



Information Architecture for the World Wide Web

Designing Large-scale Web Sites

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Chapter 2. Introduction to Information Architecture

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Information Architect: 1) the individual who organizes the patterns inherent in data, making the complex clear; 2) a person who creates the structure or map of information which allows others to find their personal paths to knowledge; 3) the emerging 21st century professional occupation addressing the needs of the age focused upon clarity, human understanding and the science of the organization of information. [1]Richard Saul Wurman

The Role of the Information Architect

Now that you know right from wrong from the web consumer's perspective, you're in a much better position to develop a web site. But besides needing a sophisticated knowledge of what works for consumers of the Web, what's actually involved in creating a web site?

Obviously, you need HTML pages. Maybe you'll grab a good HTML book or a decent HTML editing package. Maybe a high school kid can do the trick for peanuts. What about the copy for those pages? It needs to come from somewhere--perhaps existing brochures and documentation; perhaps it needs to be written from scratch. You'll also need some graphic design expertise to make sure that the pages are laid out with effective use of text, white space, and attractive images. Of course you'll need a server that is connected to the Internet; this you can lease, or you can buy one of your own. If you do, just be sure to hire someone sufficiently technically astute to administer that server. Perhaps that person should also write the CGI, Perl, ActiveX, Java, and other scripts that make the site interactive. What's missing? Maybe a project manager to make sure all these folks work together to develop the site without running behind schedule and over budget.

So now you're all set to design your web site, right?

Well, not quite. What's missing from this picture is a definition of *what the site will actually be, and how it will work*.

This may sound obvious, but for most web sites, it's true: design and production storm ahead without any unifying principle to guide the site's development. A web site essentially can be anything you want it to be and could cost millions of dollars, take years to complete, and cost thousands of lives to develop. To avoid such overkill, it will need to be defined somehow: it will need a *definition*.

That's the main job of the information architect, who:

- ✧ Clarifies the *mission* and *vision* for the site, balancing the needs of its sponsoring organization and the needs of its audiences.
- ✧ Determines what *content* and *functionality* the site will contain.
- ✧ Specifies how users will find information in the site by defining its *organization, navigation, labeling, and searching systems*.
- ✧ Maps out how the site will accommodate *change* and *growth* over time.

Although these sound obvious, information architecture is really about what's *not obvious*. Users don't notice the information architecture of a site unless it isn't working. When they do notice good architectural features within a site, they instead attribute these successes to *something else*, like high-quality graphic design or a well-configured search engine. Why? When you read or hear about web site design, the language commonly used pertains to pages, graphic elements, technical features, and writing style. However, no terms adequately describe the relationships among the intangible elements that constitute a web site's architecture. The elements of information architecture--navigation systems, labeling systems, organization systems, indexing, searching methods, metaphors--are the glue that holds together a web site and allows it to evolve smoothly. To a novice, this terminology is not very clear. These elements are extremely difficult to measure, and therefore even harder to compare. You really have to spend time using a site and get a feel for it before you can confidently talk about a site's information architecture.

Yet, we know these things are important. How? Well, consider your responses to the Boot Camp exercise in Chapter 1. How many of the likes and dislikes are *not* related to technical issues, copy editing, or graphic design? Remaining issues are probably tied to information architecture. Although perhaps indirectly, a poorly planned information architecture will adversely affect those other areas.

Well-planned information architectures greatly benefit both consumers and producers. Accessing a site for the first time, consumers can quickly understand it effortlessly. They can quickly find the information they need, thereby reducing the time (and costs) wasted on both finding information and *not* finding information. Producers of web sites and intranets benefit because they know where and how to place new content without disrupting the existing content and site structure. Perhaps most importantly, producers can use an information architecture to greatly minimize the politics that come to the fore during the development of a web site.

The Consumer's Perspective

Consumers, or users as we more commonly refer to them, want to find information

quickly and easily. Contrary to what you might conclude from observing the architectures of many large, corporate web sites, users do not like to get lost in chaotic hypertextual webs. Poor information architectures make busy users confused, frustrated, and angry.

Because different users have varying needs, it's important to support multiple modes of finding information. Some users know exactly what they're looking for. They know what it's called (or labeled), and they know it exists. They just want to find it and leave, as quickly and painlessly as possible. This is called known-item searching.

Other users do not know what they're looking for. They come to the site with a vague idea of the information they need. They may not know the right labels to describe what they want or even whether it exists. As they casually explore your site, they may learn about products or services that they'd never even considered. Iteratively, through serendipity and associative learning, they may leave your site with knowledge (or products) that they hadn't known they needed.

These modes of finding information are not mutually exclusive. In a well-designed system, many users will switch between known-item searching and casual browsing as they explore the site. If you care about the consumer, make sure your architecture supports both modes. While attractive graphics and reliable technologies are essential to user satisfaction, they are not enough.

The Producer's Perspective

Since few organizations are completely altruistic, they usually want to know the return on their investment for information architecture design. In other words, what's in it for them? First, a disclaimer. Buying information architecture services is not like investing in a mutual fund. You can't calculate hard and fast numbers to show the exact benefit of your investment over time.

Nonetheless, you *can* demonstrate the value to the organization through less scientific means. Depending upon the goals and nature of your site, you may even be able to defend your investment with some not-so-hard numbers.

Consideration of value to the producer takes us back to the consumer. If you're producing an external web site, this involves actual and prospective customers, investors, employees, and business partners, not to mention the media and senior executives within your organization. Do you really want to frustrate any of these people? What is the value of quickly and easily helping them find the information they need?

If you're producing an intranet, the employees of your organization are the consumers. What is the cost of their time spent to find the information they need? What is the cost when employees don't find the information they need?

Finally, we need to consider the actual costs of designing and implementing the architecture. A well-designed, diplomatic architecture can prevent costly political battles that can stop a project in its tracks. The cost of time spent by high-level executives arguing over which department's information belongs on the main page can skyrocket if you're not careful. A well-designed scaleable architecture can prevent doing it all over a year later. Far too many architectures are crushed under the weight of their own content. Redesign of the information architecture impacts all other aspects of the web site, from graphical navigation bars to the content itself, and it can be a very costly adventure.

Let's illustrate with a real-life example. Recently, we met with about ten members of a large client's web site development team. Because we were in the early stages of the planning process, we had just reviewed the client's likes and dislikes, and were determining their web design philosophy. Now we were ready to begin *defining* what their site would be.

In discussing the site's likely users, around seven or eight audiences were suggested. Five or six major goals of the site were determined. Finally, we talked about the main areas of content and functionality that the site would include. This wish list included thirty or forty items. We now had a lot of useful lists and ideas, but was the web site ready to be designed yet?

At this point, many site designers would happily dive in head first. Their work would be a site headed by a main page that included thirty or forty items and links, tried to please seven or eight different audiences, and ultimately failed at achieving its five or six goals. This is what happens when the big picture of a site is ignored.

Consider what happens to a site with a single designer who sees only the trees, not the forest. Now add an order of magnitude: large organizations, rife with complex goals and messy politics, often have sites designed by ten individuals with their own vision of the site, their own deadlines and goals to meet, and their own politics to play. Is it any wonder that these sites often work so poorly, even when huge investments of time and money are made in them?

Succinctly, information architecture is about understanding and conveying the big picture of a web site.

Back to our client's committee of ten tree-people. They were still struggling over what the site would ultimately be. Which goals are the most important? Should the site be informational, entertaining, or educational? Should there be one main page for all audiences, or one for each audience? Should we design an architecture that organizes the site's information by topic, by function, or in some other way? Who within their organization should own and maintain the information in the site? What kind of navigation and wording would make the most sense?

Our last meeting ended in frustration, as the committee members argued but never resolved these points. They were especially unhappy, as they'd thought that designing a web site was supposed to be fun, without the haggling over audience definitions, dredging up of organizational politics, and dealing with other unpleasanties that had come up in the discussion. Some even expressed concern that we shouldn't even bother wading into this swamp and instead should start *doing* something, like gathering together the site's content, pushing forward on the graphic design, and so on.

Having exposed so much frustration, we were obviously on the right track. Why?

Because these thorny and confounding issues of information architecture must be resolved during the design process, *before the site is built*. If we were to avoid answering these questions and the site's development was to proceed, these issues wouldn't go away. Instead, *the burden would be on the site's users* to understand how to use and find information in a confusing, poorly-designed web site. Of course, we know that a frustrated user will click and leave with a bad memory of the site, likely to never return. Without a clear information architecture, the site's maintainers wouldn't know where to locate the new information that the site would eventually include; they'd likely begin to quarrel over whose content was more important and deserved visibility on the

main page, and so on.

Who Should Be the Information Architect?

The information architect of a large, complex web site should be two things: someone who can think as an outsider and be sensitive to the needs of the site's users, and at the same time is enough of an insider to understand the site's sponsoring organization, its mission, goals, content, audiences, and inner workings. In terms of disciplinary background, the information architect should combine the generalist's ability to understand the perspectives of other disciplines with specialized skills in visualizing, organizing, and labeling information. As it's very difficult for someone to retain all of these characteristics, you'll have to make some compromises, but it's important to consider them as you search for that elusive information architect.

Thinking Like an Outsider

Because information architecture is largely about the big picture view of the organization, its goals, and its politics, a logical choice for the architect role is a senior person who knows the organization as a whole and who isn't involved exclusively within the activities of one department. A senior person can often think like an outsider even though being on the inside, and has enough clout to enlist other departments' resources when necessary. One drawback to choosing a senior level manager is that he or she may have so many other responsibilities that the work gets delegated out to staff, thereby negating the original goal of using a single, organizationally savvy person.

Another approach is bringing in a true outsider: a new hire or a consultant (we typically function in the latter role, but we are trying to avoid biasing our discussion too greatly). The great thing about outsiders is that they can get away with asking naive questions considered suicidal by insiders, such as "Why does your organization have two completely separate order fulfillment departments? The web site will confuse users if they can order products in two different, unresolved ways. Are there any politics going on here that we can get past to improve the site's design?"

Further, an outsider can ensure that the organization chart isn't the site's architecture, and challenge confusing orgspeak labels: "Total Quality Product Dissemination Systems"? Oh, you mean "Product Shipping Options." The drawbacks of bringing in a true outsider are that they can be expensive and can lack sufficient knowledge of the organization to do the job, thus delaying the project's progress.

Thinking Like an Insider

As many organizations can't afford to outsource information architecture services or move a head honcho into the role, the responsibility often goes to an insider who is not a senior level manager. Sometimes this is ideal; it's the people in the trenches who often know the most about an organization's processes, and how to get things done within that organization. For example, who knows an external web site's audiences better than a marketing specialist, sales rep, or product manager? Who knows an intranet's intended audiences better than a human resources specialist, corporate librarian, or switchboard operator? How many senior level managers can describe every step of their organization's fulfillment process, from product ordering to computing sales tax and shipping charges to warehouse picking to delivery? Someone needs this knowledge to mirror the process on the web site.

The problem with a lower-level person is that his or her knowledge may be too specific. Additionally, such a person often lacks the political base required to mobilize cooperation from others in the organization. A possible solution is to make information architecture this person's only job responsibility. This could allow him or her to step away from original duties and focus on the broader needs of the organization and the users of its site.

Disciplinary Background

Since information architecture is a relatively new field, you can't just post a job description and expect a flock of interested, 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 site. If you are looking for someone else, you might consider the disciplines listed below as potential sources. If you're on your own, it might be worthwhile to learn a little bit about each of these disciplines yourself. Or, if possible, find someone knowledgeable about them to work with you and complement your own expertise. In either case, remember that no single discipline is the obvious source for information architects; each presents its own strengths and weaknesses.

Graphic design

Most people who have written about and practice information architecture are graphic designers by training. This is not surprising; as mentioned, graphic design is much more than creating pretty pictures. It is geared more toward creating *relationships* between visual elements and determining their effective integration as a whole. On a page, printed or HTML, these elements include white space and typography as well as images. So graphic designers traditionally have been focused on the architectures of individual pages of information, which can be a weakness when building a web *site*.

Information and library science

We've found that 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. By definition, librarians deal with organization of and access to information within information systems and are trained to work with searching, browsing, and indexing technologies. Forward-looking librarians (recently described as *cybrarians*) see that their expertise applies in new arenas unrelated to providing access to printed information stored in traditional libraries. So librarianship is an important discipline to turn to for information architecture expertise. Just remember that librarians are also prone to get lost in details, a weakness that can distract from determining the big picture of a web site.

Journalism

Journalists, like librarians, are trained at organizing information, but in a different setting. If your web site delivers highly dynamic information, like a news wire or a push technology-based service, someone with a journalism background might have a great sense of how to best organize and deliver this information. Because of their writing experience, journalists are also good candidates for architecting sites that will have high levels of edited content. Occasionally, journalists who move into information architecture find themselves intellectually constrained by their experience in organizing information for print and other traditional media.

Usability engineering

Usability engineers are experts at testing and evaluating how systems work. For information systems, they measure such criteria as how long it takes users to learn how to use a system, how long it takes them to find information in a system, 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 with information systems. Keep in mind that usability engineers concentrate on measuring a system's performance, not in designing or redesigning a system. (Of course, measurements of a site's performance can greatly determine how redesign should proceed.)

Marketing

Marketing specialists are expert at understanding audiences and communicating a message effectively to different audiences. This skill is especially valuable not only in designing externally oriented web sites, but also for intranets, which often have multiple audiences with very different needs. Marketing expertise can ensure that the message is presented in a user-oriented manner and not buried in organizational jargon. If your site is geared especially toward selling products and building brand-awareness, someone from your organization's marketing department might do the trick. The drawback to marketing-based approaches is the danger that they are more geared toward selling rather than helping users, and so may not be appropriate for certain types of web sites and audiences.

Computer science

Programmers and computer specialists bring an important skill to information architecture, especially to architecting information from the bottom up. For example, often a site requires a database to serve the content; this minimizes maintenance and data integrity problems. Computer scientists have the best skills for modeling content for inclusion in a database. However, unlike librarians or usability engineers, computer scientists aren't necessarily trained in user-centered approaches to designing information systems.

So, an information architect might come from one of many different disciplines. He or she will certainly need to know at least a little about every type of expertise involved in the entire web site design and development process, because his or her work will affect every part of the process. The architect also needs to be the keeper of the big picture as this process unfolds and the details of design and production become the main focus of all involved.

Perhaps the most important quality in an information architect is the ability to think outside the lines, to come up with new approaches to designing information systems. The Web provides many opportunities to do things in ways that haven't been done before. Many sites are pushing the envelope of design, architecture, and technology. While it's tempting to create a site that mirrors the same old things that an organization already does in other media (e.g., product brochures, annual reports), this approach could severely damage your site's chances for success. If a site doesn't rise to the occasion for its users, it won't fare well in head-to-head competition with other sites. This medium is more competitive than any other. One click, and a site becomes one of thousands that the user visits once but never returns to. It's the responsibility of the architect more than anyone else to prevent this outcome and ensure that the user encounters a site designed to take best advantage of the medium.

Balance Your Perspective

Whomever you do use as an information architect, remember: everyone (including us) is biased by their disciplinary perspective. If possible, try to ensure that other disciplines are represented on your web site development team to guarantee a balanced architecture.

Also, no matter your perspective, the information architect ideally should be solely responsible for the site's architecture, and *not* for its other aspects. It can be distracting to be responsible for other, more tangible aspects of the site, such as its graphic identity. In this case, the site's architecture can easily, if unintentionally, get relegated to secondary status because the architect is concentrating, naturally, on the tangible stuff.

However, with 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 worth mentioning: 1) find a group of friends and colleagues who are willing to be a sounding board for your ideas, and 2) 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.

Collaboration and Communication

The information architect must communicate effectively with the web site development team. This is challenging, since an information architecture is highly abstract and intangible. Besides communicating the architecture verbally, documents (such as blueprint diagrams) must be created in ways that can be understood by the rest of the team regardless of their own disciplinary backgrounds.

In the early days of the Web, web sites were often designed, built, and managed by a single individual through sheer force of will. This webmaster was responsible for assembling and organizing the content, designing the graphics, and hacking together any necessary CGI scripts. The only prerequisites were a familiarity with HTML and a willingness to learn on the job. People with an amazing diversity of backgrounds suddenly became webmasters overnight, and soon found themselves torn in many directions at once. One minute they were information architects, then graphic designers, then editors, then programmers.

Then companies began to demand more of their sites and, consequently, of their webmasters. Simple home pages quickly evolved into complex web sites. People wanted more content, better organization, greater function, and prettier graphics. Extensions, plug-ins, and languages proliferated. Tables, VRML, frames, Shockwave, Java, and ActiveX were added to the toolbox. No mortal webmaster could keep up with the rising expectations and the increasing complexity of the environment.

Increasingly, webmasters and their employers began to realize that the successful design and production of complex web sites requires an interdisciplinary team approach. An individual cannot be an expert in all facets of the process. Rather, a team of individuals with complementary areas of expertise must work together. The composition of this team will vary, depending upon the needs of a particular project, available budget, and the availability of expertise. However, most projects will require expertise in marketing, information architecture, graphic design, writing and editing, programming, and project management.

Marketing

The marketing team focuses on the intended purposes and audiences for the web site. They must understand what will bring the right people to the web site and

what will bring them back again.

Information Architecture

The information architects focus on the design of organization, indexing, labeling, and navigation systems to support browsing and searching throughout the web site.

Graphic Design

The designers are responsible for the graphic design and page layout that defines the graphic identity or look of the web site. They strive to create and implement a design philosophy that balances form and function.

Editorial

Editors focus on the use of language throughout the web site. Their tasks may involve proofreading and editing copy, massaging content to ensure a common voice for the site, and creating new copy.

Technical

The technical designers and programmers are responsible for server administration and the development or integration of site production tools and web site applications. They advise the other teams regarding technology-related opportunities and limitations.

Project Management

The project manager keeps the project on schedule and within budget. He or she facilitates communication between the other teams and the clients or internal stakeholders.

The success of a web site design and production project depends on successful communication and collaboration between these specialized team members. A linear, black-box, throw-it-over-the-wall methodology just won't work. Everyone needs to understand the goals, perspectives, and approaches of the other members of the team. For example, while the marketing specialist may lead the audience analysis process, he or she needs to anticipate the types of questions about the audience that the specialists will have. Otherwise, each will need to start from scratch in learning about that audience, wasting substantial time and resources.

For the information architect, communication is a special challenge because of the intangible nature of the work. Anyone who has played Pictionary knows that it is much harder to draw an abstract concept such as *science* than a physical object such as *moon*. As an information architect, you face the daunting challenge of helping others visualize such abstract concepts as a *metaphor-based architecture* and *indexing systems*.

The information architect has to identify both the goals of the site and the content that it will be built on. This means getting the people who drive the business, whether bosses or clients, to articulate their vision of the site and who its users are. Once you've collected the data and developed a plan, you need to present your ideas for an information architecture and move the group toward consensus. All in all, this significantly burdens the architect to communicate effectively.

This is the point of the rest of this book. The next four chapters introduce the foundations of information architecture to support your efforts to communicate an information architecture by providing useful terms, definitions, and concepts. Chapters 7 through 10 provide a framework for these communications, and for the role of

architecture in site development as a whole.

1. Richard Saul Wurman, *Information Architects*, ed. Peter Bradford (Zurich: Graphis Press Corp, 1996).

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