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Novick, David G. and Ward, Karen, "Why don't people read the manual?" (2006). *Departmental Papers (CS)*. Paper 15.
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Why Don't People Read the Manual?

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ABSTRACT
Few users of computer applications seek help from the documentation. This paper reports the results of an empirical study of why this is so and examines how, in real work, users solve their usability problems. Based on in-depth interviews with 25 subjects representing a varied cross-section of users, we find that users do avoid using both paper and online help systems. Few users have paper manuals for the most heavily used applications, but none complained about their lack. Online help is more likely to be consulted than paper manuals, but users are equally likely to report that they solve their problem by asking a colleague or experimenting on their own. Users cite difficulties in navigating the help systems, particularly difficulties in finding useful search terms, and disappointment in the level of explanation found.

Categories and Subject Descriptors
H.5.2 [**Information Interfaces and Presentation**]: User Interfaces – *Evaluation/methodology, training, help, and documentation.*

General Terms
Documentation, Human Factors, Measurement

Keywords
Usability, problem-solving, manuals, online help

1. INTRODUCTION
The annual ACM SIGDOC conference is but one expression of the enormous effort that systems developers—large and small alike—put into providing documentation for their users. SIGDOC has 271 members, and the Society for Technical Communications has over 15,000 members. Many tens of thousands more people staff help desks around the world. The cost of providing documentation and help resources runs into the billions of dollars. The related costs of avoiding the need for help by improving usability runs to billions more. The extent of this effort reflects both a perceived need of users for help in solving the usability problems they encounter in using computing systems and a commitment from developers to help users overcome these problems. Because computing experts know that the answers to most users' questions are already expressed in an application's documentation, they sometimes sarcastically tell users to "read the #$%* manual." Yet users famously shun the very documentation that would help them. Why? How then do users actually solve the problems they encounter? Do they, in fact, solve the problems? Or are users not achieving what they set out to do?

To understand why people don't read the manual or use online help, we began to study how people who use computers in their work actually encounter and solve usability problems. The study builds on previous research on usability and documentation, extending to a broader cross-section of knowledge workers and going much deeper into the users' usability problems and their solutions. In particular, this paper explores these questions:

- In real work, how do users solve (or not solve) their usability problems?
- Do users avoid manuals and help systems? If so, why?

In answering these questions, we review related research, particularly with respect to the causes and measurement of frustration of users of computing systems; explain the study's methodology, including a characterization of the participants, a description of the application domain and the task set, and a presentation of the experimental design; present the study's results; and briefly discuss limitations and future work.

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SIGDOC'06, October 18-20, 2006, Myrtle Beach, South Carolina, USA.
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2. RELATED WORK
Research into the relationship between usability and documentation grew out of research into understanding the nature of usability problems. To set the foundations for study of the use (or non-use) of documentation in responding to usability problems, we review how recent research has explored the causes of and responses to usability problems, and review the use of documentation in solving usability problems.

2.1 Responses to Usability Problems
This study, focusing on use of documentation, developed out of prior research into the usability problems that documentation was intended to alleviate. The prior research showed repeatedly that usability problems cause frustration in users. Early studies examined users' responses to these problems in terms of attitudinal or emotional effects. More recent studies have looked at users' responses in terms of the kinds of actions the users take to solve the usability problems they encounter.

Usability problems tend to induce frustration in users. This has been shown in tasks performed by college students and in tasks associated with using commercial Web sites. Bessiere et al. [2]

obtained surveys from 108 college students who had worked on a task for at least one hour. The subjects were primarily browsing the Web, processing e-mail, and word-processing. The usability problems they encountered resulted in high levels of frustration and large loss of time. Hazlett [7], too, looked at the nature of users' frustrations. In this study, users performed typical usability-testing tasks based on commercial Web sites, and their emotional responses were measured. The tasks were not intended to be representative of tasks in working life. These studies demonstrated users' attitudinal and emotional responses to usability problems, but they did not look at the ways in which users attempted to solve the problems that were causing them to be frustrated. For example, Hazlett's [7] study was not designed to assess users' solutions to usability problems, nor were users provided with documentation because the tasks were limited to browsing commercial Web sites.

Beyond attitudinal and emotional responses, users' attempted solutions to usability problems were assessed by Ceaparu et al. [6]. In this study, 59 college students spent an hour on a computer and then reported their frustrating experiences. The participants were not given a specific task but were asked to carry out tasks they did every day. The study examined the frequency, cause and severity of frustrating experiences, and time lost due to frustrating experiences. The users' solutions (or non-solutions) were compiled and categorized. The study's authors identified ten categories of solutions, including these three of particular interest to researchers in the field of design of communication:

- I consulted online help
- I asked someone for help
- I consulted a manual or a book

In many instances, subjects encountering difficulties ignored the problem or rebooted.

While Ceaparu et al. were able to classify users' actions in response to frustrating usability problems, their results had experimental design issues in common with the earlier studies. In particular, their subjects were college students and their data reflected a "snapshot" of their subjects' use of computers rather than tracking changes in use over time. Mendoza and Novick [9] addressed these issues by studying the experiences over eight weeks of middle school teachers as they learned a new application. This study found that the nature of the subjects' usability problems, the levels of their frustration, and the kinds of actions they took to solve the problems all changed over time. Even aggregating users' actions over time, the distribution of the actions of the middle school teachers differed greatly from those of the college students. The teachers tended to seek help from a colleague. In 12 percent of the episodes, the teachers ignored the problem, abandoned the task, or rebooted the computer.

In short, the state of the field is that we know that users routinely encounter frustrating usability problems with computer applications, that they try to solve these problems using a variety of sources and techniques (the college students tended to figure things out without help, and the teachers usually asked a colleague for help), and that in some cases users simply give up.

2.2 Using Documentation to Solve Usability Problems

One pattern of responses was consistent across the studies conducted by Ceaparu et al. [6] and Mendoza and Novick [9]: users rarely used documentation, either printed or online. Ceaparu et al. reported that only about 4 percent of the usability-problem episodes experienced by college students were resolved by using online help and only 1 percent by consulting a manual or book. Similarly, Mendoza and Novick found that middle school teachers solved usability problems about 3 percent of the time with online documentation and 0 percent with manuals. Neither study, though, looked at why the subjects did not use the documentation developed specifically to help them with their computing problems.

The reality of users' experience is that they can find themselves overwhelmed by the profusion of functions offered by typical workplace applications. Baecker et al. [1] studied 53 users of Microsoft Word and found that 27.5 percent of these users were "overwhelmed by how much stuff there is," that 58.5 percent had "a hard time finding the functions I need unless I use them regularly," and that for 62.3 percent, "[w]ading through unfamiliar functions can often be annoying/frustrating." Most users want the application to provide a rich set of functions [1], though, so the problem for developers of software and its associated documentation is to provide usable guidance for users who want high levels of functionality but who are perplexed by it.

The reluctance of users to consult documentation is part of the lore of the field of technical communications [see, e.g., 10]. The truth of this assumption was rejected by Smart et al. [11, 12, 13], who reported that more than 99 percent of 400 users responding to a six-minute telephone survey used print or online documentation. However, this finding involved a number of factors that tend to reduce its impact. First, only 17 percent of those surveyed used documentation in any form more than once per week. Second, the users, selected from lists of people who had purchased a particular word-processing program, were overwhelmingly novice users of that application; only 17 percent had used the application for more than six months. Third, the survey did not distinguish between business and non-business use; rates of and motivation for use of the application are likely to differ as a function of the context of use. Fourth, the survey looked at one particular application rather than at the totality of use of the various applications that characterize typical use patterns. And fifth, patterns of availability and use of documentation appear to have changed significantly since the survey was conducted and first reported in 1995. As we observe later in this paper, many popular business applications no longer come with printed manuals. And more recent studies [e.g., 6, 9] indicate much lower levels of use of both printed and online documentation.

Smart et al. [12, 13] also complemented their telephone survey with interviews of 18 subjects, using Contextual Inquiry methodology [3]. From their data, they developed a consolidated sequence model showing users' overall strategies for solving problems encountered in an application. They found that users typically do not turn to documentation as their preferred means of solving problems with software. In the model, users first look for information within the application's own user interface, then sought help from a colleague, and then went to the documentation. The data and the model suggest that users actually do avoid turning to the documentation if they can otherwise avoid it. The findings of Ceaparu et al. [6] and Mendoza and Novick [9] can be seen as consistent with those of Smart et al. in the sense that virtually all users turn to documentation at some point. But the three studies are also consistent in their implication that most users prefer not to do so.

As part of their research, Smart et al. [12, 13] recorded users' attitudes toward both printed and online documentation. Although Smart et al. did not provide quantitative summary analyses, it appears that their subjects' attitudes were generally positive toward printed documentation and more negative toward online documentation, largely because of usability problems with the online documentation.

Users' reluctance to use documentation should have been alleviated by the movement toward minimal manuals, as advanced by John Carroll [4]. In some ways, the minimal-manual movement has largely won the day. Documentation now often takes the form of embedded help, and user-centered design reduces the need for even that help. Applications now frequently come with a start-up card rather than a full manual. Yet [cf., 6, 9] many applications have, in effect, migrated their huge printed manual to a huge online manual, and users continue to have frequent frustrating experiences with computer applications. It may be true that the users find their minimal manuals less frustrating than earlier documentation, but the evidence appears to be that users now rarely use any documentation, minimal or otherwise. The empirical foundations of minimal manuals involved well-conducted protocol studies of actual computer use. But these studies tended to focus on particular applications rather than the users' holistic work environment, and more recent literature associated with the minimal-manual movement [e.g., 5] primarily provided techniques for minimizing manuals rather than empirical insights into the reasons for users' shunning the big manual or avoiding the use of documentation generally. Consequently, questions of the reasons underlying users' preferences and behaviors remain open and salient. Beyond college students and middle school teachers, what usability problems and solutions characterize work life more generally? Is it true that people really do not use documentation? If so, why? Have attitudes toward print and online documentation changed?

3. METHODOLOGY

To study workers' use of and attitudes toward documentation of computer applications, we conducted a series of 25 interviews over three months. As this study is exploratory, we sought deeper interaction with a smaller number of a subjects rather than broad but shallow information from a large number of subjects. In this section, we describe the participants, their work lives, and the design of the study.

3.1 Participants

For this study, we recruited a varied cross-section of people who use computers in their work lives. Initial participants included acquaintances of the authors, and subsequent participants were identified by asking each participant to recommend others. The participants comprised 8 men and 17 women. Their average age was 44 years. In terms of education, two participants had some college, ten had a bachelor's degree, nine had a master's degree, and four had a Ph.D. Sixteen of the participants lived in El Paso, TX, and nine lived in the metropolitan area of Portland, OR.

Of the 25 participants, 22 used Microsoft Windows as their principal operating system at work, while two used OS X and one used Unix.

3.2 Participants' Work Lives

We sought participants from as wide a variety of work experiences as possible; the only constant was that they routinely used computers in their job. The participants included, among others, business owners, a white-collar worker at an auto-supply company, a foundation director, a restaurateur, and a musician. For breadth, we included one college student and three college professors. Among the 25 participants, we included four who could be described as more technically sophisticated with respect to computing and information systems; as the study was exploratory, we planned to look for possible differences in the use of documentation as a function of users' relative technical sophistication. In all, the participants can be seen as being distributed within the six categories listed in Table 1.

Participant Occupation Category	Number
Management in education/non-profit	8
Professional/technical	7
Human resources or academic advising	4
Business owner	3
Administrative assistant	2
Student	1

Table 1. Distribution of Occupations.

3.3 Interview Design

We used a straightforward interview approach in which we asked participants about their experiences and attitudes toward the use of various types of documentation. While interviews are often inaccurate with respect to behavior, they offer the insight we seek into the attitudes and perceptions that motivate users' actions. Also, this approach allowed us to explore a broad range of experiences across many applications, something that would be difficult to accomplish in a designed experiment. Our approach contrasts with the participative evaluation [7] methodology used in [9], because we wanted to be able to go more deeply into the participant's usability problems and solutions than would be permitted in surveys or self-reports. This study was primarily exploratory, and so we sought the flexibility to follow promising lines of inquiry when interacting with the participants. There was no control group, as there was no experimental manipulation.

Fifteen of the interviews were conducted in person at the participant's place of employment. The remaining ten interviews were conducted by telephone.

The interviewers followed an outline-form interview guide, seeking additional examples or going deeper into problems and solutions where possible. The interviews covered the participants' principal software applications, their self-assessed proficiency with these applications, problems they had encountered with the applications, their self-assessed frustration with these problems, whether and how they solved the problem, their self-assessed overall distribution of problem-solving methods, when (if ever) they last used printed and online documentation, the words they associated with printed and online documentation, and the characteristics of good and bad printed and online documentation. For the distribution of solution methods, the participants were asked to distribute 100 percent across five categories of solutions adapted from [6] and [9]:

- Asked someone else
- Used online documentation
- Used a printed manual

- Figured it out without documentation
- Gave up

The interviews concluded with a request for any other comments of the participants with respect to the topics covered and a request for names and contact information for further participants. The interviews were typically completed in about 40 minutes. The interviewers entered notes as the interview progressed, using the interview guide as a template. The full set of interviews was then compiled and analyzed.

4. RESULTS

We now turn to the results of the study, which include both quantitative and qualitative aspects. The quantitative results reflect participants' reported patterns of use of applications and associated documentation. The qualitative results reflect users' attitudes toward documentation and the reasons they gave for preferring to solve usability problems in different ways.

4.1 Quantitative Results

Our quantitative analyses included: demographic information about the participants; self-assessed proficiency levels, usability problem episodes, and frustration levels associated with the applications; average distributions of solution methods; length of time since last use of documentation, categories of words indicating attitudes toward printed and online documentation; and correlation of proficiency and frustration.

The participants indicated that the applications they used most frequently were applications from Microsoft Office. Of the 25 participants, 22 frequently used Word, 18 frequently used Excel, 12 frequently used Outlook, and 10 used PowerPoint. In addition, 10 participants indicated that they frequently used a database application, 3 used a browser, and 14 used a variety of other applications, including specialized commercial software. The low numbers for Outlook and, especially, for browsers suggests that users may no longer view Web browsers and e-mail environments as "applications." We note that the relatively low number of problems with browsers suggests that for many users browsers are highly usable.

Application	Proficiency	Number of Episodes	Mean Frustration
Word	3.64	21	3.23
Excel	3.33	17	3.15
Outlook	3.29	11	3.44
PowerPoint	3.20	9	4.00
Databases	3.00	5	3.33
Browsers	3.33	3	2.00
Other	3.25	13	3.58

Table 2. Users' most-frequently-used applications, mean self-reported proficiency, number of problem episodes reported, and mean frustration levels.

To see how the experiences of the broader set of computer users represented by our participants compared with those reported in earlier studies, we compiled mean levels of self-assessed proficiency, total numbers of reported usability problem episodes, and mean levels of reported frustration associated with these episodes. As suggested numerically in Table 2 and graphically in Figure 1, participants unsurprisingly assessed themselves as moderately proficient in all the applications they used frequently. The 25 participants reported 111 separate episodes of usability problems with the applications, an average of 4.44 episodes per participant. Mean levels of frustration over the various applications ranged from 2.00 for browsers to 4.00 for PowerPoint, with an average standard deviation of 0.71. The overall mean for frustration was 3.38. These results appear to be consistent with those reported by Ceaparu et al. [6] and Mendoza and Novick [9]. However, the results did not support finding a correlation between mean self-assessed proficiency and mean frustration. From prior research, we expected to find an inverse relationship between perceived proficiency and frustration. From our data, we found a weak inverse correlation, but the R-squared was too low to have confidence in this relationship.

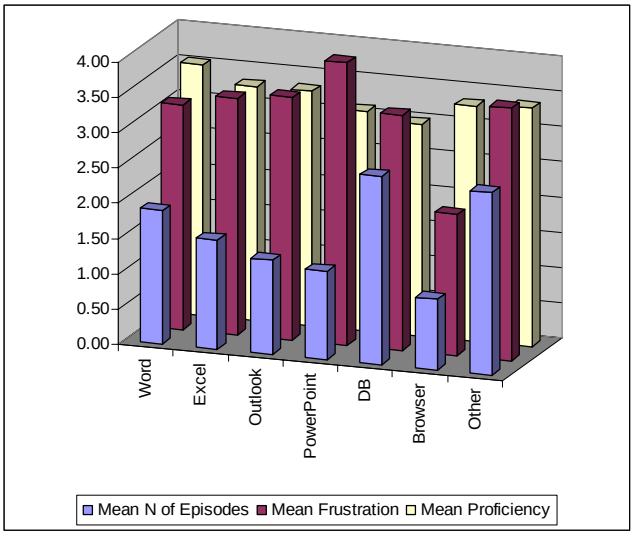

Figure 1. Participants' reported number of usability problem episodes, mean level of frustration per application, and mean proficiency per application.

We now turn from participants' problems with applications to participants' responses to those problems. A strong finding, consistent with [6] and [9], is that study participants reported that they tend not to use printed documentation. As indicated in Table 3, the mean time since the users last used printed documentation was over 61 months. The median time was 24 months. Participants' use of online documentation was more current: the mean time since last use of on-documentation was 1.64 months, and the median time was less than half a month. For both printed and online documentation, the median values may be more representative of users' experiences than the mean.

As can be seen in Figure 2, almost all of the participants had recently used online documentation; the mean reflects a few participants who tended not to have used online documentation for periods of 5 to 11 months. Conversely, only a few participants had recently used printed documentation; most had not used printed documentation in over a year, and some had not used printed manuals in over 10 years.

	Printed	Online
Mean	61.37	1.64
Median	24	0

Table 3. Mean and median number of months since last use of printed and online documentation.

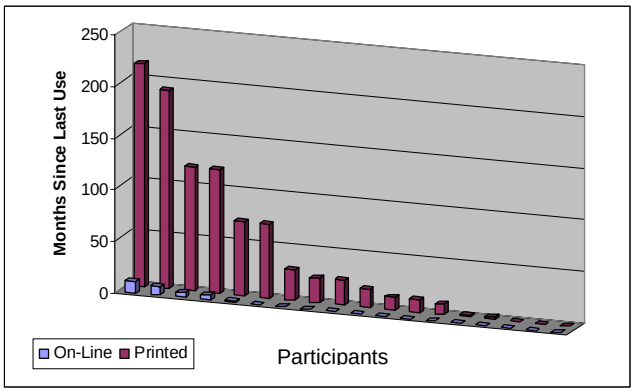

Figure 2. Distribution, months since last use of online and printed documentation.

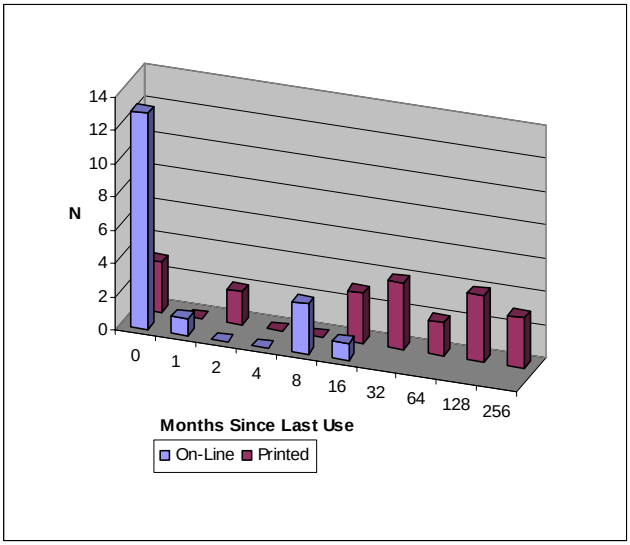

Figure 3. Histogram, months since last use of online and printed documentation, exponential scale.

The distribution of months since last use of printed and online documentation presented in Figure 2 is summarized in Figure 3 using an exponential time scale. The graphs suggest that there are a small number of users who regularly consult printed documentation and a much larger cluster of users who do so rarely. Conversely, most participants reported that they consult online documentation frequently; a smaller cluster do so only once every year or so. With respect to printed documentation, these findings are consistent with both the popular wisdom and the results reported in [6] and [9]. However, the cause of this pattern may not be participants' aversion to printed manuals but rather that software manufacturers are increasingly less likely to provide a printed manual. For their top three applications, for example, participants reported that they did not have a printed manual. With respect to online documentation, the results are again consistent with those of the earlier studies, in that reported rates of use of online documentation are higher than those for printed materials. However, rates of use of online materials appear to be somewhat higher than previously reported. This may be attributable to the differences among the studies with respect to subject populations. Perhaps computer science students and middle-school teachers are less likely than other computer users to consult online documentation.

These relative patterns of use of documentation are confirmed by participants' reported distributions of methods with which they responded to usability problems. As indicated in Figure 4, participants reported that they are least likely to use a printed manual (mean=3.16 percent) and are about equally likely to ask someone else, use online help, or solve the problem without help. In some cases, users give up (mean=10.48 percent). Table 4 presents detailed numerical results.

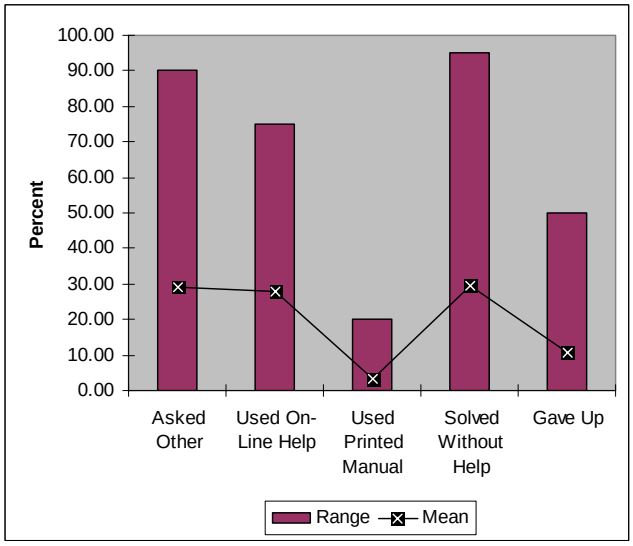

Figure 4. Range and mean of reported solution methods.

	Max	Mean	Std Dev	Median
Asked Other	90	28.98	24.14	25
Used Online Help	75	27.94	19.61	25
Used Printed Manual	20	3.16	6.16	0
Solved Without Help	95	29.36	19.47	25
Gave Up	50	10.48	12.36	5

Table 4. Range and mean of reported solution methods.

For each method at least one participant reported zero use, so the range of use is zero to the maximum value. Again, the participants' reported use of printed documentation appears to be consistent with that of prior studies, but their use of online documentation appears to be higher than previously reported. Users may not be reading the manual—perhaps because they do

not have one—but more participants than indicated in previous studies reported that they are using online help systems, about 28 percent rather than 4 percent. These data, though, indicate users' eventual solution methods rather than the methods they first tried.

4.2 Qualitative Results

Several of the questions asked were qualitative in nature. The number of subjects limits the conclusions that can be drawn from these data; several patterns can be seen in the responses, however. In this section we discuss these observations.

One of our goals in this study was to assess attitudes underlying or associated with reluctance to use documentation. Accordingly, we asked 19 of the participants to offer adjectives or short phrases describing their associations with paper manuals and with online help facilities. Overall, the participants' word associations indicated strongly negative attitudes toward printed manuals and largely positive attitudes toward online documentation. Participants offered a total of 9 positive and 61 negative words and phrases about printed documentation, and offered a total of 40 positive and 22 negative words and phrases about online documentation. Several patterns in the responses were evident. Participants suggested that manuals are

- physically hard to handle (58 percent of the 19 participants offered descriptions such as "bulky," and "cumbersome")
- hard to navigate (37 percent)
- too basic to be useful (37 percent)
- hard to understand (26 percent)
- unstylish (26 percent characterized manuals as "unstylish," "boring," or "antiquated")
- out of date with respect to the software (21 percent)

Of the 19 participants, 32 percent identified at least one positive attribute of paper manuals, though, including the observations that manuals can be helpful, handy, informative, and that one can write or place bookmarks in them. Sixteen percent said that documentation is easier to read in paper form than on the screen.

Attitudes toward application online help facilities were more positive. Participants said that online documentation is

- convenient (58 percent)
- helpful (26 percent)
- searchable (21 percent)
- easy to use (21 percent)

But participants also offered negative associations: like paper manuals, online help can be hard to navigate (32 percent) and may be too basic to be useful (16 percent).

The descriptions offered by the participants in this study accord well with the findings of earlier studies [6, 9, 13] that users do not view a paper manual as the source of choice.

The most common negative descriptions characterized a paper manual as cumbersome, suggesting that users might not be using them because they find it impractical to keep them physically nearby and convenient. One participant mentioned that her organization would be throwing out "tons of manuals" that they no longer need. The perception that paper manuals are cumbersome may be reinforced by the success of the movement toward minimal manuals. We note that one quarter of the participants reported viewing manuals as unstylish, and one fifth characterized manuals as being out of date with respect to the current software release, suggesting that printed manuals (correctly) are associated with older versions of software.

The other negative perceptions are more troubling: both manuals and online help facilities are viewed as hard to navigate (37 percent for paper manuals, 32 percent for online help) and offering an inappropriate level of explanation (a total of 63 percent for manuals, 16 percent for online). While these perceptions are stronger for manuals, they suggest that online help is not completely successful in solving those problems.

These comments and the anecdotes offered by the study participants suggest several specific factors that may be reducing the usability, utility and attractiveness of documentation. These factors, discussed in the following sections, include navigation, search terms, level of explanation, screen real-estate, and uncertain boundaries among applications, network, and operating system.

4.2.1 Navigation

As applications and their associated help facilities become more complex, navigation becomes an increasing problem.

Participants in our study repeatedly reported knowing how to accomplish a task but not remembering where to find the functionality, echoing the observations of Baecker et al. [1]. This is an intrinsic limitation of graphical user interfaces: it can be hard to find something that you cannot see. The solution of adding ever more tool bars to keep functionality visible may be reaching a limit, though; the clutter of tool-bar options may be making it difficult to see the desired functionality even when it is clearly displayed. When asked to describe a recent problem they had encountered, for example, 28 percent of the 25 participants recalled incidents involving problems turning off or hiding change tracking in Word. In current editions of Word the relevant tool bar is displayed by default when change tracking is enabled, and the needed controls are visible. Despite this, participants reported searching extensively, consulting help, and asking colleagues.

So when users have trouble navigating the application, they turn to help—only to have trouble navigating that as well. Even when intending to go to Microsoft's Internet site, for example, one subject reported that she uses Google to locate the page within the Microsoft site to avoid having to navigate the site directly. Another participant expressed frustration at getting into a reference loop when using help. A third described finding the information she needed as being like "searching for buried treasure," and a fourth complained of a lack of cues to know whether the path will lead to the desired information. One person mentioned an interesting twist on the help navigation problem: he had difficulty locating the help functionality. He wanted the local help documentation, but he kept accessing the Internet-based documentation instead.

4.2.2 Search Terms

Participants reported feeling frustrated or having difficulty locating information because the terms and keywords used in the help facilities failed to match their own vocabulary; they didn't know the right word to use in searching. Some participants indicated that they compensated for this terminology mismatch by scanning an index or table of contents instead of using the search facility. They find it easier to locate the appropriate section of the

documentation and then browse for the specific information that they need.

4.2.3 Level of Explanation

Participants mentioned problems with the level of explanation being offered; as might be expected, however, they did not agree as to whether the explanations were too basic or too technical. One participant described one help facility as covering "stuff so basic you wonder 'does anyone really need to read that?'" Others spoke of explanations being hard to understand, of assuming that the user knows the jargons or symbols of the application, of not being written for the casual user. Subject preferences for asking another person or turning to unofficial Internet-based sources may be a partial attempt to find help offered at an appropriate level of complexity and expressed in correspondingly appropriate terms.

4.2.4 Screen Real Estate

Although most participants preferred accessing help online, we saw some indications of limitations of on-screen presentation of information. Five participants (25 percent) reported using the online help facility to locate documentation so that they could print it for use in solving the problem. Limited screen real estate and window-manager behavior may be part of the problem: these participants complained that help windows hide (or are hidden by) application windows, making it impossible to see both at once.

4.2.5 Uncertain Boundaries

Four participants (16 percent) appeared to be uncertain as to the boundaries among applications, network, and operating system. For example, one participant reported looking in the application help to determine why her mail reader had lost connection to the mail server. Another described difficulties sharing a spreadsheet across applications. This confusion is understandable in that applications are converging on common GUI conventions and more closely integrating what were once distinct applications. So to the extent that users have less to learn about user interfaces, it becomes ironically much less clear to users where a problem is occurring and thus in which application's documentation they should look for answers. Likewise, no single application's documentation is likely to address incompatibilities or interactions with other applications. Thus, a vexing class of problems "falls through the cracks" and is not addressed by any official documentation—and this may not be apparent to users when they are dealing with such a problem.

4.2.6 Summary

The qualitative results suggest some systematic reasons why users report that they do not turn first to documentation when encountering problems. Whether presented on paper or online, users find documentation difficult to navigate. It may not be clear to users which application's documentation—if any—holds the solution to the problem that they are seeing. If they do manage to locate an answer, it likely is written at the wrong level of detail or expertise. And even if the answer is useful, a lack of screen real estate makes it challenging to both read and follow the instructions at the same time.

5. CONCLUSION

The interviews conducted in this study indicate that computer users at work report that they generally do not use printed documentation. On average, more participants reported that they abandoned a task than used printed documentation. The median proportion of the times that participants reported solving problems with computer applications by using printed manuals was 0 percent. The most likely reasons for not using printed manuals are their perceived unavailability, bulkiness, difficulty of navigation, inappropriate level of detail or expertise relative to the user, and being out of date, either in their content or just in the "dated" quality of being a printed document.

In these interviews, computer users in work contexts reported using online documentation more frequently than suggested by previous studies. However, the median proportion of the times that participants reported that they solved problems with computer applications by using online help was only 25 percent. Users believed that they were equally likely to solve a problem by asking someone else or by finding a solution without help. While they report using online documentation more frequently than printed documentation, the reasons that users do not like online help are similar to some of the reasons that they do not like printed manuals, primarily that the documentation is hard to navigate and that it is pitched at the wrong level of detail or expertise. Additionally, online help and the user's application compete for screen area, which makes it hard for users to view both at the same time.

5.1 Discussion

Users may not be using paper manuals because paper manuals are not available. No participant in our study complained about a lack of paper documentation, however, which suggests that minimal manuals have been well accepted by these application users. In fact, when asked to describe the characteristics of a good manual, three participants indicated that they could not conceive of such a thing, and two more talked about having the "paper" manual on CD-ROM. These responses may indicate that the distinction between printed manuals and online help lies not in paper vs. electrons but in the organization of the content. Indeed, users' reluctance to use online help may reflect the extent to which online help is simply an electronic equivalent of traditional paper manuals. And given the participants' concern about the effects of terminology mismatch on search, it becomes increasingly apparent that simply adding a search function to this kind of online manual does not create a useful help system.

Users may perceive the time cost of figuring something out via documentation as comparable to the time cost of solving the problem by trial and error. The one college student in this study preferred to solve problems by trial and error, which is consistent with the observations of Ceaparu et al. [6]. Most of the participants in this study, however, were busy professionals who may not have felt that they had time to spend in exploring either the application interface or the documentation to find an answer.

In light of these disincentives, users may be reasonable in preferring other sources of help. It may be faster to locate a colleague than to navigate the "convenient" online help. The colleague will not insist that you use the correct terms or correctly identify the source of a problem, and most people will adjust their explanations to the level of the questioner—or better yet, just fix the problem themselves. Asking a knowledgeable human being is the gold standard for a help facility. Thus patterns of solution preferences may reflect availability of preferred alternatives to documentation. The middle-school teachers in [9] had many colleagues working on

exactly the same problem, so numerous relative experts with current knowledge of relevant solutions were available to them.

5.2 Limitations and Future Work

When we designed and executed this study, we asked the participants to tell us about their use of "online" help. The online help category had been used by Ceaparu et al. [6] and again used by Mendoza and Novick [9]. In our interviews, we learned that subjects actually use three different kinds of online help: the help provided with the application, help available from the publisher via the Web, and help available from unofficial sources such as online forums and newsgroups, usually located via a search engine. While these three kinds of online help remain aggregated in this study's quantitative analysis, qualitative analysis of the participants' accounts of their use suggests that participants in fact consider these to be distinct sources of information. For example, one participant commented that he did not want to be referred to a "chat room with 100 postings" because he doesn't have time to wade through them.

Another category in which subcategories might be clarified is "asked someone else." In Ceaparu et al. [6], the reported data did not indicate the kind of person whom the subject asked for help. Similarly, in Mendoza and Novick [9] this category was not subdivided because in virtually all cases the subject asked a colleague. In retrospect, this apparent uniformity may have resulted in part because the trainer was also one of the subjects' colleagues. In the present study, the quantitative data remain aggregated in the category of "asked someone else," but analysis of participants' responses suggests that the "someone else" might be either a colleague or, rather, a professional staffing a help desk. This difference is likely to be important, because (a) our data suggested that the availability of a help desk varied hugely among the participants, and (b) we can distinguish between informal social networks and formal commercial relationships.

With these insights born of experience with the present study, we have started a second study that will distinguish among kinds of online help and among ways in which people "asked someone else." The study will also include protocol analyses of interview subjects, observing the participants at work. We expect the protocol analyses will enable us to assess the validity of participants' accounts of their use of documentation and will help us model (cf., [13]) the processes through which the participants seek to solve the usability problems they encounter.

6. ACKNOWLEDGMENTS

This work was supported by National Science Foundation Award No. 0080940 and an endowment from SBC. Nigel Ward provided a useful critique of this paper. We thank the anonymous reviewers for their helpful comments. We extend a special thanks to the participants, who generously gave us their time.

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