clear understanding of how the demographics, aesthetic preferences, and purchasing behaviors of their customers differed from those of Barnes & Noble. It is no mistake that the physical layout and the selection of books differ significantly between these two stores, even within the same town. They are different by design. And that difference is built upon an understanding of their unique customer or market segments.

Differences in customer preferences and behaviors within the physical world translate into different information needs and information-seeking behaviors in the context of web sites and intranets. For example, senior executives may need to find a few good documents on a particular topic very quickly. Research analysts may need to find all the relevant documents and may be willing to spend several hours on the hunt. Managers may have a high level of industry knowledge but low navigation and searching proficiency. Teenagers may be new to the subject area but really know how to handle a search engine.

Do you know who's using your web site? Do you know how they're using it? And perhaps most importantly, do you know what information they want from your site? These are not questions you can answer in brainstorming meetings or focus groups. As our friend and fellow information architect Chris Farnum likes to say, you need to get out there in the real world and study your "users in the mist."

What Lies Ahead

So, information architecture happens. Information architectures are being created every day by generalists and specialists, by innies and outies, risk takers and people who get things done, and by people who've never heard the term "information architecture." They're being created inside all manner of information ecologies with unique combinations of users, content, and context.

Herein lies the dual challenge to the information architecture discipline. As professionals, we must advance our own understanding and our ability to perform this very difficult work inside massively complex environments. We still have so much to learn! And as a community, we must strive to advance the practice of information architecture by educating those around us who create or influence information architectures while they're focused on doing something else. We still have so much to teach!

In any case, we hope we've done a good job of setting the stage. Now it's time to delve into the guts of information architecture, so roll up your sleeves and dig in.