Chapter 1: THE BIG PICTURE

This book walks you through the process of developing useful and usable World Wide Web sites. The methods we prescribe are based on our own experiences creating and revising Web sites, and they are supported by a growing body of research in user-centered design and usability testing. If you follow this Practical Web Development process, we can help you create an effective Web site.

Who Should Read this Book?

You might be a media librarian in a junior high school, or the newly appointed Webmaster for an "Intranet" in a large corporation. Maybe you're a university professor, administrator, or technology specialist who has been appointed to the committee that will design the campus Web site – or remodel the one you already have. You might be part of a museum design team preparing to create your first on-line exhibits via the Web.

You may be a computer programmer working with a Web design team, or a traditional print designer who is making the transition to screen-based design with this Web project. Or you may be someone in a company or non-profit organization who has been made responsible for the design of a Web site, even though your primary job is something else entirely. Finally, you could be just about anyone who has already created a Web site and found out – or been told – that it isn't working and needs to be fixed.

But you know that simply throwing information onto the Web isn't going to produce the results you want because you've been to disorganized, confusing sites where you know they have what you want but you simply can't find it. Fancy technology tools aren't the answer either – you've been to great-looking Web sites that don't offer much beyond the surface, or hide what information they do have behind a maze of high-tech effects.

You want to know what you can do as a designer, or a member of a design team, to give the people visiting your site a good experience. You want to be able to explain why you think your site is going to work well for the people who will use it, and you want to be able to demonstrate that it does work. You want to know if there are problems with the site before you publish it to the world, or even just to your own organization.

For What Kinds of Web Sites Is this Book Most Useful?

Our expertise is in designing instructional products so the process we recommend is primarily aimed at meeting your users' needs for information and information services, rather than meeting your users' desire to be entertained (Neiderst, 1996). Of course, any design should be interesting, and may be entertaining, but we are focusing on design for informational, instructional, or service-oriented sites, rather than design for marketing or "Web-presence" type sites.

If you're designing a site primarily for informational or instructional purposes and you want to know how to go about the entire process with confidence – this book is for you.
How Is this Book Different than Other Web Books?

This book outlines a process for creating useful and usable Web sites so that you can get started now on the job you need to do, and feel confident that you will get the results you want. The process we recommend will help you find out what your audience wants, and show whether you have given it to them in a form that they find easy to use. Although we can't tell you exactly which guideline to follow at which moment, we do present guidelines as part of the whole design process so that you can apply the right kinds of guidelines at the appropriate times. Our process will also help you determine your own priorities so that you can be confident about making trade-offs between guidelines when you need to.

How Do Web Sites Usually Get Developed?

During the dozens of workshops, presentations, and design consultations we have conducted, we've heard the same story over and over again. Web sites are most commonly developed through an ad hoc process.

What do we mean when we say "process?" Simply put, we mean "the way things get done." What comes first? What comes after that? Which things are done at the same time and which things have to wait for others? Who does what? Everything gets done through a process, whether anyone pays attention to that process or not.

Creating a Site the 'Ad Hoc' Way

In this case we mean "making it up as we go along." Many Web site designers have created other kinds of products or services, so their ad hoc processes are not completely random, but like any new medium the Web brings its own complexities with it so even experienced designers are finding themselves making up the process as they go along.

Someone in a small organization, usually a technical person, realizes how useful it could be for the organization to publish information on the Web. We'll call this person "Webbie."

Webbie gets permission from an immediate supervisor to spend some time – not too much! – creating a simple Home Page. The Home Page starts out simply with a copy of the organization's logo scanned from the letterhead, links to some search tools, and maybe clickable "button" graphics with pictures on them. This project is fun and satisfying for Webbie, especially when people start to use the Home Page.

Webbie looks for design guidance and finds hundreds of Web pages with guidelines on them, but discovers that the advice on those pages is often disorganized, sometimes contradictory to advice on other pages, and always hard to apply to real design problems. Webbie tries to sort out the design issues, but relies mostly on common sense in the long run.

People begin to call and send electronic mail to Webbie. Some of them can't find what they want in the site. Others want to put information there and need Webbie's help to do it. At this stage the Home Page may get longer and longer because everyone wants their information to be linked directly to the Home Page, and Webbie may not be in a position to say "no," even if the Home Page is getting very...
cluttered. Webbie's exciting adventure is becoming something of a burden.

About the time Webbie is thinking of asking for some help in maintaining the growing Web site, a Decision-Maker in the organization suddenly realizes that the site is visible to the world or that it is becoming an important part of how the organization does business. By now Webbie is probably called "Webmaster," but an awful lot of people are telling Webbie just how to run the Home Page.

From here it gets complicated. Webbie's organization may hire a design consultant, or form a "Web committee" to be sure that all the people with something to say about the Home Page get a chance to do so. Webbie may go full time as Webmaster, or be replaced by someone else in the organization, or acquire a small staff. No matter what happens, though, the Home Page (now a bustling site) already exists and the process from here on in consists of making revisions to it based largely on published guidelines, people's opinions, and compromises between people whose opinions differ.

Creating a Site the 'Post Haste' Way

This is a story about a larger business. Company executives have concluded that their business needs a web site right away. They are losing money, they believe, if they don’t get their site online as fast as possible. Their competition may beat them to it. Everyone -- it seems -- is putting up web sites for selling their products and services.

The company executives realize that they don’t have anyone in their organization who has expertise in design and development of a web site for their business. So they ask around to find out who is good at creating great looking web sites -- and fast! A number of folks have hired the “WhizBangGang” from the local area and have gotten excellent results in record turnaround time.

The decision is made to check out the WhizBangGang. They respond quickly, and a meeting is set up within a week with the company executives. The company executives, who are used to working with advertising agencies, tell the WhizBangGang about their plan and what they want the new Web site to do for their company. They want customers to buy widgets online just like they do on the phone from their sales people and from their mail-order catalog.

Within two weeks the WhizBangGang returns with a computer prototype of the Web site and makes a presentation to the company executives, much like the ad agencies they are used to dealing with. The computer prototype has beautiful graphics and animations. In fact, it is quite consistent with the company’s latest advertising campaign. After the flashy introduction, customers can browse the online catalog. They can even manipulate the pictures to see each product from different angles by clicking and dragging. The customer order form is just like the one in the catalog. By filling in the blanks, customers can place their orders with a few mouse clicks. The company executives really like it, so they give the go-ahead to the WhizBangGang to produce the new Web site.

The WhizBangGang meet their deadline. The new site is ready to go in just six weeks. They meet and present the new site to the company executives. The new site looks and works as promised. The company starts advertising the new Web site through their normal channels: newspaper and magazine ads. They also register their site
with the big portals and commercial search engines, and rent Web advertising space them as well.

After six months, the sales figures from the Web site are very disappointing. Customers just aren’t buying products from the Web site. Sales from telephone and mail-order catalogs have remained steady, even increasing a little. The company executives are beginning to wonder why they spent all that money on the new Web site, when it just isn’t working out like they had hoped. They are beginning to think that maybe the Web is a fad after all, since they have heard about similar disappointments from other businesses in the area. But not from everyone. Some of their competitors are making significant numbers of sales on the Web, so the company executives wonder why some are experiencing success and they are not.

Creating a Web Site the ‘Boss-knows-best’ Way

This is another story – this time about a college Web site. The president of a small college is concerned about decreasing enrollments over the last five years and decides to promote the college on the Web. The president has some definite ideas about what should go on the Web site. He assembles a team of local talent from the computer science and fine arts departments. He tells them exactly what he wants on the Web site – the nine main categories on the home page, and suggests some pictures that would be good to include (from the printed literature they send out to prospective students).

The design team includes graduate students who are computer programmers and graphic artists. They are excited to get an opportunity to work on a real project, and hope to put this one in their portfolios when they go looking for jobs in the near future.

In about six months, the design team presents the Web site to the president and some important alumni. They get some very specific feedback on changes that should be made, and go back to do some more work. In another month, they bring back a revised Web site for another review. It is closer to what the president had in mind, but he directs them to make some further changes before bringing it online.

Finally, after about eight months, the new Web site goes live. They register the Web site with popular search engines and Web portals. The college advertises the new Web address in their printed literature for student recruitment. They advertise the Web address in the alumni newsletter. They put the Web address on their letterhead. They even put the Web address on banners hanging in the football stadium and the scorer’s table in the basketball arena.

The Web access logs show that for the next few months the hits are increasing almost exponentially. The president is hopeful that this might affect their enrollment figures, but it is too soon to tell. After about six months, the number of Web visitors starts level off and shows signs of decreased usage.

Wondering what may be going on, the president asks one of the faculty members in the political science department to do a survey of incoming students, faculty and staff on campus and alumni. He wants to know why the Web site isn’t being used.

Six weeks later the results of the survey arrive on the president’s desk. The results are pretty clear, according to the professor: people tend to have a hard time finding information they are seeking about the college. So they give up after a few minutes of futile searching. If they
really need to find some useful information, they instead call the 800 number for the college.

What's Wrong with These Stories?

No Input from Users

There wasn't any input from the people who would be using the site during the process of creating it.

In the first example, Webbie didn't really know (nor did the committee that came together later) what the users of that site would find most useful, or how they would expect the site to be organized, or what they would expect things in the site to be called. No guidelines could answer these questions for Webbie – only the users themselves can answer them.

In the second case, the company executives assumed that users of the Web site would want the same things as they did from the company phone sales and mail-order catalog. They also assumed that what worked as an advertising strategy in other media would also work on the Web. They did not test these assumptions, but moved ahead rapidly since time was of the essence.

In the third case, the college president was confident that he knew what prospective students, faculty and alumni would want from the Web site. It never occurred to him to ask them, and the design team didn’t ask either. They assumed the president knew what the users would want.

No Testing of the Design or the Site

No one tested the site, either early in the process or late, to discover whether it was working the way it was supposed to.

Webbie may have had a couple of friends try it out, or the "Web Committee" may have reviewed it, but without trying it out on the real people who will use it every day and who did not build it themselves, no one could be sure that it worked well for them.

In the second example, the company executives relied on the expertise of the WhizBangGang. These designers were very good at making attractive and appealing graphics and animations. They had competent computer programmers on their team. The Web forms worked flawlessly with the inventory database. But no one bothered to test out the Web site with the equipment and connections that typical customers had access to. It turns out that the beautiful splash screen took almost two minutes to load on a 56K modem. Many potential customers got tired of waiting and left the site without placing any orders. Those who had the patience to go on found themselves confused by the ordering process on the Web forms. They weren’t sure if they had even placed their orders successfully. They were worried about the security of the Web site and whether their credit card information would be vulnerable to hackers.

In the third case, the Web site was not tested with prospective students, faculty or alumni to see if they could find information they were looking for. The president and the design team never knew this was a problem until many months later when the survey results came in.
No Record of Design Decisions and Standards

No one kept track of design decisions and guidelines being applied to these sites as they went along.

Eventually Webbie or someone else would begin to do so, but the job would be overwhelming by that time and many of the reasons for early decisions forgotten. The job of setting standards for a growing site and explaining them to a growing number of people involved in working on the site is considerably more difficult when there is no record of why the site is designed the way it is.

In the second case, the client did not ask the WhizBangGang for any report of their design decisions or guidelines. The company was in a hurry to get the Web site up and going. They assumed that the Web designers knew what they were doing and why. It did not occur to them to ask.

In the small college example, the designers assumed the president knew what he wanted and why. He was making a most of the decisions about the design. They were attempting to implement the design. It did not occur to them to keep track of those decisions.

Hard to Justify Decisions and Avoid Capricious Redesign

When design decisions are made only by opinion – even opinions from those who think they know what is the best way – the resulting Web designs have not been empirically tested. Such decisions are essentially made in a vacuum. Without additional information on how well – or poorly – the designs work with the intended target audiences, the basis of further design decisions will still be largely opinion.

In the first example, once the Web site was gaining more visibility and attention, Webbie found herself caught between various individuals within the organization who had different ideas of what the design should be. Without empirical data to support design decisions, she was caught in a tug-of-war of opinions.

In the second example, the only empirical information available was that sales on the Web were very low. Since there was no user testing, the company didn’t know if the problem was in the Web site or that customers prefer to use traditional catalog ordering methods. Should the company try to fix the Web site, or write it off as a loss? If they decide to redesign the Web site, how would they know what needs to be fixed?

Likewise, in the third case, the president has data that the hits were doing down, but doesn’t know why. Efforts to redesign the site would be “shooting in the dark.”

Finding the Problems “In Public”

If there is a design problem in Webbie's site, it's going be embarrassing and inconvenient to find out about it "in public," when everyone is actually using the site. Even a small problem, like a confusing title on a critical link, can cause big confusion. When this confusion is multiplied by several hundred, or even thousands of, people a day, Webbie is going to be answering a lot of phone calls and mail messages. Although it might be tough for Webbie to test the new site and discover that a pet idea isn’t working out, it is far worse to make that discovery problem once the site is published, and advertised, and receiving visitors.
In the second case, the company may never recover the lost business at the Web site. Visitors there may not have been their regular customers who have been using phone and traditional catalog orders. Having been frustrated, these new visitors would not be likely to return anytime soon. Some of them may also wonder that if the Web site is so hard to use, would the products this company sells be any better? A Web site that doesn’t work could inadvertently become negative advertising for that business!

Remodeling the Site While It's Being Used

Once a site is published it can be time-consuming and difficult to make significant changes short of replacing the whole site.

In the third case, the college had a fairly large number of Web pages. A new design team was formed, after the president learned about the problems with the current site from the political science professor’s survey. The new design team created an entirely different information architecture. New Web pages with different names were created and linked together. This took another six months to do.

Not long after the new site was brought online, a number of new complaints started rolling in. Visitors who had managed to learn to find things in the earlier site were frustrated to find that their bookmarks no longer worked. Since it took them so long to find what they wanted in the first place, they made bookmarks in their Web browsers so they could directly visit the same pages again at a later time. Furthermore, others who were using commercial search engines (which still had pages from the old site in their indexes), would attempt to following links on the search results pages (to the old site) only to discover that those Web pages did not exist any more! Finally, current students and staff who worked at the college started complaining to the president about the new design, because they had to learn where things were “all over again.”

Problems Can Go Undetected Without Testing

Perhaps the worst outcome in the ad hoc development of a Web site is that problems could be driving people away from the site and no one discovers that it's happening. This probably happens more often than designers know, because the most common response users have to frustration in Web browsing is not to tell anyone about it, but to "vote with their feet," and go somewhere else. A study conducted at George Tech indicated that approximately forty percent of user mouse clicks were on their Web browser's "back" button (get citation from R695 study, fall 1997).

Users do not always think analytically about what caused them to feel frustrated, so they might not send a quick feedback form to say "the second-level navigation in this site was confusing." Frustration is usually a negative emotion, so frustrated users may not be concerned with giving helpful hints on improving the site – they may simply hope they don't have to visit that site again looking for anything.
The Way it Should Be Done: *Practical Web Development*

Figure 1 summarizes the way it can – and should – be done. This process is what this book is all about. We call it "*Practical Web Development*" – because if done well it will result usable and useful Web sites. We have used this approach ourselves to build successful Web sites and to help others do the same since 1993. We decided to write this book to share some of the lessons we have learned about *Practical Web Development*.

We didn't invent all the parts of this process. We adapted them from the processes many designers, including designers of instructional materials, computer software, office furniture, and even buildings, employ to ensure that the people who rely on their products will find those product usable and useful.

**Practical Web Development: A Systematic Process**

**Analyze Your Needs and Those of the Users**

Bring a group of people together from various parts of the organization to form a design team and create a working set of goals for the Web site. Use those goals to help identify the primary and secondary audiences for the site.

Dispatch a task group to find out what the primary and secondary audiences for the site are going to want in the way of information, and how those people get this information now. The task group should also try to identify problems people have getting this information now, and find out what is working well in the current non-Web systems people are using. The task group should report frequently to the rest of the design team as they work.

In order to find out what they need to know, the task group identifies the actual people who currently handle the appropriate information, asks those people questions, and records their answers. The task group sorts through the data they have gathered and assembles a proposed model of how the audience will view this site and how the information in the site will be organized. Assembling this model requires going through the data again and again, proposing many ideas and questioning them closely, and "closing in on" a model that seems promising.
Paper Prototyping and Usability Testing

The task group creates a set of paper pages, called a paper prototype, containing a sample of the content and structure they're proposing for the site. They recruit people who are potential members of the primary audience for the site, or users, and ask them to find the
answers to frequently asked questions using the paper prototype. As
the subjects use the paper prototype, members of the task group
("usability testers" at the moment) observe them, recording their
actions and their comments. The usability testers alter the prototype –
sometimes on the spot – and test it again until they have what looks like
a reasonable content organization for the site.

**Computer Prototyping and Usability Testing**

The task group transfers the tested paper prototype to electronic
form, calling in technical specialists to help if they need to. They add
any graphics and interactive functions that had not been part of the
paper prototype.

They conduct more usability tests, this time with the computer
prototype. They ask typical users to do the same kinds of tasks that
were done in earlier usability tests of the paper prototypes. They also
test the computer prototype with different computer platforms and Web
browsers – including a text-only browser.

They observe the users, recording their actions and comments just
as they did while testing the paper prototypes. They modify the
computer prototype in response to any problems, and then test it some
more.

**Building the Web Site**

Appoint a Webmaster (maybe the current "Webbie" in your
organization), and put that person in charge of publishing the site
directly on the Web. If there is a pre-existing Web site, leave it in place
and publish the new one at a different, temporary, address.

Put the published site through a period of internal and external
review, and make as many people in the organization as possible aware
of its existence. Let people know how the site was developed so that
your process doesn't degenerate into a contest of opinions. Look for
people who will be information providers to the site – those who will
provide needed content and provide continual updates to that content.
Expect new information providers to come forward when they
recognize that the site contains "holes," or places where their content is
needed but has not yet been contributed.

During this part of the process, the task group puts their assembled
editorial notes together into a coherent set of guidelines so that
everyone who will be a part of adding to the site from now on can help
maintain the structure that was developed through a user-centered
design process.

**Maintaining the Site**

The Webmaster and people designated to continue on the design
team (probably representatives of important stakeholders in the
organization) should monitor feedback from users and information
providers coming in through established links in the site and through
informal channels. This feedback will help guide ongoing small-scale
revisions to the individual pages of the site, or new sections added to it.
The design team should also be alert to the probability that this process
will start over within a year or so and result in substantial revisions to
the site.
User-Centered Design for the Web

What Is User-centered Design?

Although Practical Web Development is based in user-centered design, user-centered design is not just one particular process. It is a fundamental set of assumptions about the role of the designer and the role of the user in creating systems, products and services. As you work through the process in this book, it will help to keep some of those assumptions in mind:

- Users have a right to usable products and systems.
- Usefulness and usability are defined by the users, not designers.
- Designers are problem-solvers on behalf of the users.
- Users have a right to usable products and systems

Usability is not a privilege that is available only to those who have "put in their time" with an interface, or only to those who read the manuals from cover to cover, or only to those who can afford high-end computer systems and fast modems to surf the Web. Computer technology used to be so complex that people who wanted to use it had no choice but to put in long hours mastering the vagaries. Technology is still more complex than we might wish, but as designers we have many tools at our disposal to simplify the experience of those who use technology.

When people make mistakes repeatedly in using technology they are experiencing poor design, and the time they lose in recovering from errors or puzzling over what to do next is time taken away from the fruitful pursuit of their own goals. People have a right to expect that the design of a product will eliminate frustrations rather than causing them – no one should have to tolerate poor design.

Usefulness and Usability Are Defined by Users, Not Designers

Users tend to define usability as being able to pursue their own goals without having to spend more time than is absolutely necessary on any elements of the task not directly related to achieving their goals. Users do not define figuring out confusing page titles, puzzling over inaccessible links, or waiting for graphic files to download as good uses of their time.

It's tempting to consider users "lazy" when they define usability in these terms, but they are simply choosing to spend their best energy on their own tasks instead of spending it overcoming obstacles that we have inadvertently thrown in their way. Users of the Web do have a choice: to stay or to leave your Web site. They are in control of the mouse and keyboard.

Designers Are Problem-solvers on the Behalf of Users

In the user-centered design view, the goals originate with the user, and the designer facilitates those goals – largely through inquiry and problem solving. The focus of the user's activity is not on the designer's product, but on his own tasks; and the focus of the designer is on the user.
But Can User-centered Design, or *Practical Web Development* Guarantee a "Perfect" Web Site?

No. No matter what method you use to design a Web site, it won't be perfect. All the experts in the world couldn't produce a perfect site, and neither could a team using every user-centered design technique there is.

Why? There are some information design problems and interaction issues for which we simply don't have good solutions right now, and as computer technology continues to progress there will continue to be such problems and issues. In addition, every time you optimize a design for one audience or purpose, you compromise it for some other audience or purpose—and most Web sites serve more than one audience.

Today's excellent design may not be excellent tomorrow either. People's tasks and goals change, and the site that supported them a year ago may not be doing such a good job today. Web technology is advancing constantly, providing more capabilities but also more complexities, and no design can anticipate the changes that might be forthcoming. The expectations of our users rise as they gain experience with the Web. The focus of an organization can shift quickly, requiring that the underlying structure of its Web site do the same.

So, as Long as it Isn't Going to Be Perfect Anyway, Why Worry about Process?

Perfect vs. Usable and Useful

A site does not have to be perfect to be useful and usable. For example, if a site has something that no one else has and that many people want very badly, users may overlook or overcome severe problems with navigation, menu titles, and so on. Likewise, if a site is very easy to use, people may use it in preference to another one which is more difficult but more complete or useful. In either case, you probably want your audience to experience your site as both useful and usable, not to have to struggle with one dimension for the sake of the other. Your goal should be to balance these dimensions, doing your best on both.

Inevitable Problems vs. Avoidable Problems

*Practical Web Development* lets you discover which problems you can fix and which problems you may have to live with. A design that isn't perfect can still be very, very good. Find and fix the big problems in your site, and you increase the chance that your site will be very, very good.

You can find the problems that you will not be able to fix—missing content from information providers over whom you have no control, or browser interfaces that prevent easy interactions. And you can do something to mitigate those problems for your users, or at the very least warn your stakeholders that the problems exist and educate them about why the problems exist. Then at least the stakeholders won't be surprised and confused when complaints surface.
Where Do User-centered Design and Usability Come From?

Software developers began to worry about the difficulties users experience when they interact with computers very early in the history of developing software for non-technical users. In 1971 the term "ease of use" was proposed as a definition for usability (Miller), and by 1981 that definition had been amplified to "a measure of effectiveness, learnability, flexibility, and attitude" (Shackel, 1991).

Methods for anticipating usability problems, diagnosing the causes of them, and designing to prevent them have been evolving for two decades. Gould and Lewis of the IBM Watson Research Center identified simulation and prototyping as part of the usability process for software in 1983. By 1985 they had identified three major principles characterizing the software development process required to create usable products: (a) early focus on users and tasks, (b) empirical measurement, and (c) iterative design.

Between 1985 and the early 1990s discussions regarding the nature of usability proliferated, with more and more attention focusing on the practical issues of how to software development projects should be carried out to ensure the creation of usable products (Shackel, 1991; Dumas & Redish, 1993; Nielsen, 1994; Rubin, 1994).

From early efforts concentrated in R&D centers, the principles and practices of user-centered design and usability spread quickly to major software developers like Microsoft, IBM, Hewlett-Packard, Digital Equipment Corporation, and Apple. By 1989 these companies were building, or had built, usability laboratories (Dieli, 1989), and by 1990 the specialists working in those labs had formed the Usability Professionals Association (UPA). By 1999 the UPA counted 9,000 members from software companies, universities, research labs, government agencies, and a variety of other organizations in 22 countries.

What Are the Key Concepts Within User-centered Design?

In a study of usability specialists, (Miller, 1992) concluded that by then agreement was widespread on the fundamentals of system design for usability as:

- user-centered
- user-supportive
- experimental
- employing an iterative process

User-Centered

User-centered design involves users of the eventual product in the process of design, and places issues concerning users first in the list of priorities for decision-making. This kind of design may be compared to technology-centered design.

When technology is the center of the design process, decisions are often made on the basis of whether or not it is efficient to implement certain features from a programming perspective, and whether or not
certain aspects of the technology are popular or perceived to be cutting edge. Technology-centered design can lead to web sites optimized for high-end browsers that the sites' visitors do not have installed, web documents translated directly into HTML without being reviewed for their readability, and fancy Java scripts that crash users' computers.

When users are the center of the design process, decisions are made as much as possible on the basis of the anticipated impact they will have on the users' experience with the resulting product. Those decisions may lead to extra programming effort, or to the use of technology that is less than cutting-edge. In order to make such decisions, designers have to involve users in the process of design. That involvement may be by proxy, as it is when designers construct user-profiles and use those profiles to try out hypothetical features. Users may also be involved directly as participants in design try-outs, contributors to structured design activities, or collaborators throughout the design process.

**User-Supportive**

The design process must be extended beyond design issues alone if the resulting product is going to support users in completing their tasks. Design for usability must incorporate analysis of users and their tasks. Analysis determines what tasks users must do, how those tasks are done, and under what conditions users typically work. Analysis helps designers figure out what kind of experience users are expecting from a product, and what kinds of experiences they will accept. Analysis reveals the capabilities users already have and the ones they will need to have if they are to use a product effectively.

**Experimental**

Design for usability is design based on empirical data instead of opinion, speculation or principles alone. Opinion, speculation and principles share a common problem; none of them are based in the precise context of the design being created right now. All three can be a reasonable starting place for design. However, it is imperative to test design decisions directly in the context of the product under development to discover whether the general case has held true in the specific context. Often, they do not.

**Employing an Iterative Process**

Analysis, although important, provides only design direction and not usually explicit answers to specific questions. An iterative process is required to discover problems that cannot be predicted with accuracy before designs are tried out in the specific context for which they are intended. Software designs must also be experienced to be understood, so they must be tried out in some preliminary form or else the potential design problems in them will not be discovered until it is too late to change them. In an iterative process, designs are developed and tested through several passes, each one usually yielding a design more complete and more successful than the one before.

**Flexible Process**

Design for usability is not a single method, or a fixed process (Nielsen, 1994). Since design for usability emphasizes the specific
context in which a product is to be used, multiple methods for data collection and analysis are employed in order to carry out the development process successfully. Those methods are ordered in whatever way makes best sense for the product under development, although most projects do fall into a general pattern of analysis, prototype development and testing, implementation and evaluation. Within that pattern, however, designers may find themselves prototyping a product very early in the process in order to conduct some analysis of how users' tasks might react to a new product. Or they might find themselves conducting interviews with users very late in the process trying to determine which features will be missed the least if they were dropped from development.

Rubin (1994) points out that testing, or conducting specific usability studies, is only one component of user-centered design. He further breaks down testing into four main categories of tests: exploratory, assessment, comparison, and validation. Each type of test is appropriate for discovering different types of information applicable to different stages of the design and development process. The types of information required at various stages change depending on the nature and goals of the project and on the context in which the product will be used.

**Usability Sounds like Another Name for Formative Evaluation. Is It?**

Corry, Frick and Hansen (1997) explain that formative evaluation and usability testing share some key characteristics in that they both:

- Seek to discover the effectiveness of products or materials by trying them out with the target population
- Employ both experts and target users in their evaluations
- Collect data during design and development
- Employ an iterative process
- Use similar methods, including direct observation, think-aloud protocols, questionnaires, surveys, data logs and interviews

They go on to describe the main differences between formative evaluation and usability testing as being:

**Focus**

Formative evaluation usually focuses on effectiveness, often measured as learning gain, while usability focuses on the whole system and the users' experience with it

**Discipline of Use**

Formative evaluation has been discussed and conducted primarily in instructional technology, while usability testing comes out of technological product design, document design, and human-computer interaction.
Where Does the Process in this Book Fit into the Big Picture?

This book presents a particular subset of methods drawn from the many methods available. We have selected practical, general-purpose methods and sequenced them into a “typical” process that may be tailored to the individual needs of readers’ projects. The particular process we have chosen to describe is most applicable to web development for sites that offer primarily informational content vs. primarily marketing or entertainment content.

We have simplified the process on purpose so that you can follow it through the book a step at a time and make your own decisions about repeating a step or tailoring an activity to your own needs without having to wade through a hundred options in every chapter. We have also described both methods and process in such a way that you can use them immediately without waiting to become a specialist in user-centered design or usability methods. It is possible to make mistakes implementing these methods, but we have chosen methods that should yield valuable results even if they are not carried out perfectly.

By choosing to represent one path through the development of a web site, we recognize the possibility that readers may think we are advocating a single approach to designing for usability. We are not. We have included case studies throughout the book to help illustrate the variety of appropriate and valid options you have for choosing methods and process. We also encourage you to investigate additional resources for learning more about user-centered design. Once you understand the principles behind designing for usability, you can design many different useful studies in the context of different projects.

What Are the Major Trends in Usability Methods?

In summarizing the diversity in current usability practice, Madsen (1999) describes the direction that specialists are moving. Usability practice is becoming:

- less lab-centered
- less likely to emphasize neutral observation
- more likely to emphasize user participation in design
- more likely to include developers as trained participants in usability activities

Taken together, these trends suggest that the gap between developers and those who use their products is closing. Usability studies are moving into the field where users actually do their work and use products. Developers are working more and more directly with those who will have to live with their designs, and developers are becoming adept at usability methods themselves instead of relying on specialists to handle the whole process.

If you follow the process described in this book, you and those who may be working with you will come into contact with the eventual
users of your web site. You will experience the powerful difference such contact can make in your designs.

**Summary**

The process of *Practical Web Development* rests on the attitude that design revolves around the needs of the user, not the opinions of the designer. Many of us were not taught to design this way, and it can be difficult to make the change to this new way of thinking. But we have observed that once a team actually gets started using *Practical Web Development* the process itself helps to change our attitudes about design.

Give *Practical Web Development* a try. Start from what the users want and need. Test your design. Blame problems on the design and not the users. Fix the design and test it again. That's the approach we recommend.

**Where Can I Find More Information about User-centered Design Processes and Methods?**

For more complete descriptions of all usability methods, you can consult the resources listed here. We have chosen a few to get you started. As you explore, you'll find that there is a growing body of helpful information about usability.


The *Handbook of Usability Testing*, by Jeffrey Rubin, is an authoritative technical reference for a wide variety of methodologies.

The *Usable Web*, by Keith Instone, is a regularly updated Web site with multiple views of links about human factors, user interface issues, and usable design specific to the World Wide Web. See URL: [http://www.usableweb.com](http://www.usableweb.com)

*What else should we add here?*

**References**


