UNIT-V

User Documentation and Online Help: Introduction, Online Vs Paper Documentation, Reading from paper Vs from Displays, Shaping the content of the Documentation, Accessing the Documentation, Online tutorials and animated documentation, online communities for User Assistance, The Development Process

Introduction

Modern interactive systems are expected to provide online help, online manuals, and interactive. tutorials to serve user needs for training and reference. In fact, as displays appear in cars, phones, cameras, public kiosks, and elsewhere, ubiquitous online help should be the norm.

Even though increasing attention is being paid to improving user-interface design, the complexity and diversity of interactive applications are also growing.

There will always be a need for supplemental materials that aid users, in both paper and online forms. Some of the many forms of traditional paper user manuals are:

• ***Installation manual*** with step-by-step instructions to set up an application

• ***Brief getting-started notes*** to enable eager first-time users to try out features

• ***Introductory tutorial*** to explain common features

• ***Thorough tutorial*** that covers typical and advanced tasks

• ***Detailed reference*** *manual* with all features covered

• ***Quick reference*** *card* with a concise presentation of the syntax

• ***Conversion manual*** that introduces the features of the system to users who are knowledgeable about a similar system or previous versions of the same system.

There are also diverse ways of providing guidance to users online. Most forms of paper manuals now exist online, but popular variations include:

• ***Online manual:*** An electronic form of comprehensive paper manuals that cover the interface features. Online manuals make the text more readily available, searchable, and up-to-date, but they may be difficult to read, annotate, and absorb.

• ***Online help:*** Brief descriptions of specific topics to help users cope when problems arise. Online help can provide indexes of terms, keyword searches, step by-step guidance, and access to complementary web information.

• ***Context-sensitive help****:* User-controlled interactive help, ranging from simple balloon help explaining objects to system-initiated assistants that monitor users' activities and provide relevant information

• ***Online tutorial****:* An online training environment that uses electronic media to teach novices by explaining objects and actions through textual descriptions, graphical imagery, and interface screen grabs. The scope of the tutorial can vary greatly, from brief two-minute introductions to week-long computer based training courses.

• ***Animated demonstration****:* Appealing animated graphics presented as a slide show, series of screen captures, or well-produced video engage users and show the actual interface, often with verbal explanations.

• ***Guides****:* Audio or video recordings of authoritative personalities or animated characters who provide introductions or focused segments that cover key topics.

Online Vs Paper Documentation

There are many reasons to have online manuals include:

• ***Physical advantages:***

• Information is available whenever the information appliance or computer is available. There is no need to locate the correct manual.

The harsh reality is that many users lose their paper manuals or do not keep them current with new versions of the software.

• Users do not need to allocate physical workspace to opening up manuals. Paper manuals can be clumsy to use and can clutter a workspace.

• Information can be electronically updated rapidly and at low cost. Electronic dissemination of revisions ensures that out-oi-date material cannot be retrieved inadvertently.

• ***Navigation features***

• Specific information necessary for a task can be located rapidly if the online manuals offer indexes, tables of contents, lists of figures, glossaries, and lists of keyboard shortcuts.

• Searching for one page in hundreds can usually be done much more quickly on a computer than in a paper manual.

• Linking within texts can guide readers to related materials; linking to external materials such as dictionaries, encyclopedias, translations, and web resources can facilitate understanding.

Interactive services

• Readers can bookmark and annotate the text and send text and annotations by e-mail.

• Authors can use graphics, sound, color, and animations that may be helpful in explaining complex actions and creating an engaging experience for users

• Readers can turn to newsgroups, list servers, online communities, e-mail; chat, and instant messaging for further help from other users.

• Blind users (or busy users on the move) can use screen readers and listen to instructions.

• ***Electronic advantages***

• Online manuals are cheaper to duplicate and distribute than paper manuals.

However, these advantages can be compromised by potentially serious negative side effects:

• Displays may not be as readable as paper manuals.

• Each display may contain substantially less information than a sheet of paper. The display resolution is also lower than that for paper, which is especially important when pictures or graphics are used.

• The user interface of online help systems may be novel and confusing to novices. By contrast, most people are thoroughly familiar with the "user interface" of paper manuals.

• The extra mental effort required for navigating through many screens may interfere with concentration and learning, and annotation can be difficult.

• Splitting the display between work and help or tutorial windows reduces the space for work displays. If users must switch to a separate help or tutorial application, the burden on short-term memory can be large. Users may lose the context of their work and have difficulty remembering what they read in the online manual. Large displays provide a potential resolution for this problem for desktop applications.

• Small devices such as cell phones do not have enough display space to provide online help. They usually have to rely on paper manuals or separate web-based online manuals and tutorials.

Reading from paper Vs from Displays

The paper surface and color, the typeface, character width, letter sharpness, text contrast with the paper, width of the text column, size of margins, spacing between lines, and even room lighting all have been explored in efforts to produce the most appealing and readable format.

In the last 50 years, the cathode ray tube (CRT), called the *visual display unit* (VDU) or *tube* (VDT), became the alternate medium for presenting text. Early concerns about CRT radiation or other health hazards have lessened as manufacturers, labor unions, and government agencies. The liquid crystal displays (LCDs) not only eliminate radiation, but their designs consume less physical space.

Numerous studies have found proofreading of text on computer displays, compared to on paper. The potential disadvantages of reading from displays include these:

• ***Fonts*** may be poor, especially on low-resolution displays. The dots composing the letters may be so large that each is visible, making users expend effort to recognize characters. Monospace (fixed-width) fonts, lack of appropriate kerning (for example, adjustments to bring "V" and "A" closer together), inappropriate inter-letter and interline spacing, and inappropriate colors may all complicate recognition.

• ***Low contrast*** between the characters and the background and *fUZZY character boundaries* also can cause trouble.

• ***Emitted light*** from displays may be more difficult to read by than reflected light from paper; glare may be greater, *flicker* can be a problem, and the *curved display surface* may be troubling.

• ***Small displays*** require frequent *page turning;* issuing the page-turning commands is disruptive, and the page turns are unsettling, especially if they are slow and visually distracting.

• ***Reading distance*** is easily adjustable for paper, while most displays are *fixed* in place, and display *placement* may be too high for comfortable reading (optometrists suggest reading be done with the eyes in a downward-looking direction). Users of tablet computers and mobile devices often hold their displays in a lower position than desktop displays, to facilitate reading.

• ***Layout and formatting*** can be problems-for example, improper margins, inappropriate line widths or awkward justification (left justification and ragged right are recommended). Multicolumn layouts may require constant scrolling up and down. Page breaks may be distracting and waste space.

• ***Reduced hand and body*** *motion* with fixed-position displays, as compared to paper, may be more fatiguing.

• ***Unfamiliarity of displays*** and the *anxiety* of navigating the text can increase stress.

Shaping the content of the Documentation

Training and reference materials for computer systems were paper manuals. Writing these manuals was led by junior member of the development team as a low-effort task at the end of the project. As a result, the manuals were often poorly written, delayed or incomplete, and were tested inadequately.

The benefits of well-designed manuals include shorter learning times, better user performance, increased user satisfaction. "Good online documentation is better than poor paper documentation and good paper documentation is better than poor online documentation."

Towards minimal manuals

Learners are actively engaged in trying to make the system work, to read portions of the manual, to understand the displays, to explore the functions of keys, and to overcome the many problems that they encounter. The "active user paradox" states that users' eagerness to conduct meaningful activities often stops them from spending time "just" learning, and therefore their skills remain mediocre. Learners apparently prefer trying out actions on the computer, rather than reading lengthy manuals. They want to perform meaningful, familiar tasks immediately and to see the results for themselves.

They apply real-world knowledge, experience with other interfaces, and frequent guesswork. The image of the new user patiently reading through and absorbing the contents of a manual is rare in reality.

These observations led to the design of *minimal manuals* that anchor the tool in the task domain, encourage active involvement with hands-on experience as soon as possible, promote *guided exploration* of system features, and support error recognition and recovery.

Users benefit from seeing typical queries that demonstrate the syntax and serve as templates for other queries. In fact, complete *sample tasks* and *interaction sessions* are extremely helpful in giving a portrait of the interface features and inter action style.

Visual aspects are helpful to readers, especially, with highly visual direct manipulation interfaces and graphical user interfaces. Viewing numerous well-chosen screen prints that demonstrate typical uses enables users to develop an understanding and a *predictive model* of the interface. Often, users will mimic the examples in the manual during their first trials of the software.

Use of the OAI model to design manuals

The object-action interface (OAI) model offers learning process and provide guidance to instructional-materials designer.

They are equipped to learn about the interface representations. The instructional materials should start with familiar objects and actions in the letter-writing task, link these concepts to the high-level interface objects and actions, and then show the syntax needed to accomplish each task as shown in below diagram.

Knowledgeable users who understand the task and interface can move on to expert levels of usage with shortcuts that speed performance. Some users are complete novices, while others are knowledgeable about the task (letter writing or word processing) but must learn a new tool (word processor).

These users need a presentation that shows the relationship between the metaphors and plans they know and the new ones-these metaphors and plans are becoming increasingly standard across word processors, but the dialog boxes, clicks, and keystrokes may vary. Finally, some users will have learned the task and interface objects and actions but be unable to recall details of how to convert their plans into specific actions. These three scenarios demonstrate the need for three popular forms of paper manuals: the *introductory tutorial,* the *conversion manual,* and the *quick reference*.

The OAI model can also help researchers to map the current levels of knowledge in learning systems.
For example, users who are learning about database management systems for US.

Many users will work through these sessions to verify their understanding, to gain a sense of competence in using the interface, and to see whether the interface and the manual match. Another helpful guide to using a system is an overall *flow diagram* of activity as shown in below.

Organization and writing style

Designing instructional materials is a challenging endeavor. The author must be knowledgeable about the technical content; sensitive to the background, reading level, and intellectual ability of the reader; and skilled in writing lucid prose.

Assuming that the author has acquired the technical content, the primary job in creating a manual is to understand the readers and the tasks that they must perform. A precise statement of the *instructional objectives* is an invaluable guide to the author and the reader. The sequencing of the instructional content should be governed by the reader's current knowledge and ultimate objectives. Precise rules are hard to identify, but the author should attempt tell present concepts in a logical sequence in increasing order of difficulty, to ensure that each concept is used in subsequent sections, to avoid forward references, and to construct sections that contain approximately equal amounts of new material.

In addition to these structural requirements, the manual should have sufficient examples and complete sample sessions. Within a section that presents a concept, the author should begin with the reason for covering the concept, describe the concept in task-domain semantic terms, then show the computer-related semantic concepts, and, finally, offer the syntax.

Writing style should match users' reading ability. Subjects of a study on learning performance and reading ability used a tutorial written at the fifth-, tenth-, or fifteenth-grade reading level. Higher reading ability led to significant reductions in the completion time and number of errors and to higher scores on a concepts test. Increased complexity of the writing style did not lead to significant differences on the performance variables, and subjective preferences significantly favored the fifth-grade version. Subjects could overcome the complex writing style, but the authors conclude, "The most sensible approach in designing computer dialogue is to use the simplest language."

Accessing the Documentation

Online Manuals and Help

In spite of improvements, however, most users avoid user manuals and prefer to learn interface features by exploration. Even when problems arise, many users are reluctant to consult written documentation. Hence, designers have begun to explore new ways to provide help besides traditional user manuals.

Kearsley offers examples of online help with empirical data about usage, and these guidelines:

- Make the help system easy to access and easy to return from.
- Make online help as specific as possible.
- Collect data to determine what help is needed.
- Give users as much control as possible over the help system.
- Supply different help for different types of users.
- Make help messages accurate and complete.
- Do not use help to compensate for poor interface design.

Standard formats such as WinHelp and Windows HTML Help have stimulated development of a growing number of software tools, such as RoboHelp and help MATlC Pro. These tools facilitate coordination among teams of authors in creating interactive online help in multiple formats for multiple platforms.

Online manuals

Most manufacturers now put their user documentation online. The low production and shipping costs of CD-ROMs first encouraged hardware suppliers to produce online manuals that were exact images of the paper manuals. Apple put its six-volume *Inside Macintosh* series for developers onto a single CD-ROM with scanned images and hypertext links.

Another Apple innovation was to create a CD-ROM guide for interface designers with more than a hundred animations of poor, good, and better designs. Modern designs assume that online manuals or web-based manuals will be available, usually with standard browsing interfaces to reduce learning effort. For mobile devices, small displays limit the possibilities, but providing helpful instructions on the device to complement printed user manuals should still be a priority.

Although they are generated from the same source document (usually an XML document), online manuals now tend to differ from paper manuals in many ways. Online manuals can benefit from all the physical advantages, navigation features, and interactive services mentioned in. On the other hand, paper manuals have traditionally housed supplementary local information that is often written in margins or included on slips of paper stuck in at the appropriate pages.

Online manuals that allow for local annotations, synonyms, or translations have enhanced value. Additional desirable services include bookmarking and automatic history keeping that allows backtracking. Designers 'will be most effective when they design online manuals to fit the electronic medium and take advantage of text highlighting, color, sound, animation, and especially string search with relevance feedback.

A vital feature for online manuals is a properly designed table of contents that can remain visible to the side of the page of text. Selection of a chapter or other entry in the table of contents should immediately produce the appropriate page on the display.

Online help

Online help offers concise descriptions of the interface objects and actions is probably most effective for intermittent knowledgeable users; it is likely to be less useful for novices who have more need for tutorial training. The traditional approach of users is type or selects a help-menu item and to display a list of alphabetically arranged topics for which there is a paragraph or more of helpful information that users can read. This method can work, but it is often frustrating for those users who are not sure of the correct term for the task they wish to accomplish. They may see several familiar terms (search, query, select, browse, find, reveal, display, info, or view) but not know which one to select. Worse still, there may not be a single command that

accomplishes the task, and there is usually little information about how to assemble actions to perform tasks, such as converting graphics into a different format.

Sometimes simple lists-for example, of *keyboard shortcuts, menu items,* or *mouse shortcuts-can* provide the necessary information. Each item in the list might have an accompanying feature description. However, many designers recognize that such lists can be overwhelming and that users usually want guidance for accomplishing their specific intended tasks (for example, printing on envelopes).

Users expect to be able to search through the full text of online documentation. In one approach, an expanding and contracting table of contents was combined with string-search capabilities and relevance feedback indicating the number of "hits" on the table-of-contents listing. A series of three empirical studies showed the effects of several improvements to the online documentation and compared it with the paper version. Use of the electronic version was advantageous, especially when the search queries contained words that were in the document headings or text. Browsing strategies were found to be most effective, but search by keywords proved to be a useful complement.

Context-sensitive help

The ability to provide context-sensitive information is a powerful advantage of online help systems. The simplest way to take context into account is to monitor the cursor location and provide helpful information about the object under the cursor. This form of user-controlled interactive object help is readily understandable to users and even fun to use. Another approach is to provide system initiated help called “intelligent help” that tries to make use of the interaction history, a model of the user population, and a representation of their tasks to make assumptions about what users need.

User-controlled, interactive object help a simple approach to context sensitive help is based on the interactive widgets in the interface. Users position the cursor on a widget (or other visible interface object) and then press a help key or remain still for a couple of seconds to produce information about the object on which the cursor is resting. In a common version of this technique, users simply move the cursor to the desired location and hover over the object, causing a small pop-up box to appear with an explanation of that object shown below. A variant consists in turning on all the balloons at once, so that users can see all the explanations simultaneously. Another approach is to dedicate a portion of the display to help, which is updated automatically as users hover over or select interface widgets as shown below.

User-controlled help can also be used for objects more complex than widgets, such as control panels or forms. System-initiated help by keeping track of user actions, some researchers believe that they can provide effective system guidance, such as suggesting that users should redefine their margins since they are indenting every line.

The researchers prepared messages for expected error conditions, but they found User-controlled help can also be used for objects more complex than widgets, such as control panels or forms.

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Hybrid approaches more recently, intelligent help advocates have promoted a mixed-initiative approach in which initiative is shared between the user and system and an advice-giving approach. Many users considered the paper clip so intrusive that they immediately turned it off.

Online tutorials and animated documentation

An online tutorial is an interactive training environment in which users can view explanatory descriptions of user-interface objects and actions, often tied to realistic task scenarios. There are many approaches to the use of electronic media to teach users how to master an interface. Depending on the

complexity of the interface and the amount of time users are ready to spend absorbing the tutorial materials, they might be served well by an extensive computer-based training module, an animated demonstration of features, or a recorded welcome message by a familiar person. It reviews a range of online possibilities, from textual and graphical tutorials to animated demonstrations and guides.

A more ambitious approach to training is based on a complex model of learning patterns tied to carefully designed educational tutorials that guide users and correct their mistakes. These have demonstrated impressive outcomes, but the success stories are based on years of development, testing, and refinement. The successful designs provide clear challenges, helpful tools, and excellent feedback. They do not depend on natural-language interaction, but rather provide users with a clear context in which to work and control their learning experience.

Online tutorials

One introductory tutorial for the Adobe PhotoShop package displays the exact steps users must make, and then shows the actions being carried out using a recorded demonstration. Users just keep pressing the space-bar key to speed through the demonstration. Some users find this guided approach attractive; others are put off by the restrictive sequencing that prevents errors and exploration.

In contrast, Adobe's PhotoDeluxe includes an online tutorial that leads users through the multiple steps needed for graphical image manipulation.

The opportunity for carrying out *practice tasks* as part of online tutorials is one of their greatest strengths. Getting users to be active is one of the key tenets of the minimal-manual approach, and it applies especially well to online tutorials. One study of hands-on practice methods for learning software compared free exploration, exercises, and a combined format consisting of an exercise followed by free exploration. The type of practice did not affect the performance of the low experience subjects, but the performance of high-experience subjects significantly improved when they were trained using exercises.

Creators of interactive tutorials must address the usual questions of instructional design and also the novelty of the computer environment. Sample documents for word processors, slides for presentation software, and maps for geographic-information systems help users to experience the applications. Repeated testing and refinement is highly recommended for tutorials.

One attractive variant is the start-up tip: Each time users start the interface, they get a pop-up box displaying a brief explanation of a feature. Some systems monitor user behavior and show start-up tips only for features that are not used by this particular user.

Animated demonstrations

Animated demonstrations have become a modern high-tech art form. Manufacturers originally designed them mostly to attract potential users of software or hardware by showing off system features using the best animations, color graphics, sound, and information presentation that advertising agencies can produce. Those demonstrations focus on building a positive product image.

More recently, demonstrations have become a standard technique to train users as they work. The focus is on demonstrating step-by-step procedures and explaining the results of the actions. Automatic pacing or manual control satisfies hands-off or hands-on users, respectively. Additional control to allow users to stop, replay, or skip parts adds to the acceptability.

An animated demonstration can be prepared as a slide show, a screen-capture animation, or a video recording of a person using the device. A slide show might be appropriate for form-fill-in or menu-based interfaces, but animation is preferable to demonstrate direct-manipulation interactions such as drag-and-drop operations, zoom boxes, or dynamic-query sliders. A screen-capture animation is easy to produce with standard

tools such as Camtasia. These recordings can then be saved, possibly annotated or narrated, and then replayed automatically by users. In our own explorations, we found that users appreciated the recorded voice explanations, which make the demonstrations livelier and lead to more compact demonstrations; however, providing scripts and subtitles is necessary to address the needs of users with disabilities. Also, a video recording of a person using the interface can help clarify how special hardware is to be used-for example, to demonstrate the two-handed operation of a drawing system or the unfolding of a telephone keyboard accessory.

Animated demonstrations have been shown to be more effective at conveying the purpose and use of a tool than static explanations. Users have also been shown to be faster and more accurate to perform tasks after being shown animated demonstrations rather than textual explanations. Surprisingly, however, the time and error effect was reversed after a week, showing limitations to the benefits of using animations as teaching tools. The authors suggest reinforcing the animations with textual explanations. Segmenting the animations may also help comprehension and retention. Other studies show that the benefits of animations for learners may not be clear, but that users usually enjoy this presentation style.

Integrating the help facility by building overlays with *sticky notes* in which tasks such as searching for or annotating a photo could be demonstrated *by* a sequence of three to five sticky notes. The sticky-note approach was also useful to help users get started

Dynamap's multilayered design allows novices to start with a simple interface consisting of only a map in Level l and to move up to Level 2 or Level 3 when they are ready, adding dynamic-query filters and a scatter plot, respectively.

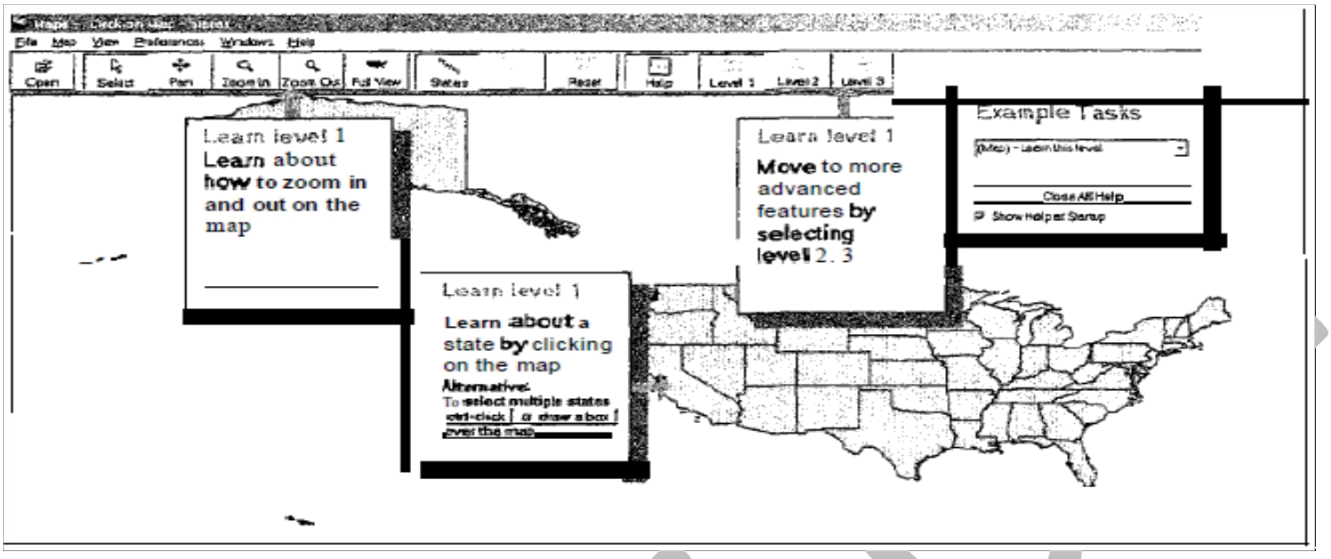

Figure: Dynamap is a multilayered interface with three levels. Level 1, shown here, consists only of a map. Sticky notes introduce the main functions and example tasks. The "show me" buttons initiate animated demonstrations that activate the interface itself. Users can advance step by step through the demonstration or execute the commands themselves, following the directions. A sticky note also points to the buttons allowing users to *move* to levels 2 and 3.

Because of the multilayered interface design, the number of sticky notes needed at any level is small. "Show me" demonstrations can be launched from the sticky notes, all from within the live interface itself. A greater level of integration in the application permits users to alternate between watching a demonstration and trying other steps by themselves.

Computer-game designers deserve credit for advancing the art of the animated demonstration, with lively introductions that show samples of how the game is played. With public kiosk games, the motivation is clear: getting users to put their money in the machine. Demonstrations have to explain the game and make it seem appealing and challenging, all within 30 seconds.

Guides

Audio and video recordings of *human guides,* such as the marketing manager for the software, a famous personality related to the content, or a cartoon character for children, can lead users through a body of knowledge. A pioneering effort was the GUIDES 3.0 project, in which a Native American chief, a settler 'wife, and a cavalryman appear as small photographs on the display to guide readers through the materials by offering their points of view on the settling of the American West. When selected, the guides tell their stories through video sequences. In addition, a modern 'woman is available in TV format to help guide the readers through

using the system. This approach does not anthropomorphize the computer, but rather makes the computer a medium of communication, much as a book enables an author to speak to readers by way of the printed page. For games and children's software, a cartoon character has been shown to be equally helpful and appealing as a real person.

Introductions to online services such as CompuServeor America Online., web sites such as the library of Congress, and Bill Gates' CD-ROM book *The Road Ahead* welcome new users and offer guidance about which features to begin using. Audio tours of art galleries have also become popular at many museums. An informed and engaging curator such as J. Carter Brown can lead visitors through the National Gallery of Art in Washington, D.C., but users can control the pace and replay sections. The well-designed CD-ROM *A Passion for Art* has several authoritative guides explaining the software, discussing history, and exploring the impressionist art in the Barnes collection, a still photo or a video of the speaker is accompanied by spoken text to guide users through the software and the collection.

Audio or video lectures may be recorded for playback on the computer or on a separate system. Video Professor has become a successful company selling such introductions for dozens of popular software programs. These videos are tutorials, meant to be viewed from beginning to end, rather than a way of getting help when problems emerge.

Online communities for User Assistance

Instead of natural-language conversations with computers to get help, interaction with other people online is proving to be effective. This communal approach may employ e-mail, chat, or instant messaging for question asking and responses. Questions can be sent to a designated help desk or staff person, or posted on a discussion board as shown in below. Responses can be received in seconds or, more typically, minutes or hours, but the downside is that users must publicly expose their lack of knowledge and risk getting incorrect advice. In one simple but positive example, a broadcast message produced the answer to a user's query in 42 seconds:

Time: 18:57:10
Fran: <azir>
after i change a list to a group, how long before I can use it?
Time: 18:57:52
Fran: starlight on a moonless night <clee>
you can use it immediately.

The communal broadcast approach is increasingly appealing because of the low cost to software maintenance organizations and help-desk staff. Many respondents get a sense of satisfaction from being able to help others and demonstrate their abilities. Some are motivated to achieve prominence within a community in the hope of gaining consulting contracts. Microsoft has made an ambitious effort to use online communities to provide assistance for professionals and novices. They reward active contributors with a most Valuable Professional citation on the web site, thereby steering consulting opportunities to these active contributors.

Purchasers of more expensive software expect and may pay for dedicated help-desk services, which promise e-mail or chat responses 'within hours or minutes. They *may* also pay for telephone-based customer service to get personalized help. Government agencies are often required to provide help to citizens, especially at tax-filing time, but these personal services can be costly to provide.

The Development Process

Recognizing the difference between a good and a bad user manual is necessary for producing a successful manual on time and within a reasonable budget. Production of a manual, like any project, must be managed properly, staffed with suitable personnel, and monitored with appropriate guidelines as shown in below.

Development process guidelines

- Seek professional writers and copy writers.
- Prepare user manuals early (before implementation).
- Review drafts thoroughly.
- Field test early editions.
- Provide a feedback mechanism for readers.
- Revise to reflect changes regularly.

Getting started early is invaluable. If the manual-writing process begins before the implementation, there will be adequate time for review, testing, and refinement. Furthermore, the user manual can act as a more complete and comprehensible alternative to the formal specification for the software. Implementers may miss or misunderstand some of the design requirements when reading a formal specification; a well-written user manual may clarify the design. The manual writer becomes an effective critic, reviewer, or question asker who can stimulate the implementation team. Early development of the manual enables pilot testing of the software's learnability even before the interface is built. In the months before the software is completed, the manual may be the best way to convey the designers' intentions to potential customers and users, as well as to implementers and project managers. Informal walkthroughs with users are usually an enlightening experience for software designers and manual writers. Potential users are asked to read through the manual and to describe aloud what they are seeing and learning.

Field trials with moderate numbers of users constitute a further process for identifying problems with the user manual and the software. Field trials can range in scope from half an hour with half a dozen people to several months with thousands of users. One effective and simple strategy is for field-trial users to mark up the manual while they are using it. They can thus rapidly indicate typos, misleading information, and confusing sections.

Software and the accompanying manuals are rarely truly completed rather they go into a continuous process of evolutionary refinement. Each version eliminates known errors, adds refinements, and extends the functionality. If the users can communicate with the manual writers, then there is a greater chance of rapid improvement. When possible, keeping logs of the use of help materials and help-desk calls will determine which part of the system needs modification.