

# Combining Usability Research with Documentation Development for Improved User Support

Timothy Keirman  
Tec-Ed, Inc.  
4300 Varsity Drive  
Ann Arbor, MI 48108  
1-734-995-1010  
tim@teced.com

Lori Anschuetz  
Tec-Ed, Inc.  
38 Windsor Street  
Rochester, NY 14605  
1-585-454-7440  
lori@teced.com

Stephanie Rosenbaum  
Tec-Ed, Inc.  
Post Office Box 51054  
Palo Alto, CA 94303  
650-493-1010  
stephanie@teced.com

## ABSTRACT

As a usability research and information design firm, Tec-Ed has noted the advantages of evaluating a product's usability in conjunction with developing its print and online documentation. Usability research identifies the problems with a user interface. When business or technical constraints prevent problems from being corrected in the interface, we still improve the product's usability by addressing these problems in the documentation. In other cases, the documentation can inform us of specific problems to research in the usability work.

This paper describes two case studies in which the same team performed both usability and documentation projects for a product. In addition to the expected benefits from combining usability and documentation work, using the same team resulted in efficiencies in process and quality of execution. The experience also suggests that usability evaluation is not simply an alternative career path for technical communicators, but rather a complementary skill that can enhance their professional development while adding more value to the work they do for employers as well as users.

## Categories and Subject Descriptors

D.2.2 [Software Engineering]: Design Tools and Techniques  
— *user interfaces*

## General Terms

Documentation, Human Factors

## Keywords

Heuristic evaluation, online documentation, online help, print documentation, professional development, usability testing

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.  
*SIGDOC '02*, October 20-23, 2002, Toronto, Ontario, Canada. Copyright 2002 ACM 1-58113-543-2/02/0010...\$5.00.

## 1. INTRODUCTION

Effective communication is an important part of the usability of a product. Few, if any, technology products will ever have perfectly intuitive interfaces that need no explanations to help people use them. Combining technical communication and usability research can greatly improve a product for its intended audience.

Usability research is a way to gain insight into a product and its users—for example, to learn what features of the product people use easily and successfully, and where and why they have problems. By observing users as they perform tasks with a product and interviewing them, and by evaluating user interfaces according to accepted industry standards, usability professionals can not only recommend user-interface improvements but also identify places where documentation will help people use a product more successfully.

Integrating usability and documentation work has many benefits:

- Usability research identifies current and potential user problems with the product, its documentation, or both.
- Usability data can help documentation address specific audience groups.
- Usability data can help documentation target identified problem areas.
- Usability data can help writers reduce documentation by identifying areas where users don't need help.

The case studies in this paper combined usability methods with documentation work to improve a product. Case Study 1 consisted of a heuristic evaluation first, followed by development of print documentation. In Case Study 2, the documentation effort came first, followed by usability testing and then revisions to the user interface as well as the documentation. The order of the usability and documentation projects was determined by practical considerations: by the client hiring us initially for a usability project in Case Study 1, and by our intent to test the documentation in Case Study 2. We do not think one order is inherently preferable to the other; more important is that both types of projects be performed.

Common to both case studies is that the same team performed the usability and documentation work. Using the same team enables the latter project(s) to flow more smoothly and effectively and improves project quality because the team:

- Already understands the domain and terminology of the product. Language is obviously an essential element of documentation, but it's also a critical part of any user interface.
- Develops a unified vision for the product as the usability work informs redesign of the product and its documentation.
- "Owns" more areas of the product's development.

To be effective, the team members who perform the usability and documentation work must be competent in both disciplines. The team members in these case studies have master's degrees in technical communication with a usability focus, as well as years of experience performing both documentation and usability projects.

Technical communication skills include not only the ability to write well, but also knowledge and application of audience analysis, task analysis, and information design, as well as attention to detail. Usability skills also include audience analysis, task analysis, and attention to detail, thus overlapping technical communication skills. In addition, they require knowledge and practice of various usability methods (lab testing, heuristic evaluation, usability focus groups, ethnographic interview, contextual inquiry), and the ability to identify which method to use to meet a client's needs given the state of the product and budget and schedule realities.

Technical communicators often have contact with a product's users, which is good grounding for learning usability skills. At Tec-Ed, some technical communicators have trained in usability through attending workshops on usability techniques, attending conferences, and reading usability literature. Tec-Ed is a small company whose staff members must be multiple experts, which makes our "dual expert" project teams possible.

The following case studies build on Tec-Ed's previous experience with paired usability and documentation projects [2, 5] and highlight how technical communicators develop professionally. The technical communication field continues to expand and merge into other related fields, with people retaining and applying their "former" skills while learning and using their "new" skills in more valuable combinations [1].

## 2. CASE STUDY 1: FINANCIAL SERVICES WEB APPLICATION

In early 2001, a startup company in the financial services sector wanted to evaluate the usability of its new web application for financial advisors in Europe. The web application enabled financial advisors and their assistants to buy, sell, and manage mutual fund accounts online for their clients, as contrasted with their current method that was paper-based and involved extensive phone calling to execute orders. The application also enabled managers at financial institutions to evaluate their advisors' performance.

Case Study 1 is an example of the interconnectedness among technical communication, usability research, marketing, and engineering for a product. In this case study, the marketing department engaged Tec-Ed to evaluate the usability of the product and write the print user guide, sharing the information discovered with the product engineering department.

### 2.1 First, the Heuristic Evaluation

The purpose of the heuristic evaluation was to assess the overall user experience with the web application and identify any critical issues before the company installed it at the beta site. Research shows that independent evaluation by two or more usability specialists can identify a majority of the usability problems in a product or website [7]. In heuristic evaluation, usability specialists apply their training and experience in human factors to conduct evaluations of products or websites, following industry-accepted standards of usability [6] and using their experience from previous usability studies. The evaluators also take into account the company's strategic objectives and priorities. The company described four customer groups the web application needed to satisfy:

- *Financial advisors*: Have deep financial backgrounds but not much computer literacy. The financial advisors are responsible for handling millions of dollars in their clients' accounts and are used to making critical decisions daily based on in-depth financial research.
- *Assistant financial advisors*: Do most of the trading based on directives from the financial advisors they support.
- *Institution managers*: Supervise the financial advisors to ensure that the institution's clients are served as well as possible. The institution managers are not as computer literate as the assistant financial advisors.
- *IT personnel*: Use the administration functions of the web application, but not its financial research or trading functions.

The company was concerned whether these customers would be able to perform their tasks easily, successfully, and relatively quickly—that is, with a minimum number of steps or "clicks." Two Tec-Ed usability specialists independently reviewed the web application, assigning findings to the following four "usability issue" categories:

- *Task support* deals with how well a product or system enables users to perform their typical tasks to achieve their goals with the product.
- *User-interface behavior* deals with issues surrounding system feedback, user orientation, navigation, input and selection, and users' ability to recover from errors.
- *Presentation of information* deals with the information design of pages, text readability, clarity of graphic elements, and the absence or use of standards for elements such as fonts.
- *Terminology* deals with how well the site uses the language of its users and the clarity and consistency of instructions and messages. Terminology includes the names of menu items, links, forms, and pages.

During our screen-by-screen evaluations, we explored general questions such as:

- How easy to use is the interface?
- How well is the interface organized? Are navigational aids adequate to support that organization? What feedback does the interface provide to orient the user?
- Are on-screen instructions, as written by the developers, presented clearly? Is the language direct and simple, so that users comprehend quickly and translating the interface for various languages is easier? (The application did not yet have a help system.)
- What on-screen elements must users encounter that they don't need? What elements might be missing?
- How well does the interface assist users in avoiding problems?

During our task-based evaluations, we “put on the user’s hat” to perform tasks such as trade funds, check the status of a pending trade, determine the value of a client’s holdings, research funds, change the language of the user interface, review financial advisor performance, and more. Having task information up front not only helped us evaluate work flow/task support issues that we might not have seen if we simply evaluated individual screens—it also helped prepare us to write the documentation. Combining usability expertise with our technical communication backgrounds has enabled us to “mentally flag” issues to be addressed through product improvements and/or documentation in a way that strengthens our process.

The evaluators then compared our results to develop a final list of findings and recommendations, which we delivered in a comprehensive report. Although we found no critical issues in the application that would prevent the company’s customers from doing financial research and trading, we identified several usability flaws including the following:

- Some tasks required users to perform more steps than necessary. In speed measured by number of mouse clicks, the application was “slow” to use.
- The Trading Services menu included items for both trading and non-trading tasks, making it difficult to learn and, once learned, awkward to use.
- Users could not easily tell where they were within the application.
- Users could not compare funds without knowing the actual fund numbers; a good search function for finding funds did not allow easy comparison of funds.
- On-screen instructions were provided inconsistently and sometimes not at all.

## 2.2 Next, the User Guide

As Tec-Ed began developing the print user guide for the company’s beta test, our experience from the heuristic evaluation enabled us to design efficiently and write quickly. In particular, because the client could not implement our user

interface redesign recommendations prior to the rapidly approaching beta test, the user guide would need to compensate for the convoluted Trading Services portion of the web application. Our solution was to adhere to principles of minimalist documentation and provide procedures only [3], without any attempt to explain the “how and why” of what users should do with the items on the Trading Services or other menus. An overview of the Trading Services menu risked confusing users, whereas an overview of a well-designed software menu can help users envision how they would use its functions.

In addition, to help the one user guide “fit” the four audience groups, we addressed each group with a table in the introductory chapter. Each table tells group members “If you need to...” and then points them to a specific chapter for each detailed task.

Tec-Ed was able to develop a quality step-by-step user guide of over 100 pages, with two review cycles, in less than four weeks because:

- The consultants who conducted the heuristic evaluation for the web application have technical communication backgrounds and could also write the user guide.
- They were already familiar with the application, which significantly reduced the number of hours they needed to “ramp up” on the documentation project.
- They were aware of usability issues in the product that they could address in the user guide.

This case study is just one example of how being “hybrid” consultants, formed from technical communication backgrounds enhanced with usability training and experience, gave us efficiency and solution design advantages on projects pairing usability evaluation and documentation.

## 3. CASE STUDY 2: INTERNAL DATABASE APPLICATION

As part of our preparations for 2000, Tec-Ed implemented a custom database application called Tracker to monitor time and expenses on client projects, internal projects, and overhead activities. The Tracker system enabled employees to import project budgets and time data from Excel spreadsheets directly into an Access database. Once the data was imported, managers could generate customized reports to determine the status of projects, employee utilization, and so on.

After a software consultant developed Tracker (including building its initial user interface), Tec-Ed created the documentation—consisting of online help and a print manual—and then conducted a usability test of both the documentation and user interface. We would be able to decide whether usability problems discovered during the test would be most effectively addressed by altering the design of the user interface, the online or print documentation, or both. When technical, budget, and schedule constraints permit, we prefer to fix usability problems by improving the user interface (which should also reduce the need for documentation). In this case, because we had direct responsibility for the user interface, we would be able to change it as required.

### 3.1 First, the Documentation

Tec-Ed used the opportunity provided by this internal project to experiment with the design of the Tracker documentation. In particular, we were interested in where employees would look for various types of information—in the print documentation, the online help, or the user interface itself—and which of these formats was most effective for the various types of information. The lead writer on the project hypothesized that when employees did not know how to get started with a task, they would go to the print documentation for assistance. However, when employees were already immersed in a task, she hypothesized that employees would go to the online help, particularly context-sensitive help, since they could access it directly from the user interface.

To test this theory, she designed the print documentation as a minimalist Getting Started guide. It included a quick-reference task list that directed employees to the screen or function to use to perform a particular task, such as entering project expenses, importing an employee timesheet, or revising a project budget. The rest of the Getting Started guide contained step-by-step procedures for performing these tasks. The guide was considered “external” documentation, as opposed to the “internal” documentation provided by online and embedded help. The internal documentation included a task switchboard that was part of the user interface. This task switchboard allowed users to select a task from a list, and then opened the appropriate screen needed to perform that task. Once in a screen, users could access conceptual and procedural information by clicking a help button. They could also access context-sensitive field help by pressing F1.

The procedural information provided in the online help was the same as in the print manual, and each procedure was designed to help guide users through a particular task from start to finish. The field-specific help, on the other hand, was only available online, in an attempt to encourage employees to use the context-sensitive help to find field-specific information. The context-sensitive field help was designed to answer narrowly focused questions that might occur to employees while using the application, such as “How many letters can I use to create a project code?”

### 3.2 Next, the Usability Test

Once the first version of the Tracker documentation was complete, we began preparing for the usability test. In usability testing [4, 8], people whose characteristics (or personalities or profiles) match those of the product’s target audiences perform a sequence of typical tasks. Each participant, working one at a time, performs the same tasks under controlled conditions, facilitated by a test administrator.

Usability testing discovers the extent to which a product meets the needs of intended users. It enables researchers to:

- Concentrate on areas where user problems are expected.
- Target the behavior of specific user groups.
- Collect meaningful data about aspects of product use.
- Recommend product changes based on data, not opinion.
- Confirm or challenge the usability assumptions of product developers.

We first prepared a test design—including usage scenarios and task lists—based on the goals, objectives, and issues to be explored in the usability test. The primary goal of the Tracker usability test was to determine how successfully employees could complete basic Tracker tasks, and how the documentation and user interface could be improved to help employees complete their tasks more easily. A secondary goal of the test was to gain insight into where users wanted and expected to find various types of information. Specifically, we wanted to learn:

- How effective is the embedded help? To what extent do users pay attention to or ignore it? At what point do users need more assistance than the embedded help provides?
- Under what circumstances do users turn to the print documentation? What kind of information do they expect to find there? How effective is the print documentation in answering their questions?
- Under what circumstances do users turn to the online help? What kind of information do they expect to find there? How effective is the online help in answering their questions?
- Is the flat structure of the quick reference list or the tree structure of the switchboard easier to use?
- What are users’ opinions of the Tracker documentation? What elements do they find helpful or difficult? What would they change?

To explore these questions, the test design identified both system- and documentation-oriented tasks for test participants to perform. The system-oriented tasks included setting up a new project, defining a project code, importing the project budget, entering an invoice, and updating invoice information. The documentation-oriented tasks included locating a field definition and a task procedure, and using the quick-reference list in the print documentation as well as the task switchboard in the user interface.

A key ingredient in effective usability testing is the recruitment of participants who are truly representative of the target audiences for the product. For this usability test, we recruited Tec-Ed employees for whom Tracker use would be a primary or secondary part of their jobs.

Finally, we created a session protocol for the test administrator, so participants would receive the same instructions and error remediation. The administrator facilitates the test sessions; a second usability specialist observes the sessions, taking detailed notes of participants’ behavior and comments. Videotape and audiotape capture “raw” data for each participant.

We conducted a total of six 90-minute usability sessions with individual employees at Tec-Ed’s Ann Arbor office—one dry run to finalize the test design, one pilot test to try out the session protocol, and four regular test sessions. Three of the participants for the regular sessions were new to the Tracker system, while one had used it extensively for about eight months. Participants performed tasks with Tracker while thinking aloud.

The writer of the Tracker print and online documentation served as the principal investigator for the usability study. Another Tec-Ed usability specialist reviewed the test design and session protocol, and assisted with note-taking during the test sessions.

Having the documentation writer serve as the principal investigator for the usability research was beneficial in several ways:

- She was already familiar with the product and needed less “ramp-up” time than a usability specialist new to Tracker would have needed.
- Because she was aware of weaknesses in the design of both the documentation and the user interface, she could tailor the test design to address these key issues and knew to watch for them in the usability test.
- Although aware of problems in the interface originally provided to Tec-Ed, she wanted to observe users’ behavior with this interface and use this data to inform her solutions.

Best practice recommends that development and usability testing be conducted by different teams because of the challenges inherent in effectively evaluating one’s own work product. However, this was an internal project at a small company and a completely separate team for usability testing was not possible. By bringing in a second person to assist the writer/lead investigator with the usability test, Tec-Ed was able to mix a fresh perspective with the experienced one, and counteract biases introduced by having the writer test her own documentation design.

The results of the usability test showed that our employees rarely used the print documentation when attempting a new task, but rather went directly to the user interface and tried to figure out the task for themselves. Once in the middle of a task, however, they did indeed turn to the context-sensitive online help, as we had hypothesized. They used the print documentation as a last resort when they had trouble navigating the help system and finding the information they needed.

### 3.3 Then, the Redesign

As a result of the usability test, we made several important changes to both the documentation and the user interface. Since employees tended to start using the application without consulting the print documentation, we placed greater emphasis on refining the user interface to match users’ expectations and embedding instructions directly into the interface, rather than on providing procedures in an external print manual. We altered several navigation elements in the online help, reducing the number of hotlinks, deleting the table of contents, and expanding the index to help employees find information more easily. We also refined the terminology used in the print documentation, online help, and user interface to better match users’ expectations.

Because the writer of the documentation had personally witnessed the problems employees encountered during the usability testing, she was already convinced of the need to make changes. Perhaps more important, she was responsible for redesigning the user interface as well as the documentation. She was thus able to decide which problems were best addressed through the user interface and which through the print or online

documentation, without some of the territorial issues that can result when two different people or groups are responsible for these elements.

As with Case Study 1, this case study underscores the evolution of technical communicators who expand their skills into the field of usability research. By having the same qualified professional write the documentation and conduct the usability evaluation—and then redesign the user interface—Tec-Ed was able to maximize the value of the product development for an internal tool that is critical to our company.

## 4. CONCLUSIONS

This paper described two case studies in which the combination of technical communication with usability research, performed by the same people, produced a complementary relationship that enhanced the product under development. Using the same team for both usability and documentation projects also increased the efficiency with which the latter projects were done, because of the teams’ familiarity with the product.

This seamless approach between projects made the teams feel that they were contributing to the product’s quality more substantially than the individual projects could. This “greater than the sum of the parts” theme is also important as the technical communication field evolves to expand and merge with other disciplines. For the professional technical communicator, migrating from preparing documentation to conducting usability research should not be considered as “exchanging” one field for a related field. Being a technical communicator and being a usability specialist need not be an either/or proposition. Rather, we view this professional development as moving from one room into a bigger room that contains all these interrelated skill sets. Rarely if ever will a product be entirely usable. After all, real-world project schedules and budgets are not conducive to producing the ideal. However, using the same experienced and cross-trained people on the usability and documentation teams has a multiplier effect on the efficiency and quality of the deliverables.

## 5. ACKNOWLEDGMENTS

The authors thank Amber Clark, Jacie Wedberg, and Beth Almay for their help in preparing this paper.

## 6. REFERENCES

- [1] Anschuetz, L. and Rosenbaum, S. Expanding Roles for Technical Communicators. Mirel and Spilka (eds.), *Reshaping Technical Communication*. Lawrence Erlbaum Associates, Inc., Mahwah, NJ, 2002.
- [2] Bugental, J. and Rosenbaum, S. Combining Usability Testing and Documentation for User Support, in *Proceedings of ErgoCon 98* (San Jose, CA, May 1998), 61-67.
- [3] Carroll, J. *The Nurnberg Funnel*. MIT Press, Cambridge, MA, 1990.
- [4] Dumas, J. and Redish, J. *A Practical Guide to Usability Testing*. Intellect Books, Portland, OR, 1999 (revised edition).

Reprint of paper from *SIGDOC 2002 Proceedings*,  
(Toronto, Canada), published by Association  
for Computing Machinery, Inc., 2002.

- [5] Kantner, L., Leas, C., and Rosenbaum, S. The Best of Both Worlds: Combining Usability Testing and Documentation Projects, in *Proceedings of IPCC 97* (Salt Lake City, UT, October 1997), 355-363.
- [6] Koyani, Sanjay. From Research to Practice: Using Research-Based Web Design and Usability Guidelines to Significantly Improve Web Design, in *Proceedings of Usability Professionals' Association Annual Conference* (Orlando, FL, July 2002).
- [7] Nielsen, J. *Heuristic Evaluation*. Nielsen and Mack (eds.), *Usability Inspection Methods*. John Wiley & Sons, New York, NY, 1994.
- [8] Rubin, J. *Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests*. John Wiley & Sons, New York, NY, 1994.