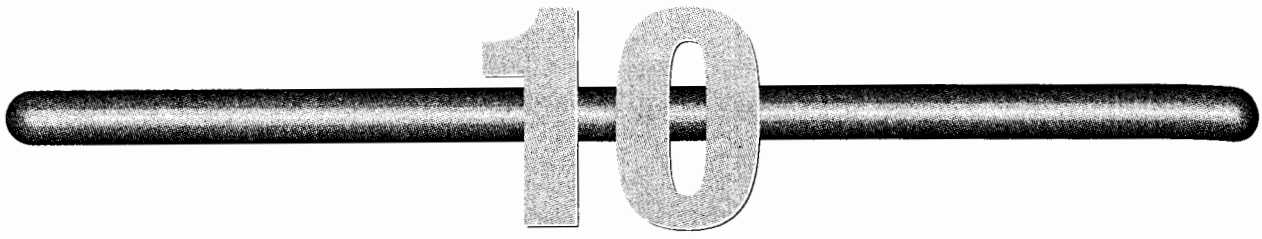

Writing for the Web

Introduction

Writing for the Web is similar in many ways to writing for print. Just as with print, you always begin by analyzing your audience and purpose. Just as with print, you need a strong command of grammar and usage, a good vocabulary, and the ability to control style and point of view so that you can reach a common ground with your audience and achieve your own communication goals.

How we write for the Web resembles writing for print in another important respect: What we do depends very largely on genre. There is no one way to write for the Web, just as there is no one way to write for print. Indeed, writing for a website very often resembles writing for the analogous print genre. The features and news stories for a website about country-and-western music will be written much like features and news stories in country-and-western music magazines. Research reports in online academic journals bear many similarities to those written for print journals.

Amid these commonalities, however, there are differences between writing for print and the Web. The most significant are these:

1. The Web medium encourages casual, restless reading behavior.
2. Web writing is not necessarily text. Sometimes we write for oral delivery.
3. The Web is a strongly non-linear information environment. This is the most significant difference and the one we will explore in greatest detail.

Writing for a "Non-Sticky" Medium

Patterns of behavior develop around each communications medium. One characteristic we see in Web use is the willingness to quickly abandon a website as soon as the user experiences just a bit of boredom, disappointment, or frustration. The

phrase "surfing the Web" captures this behavior. Website owners are keenly aware of the casual, restless character of much Web use, and they often talk about "stickiness," the much-desired ability to hold users for a reasonable amount of time.

In contrast, restlessness is not an inherent characteristic of print. Even if people are not immediately engaged by a book, they will usually stay with it for a while before abandoning it. People will settle down with a newspaper or magazine, even though they jump around among the articles. Nor is restless behavior characteristic of cinema. After paying their admission at a movie theater or renting a VCR or DVD movie, people are inclined to sit through the movie, even if it starts slowly or is only modestly satisfying. Television is less sticky than cinema, especially in the era of remote control devices and dozens of channels.

Causes of Restless Behavior

One factor that contributes to the lack of stickiness is limited legibility and other problems that arise in reading from the computer screen. Another factor is that almost all websites are cost free and easily and quickly accessed. With very little investment to get in, there is little reluctance to get out. Along similar lines, users can almost always find a website that is comparable to the one they are looking at. Websites with unique or unusual content hold special value. Finally, these patterns of behavior, once they start, become habitual and are carried to each new website. They become part of the cultural context of the medium though, like other aspects of culture, they are subject to change.

Note that hypermedia delivered on CD/DVD is stickier than the Web, even though a website and a CD/DVD title may be quite similar in regard to content and interactivity. This difference stems from the effort entailed in acquiring and loading a CD or DVD and the fact that there is a physical medium to be owned and looked after. Also, because CD/DVD titles are often more video intensive and provide a more cinematic experience, they share some of the cultural habits that people bring to cinema.

Web Writing Guidelines and the Rhetorical Perspective

Web experts have offered advice for writing for the Web. These recommendations generally reflect the Web's lack of stickiness and emphasize writing for people who are inclined to scan and skip. Here is a good set of general guidelines adapted from Jakob Nielsen (2000, 1997).

1. Keep your writing concise and direct.
2. Make sure each sentence conveys useful content.
3. Provide ample blank space. Don't crowd the page with text.
4. Don't expect people to read more than short amounts of text on the Web. Avoid long scrolling pages. Provide links that let users access more detailed information if they want it (layering).
5. Write for scannability. Use short paragraphs, subheadings, and bulleted lists.

6. Build paragraphs around topic sentences so that readers can quickly and readily grasp the central idea of each paragraph.
7. Create an overall structure in which the key points are explained early on. Don't save important information for the conclusion. Write so that the reader can leave off at any point and still come away with your most important content.

These guidelines are sensible and useful. On the other hand, these guidelines (and indeed any set of guidelines) can't possibly be the complete answer to writing for the Web. How we write depends on the particular rhetorical situation. For example, brevity and scannability are not the main concerns for someone reading about a promising treatment for a serious medical condition he suffers from or about the prospects of a company he has invested in. If readers are strongly interested in the content, they will most certainly read extended text, and they will not hesitate to scroll for more information. Likewise, genre affects people's reading habits and expectations. Scientists will not be surprised by or highly resistant to extended text in an online research journal. Similarly, people who read memoirs or other forms of personal writing on the Web will not expect short paragraphs and bulleted lists.

Regard these (and similar) guidelines as a good default strategy that helps us address the Web's lack of stickiness. They are especially relevant to home pages, for here we want inviting, easy-to-scan writing that establishes its value quickly and draws the user further into the website. On the interior pages the content can become more detailed, and in other ways make greater demands on the reader. The real answer is writing (and other content) that responds to people's needs and interests and is trustworthy, current, clearly and smoothly written, and handsomely and functionally formatted.

Writing Audio Discourse

Many websites incorporate video and animation sequences, and these often include audio discourse. Furthermore, many websites incorporate audio-only sequences without video or animation. For example, a city website might include audio narration that the user can play while viewing pictures of city landmarks.

When you write for a narrator, whether off screen or on screen, your writing must fit the narrator and the rhetorical situation. Stated differently, you need to create the kind of narrator that fits the audience, purpose, and theme of the website.

Furthermore, you may want to influence the narrator's oral delivery of your text. You can prepare a narrator's script that employs boldface to show emphasis, ellipses to show pauses, and so forth. You might even produce your own demo audio version of the narration.

Often you need to coordinate your writing with shifts in the "camera eye." For example, let's imagine that Asthma Horizons includes an animated lesson on the function of the lungs explained by an off-screen narrator. At some point the animation switches from an external view of the lungs to a microscopic view of

the individual alveoli (air sacs). The narration should reflect this shift with transitional phrases and sentences—for example: "Now as we explore the interior of the lungs. . . ."

The principles and techniques of writing for narrators and actors belong to the fields of public speaking, broadcasting, and cinema and are beyond the scope of this book. Good resources include Bruce Gronbeck, Douglas Ehninger, and Alan Monroe (1999) and J. Michael Straczynski (1996).

Writing for a Non-Linear Environment

As you know, the Web is predominantly a non-linear environment, an environment in which users have a lot of choice in what they view next. In the case of hierarchies, users are generally invited to explore any branch of the hierarchy or to follow the secondary links. The other information structures, except for the linear structure, also offer significant navigation options. For writers, the most important difference between print and the Web is non-linearity.

It is definitely a mistake to equate the print medium with linearity. Even though the sequence of bound pages encourages linear reading, print documents range all the way from the strict linearity of the novel to the complete non-linearity of the encyclopedia. Print, however, is and will remain a much more linear medium than the Web.

There are important benefits (or at least potential benefits) in non-linear information environments: Readers are more able to find and read exactly what they care about. Furthermore, they are more fully empowered to follow their unique interests and make their own connections among ideas. This was an important theme in Vannevar Bush's "As We May Think," and it remains important today, especially in the writings of postmodern Web and hypermedia theorists.

From the writer's perspective, links can function as enticing "hooks" to draw readers who may not have a strong initial interest in the topic. For example, in Figure 10.1, we see a writer who is working very hard at creating enticing links to draw users into an online essay on evolutionary biology that the writer thinks the audience might not otherwise take an interest in.

If these benefits were not important, Web designers would simplify their task and build sites consisting of one very long page. Instead, we accept the challenge of designing non-linear information environments.

The drawbacks of non-linear writing—as you will see—are significant. Risks include excessive redundancy, dull writing, irritating loose ends, confusion, and missing information. In the remaining sections of this chapter, you will learn how to avoid these pitfalls and succeed with non-linear writing.

Caution Referring to Other Pages

Both online and in print, writers use phrases such as these to refer to other parts of a document:

As noted previously, . . .

You will recall that . . .

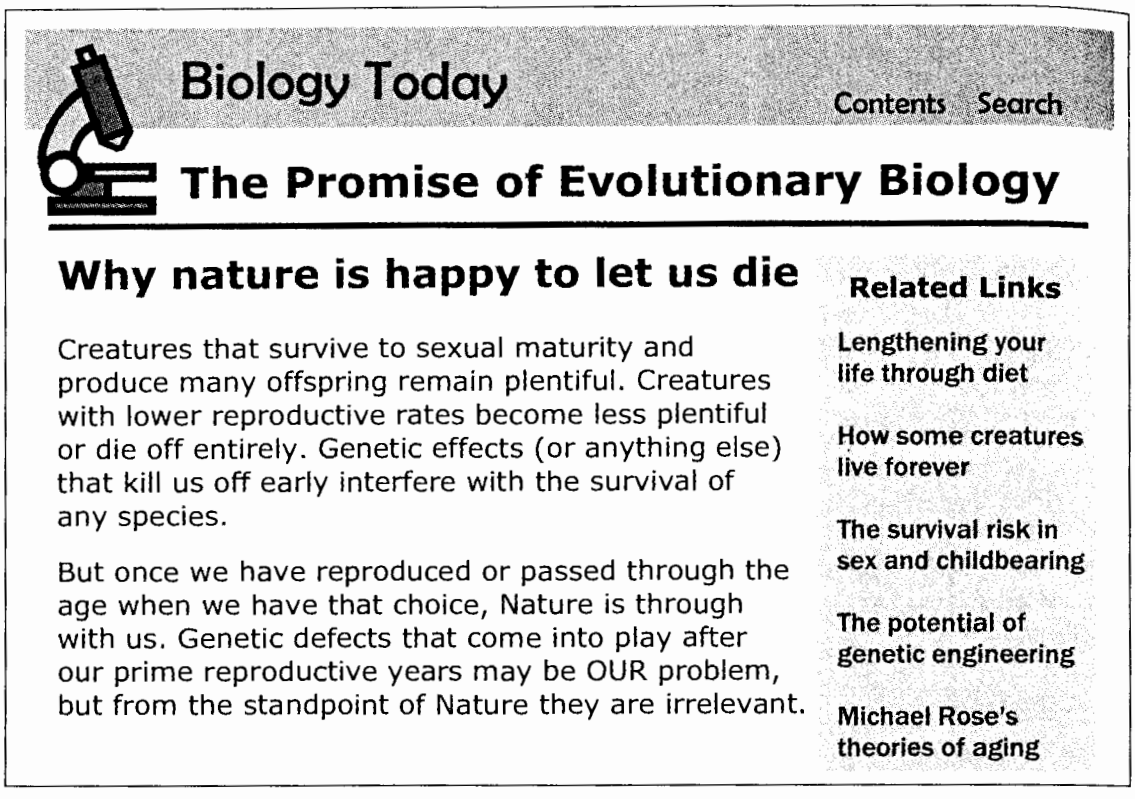

Figure 10.1. An non-linear essay on evolutionary biology that draws the user into the subject matter.

As you will learn, . . .
We demonstrate this later.

On the Web we use such phrases within a single lengthy Web page and perhaps within a linear sequence of Web pages. But we must be very careful about referring users to other pages in a website. In a non-linear environment, we usually do not know where users have been or where they will go next. These phrases, then, are apt to prove false (the user *does not* recall X and *will not* encounter Y) and so become irritating or confusing loose ends. The standard way, of course, to refer to other parts of a website is by building a link. Links, however, are invitations; they don't embody assumptions about the routes taken by individual users.

Managing Pre-Requisite Relationships

Pre-requisite content refers to something the user should read before going on to something else. Many kinds of printed books exhibit a complete chain of pre-requisite relationships in which each chapter depends upon the previous one. At least from the writer's point of view, there is one pathway through the material. The reader is certainly free to leave this pathway (just like hikers can choose to leave a trail) but the writer is no longer responsible for the quality of the reader's experience.

Even in a non-linear environment there are usually many pre-requisite relationships, also referred to as "dependencies." Managing these dependen-

cies is very complex and also very important. This is how you keep users from entering a danger zone where they (1) will be confused and frustrated by the incompleteness of the information they are receiving or (2) will not receive information the author considers important or even essential.

Note that being unaware of missing information can be much worse than confusion. A badly designed website may allow a user to read about a new medical treatment without encountering the pre-requisite node that explains who shouldn't undergo this treatment.

Designers should think carefully about dependencies when the initial structure of the website is first worked out. Also, a writer or editor should check for dependency problems later in the development process. Athough your goal is to prevent users from navigating into danger zones, the designer's responsibility is not absolute. Users who bounce through a website mostly following associative secondary links are apt to encounter pages they won't fully understand. Furthermore, even when you design so that users must encounter pre-requisite information, there is no way (short of extreme measures) to force users to actually read the pre-requisite information you present them with.

Modularity

Modularity refers to content that has no pre-requisites. It can stand alone and still provide a satisfying experience for the reader—or, at least, this is the author's intention. Encyclopedia articles are modular because each article is written without regard to what other articles the reader might previously have looked at. The encyclopedia assumes a certain general level of literacy and a certain degree of knowledge about the world, but beyond this baseline level of education, no assumptions are made about the reader's prior knowledge regarding any article. Similarly, the articles in newspapers and general-interest magazines are usually modular.

On the Web, every home page has to be modular, and often many other pages are as well. A certain number of websites are fully modular, in the manner of an encyclopedia. For example, The Electronic Labyrinth by Christopher Keep, Tim McLaughlin, and Robin Parmar is a valuable website devoted to hypertext history and theory. Each page is skillfully written to make good sense to readers with a strong humanities background, and each contains links to draw users to other articles. An article from the Electronic Labyrinth appears as Figure 10.2.

The All Music Guide, (www.allmusic.com) is another modular website. Essentially a digital encyclopedia of musicians, it invites users to jump freely from one biography to another following their interests and making their own intellectual connections.

The encyclopedic approach works well when the user's focus is on individual articles (what we often think of as using a book as a "reference"), but becomes problematical when the user is trying to obtain a systematic and broad understanding of a complete body of knowledge. This is because the articles are short, because each addresses one topic, and—most of all—because the author is not guiding the reader by providing any sort of sequence or overall organizing principle.

The Electronic Labyrinth

Home Contents Timeline Bibliography Index

Readerly and Writerly Texts

Translated from Barthes' neologisms *lisible* and *scriptible,* the terms readerly and writerly text mark the distinction between traditional literary works such as the classical novel, and those twentieth century works, like the new novel, which violate the conventions of realism and thus force the reader to produce a meaning or meanings which are inevitably other than final or "authorized." Barthes writes:

> The writerly text is a perpetual present, upon which no *consequent* language (which would inevitably make it past) can be superimposed; the writerly text is *ourselves writing,* before the infinite play of the world (the world as function) is traversed, intersected, stopped, plasticized by some singular system (Ideology, Genus, Criticism) which reduces the plurality of entrances, the opening of networks, the infinity of languages. (*S/Z* 5)

Readerly texts, by contrast, are anything but readerly; they are manifestations of The Book. They do not locate the reader as a site of the production of meaning, but only as the receiver of a fixed, pre-determined, reading. They are thus products rather than productions and thus form the dominant mode of literature under capital.

Behind these distinctions lies Barthes' own aesthetic and political projects, the championing of those texts which he sees as usefully challenging--often through the method of self-reflexivity--traditional literary conventions such as the omniscient narrator. For Barthes, the readerly text, like the commodity, disguises its status as a fiction, as a literary product, and presents itself as a transparent window onto "reality." The writerly text, however, self-consciously acknowledges its artifice by calling attention to the various rhetorical techniques which produce the illusion of realism. In accord with his proclamation of The Death of the Author Barthes insists, "the goal of literary work (of literature as work) is to make the reader no longer a consumer, but a producer of the text" (*S/Z* 4)

Figure 10.2. The Electronic Labyrinth, an example of the encyclopedia model. (www.eserver.org/elab)

The Electronic Labyrinth is especially interesting because it reflects and expresses a postmodern philosophical perspective. The authors definitely want readers to make their own connections. This intention is implicit in the word "labyrinth," meaning a maze. But will all visitors possess the intellectual ability and commitment to create his or her own synthesis of this complex intellectual territory? At least some people will prefer a traditional linear treatment of the same general subject area, such as Ilana Snyder's *Hypertext: The Electronic Labyrinth* (1996).

It is possible to back off from an uncompromising encyclopedic structure and provide readers with some authorial guidance. For example, the Electronic Labyrinth provides a kind of electronic table of contents in which the articles appear grouped into general categories. This strategy adds a limited hierarchical dimension to what is primarily a web-like structure.

Open-Endedness

Open-endedness is the user's perception that relevant information is missing, that something pertinent has been left unsaid. A limited degree of open-endedness is acceptable; indeed, in the hands of a skillful writer, open-endedness can create interest and suspense. On the other hand, clumsy and excessive open-endedness results in annoyance and confusion. Open-endedness, therefore, is an important aspect of writing for the Web, whether nodes are modular or whether they have pre-requisites.

Consider, for example, the website of a professional basketball team that includes a linear sequence of pages recounting the team's history. On a page entitled Years of Struggle (Figure 10.3), interest and suspense are generated by skillfully withholding information and only hinting at Elena's career as the Cougars' star player:

> After four exciting but losing seasons, Coach Ito was desperate to build the team that would finally bring success to Cleveland. In a flurry of trades, she acquired Vivian Sinnick from Atlanta and Mary Villa from Los Angeles. She persuaded the Cougar owners to pay the hefty sum necessary to pick up veteran center Estelle Winchell, who was available as a free agent. And then, almost as an afterthought, she signed the unknown Croatian guard who had not yet played basketball in the United States.
>
> NEXT: Elena!

Figure 10.3. A skillful instance of open-endedness. In this linear sequence, the writer builds suspense by withholding the identity of the player who will be featured on the next page.

In contrast, consider a bank whose website includes pages with tips on money management. One page tells the story of an unfortunate individual whose entire checking account was wiped out by a thief who stole the individual's debit card. Users, however, will wonder how the thief got the PIN number. Was this a special kind of debit card that allows ATM withdrawals without entering a PIN number? Did the thief use some sophisticated computer trick to figure out the PIN number? Did the individual foolishly tape the PIN number to the front of the debit card? Without this item of missing information, the open-endedness reaches the level of puzzlement and irritation. In fact, even if the answer is available via a link, the user is not likely to perceive anything positive in the strategy of temporarily withholding this information.

Audience and Purpose Determine What Is Pre-Requisite Information

The concepts of pre-requisite information and modularity depend on audience and purpose. What is pre-requisite information for one person may not be for another. Let's say a mathematics professor is examining an online or print textbook on statistics to see if it's suitable for her course. For this audience, each chapter is modular; for a student trying to learn statistics the chapters will be highly dependent.

In regard to the purpose, consider a middle school student who needs to find out the date of the beginning of the Normandy Invasion. The student goes to a library and stumbles upon a long and complex book on World War II, a book that most readers choose to read straight through. The student, however, goes to the index and finds the page that gives the single fact he is after. For this student's very limited purpose, a non-linear (random access) experience with this complex linear book has been entirely successful. If this had been a historical website about World War II, the student might have met his or her limited needs by typing "Normandy Invasion" and "date" into the site's Search feature.

Linear and Multipath Writing

There is no reason, of course, why Web content needs to be non-linear. With a highly dependent subject area such as mathematics, a complex argument or explanation, or a narrative with foreshadowing and flashbacks, the best or only option may be a linear presentation. This may consist of a sequence of Web pages linked with Next and Previous buttons or a "paper like" screen document created with Adobe Acrobat (PDF file).

If your subject matter tends somewhat toward a linear presentation but you need to give users a limited degree of navigational freedom, consider the multipath information structure. For example, Figure 10.4 represents part of an online statistics tutorial in which the learner can choose between examples drawn from the social sciences or the natural sciences. Whichever choice the user makes in regard to learning multivariate regression, the user will be prepared to learn simultaneous regression. A major theme in Chapter 13, "Non-Hierarchical Information Structures," is how to write for the other information structures.

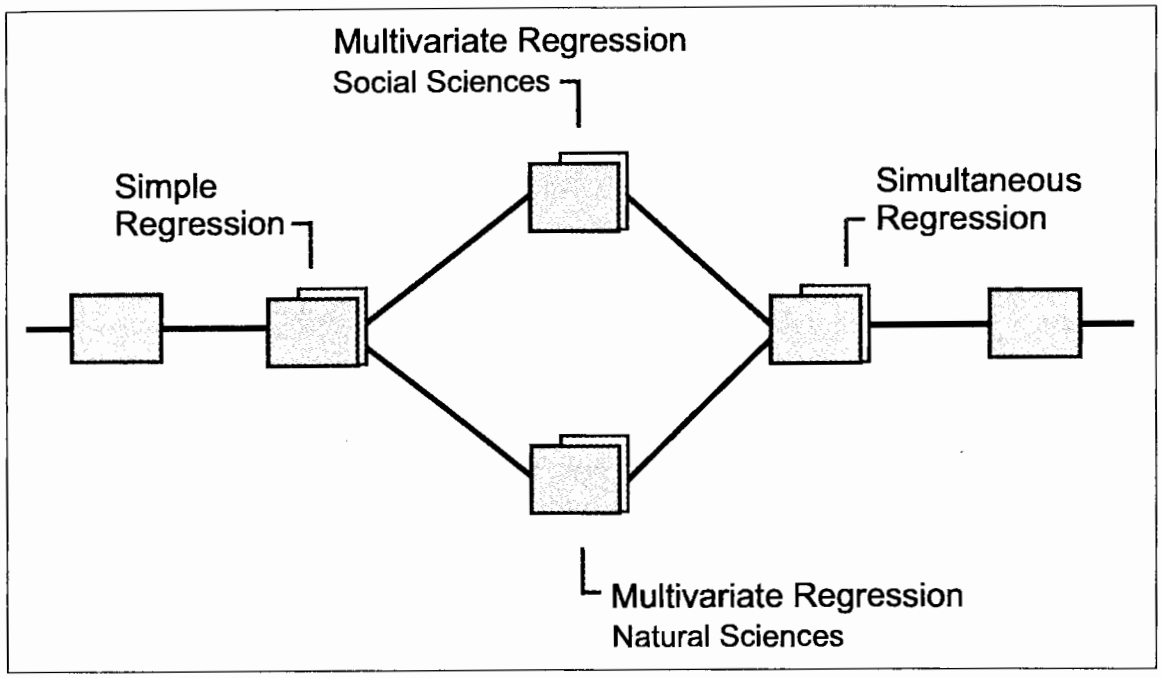

Figure 10.4. A multipath tutorial in which either alternative pathway provides the necessary pre-requisite information.

Another option is to allow users complete navigational freedom but to implicitly suggest a linear sequence, as shown in Figure 10.5. This strategy accommodates readers with different backgrounds: Knowledgeable readers might well choose to skip the more basic information presented in Sections 1 and 2, while newcomers to this topic would probably read all the sections in sequence.

Strategies for Dealing with Complex Dependencies

Writers will discover that non-linear writing is sometimes so easy as to appear automatic. It is worthwhile to understand why. The Company branch of the Zompco hierarchy consists of these third-level pages: President's Message, Careers at Zompco, Investor Relations, Outreach to the Community, and Zompco's History. There is considerable semantic distance among these pages. In other words, they cover fairly separate topics, and so writers face few problems stemming from the user's freedom to visit these pages in any order. Typically, dependencies become more complex at the lower levels of a hierarchy, where the semantic distance is less. For example, if the Investor Relations page has several child pages, these pages will be more closely tied to one another, and challenges may well arise writing them as independent modules.

There are many ways to design Web pages so as to manage dependencies. Here we examine three fundamental strategies. We do so by considering the Products branch of the Zompco hierarchy. A second-level product overview page provides links to each of five third-level product description pages. In explaining each of these technologically sophisticated products, the designer does

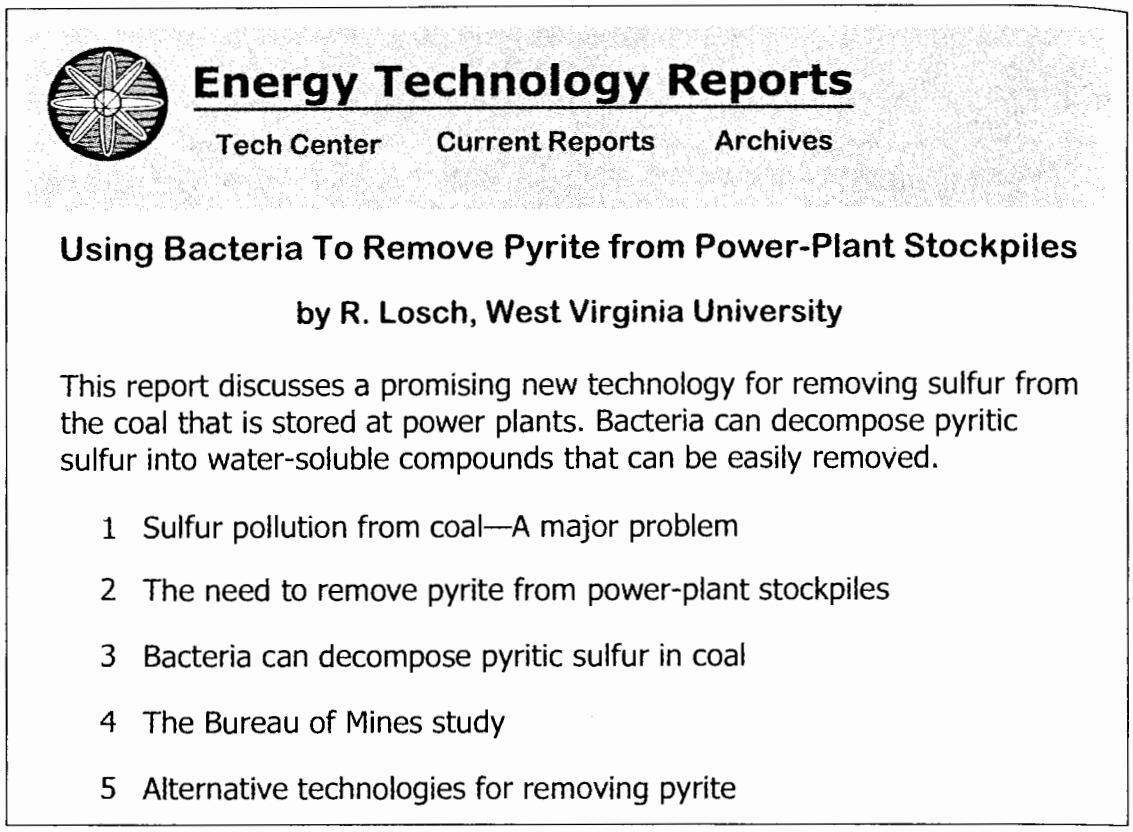

Figure 10.5. An online technical report with a suggested linear sequence.

not want to leave a product inadequately explained, but neither does the designer want to tediously explain the same technology several times. The three strategies are (1) the gateway strategy, (2) the proximity strategy, and (3) the glossary strategy. Figure 10.6 illustrates a simple instance of each strategy and shows that the distinction among them is the location of the pre-requisite information in relation

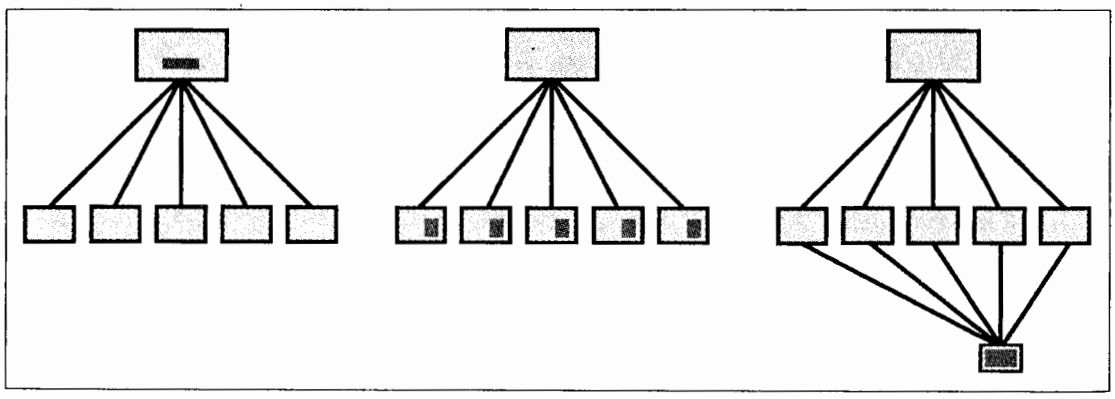

Figure 10.6. The placement of pre-requisite information (above, with, and below) in the gateway, proximity, and glossary strategies.

to the content that is explained by the pre-requisite information. The pre-requisite information can be placed (1) above, (2) with, or (3) below (respectively). For a sophisticated discussion of hypertext dependencies, see Scott Fisher (1994).

The Gateway Strategy

Let's say that Zompco incorporates state-of-the-art Strato-Arc technology in all of its products. An explanation of Strato-Arc technology is pre-requisite information because the company does not want potential customers to make a purchasing decision without knowing about this important advance. It is very easy and effective to include an explanation of Strato-Arc technology on the product overview page, the parent of the product description pages. The product overview page is now serving a gateway function: It is unlikely that users will bypass this explanation.

Let's assume that Zompco starts selling two groups of products, one based on Strato-Arc technology and the other based on Mega-Warp technology. The product overview page can be readily adapted to this situation, as shown in Figure 10.7.

The gateway strategy, however, is harder to employ and often clumsy when different nodes require different pre-requisite information. For example, one or more Zompco products might incorporate both technologies or certain products might incorporate various combinations of three advanced technologies. At this point, the other strategies, possibly in conjunction with the gateway strategy, become attractive alternatives.

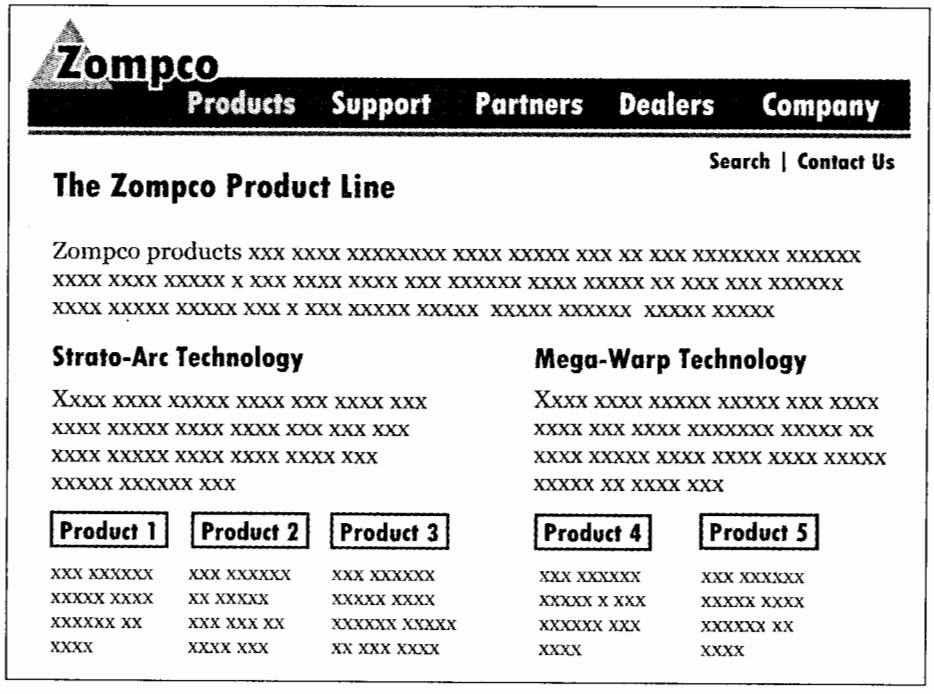

Figure 10.7. A portion of the Zompco product overview page that invites the user to examine the Strato-Arc and Mega-Warp product groups.

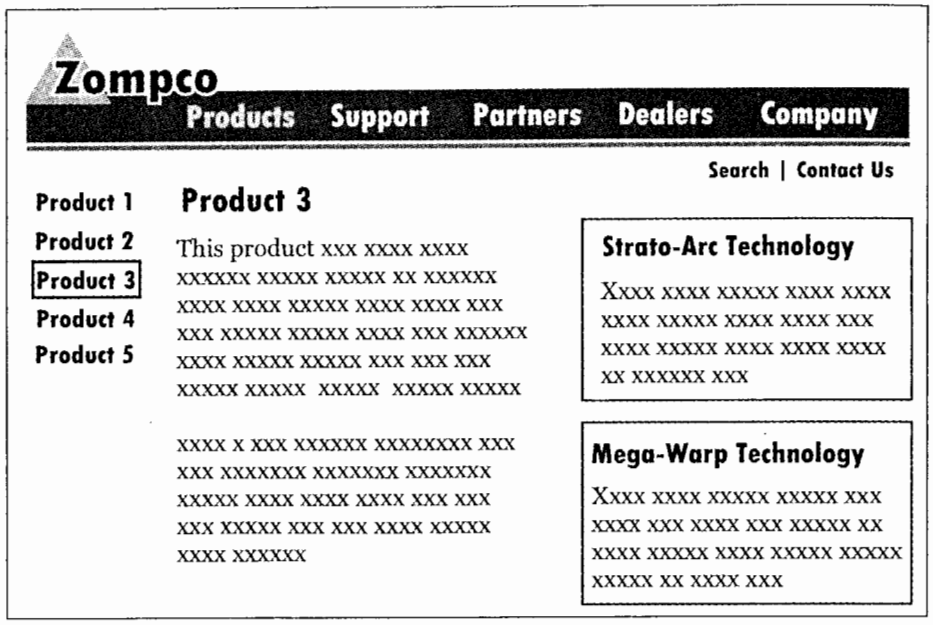

Figure 10.8. A Zompco product description page with sidebars, each explaining an advanced technology used in this product.

The Proximity Strategy

The proximity strategy entails placing the pre-requisite information on the same page as (that is, in close proximity to) the content that the pre-requisite information explains. In effect, the designer is modularizing these pages. This strategy handles dependencies flexibly: A Web page, as shown in Figure 10.8, may contain one or several different items of pre-requisite information. Furthermore, pre-requisite information can be customized. For example, Mega-Warp technology can be explained differently from one product to the next.

One problem with the proximity strategy is that a potential customer who is examining the full Zompco product line will encounter considerable repetition as the different Zompco technologies are explained on each product description page. A means of alleviating this problem, shown in Figure 10.8, is to format the pre-requisite information so that users can easily skip it.

The Glossary Strategy

A third strategy, represented in Figure 10.9, is to provide links (converging primary links) to one or more "glossary" nodes that provide the pre-requisite information. The idea here is similar to adding a glossary of technical terms at the back of a book so that users can refer to the glossary entries when they encounter an unfamiliar term. Using the glossary strategy, the Zompco Web designer provides links from each product description to one or more glossary nodes explaining a particular advanced technology used in that product.

Like the proximity strategy, the glossary strategy handles complex dependencies flexibly. Whatever technology or technologies a product incorporates,

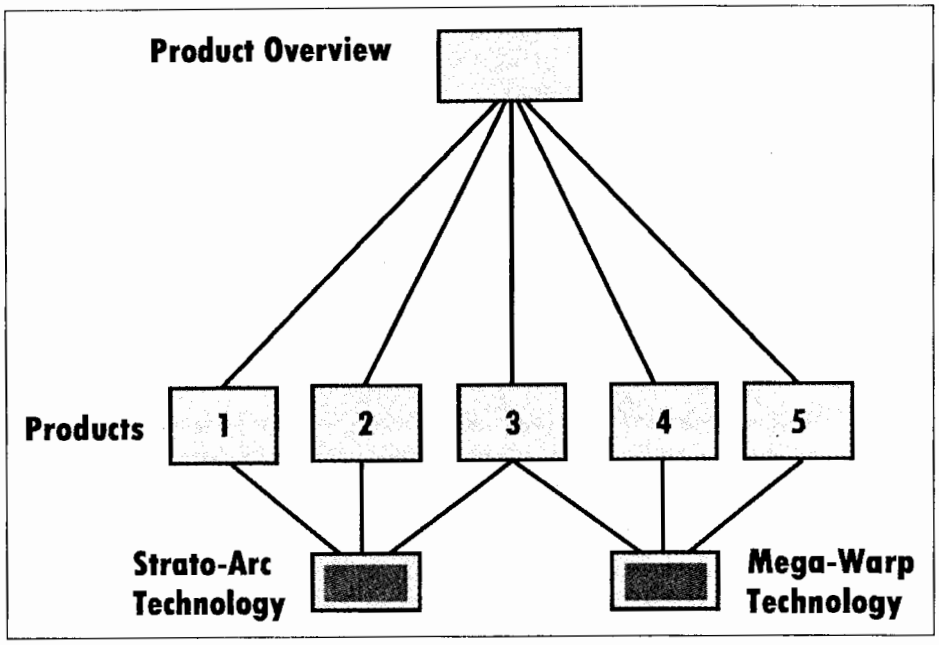

Figure 10.9. Two glossary nodes that explain the Zompco technologies employed in Zompco products. Note that Product 3 incorporates both technologies.

there will be links from that product's product description page to one or more glossary pages. In contrast to the proximity strategy, the product description pages are kept short and there is no repetition. If the user is on the Product 1 page and follows the glossary link to the page explaining Strato-Arc technology, the user can ignore that link when she sees it on the other product pages. In fact, the browser's visited link feature will conveniently remind the user that she has read this information.

One drawback to this strategy is that the user must be proactive in accessing the pre-requisite information. If the pre-requisite information is of great importance, for example, information about the appropriateness of a medical treatment, either the gateway or proximity strategy should be used, and the user might even be required to click a checkbox confirming that she has read the pre-requisite information.

Adaptive Behavior Can Enhance Web Writing

In the previous chapter, "Effective Links," we looked at the prospect of websites that adaptively display a different set of links and possibly different content at the destinations of links in order to meet the needs of individual users. This kind of adaptive behavior could certainly be employed to handle the problem of complex dependencies. For example, the Zompco website might adaptively provide all the pre-requisite information the user needs when clicking a particular product description page. If that user then clicks another product description page,

any pre-requisite information the user has already viewed (e.g., the explanation of Strato-Arc technology) would be removed from this page. Adaptive behavior, however, must be employed cautiously. Perhaps the user chose not to read the explanation on the first product description page. Perhaps the user wishes to read it again. There is an inevitable gap between what systems can infer about users and the variety in human motivations and behavior.

Summary

1. Writing for the Web is similar in many ways to writing for print. Furthermore, there is no one way to write for the Web, just as there is no one way to write for print. There are, however, differences in how we write for each communications medium.
2. The Web is a "non-sticky" medium. Habits of casual, restless reading behavior arise from limited screen legibility and rapid, cost-free access to unlimited information. Consequently, it makes sense to write with the expectation that users are apt to scan and skip. On the other hand, how we write depends on the particular rhetorical situation.
3. People will read extended text if the writing responds to their needs and interests and is trustworthy, current, clearly and smoothly written, and handsomely and functionally formatted. A good strategy is for the home page to be especially inviting and easy-to-scan so as to draw users to more detailed, more demanding content on the interior pages.
4. The Web, in contrast to print, often includes audio discourse. When you write for a narrator, whether off screen or on screen, your writing must fit the narrator and the communication situation. You may want to prepare a narrator's script. Often you need to coordinate your writing with shifts in the "camera eye."
5. In contrast to most print genres, the Web is a strongly non-linear information environment. Users are continually invited to choose what to view next.
6. Non-linearity empowers readers to find and read exactly what they care about, to follow their unique interests, and to make their own connections among ideas. Non-linearity allows writers to create links that function as enticing "hooks" to draw readers who may not have a strong initial interest in the topic.
7. On the Web we must be very careful about phrases such as "As noted previously" and "As you will learn" except when they point within a single lengthy Web page and perhaps within a linear sequence of Web pages. In a non-linear environment, these phrases are apt to prove false because we usually do not know where users have been or where they will go next.
8. In non-linear writing a complex challenge is managing pre-requisite relationships, also referred to as "dependencies." The risk is that users will navigate into a danger zone where they (1) will be confused and frustrated by the incompleteness of the information they are receiving and (2) will not receive information the author considers important or even essential.

9. Modularity refers to content that has no pre-requisites. It can stand alone and still provide a satisfying experience for the reader. Encyclopedia articles are modular. On the Web, every home page is modular, and often many other pages are as well. Novels and other linear documents are absolutely dependent; each chapter is built on the preceding chapters.
10. Modularity does not rule out a limited degree of open-endedness, the perception on the part of the reader that some information has been left out.
11. The concepts of pre-requisite information and modularity ultimately depend on the audience and the audience's purpose. What is pre-requisite information for a novice may not be so for an expert. Content may be modular because the user has a very limited or specialized purpose in reading the material.
12. There is no reason why a website must be non-linear. When there are complex dependencies, a linear or multipath structure may be better. Another option is to allow users complete navigational freedom but to implicitly suggest a linear sequence.
13. At times modularity arises almost automatically because there is considerable semantic distance among the nodes. That is, they cover fairly separate topics. This situation often occurs at the second level of a website's hierarchy. Semantic distance tends to decrease at deeper levels, making dependency problems more complex.
14. Three important strategies for managing complex dependencies are (1) the gateway strategy, (2) the proximity strategy, and (3) the glossary strategy. The distinction among them is that pre-requisite information appears (1) above, (2) with, and (3) below the content it explains.
15. Although very valuable, these strategies are not without drawbacks: The gateway strategy may be hard to employ and clumsy when different nodes require different combinations of pre-requisite information. The proximity strategy risks tedious repetition because the same pre-requisite information appears on multiple nodes. The glossary strategy requires users to be proactive in accessing the pre-requisite information.
16. Although there are inevitable limitations, adaptive systems can potentially address the problem of complex dependencies.

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Discussion and Application

Items for Discussion

1. The Centerville School District conducts an annual science fair. Figure 10.10 shows the letter they mail to community members who have volunteered to serve as judges. Plans are now underway to build a website for the science fair, and the designers are planning to include the letter on the website. How would you change the letter to take full advantage of the online medium?
2. A print book, *The Male Executive's Guide to Dressing for Success,* is being adapted for the Web. The book consists of an introductory chapter, followed by nine more chapters on selecting these items of dress: slacks, shirts, sport jackets, neckties, shoes, socks, hats, outerwear, and formal attire. The book was written as a fully linear document. For example, the chapter on neckties is written with the assumption that the reader has read all the previous chapters.

   The designer intends for the Web version to be non-linear: The user should be able to read the introductory node and then proceed directly to any of the subsequent chapters. Explain how the print version will need to be re-written for the Web version.
3. Find a movie review that you consider well-written. Choose an "essay-type" review rather than any kind of capsule or summary review. (It's best if you've seen the movie.) Create a non-linear version of the review with modules such as these:

   - Plot and genre (mystery, comedy, etc.)
   - Setting
   - Acting and directing
   - Theme and significance
   - Overall evaluation and recommendation

   What is gained and lost in the revised version?
4. Find a travel guide for Europe (or for several nations within Europe) with a chapter on each nation. Almost certainly this travel guide is not designed to require linear reading. Can you identify information design techniques that enable the travel guide to function well as a non-linear document? For example, can you find instances of the gateway, proximity, and glossary strategies?
5. Find a relatively brief article from a print encyclopedia that is informative but not especially interesting or enticing. Re-write the article in a livelier,

Thank you for volunteering to be a judge at the 2002 Centerville Schools Science Fair, sponsored by the Centerville Consolidated School District and FOSEC (Friends of Science Education in Centerville). This letter tells you everything you need to know to serve as a judge.

Arrangements

The judging will be held on Friday, May 8, from 6:00–9:30 pm at the Centerville Town Hall. When you arrive, sandwiches (including veggie sandwiches) and beverages will be ready. While you eat, there will be a 10-minute briefing and a chance for you to ask questions. Our goal is for the judges to get started between 6:15 and 6:30. (There will be a second briefing for those who get delayed.) If you have further questions, please send an email to Gila Delgado, Science Fair Coordinator, at giladelgado@trapazoid.net.

The judging process

During the briefing, you will be teamed up with a judging partner, and your team will be assigned a particular group of entries. For example, you and your partner might judge two rows of 7th grade entries. The job consists of these steps:

1. Find the entries that your team will be judging. (We will have folks to help you with this.)
2. Examine each entry from the point of view of the Guidelines (see below) and discuss your impressions with your partner.
3. Work with your partner to write brief, helpful, encouraging comments on the Judging Form.
4. Decide which are the best of the entries you have judged. Give these entries an Honorable Mention award, a red ribbon. All this should be done by 8:15.
5. Meet with the other teams judging the same category that you're judging. For example, you might meet with the two other teams that judged 7th grade entries. Collectively, pick the very best entries in the entire category and give these entries an Outstanding award. Finally, look for an entry that might be considered for Best of Show.

Limiting the number of Outstanding awards. Winners of the Outstanding award receive a blue ribbon and a savings bond. Outstanding awards can only be given on a limited basis. On the night of the judging, we will know how many awards we can give for each category (a likely number will be three).

If you don't find many Outstanding entries. It is possible that there will be fewer Outstanding entries in a particular category than the number we have budgeted for. If your group of judges decides to give out, say, only one Outstanding award, please let us know so we can allocate more awards to other categories.

Team entries. Some entries are the work of more than one student. In order to win an award, a team entry should be significantly better than the individual entries it is competing against. Also, please note that if a team entry wins the Outstanding award, all members of the team receive a savings bond.

(Continued)

Writing your comments

The judges' comments are the single most important part of the competition. The students take the comments very seriously. Comments need not be long: a paragraph will be sufficient. The comments should be helpful and encouraging and should be written at the grade level of the entry and at the level of sophistication shown by the entrant. So, for example, do not use the phrase "statistically significant" in comments for a 7th grader, unless this is a very sophisticated 7th grader whose entry reveals a familiarity with statistics.

Here is a sample comment that might be appropriate for a 7th grade entry:

> This is a good investigation. It is certainly interesting and important to determine how different amounts of detergent affect the growth of algae in pond water. You should have made one more sample to show how much algae grows when there is no detergent at all in the water. This sample would have made for a useful comparison with the other samples (a "control" for your experimental variables). Your display is attractive, and the explanations are clear and well written. Tables, however, are easier to read if the numbers line up. We hope you continue your interest in studying the environment.

Guidelines for judges

1. Was the problem clearly stated? Was a hypothesis stated?
2. Were variables adequately controlled? Was the experiment repeated several times to establish validity and/or was the sample size sufficient?
3. Were conclusions justified and properly drawn from the experimental process?
4. Were written materials effectively and correctly written? Were graphs, illustrations, and all other visual aspects of the display presented effectively?
5. How original is the topic?
6. How ingenious was the method of finding a solution?
7. How difficult was the experiment?

Figure 10.10. The letter to judges for the Centerville Science Fair.

more intriguing manner. Very often encyclopedia articles provide references (very much like hypertext links) to other articles in the encyclopedia and to external sources. Can you make this encyclopedia article more interesting by adding or changing references?

6. Comment on this assertion:

   Many people say that one advantage of the Web (and other forms of hypermedia) over traditional print books is that the Web provides users with more navigational freedom. But how can this be? I can open any book to any page at any time. Nothing can be faster or easier. On the Web, I can only follow links that the designer has created, unless I use the Search feature—which takes time and does not always lead to success. As I see it, printed books offer greater navigational freedom than the Web.

7. A small university has built a subsite on its main site for the athletics department. You are designing a section of this subsite specifically devoted to recruiting student athletes. The basic hierarchy will consist of an introductory page and a second-level page for each of these six sports: volleyball, baseball, basketball, soccer, golf, and swimming.

   Your plan is for the introductory page of the recruiting section to include information about general academic and sports policies that are common to all six sports. Now you've been asked to strengthen the recruitment effort by adding this information: Members of the golf team, volleyball team, and swimming team are given free access to the golf course, volleyball courts, and swimming pool belonging to a local country club. What are the effective and ineffective ways to add this information?
8. A physician is planning to write a textbook on human physiology. The general plan is to write a chapter for each of the major systems of the human body: the nervous system, digestive system, circulatory system, respiratory system, and so forth.

   The physician's original idea was to make each chapter fully modular in order to give instructors unlimited choice as to which systems of the human body to teach and the sequence in which they will be taught. It soon became clear, however, that there would be too much redundancy among the chapters. What ideas can you suggest for designing this book?
9. The brochure copy shown in Figure 10.11 announces a presentation by digital communication expert William Horton. The presentation, "Beyond

Beyond the F1 Key

The revolution in communication technologies has smashed the barrier of effective human-to-human communication. The Web, multimedia, digital video, intranets, and a thousand acronyms promise to remake our lives for the better. For the promise to be fulfilled though, we need a corresponding revolution in technique. We cannot create twenty-first century media with eighteenth century skills.

"Beyond the F1 Key" is a truly interactive presentation, in which the audience selects the topics from ones such as these:

- Are you dot.COMpetitive?
- Are you new-media literate?
- What are some new careers and new missions?
- How can you get vaccinated against chaos?
- What are some simple things that work?
- Do you write world-class Help?

Along with a bit of fun, the presentation offers advice on how we can keep our sanity, our jobs, and our sense of humor amid the most important change in the way our species communicates since the invention of the alphabet.

Figure 10.11. A description of an "interactive" presentation.

the F1 Key," was the keynote address at a conference. Characterize this presentation, drawing upon the ideas presented in this chapter and the book as a whole. What benefits and potential problems do you see in Horton's "interactive" presentation?

Application to Your Project

1. If your website will contain extended text, have you thought about this text from the standpoint of stickiness? In other words, do you feel confident that this text is important enough to your users that they will be motivated to read it? Are there text elements that should be re-written and reformatted for brevity and scannability?
2. Analyze your design from the point of view of pre-requisite information, modularity, and open-endedness. Do you see problems? Can your users enter danger zones in your website? What strategies might you use to address these problems?