Online Documentation: The Next Generation

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Information delivered through the computer means many things today. You may embed online help within the software applications you develop, deliver online documentation on CD-ROMs or floppy disks, or establish information databases to be accessed through a company intranet or on the World Wide Web. Some companies distribute nearly all of the information users receive in electronic form rather than as paper manuals. They save the cost of printing and shipping the manuals. Users get the problems of navigating the current crop of online information to use the application software.

The current generation of online information leaves much to be desired from the perspective of the end-user. Certainly, effective online information is out there, designed for quick access and structured so that a user's questions are anticipated. But we find too often that online information is badly designed and inappropriately written.

The most serious problems arise in two ways. First, some organizations simply put their old legacy manuals online. These manuals were designed and written for paper. They work all right if users take the time to print and bind them

themselves, or at least they work as well as the old paper manuals worked. The development organization has simply transferred the cost of printing and binding to the customer.

Second, other organizations reconstruct the online help and documentation into WinHelp, Microsoft's tool that links help files to any *Windows* software application. However, they often reconstruct the online information without sufficient understanding of the types of information users are looking for. In addition, the information may be poorly organized, making navigation difficult. Users searching for information often become frustrated with the lack of appropriate content and the difficulty of finding the information they need.

We can no longer assume that information written for paper can be transferred without change into online forms, nor should we assume that the paper documents were themselves effective. The next generation of online help and other forms of electronic information delivery provides us an opportunity to complete rethink how end-users learn to use application software to do their jobs. Using new design methods, we have the opportunity to provide information that is more useful, less frustrating, less voluminous, and less expensive. If development organizations employ the services of experienced online-information developers and those developers know and use the principles of minimalist design, we can solve many of the problems endemic in today's software documentation and deliver information electronically at the same time.

Using minimalism to develop effective online information

Minimalist design follows the principles originally developed by Dr. John M. Carroll, formerly with IBM's Watson Research Laboratory. Today, those principles are being promoted by other leaders in the field of information design. The principles are simple:

- focus on the user's needs
- ensure ease of access to the right information
- provide just the right words and graphics to ensure successful performance
- emphasize troubleshooting and correcting mistakes
- provide for both novice and expert users through layering

But like any principles founded on a strong understanding of users, minimalist design requires that information designers work closely with users to ensure that their information needs are thoroughly investigated and understood.

Many users tell us that they can't find the information they need in the documentation. In fact, the documentation, whether in paper or online, seems to concentrate more on the intricacies of the product than on answering users' questions. In our research on the usability of online help systems, we often find that unsuccessful documentation focuses on the underlying system rather than the users' needs.

Take, for example, the documentation that came with a cellular phone I bought a few years ago. I travel a great deal, consulting, developing, and teaching workshops on information design. I use a cellular phone to make calls back to the office and to clients, using my long-distance access number. My company bought me a phone that would let me store and recall the 800 number, punch in my access code, and dial the phone number.

Here is the section of the manual that is supposed to explain how to program the phone to dial the access code:

DTMF Tones

During conversation mode, depressing digit keys will send the corresponding DTMF signals

To send a string of DTMF signals while in conversation mode, enter the digits into the display and then press "FCN" + "SND".

For example, if you recall a number programmed with a pause between the telephone number and numbers to be sent as DTMF signals, press "FCN" + "SND" at the pause. The numbers after the pause will be in DTMF format.

Only after talking to a telephone engineer was I able to discover that DTMF tones applied to the task I wanted to perform. Please don't ask what DTMF means—I keep forgetting because it isn't that important to me. To this day, I still can't figure out how to use the DTMF tone function. The instructions appear to be written by an expert and assume that I know all about the inner workings of cellular phones, something I am much too busy with my own work to even want to learn.

Such documentation is typical of an organization that has its development engineers write the manuals. It focuses on the inner workings, the system functions, rather than on what the users want to do. The user seeking procedural help is often not interested in reading information about the underlying structure and logic of the software.

Effective online information focuses on the user

Well-designed and -written online information focuses on the users and what they are trying to do. To develop effective online information, designers must meet the users, watch them doing their jobs, listen to the kinds of questions they ask about the software, and learn how they think about what they are trying to do.

To write effective documentation for the cellular phone, the information designer needs to know that the users want to dial an 800 number and then punch in an access code. Consequently, the designer might write something like the following:

> **Making credit-card calls automatically**
>
> Many credit-card calls require that you enter an access code after you have dialed an 800 number.
>
> To enter an access code automatically, you must store it using the same instructions for storing frequently dialed numbers.
>
> When you want to send your access code, simply recall it from storage and then press **Function Send.**

Since I don't work for the cell phone company, I can't guarantee that these instructions are correct. However, I could follow these instructions because they are written in language I understand.

If we design and write online information with a user focus, rather than a system focus, our users will be able to recognize answers to their questions and points of confusion in the instructional and reference material.

Effective online information focuses on ease of access

Having the right information written in language that the users can understand will go a long way toward improving the quality of the current generation of online documentation. However, the right content is not enough. In many online information systems, the right information is nearly impossible to find. Unless they must look through many volumes of documentation, many people actually find the paper manuals easier to use. Not only can they see what is on your current page, they can see the whole book at one time. By looking at the table of contents, flipping pages, or searching the index, they can usually find the information they need if it is there.

Not so with online information. Unless the information developers have created a consistent and thoughtful structure for the help topics, provided a detailed, expandable table of contents, developed index and full-text searches, and given users a way to flip through topics with a browse sequence, they may never find a topic they need, even if it is there. With most online information available today, users can view only one topic at a time. Users find themselves going through menu after menu of obscure choices before

getting to a topic, only to discover that it doesn't contain the information they need. Sometimes, the only alternative is to start over at the main menu.

Even the search mechanisms in much online information can be difficult to use. If the information has not been thoroughly indexed with lots of synonyms, you may get a series of frustrating "no information found" messages. Even the full-text search may produce hundreds of hits rather than the one relevant topic you are looking for.

Effectively designed online information can be accessible if it is designed with user access in mind. The rule of thumb that I use in my designs reads:

"The user should use no more than three clicks to reach relevant information."

To follow the "three clicks" rule requires that the information designer create a shallow system with a thorough and always-visible table of contents, a thorough index with lots of related words, and a full-text search that leads users through a series of decision points to find what they need.

To aid access to relevant information, the designer must create context-sensitive links to the software application itself. If the user needs information about how to complete a particular field or choose a radio button or check box, that information should be immediately available through some form of "bubble" or "balloon" help. If the user needs information about what to do next, the designer should organize the information according to the most typical workflow. If the user finds graphic information more accessible, the designer should provide a pictorial view of the system with graphic hotspots on the illustration.

Effective online information supports performance

When paper-based information is simply "dumped" online, the user often feels inundated by too many words. Paragraphs that looked readable on paper become unreadable on screen. Information that once occupied two or three

pages now appears in bottomless scrolling text with no end in sight.

Minimalist principles suggest that less information, not more, helps people perform tasks most quickly and easily. Short sentences, step-by-step instructions, brief explanations all help people skim the instructions and get on with the task. They spend less time reading and more time doing.

If users need more than quick job aids, then effectively designed online information presents more information through hypertext links and layering. As the first line of information, the users' needs may be addressed through "cue cards" that sit on top of the appropriate application screen. Such cue cards can even assist the users in performing the task by interacting directly with the software. If the designer includes interactive help screens, the users can select an icon or push a button that performs part of the task for them.

Effective online information emphasizes troubleshooting

Users tell us that the information they most need is information that helps them correct mistakes and get out of trouble. In many cases, something has happened in the software that the users don't understand. They would like to ask "What happened?" and have the online help respond appropriately.

Well-designed online information answers the critical question "Why?" Ideally, the designers have identified the most likely problems that will occur for ordinary users and provided solutions and troubleshooting tips.

Effective online information clusters information for different user types

Users differ in their information needs. Experts are looking for help performing more complex tasks, while beginners want help with the basics. Experts want in-depth explanations of how the software works, while beginners only want to complete a task as quickly as possible.

When information is well structured for a range of user types, then users can move from simple step-by-step instructions to detailed background information to examples and demonstrations,

even to overviews and discussions of concepts. Tools like Windows Help and other hypertext-based systems often allow designers to create layers of information around a central help topic. Users can access pop-up definitions of terms without leaving their help topic. They can get more help to perform difficult steps in a procedure by linking to an expanded step. Experts can click on buttons that bring up in-depth explanations; beginners can ask for demos or examples of how a particular function will meet their needs.

A rich information architecture based on clusters of information can enhance the users' options and allow users to perform tasks more effectively.

Minimalism summarized

The injunctions of a minimalist approach focus on the need to plan help that is genuinely helpful. To do so is not as simple as it sounds. Good information design begins with the design of a user-centered interface. Information designers recognize that the interface contains information that enables people to learn and perform actions and reach their goals. But the information does not stop with the interface. As human-performance specialists, we know that users have different information needs, that novices do not have the same needs or interpret information in the same way as experts.

Types of online information

The design of effective online information starts with the interface and then moves on to context-sensitive help; procedural, conceptual, reference, and instructional information; interactive multimedia tutorials; and more. These online information types are described in the next section.

Beginning with the user interface

The next generation of online documentation will begin with the user interface. The interface provides information directly to users through text, graphics, and icons. It also provides information indirectly, through the arrangement of the screen objects and the workflow encouraged by the sequence of events supported. The interface is, however, just the beginning. More extensive online information is already being included as part of the interface in the form of wizards, coaches, and guides. Apple Guide, for

example, provides users the ability to work within the help system to accomplish tasks. The wizards included in parts of Microsoft Office provide step-by-step instructions inside the application software. The line that many developers perceive between the interface and help has becoming increasingly fuzzy.

Adding bubble help

The institution of bubble or balloon help has enabled information designers to include a second level of information to support user tasks. If the name of a function is unclear, if the icons are indecipherable, then the user can request help that answers questions such as

"What is this?"
"What do I do with this?"
"What information do I enter here?"

The questions are answered in the context of the functions; the information is immediately at hand, rather than buried in a paper user manual or somewhere in the online manual. Many users have come to view the immediate help available on the screen as simply an extension of the interface, another level of information.

Creating context-sensitive procedural help

The next level of information comes with context-sensitive help. Although bubble help is itself context-sensitive, we generally refer to more extensive step-by-step instruction as providing the core of context-sensitive help. This type of help addresses the critical user questions of

"How do I . . . ?"

In the current design of most help systems, users must initiate the call for help. What they most often expect to receive in response is procedural help, explaining how to complete tasks and reach relevant goals. For example, if users want to set the tabs in the cells of a table, they should be able to find step-by-step procedures for performing this task in the online help.

With context-sensitive procedural help, the user can find appropriate step-by-step procedures for the task at hand because the help designer has anticipated the user's questions. The designer has

looked at the content of the interface and decided what type of help might be needed by someone finding himself in this part of the software. The success of context-sensitive help depends heavily on the ability of the designer to anticipate the user's need for information in a particular context.

A very few help systems attempt to trace the keystrokes that the user has made in an effort to better anticipate the help needed. In general, however, such systems have been unsuccessful because it has proven extraordinarily difficult to relate a series of keystrokes to a user problem.

Procedural help can also be accessed by the user through a variety of mechanisms provided in most help systems today, including tables of contents, full-text search, index, and other implementations of keyword searches such as Microsoft's Answer Wizard in Windows 95. Once again, the user initiates the search for procedural help by searching through index entries or tables of contents or by manipulating a request through a search system.

Including conceptual, background, and reference information

In addition to procedural information, users may be interested in reading conceptual, background, and reference information, most of which can be provided in some electronic form. Reference information is especially well suited for online use. The information describing UNIX commands, for example, has long been available online through the MAN pages.

Conceptual information is somewhat less successful on line. Many users prefer to read conceptual information carefully and at leisure. They want to be able to take home a book about the problem they are trying to solve. The book, however, can be distributed electronically, available for on-demand printing and updating through a web site.

We also have the opportunity with fully integrated information to provide what has been often thought more traditionally regarded as training. Online tutorials, interactive multimedia training, and web-based training can be included in the context of the software interface. One system, for example, provides users with a help

icon to access the help system and with a tutor icon to access the computer-aided instruction (CAI). Demonstrations and interactive tutorials can also be embedded within the help system itself. In addition to accessing procedures and conceptual text, users can decide to try an interactive example. Apple provides such a system in the Macintosh Guide, which will actually perform a step in a procedure, such as selecting a menu item or opening a dialog box if the users cannot figure out the step for themselves. In Windows 95™, users have the option of asking the help system to locate and open a dialog box.

It is also possible to associate a help system with an online training simulation. In one application, we used the actual context-sensitive help from inside a CAI simulation. In other designs, we have layered information so that the users have many choices depending on their information needs. From a procedural help topic, they might select a pop-up definition, a conceptual overview, an annotated example, an interactive tutorial, or many of the myriad possibilities available to the information designer.

Moving into the next generation

All of these methods of providing help and information to the users from the interface through interactive multimedia add up to a system that supports the performance of users from novices to experts. Performance-support systems integrate many types and levels of information into the interface, allowing users to find the level of support that best suits their needs. In fact, much of the discussion of performance support in the second half of the 90s is about the design of user-centered supportive interfaces and functionality.

Today, we are extending information design and performance support from the application and the CD-ROM to the Internet and the intranet. Both Netscape and Microsoft have begun to provide functionality that allows designers to link applications to web pages. The web pages can be designed to provide procedural, conceptual, reference, and instructional help. They might also be designed to enable links to people-based customer support. Customer support is, in turn,

supported by electronically based information constructed in databases (knowledge bases) and around frequently asked questions (FAQs).

What should we look for in information design in the next generation, over the next five to ten years? I hope that we will see increasingly sophisticated interface designs that support user workflow and are more successful in anticipating user problems and questions. In a recent interview with Austin Henderson, which appeared in *Common Ground*, the quarterly publication of the Usability Professionals' Association, I described Henderson's work at Xerox PARC (Palo Alto Research Center) and now as manager of the Discourse Architecture Lab, part of Apple Research Laboratories. He discussed the need for developers to be much smarter about accommodating application design to users. He would like to see more anticipation of user problems and the design of systems that can initiate help by creating a dialog with the users. Such a dialog helps create a more custom response to individual users or users working in the context of an organization and its requirements.

Many of us in user-centered interface design have predicted for some time now the demise of large, multi-functional software tools in favor of more specifically designed, customized applications. We are finally seeing this prediction come to fruition with the development of applets for the internet, which are small applications used for very specific purposes. The applets can be customized to the needs of users in specialized work environments. To develop such focused applications will, however, require considerable understanding of the users, tasks, and environment. The information needed by users to understand what they are doing and how to use the application will come from their environment and the information built into the interface and help.

The next generation of online information will depend, in part, on these advances in technology. However, technological advances will not improve usability or help us develop strong design methods. For online information to succeed will require superb design—or the information we disseminate electronically will simply add to the information glut.