Organizing a Web Site: "Elementary, My Dear Watson"

What's Inside:
- Basics of site architecture, navigation, and the graphical user interface
- How to choose content for different types of sites
- Mind-mapping as an organizing strategy
- Linking and appropriate clicks to content
- Site maps

The major problems facing the development of products that are safer, less prone to error, and easier to use and understand are not technological: they are social and organizational.

DONALD A. NORMAN (1998)

Whether you're experienced in writing/editing a speech, a press release, an annual report, a film script, or a feature story, you possess two very significant skills when it comes to organizing information on a Web site:

1. You know how to structure information so that the flow of content is logical and coherent.

2. You've learned to write/edit with the reader constantly in mind.

These skills, when combined, are extremely important, because many of your team members will not have them, or will not have honed them to the same degree that you have. Although everyone knows how to organize information in ways that make sense to themselves, most people have trouble stepping beyond the personal to create alternative organizing schemes.
that may be more accessible to others. As usability specialist Adam Smith (2001) notes:

At a very basic level we have a strong tendency to see ourselves as being archetypal and our current situation as being “normal.” Most of us are not conditioned socially, nor primed cognitively, to spend a lot of time thinking about people who aren’t like us or situations that are not familiar—and for obvious reasons. But as a result we fail to appreciate the differences, small and large, that exist between us.

In this chapter, you’ll learn about different aspects of organizing and presenting information on a Web site. As information in today’s world and users’ needs for it are growing at a rapid rate, Web sites are becoming larger, more complex, and increasingly dependent on databases and internal search engines. However, as information designer Robert Horn (1999:16) points out:

Simply storing large amounts of information on computers and retrieving it does not solve our information needs. In fact, gigantic storehouses of information overload us with too much information and burden us with navigational problems that... sometimes make us feel that we are “lost in cyberspace.” What we need is not more information but the ability to present the right information to the right people at the right time, in the most effective and efficient form.

Organizing a Web site in this environment presents a major challenge for the development team. The important thing to remember is that, if you participate in the early stage of a site’s development, your skills at organizing information can help you make a valuable contribution to the process.

Organizational Basics

Web navigation specialist Jennifer Fleming (1998:45) notes that organizing information is about demonstrating the relationships among items in such a way that they’re easy to find. However, this isn’t always easy because “the problem with knowledge is that it’s not made up of simple linear relationships. It’s a messy interrelated thing.” Take the fictional detective Sherlock Holmes, for example. Say you had to organize the following bits of information about his life:

Cape and hat
Apartment
What ways could you create relationships among these items/people? According to information architect Richard Saul Wurman (2001:40-41), “While information may be infinite, the ways of structuring it are not.” He says that there are five ways to organize information:

1. **Alphabet:** “This method lends itself to organizing extraordinarily large bodies of information, such as words in a dictionary or names in a telephone directory.”

2. **Time:** “Time works best as an organizing principle for events that happen over fixed durations.”

3. **Category:** “Category pertains to the organization of goods...different models, different types, even different questions to be answered, such as in a brochure that is divided into questions about a company.”

4. **Location:** “Location is the natural form to choose when you are trying to examine and compare information that comes from diverse sources or locales.”

5. **Hierarchy:** “This mode organizes items by magnitude from small to large, least expensive to most expensive, by order of importance, etc.”

Using Wurman’s list, you could most logically organize Sherlock Holmes’ items/people in three of the five ways: alphabetically; chronologically according to when they first appeared in Holmes’ life story; and by category, that is:

- **Numerically**—how often each item/person appears in the published stories or films.
- **By description**—Watson’s comments about each item/person.
- **In his own words**—how Holmes refers to these items/persons.
- **Comparatively**—for example, did Hercule Poirot or Nero Wolfe smoke a pipe or play an instrument?
Referentially—where these items/persons have been referred to in scholarly journals or articles about mystery stories.

Each different method of organization that you use will create a different meaning for users of a Web site. As information and interface designer Nathan Shedroff (1999:270) states:

Information is also not the end of the continuum of understanding. Just as data can be transformed into meaningful information, so information can be transformed into knowledge and then, further, into wisdom. Knowledge is a phenomenon we can build for others, just as we can build information for others from data. This is done through interaction design and the creation of experiences...

In addition to different methods of organizing information for users, Web sites deliver information to them through three different technology routes.

1. **Without databases:** Sites without databases, generally, have a small number of pages and are coded using HTML or Web Editor.

2. **Database-supported:** Sites supported by databases are usually mid- to large-size and provide users with content coded with HTML or Web Editor plus search engines to access additional material.

3. **Database-generated:** Sites with database-generated pages usually have a great deal of data, and the information is only dynamically compiled into pages when users request it through search engines or use mechanisms such as customized portals/gateways where they can determine what, when, and how they will view the information.

**NOTE**

When creating sites with databases, information architects organize data into groupings. We find it useful to think of these groupings as *storage buckets*. For example, when a user types a keyword into a search engine, it may dip into one or more buckets to bring up the requested information.

**Architecture ➔ Navigation ➔ The Gooey GUI**

Web sites allow users to access information through different underlying technologies. However, no matter how information
arrives on the users' screen, all sites are composed of three major elements that contribute to the user's ability to access content easily—the information architecture (IA), navigation design, and graphical user interface (GUI).

**Information Architecture (IA)**

IA is the organizing of information into logically related groupings so users can navigate effectively through the content and find the information they seek.

**The Days of IA Guesswork are Over**

In the early days of the Internet, we made educated guesses when it came to information architecture. We can't afford to do that anymore. Information systems are so complicated today—they vary greatly in their content, business strategy, and user needs—that we can't rely upon educated guesses about design. Instead, we need multi-disciplinary teams that weave together their respective skills, expertise, tools, and techniques into a unified methodology. Anyone who deals with information as important and valuable stuff in and of itself—ethnographers, linguists, data-modeling specialists, marketing people, cognitive scientists, technical communicators, usability researchers, and many others—could be at the table.

And content is an area that still is quite misunderstood. Too many companies focus on technology—what their content management package should be, for example—rather than what their content is and how users will use it. One explanation is that they confuse the unstructured text that is clogging up their sites with data—that is, something that's easier to model and search. Because data is relatively easy to deal with, they assume that text is too, and don't invest the extra effort that text deserves.

**Louis Rosenfeld, Consultant**
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**Peter Morville, Executive Director**
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As part of this process, the development team will create a hierarchy among the groupings. If you compare this process to that of a building and decorating a house, it means deciding on how many floors the house will have and where certain items will go in it. What groupings would fit in the basement? Which would be more suitable on the first floor, the second, and so forth?

Developing good IA is crucial for any Web site. Steve Toub of The Argus Center for Information Architecture (2000:2,3) notes that flawed architectures can have significant effects on usability.

- Lower revenue on e-commerce sites due to failed searches: “One consulting firm observed that 56% of search engine queries on e-commerce sites ended in failure and claimed that this translates into a loss of billions of dollars.”
- Lower revenue on e-commerce sites when users can’t find what they want: “One market analyst report states that when looking for products, 62% of online shoppers had given up at least once.”
- Lost employee productivity due to poorly designed Intranets: “One oil company’s head of information services reported that 35% of an employee’s time is wasted looking for information...”

Who creates the IA for a Web site? This question is more complex than most people realize, because IA has two different aspects—content, and the technology that supports content. “Knowledge manager,” “information architect,” “information designer,” and “content strategist” are job titles that generally refer to people who think about IA from the standpoint of content: How should information be organized and how should this organization be revealed to users? On the other hand, database architects, networking architects, and data modelers are people who think about structure from a technology perspective: What technologies can be used and what technological structures built that will allow users to access the information they need?

The titles are confusing and, in fact, people’s roles in IA may overlap depending upon their technological know-how. Because this field is in such flux, keep in mind that job titles are ambiguous and people have different ideas about their roles. Take, for example, “information designer.” Writing researcher Michael Albers (2000:161) points out that: “It’s ironic that one of
the complex problems information designers face is defining information design. Any article or book you find on information design contains a definition. Unfortunately, these definitions rarely match.” For some people, information design is just another term for Web design, that is, creating the GUI. For others, it’s the creation of content within design, using knowledge of cognitive issues such as learning styles, the effects of presentation, issues of cultural impact, and so forth, to make a site most effective for users. Others go even further. Document design and usability specialist Janice Redish (2000:163) says: “My definition of document design or information design has always been, first and foremost, the ‘whole.’ Information design is what we do to develop a document (or communication) that works for its users.” According to this definition, information design is the overall process of development including planning, organizing, designing, drafting, testing, gathering feedback, and keeping content up to date.

**Navigation Design**

Navigation design is the connection between IA and the design of the graphical user interface (GUI). During this stage of a site’s development, the production team determines the pathways, from the simple to the intricate, that will allow users to move easily among the groupings of information. As your team builds these groupings, some of the navigation will become immediately obvious.

To return to the house metaphor, some of these pathways will be like staircases, leading users to drill up or down through the site. Others will be like corridors that lead users to information that exists on the same level. These staircases and corridors are represented by links.

- **Main navigation links** provide pathways to and from the main site sections. Such links must be clearly visible and have short, informative titles. If you and your team are having trouble determining a title for a site section, you may have to reconsider your architecture. Poor titles often reveal poor structure, such as content that is too varied to fit within one information group.

- **Shortcut links** allow users to access important information without drilling down through the site. Typical shortcut links are “What’s New,” “Press Releases,” and “Dis-
claimers." These links provide significant information for users that they might not notice if such information wasn’t given special linkages.

- **Converging links** bring users from different locations to the same point. You may find that a content page contains information that pertains to two or more site sections. It’s not necessary to make a decision to only link the content page to section A, rather than B or C. Rather, you can have pathways in A, B, and C that link to the same Web page.

- **Hypertext links** create additional connections both down and across a site’s sections and add layers of information to those that already exist through the main architectural structure. (For information about hypertext links, see Chapter 6, “Links, Logic, and the Layered Reader.”)

- **Redundant links** are links that are duplicated on one Web page, that is, they show up in more than one location on the page. At one point in Web history, redundant links were considered taboo. However, as new sites are developing, these links are appearing for specific items. These include links to articles, to people, or to other sections of the site. A typical example is that of the OSHA site (Figure 3.18) where the links in the navigation left bar are duplicated in the page’s text.

**The Graphical User Interface (GUI), or The Gooey**

The graphical user interface (GUI) is what the user sees on his or her screen from the “Home” page and throughout the site. It acts as a shield, representing the architecture and navigation of the site and providing access to the site’s information without actually revealing the organization of information behind it. As Shedroff (as quoted in Wurman, 2001:28) notes:

> Information comes from the form data takes as we arrange and present it in different ways. One of the most confusing points for many people is that the presentation and organization of data are entirely different. The organization of data itself changes the meaning of it, or at least its interpretation... The presentation of the very same organization of data can vary drastically, from verbal (or textual) to visual, to auditory, or to something else entirely.

Designing a good GUI is like building a house where visitors can’t get lost and can easily identify the purpose of each level,
room, corridor, and staircase. The GUI, therefore, has three major functions:

1. Help users develop a mental map of the structure of the site.
2. Provide a good overall look-and-feel to the site.
3. Assist users in reaching the information they want.

Elements of a well-designed GUI include:

- **Visual metaphors** that users can understand immediately. For example, the trash can image is a real-world metaphor for dumping unwanted files.

- **Internal consistency** in the look-and-feel of different site sections, as appropriate for users. For example, on a children’s site, the “Parent” section is likely to have a different on-screen appearance. However, a government site that alters design throughout will cause user confusion.

- **Consistency in the use of icons** throughout the site. For example, the “Help” button—which is labeled with text—shouldn’t turn into a visual of a question mark on another Web page. To avoid confusion, consistency also includes following conventions that users find on other Web sites such as underlined links.

- **Lack of clutter** so that users can find the content and links that they need. Technical communication specialist David Farkas and information designer Jean Farkas (2000:343) also suggest that the design should ensure that: “...the most important links appear high enough on the page to be visible without scrolling,” and “when pages must scroll, provide visual cues to encourage users to scroll down to links that are below the scroll line.” (For more information on scrolling, see Chapter 7, “Writing/Editing for the Web Page; Writing/Editing to the Web Screen.”)

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**Getting Started**

You’ve been asked, as an in-house writer/editor, to join a Web development team for your company. Or, maybe you’re a freelance writer/editor, and a new client wants to meet you and see what you can contribute. You want to be knowledgeable, but perhaps you don’t have experience in building/recreating a
Web site, or you've never worked for the organization before. What information can you bring to the table that would be immediately useful and, if you're a freelancer, help you get you the work you want?

As we noted earlier, organizing information is difficult for many people. Your ability to speak knowledgeably about IA in general, and that of the client's site in particular, is likely to demonstrate that you have the required expertise. It's also important to remember that a first meeting is an opportunity to discuss many other issues regarding the site such as its production, content, team members, and schedules. (For a checklist of important questions to ask at the first meeting with a client, see Chapter 10, "The Business of Web Writing/Editing.")

Find the Right IA Model

All organizations are essentially unique, but they fall within generic categories such as government, business, professional associations, and so on. And the generic categories of organizations have information that falls within typical content groupings that are relevant to users. Each content grouping has the potential of becoming one of a Web site's major sections (also known as key content areas, channels, or themes/streams). Table 3.1 provides seven models for informational Web sites by organizational type.

These IA models present possibilities for site sections that are logical and practical for users. However, many organizations forget or ignore such user-friendly structures. Usability experts Jakob Neilsen and Kara Coyne (2001), noting that major corporations spend millions of dollars on public relations (PR), tested the Web sites of such organizations to see if they contained even basic PR information:

In our study, 20 journalists attempted to use the press areas of 10 corporate websites to gather information for story assignments. Among other tasks, the journalists tried to find basic information about each company's financials, management, and commitment to social responsibility, along with a PR telephone number.

On average, journalists found the answer to each of these simple questions only 60% of the time. If these sites were being graded in a U.S. school, the average grade would be no higher than a D.

In our experience, the more you know about an organization and its competitors on the Web, the more focused, directed, and efficient you'll be in discussing the client's or team's needs.
<table>
<thead>
<tr>
<th>Table 2.1</th>
<th>A Models of Informational Web Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Organization</strong></td>
<td><strong>Web Site Sections</strong></td>
</tr>
<tr>
<td>Parent Company</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>Child Company</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>New Product/Service</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>Event Information</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>Product/Service Updates</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>Training/Investor</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>Before/Post Event</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>Environment/Innovations</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>Newsroom/Press</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>Blog/Forums</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>FAQs</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>Contact Us</td>
<td>About Us, Services, Products, Contact</td>
</tr>
<tr>
<td>Partners/Alliances</td>
<td>About Us, Services, Products, Contact</td>
</tr>
</tbody>
</table>
Table 3.1 IA Models of Informational Web Sites (Continued)

<table>
<thead>
<tr>
<th>TYPE OF ORGANIZATION</th>
<th>WEB SITE SECTIONS</th>
</tr>
</thead>
</table>
| Professional Associations (continued) | Chapters  
| | Annual Conference  
| | Publications/Newsletters  
| | Education/Training  
| | Certification  
| | Professional Opportunities  
| | Members Only  
| | Resources/Career  |
| E-commerce | Products/Services  
| | Marketing Information/Special Offers  
| | Policies: Privacy, Security, Personal Protection  
| | Product Support/Customer Service  
| | Corporate Information  
| | Newsletter  
| | Help Desk  
| | Inventory Information  
| | Online Surveys  
| | Registration Form  
| | Shopping Cart  
| | Account Information  
| | Product Information  
| | Company/Organization/Executives  
| | Company Policies  
| | Recognition/Awards  
| | Newsletter  
| | Industry Information  
| | Job Postings  
| | Marketing and Sales  
| | Technical Documentation  
| | Employee Benefits/Support Programs  
| | Work Team Meeting Areas*  
| | Educational Opportunities  
| | Libraries  
| | Company Directories  |

* Online meeting areas are cyber-workplaces where users can work on projects, share information, and contribute to the knowledge base.
We’ve also found that clients often have no idea where to start with their sites and will welcome your input when they realize that your ideas and opinions are well informed, thoughtful, and insightful. Use the checklist provided in Figure 3.1 to pull together your ideas for a Web site’s architecture before meeting a client and/or the production team for the first time.

**Choose Navigation Priorities**

Imagine that you’ve clicked on a Google search hit and landed on the page of a Web site. Perhaps you glance at the content, and then try to find out where you are on the site. Or, perhaps you look at the main site sections to see if the site has potentially good information. What happens if you can’t find what you want? You begin to wonder about the credibility of the site, and chances are, you leave in a hurry. Usability researcher Steve Krug (2000:62) uses the term *persistent navigation* to describe the navigation elements that should or could appear on every page of a site: “Done right, persistent navigation should say—preferably in a calm, comforting voice: The navigation is over here. Some parts will change a little depending on where you are, but

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**An Information Architecture Model Checklist**

- Match the organization to its model.
- Surf the Web to find other organizations of the same generic type to see what variations exist.
- Surf the Web to check other organizations within the same industry because variations on the models can often be industry-specific. For example, sports teams usually fall within Small- to Medium-Sized Businesses, but their sites, designed for fans, are likely to vary greatly from that of a hardware company. A museum is generally a government-run operation, but its target audience will be visitors and its site structure will differ from, say, the site of a federal agency.
- Consider what you already know about the organization, its goals, and potential audience, and how its information would fit into the model’s typical site sections, or vary from it.
- Prepare a rudimentary information architecture plan for the site.

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*Figure 3.1* Prepare good IA ideas for a first meeting.
it will always be here, and it will always work the same way." Krug's five elements of persistent navigation are:

- The organization's ID or logo.
- A way home.
- A way to search.
- The Web site sections.
- Utilities that provide assistance such as "Help."

In our research of informational Web sites, we've identified a variety of navigation elements, other than those linking users to site sections, that you should consider when building a Web site. We find that many of these elements are often forgotten during a site's development, and may only be caught at the end of the process when the site undergoes review. In Table 3.2, we've prioritized these navigation elements to help you and your client decide on the fundamentals for your site.

You may find that, during the Web development process, there are elements that you don't need or that the priority rankings of these elements may change. Either way, your role as a participant in building a Web site is to make sure that the client is aware of potential navigation and content elements.

The Case of the Chaotic Content

You've reached the stage where you understand the client's needs and those of the target audience. You may have a model in mind that would suit the client's content. However, that content is still in a raw form. It may be:

- Grouped into categories, but these categories aren't appropriate to the Web site
- Not grouped in any way, and the client expects you to create the organizational structure
- A mixture of the above

In addition, the content may be coming to you from a bewildering array of sources. You may get print publications from the public affairs department, reports from content specialists, print-outs from the organization's Intranet, competitive materi-
We've found, through hands-on Web development and teaching experience, that one of the best ways to make sense of content is to use a technique called mind-mapping, which was created by learning expert Tony Buzan when he was trying to figure out the best way for students to take notes. As Buzan (1999) explains:

A Mind Map is a powerful graphic technique which provides a universal key to unlock the potential of the brain. It harnesses the full range of cortical skills - word, image, number, logic, rhythm, colour and spatial awareness - in a single, uniquely powerful manner. In so doing, it gives you the freedom to roam the infinite expanses of your brain. The Mind Map can be applied to every aspect of life where improved learning and clearer thinking will enhance human performance.

### Table 3.2  Priority of Navigation Elements

<table>
<thead>
<tr>
<th>PRIORITY</th>
<th>NAVIGATION ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Obligatory</strong></td>
<td>▪ Home/Main Menu&lt;br&gt;▪ Site Map/Table of Contents/Index&lt;br&gt;▪ Contact Us&lt;br&gt;▪ Shopping Cart or equivalent (for an e-commerce site requiring financial transactions)</td>
</tr>
<tr>
<td><strong>High Priority</strong></td>
<td>▪ Search (for large sites)&lt;br&gt;▪ Language Selection (for sites aimed at different language audiences)&lt;br&gt;▪ Plug-In/Player Links (when required to use the site)&lt;br&gt;▪ Help (for sites where users may require assistance to achieve their goals)</td>
</tr>
<tr>
<td><strong>Medium Priority</strong></td>
<td>▪ What's New&lt;br&gt;▪ Useful Links&lt;br&gt;▪ Search (for small sites)</td>
</tr>
<tr>
<td><strong>Low Priority</strong></td>
<td>▪ Chat/Discussion Groups&lt;br&gt;▪ FAQ's&lt;br&gt;▪ Glossary&lt;br&gt;▪ User Surveys</td>
</tr>
<tr>
<td><strong>Nice to Consider</strong></td>
<td>▪ Print Buttons (print-friendly items)</td>
</tr>
</tbody>
</table>
Mind-Mapping: IA Revealed

Mind-mapping is a technique that allows you to build a graphical display of information in an informal way that encourages creativity and innovation. Based on a trees-and-branches approach, mind-mapping allows you to choose a central theme, word, or concept, and then create information pathways from the center, starting with large branches that show major content groupings and ending with smaller branches that reveal ever-finer details. In terms of a Web site, mind-mapping can bring you from the major site sections, through subsections, to individual page information quickly and easily.

Figures 3.2 through 3.4 show the evolution of a simplified mind map around the character of Sherlock Holmes.

- **Figure 3.2**: We’ve given the central theme four major branches of information—The Moors, Friends and Enemies, Lifestyle, and His Mind.

- **Figure 3.3**: We’ve added a secondary level of branches to the major pathways. As well, we included three tertiary branches under Cases.
Figure 3.4: We've added dotted lines to show lateral connections among the branches. Remember, information is messy!

Mind-mapping can be a powerful tool for organizing information into a logical pattern, and is based on associative thinking. (For more information, see Chapter 6, "Links, Logic, and the Layered Reader.") Jason Sawaya, one of our Web design students, used mind-mapping during university to help him organize information for exams and now uses it to develop his Web projects. According to Jason, "Mind-mapping is about opening your mind to anything. You use words that trigger subideas that, in turn, lead to other words. The important thing to remember is that mind-mapping is very subjective because it's based on your background knowledge, experiences, memories, and personality."

Mind-mapping can be used for a wide variety of tasks—from organizing To-Do lists to writing books. Writer Anne Bartlett

Figure 3.3 Secondary and tertiary branching in the Sherlock Holmes Mind Map.
Figure 3.4 Lateral connections among the branches in the Sherlock Holmes Mind Map.

(2000) describes how she used mind-mapping to organize her chapters for a joint biography of a married couple and not lose track of where her information came from.

The sources were diverse—several books, a pile of unindexed newspaper cuttings, brief snippets of information noted down in phone calls and library visits, taped interviews, medical reports, photos, and copies of various government papers.

Following Buzan’s procedure, I wrote the name of my subjects in the middle of the page. Then I made two branches, one for George and one for Maude. From there I draw more branches, each branch representing a section of each of their lives...

I wanted my map to be more than a planning tool. I needed it to be a kind of index, so I referenced each branch to the source of infor-
Information, e.g., page numbers, interview numbers, photographs. It took me two days to map all the information.

When I had finished, all the main topics and their subtopics (and sub-sub-sub-topics) were laid out before me. I could see the gaps in the information, and what was the most important information to my subjects, as these areas were dense with source material.

With that overview, the structure of the book became immediately clear, I had regained control of the material and I knew where to find what I needed for each chapter.

Mind-mapping, then, is a paradoxical process. On one hand, you’re creating organization out of informational chaos. On the other hand, you achieve this by using a chaos of ideas to generate the process. The goal is to let creativity loose and not limit ideas by making judgments about them or forcing them into any type of hierarchy. Table 3.3 provides tips to brainstorming Web site architecture with a client and other team members.

When you and/or your client brainstorm a mind map, you’ll find that natural information groupings begin to appear in hierarchical levels. These groupings will be intimately connected to the organization’s needs and the site’s goals, and will have labels that are specific to the type of content. In our experience, clients may not realize the potential size of their site until they go through the mind-mapping exercise and see the information structure emerge. This doesn’t mean, however, that all the contents of a mind map will end up on the Web site itself. The ultimate content depends on budget and time constraints.

The Site Structure: Solving the Mystery

The next step is to re-draw the trees-and-branches diagram into a site structure that will show the levels of hierarchy, that is, the vertical linkages. As Figure 3.5 demonstrates, when the Sherlock Holmes Mind Map is transformed into a site structure, the large branches became the first level of the information hierarchy, that is, the main Web site sections, while the narrower branches have been transformed into second- and third-level information.

Site structures fall within three types of models: tree, linear, or a mixture of tree and linear. For example, Figure 3.5 reflects a hierarchical structure of information known as a tree model. Each model discussed below has its own advantages and limitations.
Table 3.3  Tips to Group Mind-Mapping

<table>
<thead>
<tr>
<th>ASPECT OF MIND-MAPPING</th>
<th>TIPS</th>
</tr>
</thead>
</table>
| Process                | • Use large paper/blackboard/whiteboard.  
|                        | • Start with a center circle or box representing your key theme. If you’re starting from scratch, the topic might be "Our Web Site." If you already know a site section, it could be "Our Products."  
|                        | • Let everyone on the team call out ideas. Put every idea into the mind map, regardless of how trivial some may seem.  
|                        | • Use keywords or phrases. The shorter the phrase, the better. One-word titles are best.  
|                        | • Look for more linkages among branches (associations) as the map begins to fill.  
|                        | • Allow for divergent thinking before convergent thinking can begin. Let the lines on the map ramble—relationships will begin to be obvious as this happens. |
| Aids                   | • Use color for visual impact—giving each main branch and all its attaching branches and twigs its own color.  
|                        | • Use images and symbols whenever possible. Have members suggest graphics.  
|                        | • If a branch has a source, such as a print publication or content expert, note the source next to the branch’s title. |

Tree Models

A tree model starts with a central topic and then organizes subtopics down through multiple branches. Figure 3.6 shows a traditional tree model in which there are no lateral information links, that is, each subtopic stands alone and isn’t connected to others. For example, in a Web site with this structure, you would always have to return to the “Home” page or click on the title of another subtopic (depending on the site design) to access another part of the hierarchy.

Narrow trees: Web sites with a narrow tree model provide limited menu items selections, usually less than six, so that users need to drill down to deep content. (See Figure 3.7.) Although information in this type of model may broaden out at a deeper level,
site offers only a limited number of entry points. This type of site is useful when an organization has distinctly different audiences. For example, an e-commerce site may have a public area as well as a secure area for fee-paying customers.

Figure 3.5 From the Sherlock Holmes Mind Map to a site structure.

Figure 3.6 A traditional tree model.
Wide or Broad Trees: Sites with this model have many content areas, usually six or more, that users can click into from the main level. As Figure 3.8 illustrates, some of these content areas may have deep structures while others can be shallow. A Web site with this structure is useful when: the audience includes many different types of users; there's a great deal of content that is difficult to group into only a few areas; and/or huge volumes of content are generated by different underlying databases.

Figure 3.7 A narrow tree model.

Figure 3.8 A wide/broad tree model.
**Linear Models**

In the tree models we described above, there were no lateral connections between content. Linear models reflect equality among related chunks of content as opposed to a hierarchical structure.

**Book-style:** Figure 3.9 shows a simple linear pattern that resembles the structure of a book. Users can move backwards and forwards through the pages, using buttons with labels such as "Previous" and "Next." Parts of children's sites that involve story-telling often have book-style structures where parents can click forwards and backwards through the narrative.

**Book-style with alternative choices:** Figure 3.10 shows a simple linear structure where users occasionally have a choice between two paths as they navigate through the structure. This structure is useful for an educational site that provides alternative learning routes or an e-commerce site that is selling two models of a single product—for example, a computer with two different types of monitors.

**VCR-style:** Figure 3.11 illustrates a type of simple linear style where users can leap ahead or backwards along a linear path, a pattern of use that is similar to the fast forward or rewind functions on a VCR or cassette tape machine. This type of site is used for educational sites as it allows users to move freely within a tutorial, that is, to link back to the beginning of the tutorial for review, or jump to the end so that they can complete a test or an evaluation process.
Linear with Offshoots: As Figure 3.12 demonstrates, linear models can also have independent chunks of information that act as offshoots from the main pathway. The offshoot is useful for an informational site with some very specific information not related to other content on the site. The risk with this model is that the user may end up in a dead-end location.

**Mixture Models**

In general, no site falls entirely within a tree or linear model. Rather, they’re mixtures of tree and linear models, allowing developers to organize content in a way that provides users with the flexibility to jump from Web page to Web page, site section to site section, and even leave a site. We find that...
clients sometimes have difficulties with mixture models. They may find the surface organization to be illogical and worry that users will not get information in the appropriate order. These models can also be confusing for users if they’re not organized well and the appropriate navigational “signals” are missing. If you’re part of the IA team, you must work with the client to ensure that the content in each section retains its logic whether a user starts at the beginning, enters in the middle, or begins at the end.

A composite/hybrid model: As Figure 3.13 demonstrates, this model allows the user to travel through the site by using a variety of information paths. An information path can be based on topics, themes, business functions, and so on. A problem with this model is that users can find themselves in dead ends or back in locations already visited.

A web model: This model (see Figure 3.14) looks like a spider’s web with long paths and lateral links. Users require continual navigation “signals” to position themselves accurately on the site using this model.

A grid model: As Figure 3.15 shows, this model allows users to travel horizontally, vertically, and laterally. This type of access to content may confuse users if they move from their point of entry into the depths of a site very quickly and try to find their way back.

![Figure 3.13 A composite/hybrid model.](image)
A Tale of Two Web Sites

What happens when IA on a site doesn’t work well? Two Web sites—CanLearn Interactive (www.canlearn.ca/English/eng.cfm) and the U.S. Occupational Safety & Health Administration (www.osha.gov)—demonstrate narrow tree models that are too confining for the content. Each site is loaded with information, but the developers couldn’t figure out how to design the CUI in a way that wouldn’t overwhelm users. They chose to put large chunks of related content under fewer headers rather than increase the number of headers to reflect the quantity of material. The challenge that each site’s developers faced was: How can we let users know about everything the site has to offer?
CanLearn Interactive is a site about educational and training opportunities. It is filled with useful information such as learning planners and databases of educational institutions and occupational information. As Figure 3.16 demonstrates, the developers of the site chose a minimalist approach, treating the site as if it were a guidance counselor and the user was a visitor to the guidance counselor’s office.

The result is that the first two major content sections have completely ambiguous titles: “Getting Started” and the “Road Ahead.” For example, we thought that “Getting Started” would include self-assessment quizzes and an overview of different kinds of educational institutions. However, as Figure 3.17 shows, “Getting Started” presents users with such links as “Site Map,” “FAQ,” “Glossary,” and instructions on site use—links you would expect to see in navigation areas.

Figure 3.16  The CanLearn Interactive “Home” page.
(April 25, 2001: www.canlearn.ca/English/eng.cfm)

Human Resources Development Canada: Reproduced with the permission of the Minister of Public Works and Government Services Canada, 2001.
The OSHA developers also provide a narrow-tree solution to the problem of having a great deal of content, but used a different approach to reveal the scope of the content. Note that the OSHA “Home” page (see Figure 3.18) has a left-hand navigation bar with seven main site sections which are repeated in the text. These redundant links also have other links. The result is that users are confronted with so much content and so many links that they’re at a loss where to look first—a problem compounded by the black-and-red color scheme. In this case, a broader tree structure would have been more appropriate, or the developers could have used pull-down menus to reduce the clutter. However, when analyzing the structure of a site like this one, it’s important to remember that the developers may have been limited in their choices because of accessibility concerns and technology issues. For example, the developers may have decided not to use pull-down menus—technology that supports a narrow-tree solution—because some users might not have the technology to view such menus.
Figure 3.18  The OSHA “Home” page.

July 4, 2001 (www.osha.gov)
Navigation Patterns

*Like most aspects of usability, navigation is invisible when it's working, but when there's a problem, users can get completely stuck.*

**USER INTERFACE ENGINEERING (2000)**

Navigation patterns begin to emerge at the IA's early development stages. You'll begin to see possibilities for both vertical and horizontal ways that information can flow. The Web designer supports these patterns in the GUI which provides navigation information. Conventions in GUI design, like many aspects of Web development, have come and gone with great rapidity. In the early days of the Web, location of the navigation information, usually at the bottom of the screen, compelled users to make cumbersome mouse and cursor movements. The current trend in GUI design includes the following basic elements:

- The top navigation bar for links to corporate information, search engines, and site maps.
- The left-hand navigation bar for main content site sections.
- Bottom-of-the-page links for utility items such as policy links, privacy links, and copyright statements.
- The right-hand navigation bar for add-ons such as advertising, sponsors, surveys, opinion polls, or advertising links to similar products through affiliate programs. Generally, this bar doesn't carry main content navigation, because some users might not be able to view it on their monitors. In the future, technological advances such as Web pages that automatically adjust to different monitors may allow developers to use this bar for different purposes.

**NOTE**

An affiliate program allows site owners to link to another site where users can purchase products/services. If they do so, the owner of the original site receives a commission.
help

Figure 3.19  A word plus the underline serves as a link.

Navigation Links

Earlier in the chapter, we discussed links according to their function. Visually, a link can either be a word or words, a graphical icon, or an icon with words (see Figures 3.19, 3.20, and 3.21).

Farkas and Farkas (2000:344) note: “Potentially, icon links offer some significant advantages over text links. A familiar icon can be processed more quickly and easily than a text link. Many icons communicate across language barriers. Finally, icons can be made visually interesting and attractive, and can be incorporated into a Web site’s overall visual design.” If you have any doubt, however, about an icon’s ability to communicate to users, suggest that the designer use either a different icon or include text with the icon.

Whatever type of links your team creates on a Web site, here are some rules of thumb that your team should follow:

- Text links should be visible and noticeable—underlining is the current convention, although the color of the link now varies.
- Graphical links should be visible and noticeable—putting the icon on a button aids visibility.
- Link text titles should be informative and brief—users need to quickly understand where the links will take them.
- Unusual links should provide special instructions—for example, “Click on the picture to view the video,” or “Click on the picture to hear the interview.”

Figure 3.20  A graphical icon serves as a link.
How Many Clicks to Content?

In the early days of the Web, developers were click-happy, and users often had to drill down through many layers to get to content. For example, we rebuilt a site, originally created in 1996, with some content that was 14 clicks deep! Not surprisingly, as users became annoyed and frustrated by this practice, a rule of thumb emerged—no more than three clicks to content. To be fair to early site developers, advancing technologies such as pull-down/fly-out menus on navigation bars have helped today's developers reduce required clicks to content. (For more information on how technology can enhance content delivery, see Chapter 8, "Content + Technology: A Surprising Alliance").

When we start a site-rebuild, one of our first tasks is to do a test count of the number of clicks to content. If the problem is bad—far too many clicks before reaching a page other than a menu page—then the content has to be redesigned, and a very conscious effort made to flatten the navigation structure. In our experience, the three-click rule is an ideal to keep in your mind, but it may not work in practice. In the redesign of the site described above, the team made every effort to live by the rule. However, certain sections of the site were too complex and had content that required six clicks from the "Home" page. In these sections, we made a deliberate attempt to ensure that deeper-level pages were not just menu pages, because we wanted users to feel that they were getting practical information at every level. Therefore, many fourth- and fifth-level pages had meaningful information as well as links to deeper content.

Site Maps

The development of the information architecture and navigation design can eventually lead to a site map which is a graphical rep-
presentation of the content of the site, or a site index or table of contents which presents a text version. Site maps are a relatively new addition to the Web. Information design specialists Paul Kahn and Krzysztof Lenk (2001:72) describe this evolution:

When we designed our first website for a commercial client in 1994 there were only 300 .com sites registered and most web sites were a few hundred pages at most. By the summer of 1995 it was evident to many web designers and developers that simply following links or searching for words was not enough to support navigation on most web sites. There were hundreds of thousands of web sites and many contained tens of thousands of pages. By early 1996 site maps began to appear as a regular feature of many sites.

To return to our house metaphor, a site map can be thought of as the equivalent of the floor plans for a house. Such plans are easier to draw when the building is small, but the task grows more difficult if the building is larger. Would it be possible to represent Buckingham Palace or the Pentagon on one single page? The same problem applies to graphical site maps. Although creating maps for small sites is relatively easy, developing maps for large sites—particularly those with thousands of pages, data organized into large databases, and/or content coming in different modes such as text, video, sound, and so on—is extremely difficult. Information visualization specialists Brian Johnson and Ben Schneiderman (1999:152) point out that:

A large quantity of the world’s information is hierarchically structured: manuals, outlines, corporate organizations, family trees, directory structures, internet addressing, library programs...and the list goes on. Most people come to understand the content and organization of these structures easily if they are small, but have great difficulty if the structures are large.

Researchers in the area of information visualization (IV) continue to research the best ways to present the information in large, complex sites. However, in general, these sites use maps that show only major information groupings rather than full-site depth.

Web Detection

The more you know about Web navigation, the more valuable you’ll be to the client and the production team. Table 3.4 provides you with tips to building knowledge in this important area of Web development.
<table>
<thead>
<tr>
<th><strong>ASPECT OF NAVIGATION</strong></th>
<th><strong>LEARNING TIPS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Navigation Design</strong></td>
<td>Pick a site and first draw a chart of its high-level menu items. Take one site section and follow a flow of information stream down to its deepest page. By repeating this exercise for a variety of sites, you'll be able to see how navigation is linked to the IA. Keep an eye out for dead-end spots where users find themselves with nowhere to go except by using the &quot;Back button,&quot; and loops of content where users can get caught and can only exit the loop by leaving the site.</td>
</tr>
<tr>
<td><strong>Links</strong></td>
<td>Determine how well main navigation links are titled and whether they accurately reflect the content of the main site sections. To spot redundant links, look for similar link titles on navigation bars and in the body of the text. Trace them to their respective pages. If the pages are identical, you've found a redundant link.</td>
</tr>
<tr>
<td><strong>Site Maps</strong></td>
<td>Look at as many site maps as you can. For each one, ask: Does the site map help me understand the content of the site? Does the site map help me understand the breadth and depth of the site? If the site map is graphical, does the type of graphic work well? Could there be a different way of visualizing the site that would be preferable? If I click on an item, does it take me to the actual page? If not, where does it send me? Will this type of linking frustrate users?</td>
</tr>
<tr>
<td><strong>Search Engines/ Databases</strong></td>
<td>Check whether sites have search engines instead of site maps. Is the search engine more useful for the site? Do you think a site map would also help users? To determine the complexity of a database, click on a link to bring up a Web page. Now using a keyword from the Web page title or contents, use the search engine. Do you get the same page? (For more information on databases, see Chapter 8, &quot;Content + Technology: A Surprising Alliance.&quot;)</td>
</tr>
</tbody>
</table>
Earlier in the chapter, we demonstrated how a mind map about Sherlock Holmes could lead to a site structure that revealed the IA of a Web site. However, that process is only the starting point for developing a Web site. To demonstrate how the site structure shown in Figure 3.5 leads to the navigation design and GUI, we've created the “Home” page for a fictitious Web site: “The World of Sherlock Holmes” (see Figure 3.22 on page 98). Note how the four main branches of the site structure have become the main content site sections on the left-hand navigation bar. Users can run their cursor over these buttons to view second-level content through the use of fly-out menus. (To see this, visit our companion Web site at www.wiley.com/comppbooks/hammerich.)

Because this fictitious site is run by a fictitious non-profit organization, The Association for the Study of Sherlock Holmes, we’ve also included some of the links often found on non-profit sites. (See Table 3.1.) However, it’s important to remember that Figure 3.22 represents only one GUI possibility for “The World of Sherlock Holmes.” For example, another GUI could have shown all of the navigation routes at the first and second levels, or conversely, hidden the navigation structure through the use of visual metaphors (no text) for the site. For example, instead of words, the link “His Mind” could have been a brain or silhouette of a head.

When the Web first began, sites were fairly simple and their organization was relatively easy. However, as sites grow larger and more complex, the task of organizing content is increasingly difficult. The creation of effective informational models and easy-to-use navigation is becoming more crucial to every site’s survival. As the writer/editor of either a new or existing site, you must work with the client, designers, and programmers to ensure that the site’s IA and navigation maintains the integrity of the information and its flow, and that the GUI has a look-and-feel that is appropriate to the architecture, information, and users’ requirements.
Figure 3.22 The World of Sherlock Holmes "Home" page.

Resources for This Chapter

Books


Don't Make Me Think: A Common Sense Approach to Web Usability by Steve Krug. Discusses the usability of the GUI and approaches to testing. (Macmillan: 2000)

Web Navigation: Designing the User Experience by Jennifer Fleming. Covers both information architecture and navigation design. (O'Reilly: 1998)


Mapping Web Sites by Paul Kahn and Krzysztof Lenk. An exploration of how mapping helps in the planning and design of Web sites. Includes innovative color illustrations that demonstrate the complexities of architecture and database sites. (RotoVision SA: 2001)


Web Sites

Argus Center for Information Architecture (www.argus-acia.com). Provides recent and archived information on research, theory, and practice.

InfoDesign (www.bogieland.com/infodesign). Current articles about information design from a variety of specialists.


SiteNavigation.net (www.sitenavigation.net/snguide.html). Provides links to a variety of different sources and resources about site navigation.

OECD: Privacy Policy Generator (CS3-HQ.oecd.org/scripts/pwv3/pwpard1.htm). The Organisation for Economic Co-operation and Development (OECD) provides a free service to organizations that want to develop online privacy policies and statements.


AskTog: Human Interface Evangelism & Practical Design (www.asktog.com). A site that lays out principles for good GUI design and includes articles by Bruce “Tog” Tognazzini, a researcher in human-computer interaction.

User Interface Engineering (www.world.std.com/~uiweb/moreart.htm). Research articles from a company that specializes in GUI usability.