Reprint of paper delivered at
UPA 2005, sponsored by the
Usability Professionals' Association

Organizing Qualitative Data from Lab and Field: Challenges and Methods

Laurie Kantner
Tec-Ed, Inc.
laurie@teced.com

Deborah Sova
Tec-Ed, Inc.
deborah@teced.com

Lori Anschuetz
Tec-Ed, Inc.
lori@teced.com

ABSTRACT

Analyzing qualitative data collected in usability studies can be challenging. How can we efficiently organize our observations to discover usage patterns and build personae? What are the advantages and tradeoffs of different approaches? This paper describes three methods of organizing usability data based on study complexity and reporting requirements.

INTRODUCTION

Over the past 10 years, the authors of this paper have collectively conducted more than 150 usability studies. Currently, almost half of our usability studies collect qualitative data in the field (using contextual inquiry, ethnographic interviewing, and usability testing techniques), and most of the remaining half are laboratory usability tests that collect both quantitative and qualitative data.

Usability data is data we can see, hear, or count [1]. Quantitative data—data we can count—is by nature fairly straightforward to structure and analyze, once the researcher knows what to count. Qualitative data—what we see and hear—is less straightforward, because we translate these observations into text that we must analyze to determine its meaning.

To continuously improve our processes, the authors regularly review our methodology for conducting studies—or, in terms of this year's conference theme, we bridge our culture of practice to upgrade our skills. In a recent review, we discussed collecting and analyzing qualitative data, to reassess our methods and their appropriate uses. This paper summarizes the three methods our researchers employ most frequently to structure data for analysis.

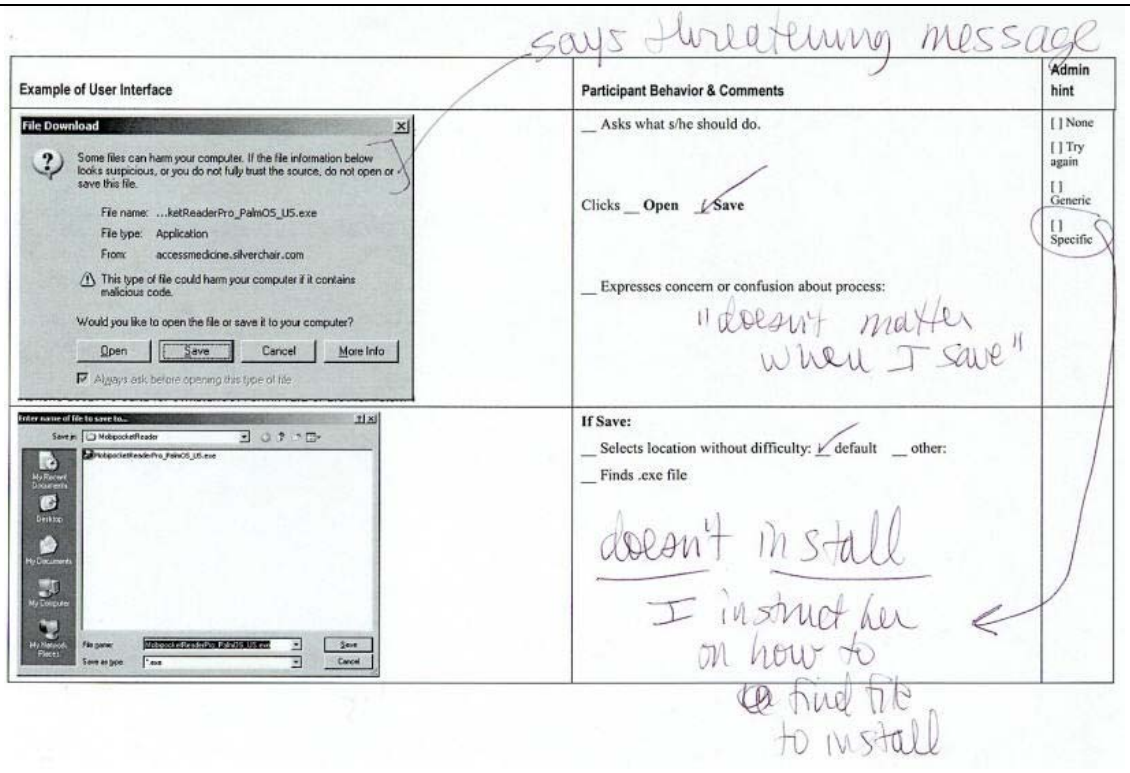
BACKGROUND: DATA COLLECTION METHODOLOGY

A key ingredient in structuring collected data for analysis is how that data is captured in the first place. The authors have tried various methods of capturing data during interviews and sessions, from handwritten notes to automated logging tools. As is true across the profession, we have had to meet the increasing challenges of faster product cycles and slimmer budgets. Time pressures have limited our use of recordings to spot-checking where notes are confusing or scant or raise more questions. Budget pressures have increasingly required assigning a single, senior usability researcher to studies rather than a team of two. Therefore, we needed to find ways to strengthen our ability to complete sessions with a wealth of accessible data ready to structure and analyze.

Even when we can assign two researchers to studies (which, by policy, we do for field studies), we are often carrying out field research in multiple geographic locations. To conserve travel budget while maintaining rigor, we assign one lead researcher for all sessions but may choose a second, local staff member for sessions in each area. This use of changing note-takers means we need to be extremely organized in our data collection and analysis processes to deliver high-quality results.

The primary method we've standardized on for data collection is handwriting notes on custom note-taking instruments we've designed. During the session, these instruments prompt the kinds of observations we need to make and often shorten what we need to write. After the session, these instruments structure the notes for faster interpretation and analysis. We have used and refined this method for a decade [2]. Here is an example of a typical script, with guidelines both for moderation and note-taking:

Structured note-taking form to capture qualitative data during usability sessions



The session protocol and note-taking instruments are based on an earlier deliverable, a test plan that provides a blueprint for the issues we plan to study, the tasks or questions that will collect data about those issues, and scenarios that will motivate the user to perform the tasks. We continue to refer to this test plan throughout all phases of the study. We use it as a guide when structuring our data for analysis, converting "the chronological organization of our notes to a topical organization for our report." [3] After all, the data we report must answer the design team's questions, not simply describe what users did and said step by step.

Here is an example of two parts of a typical test plan. The first part is the list of issues we plan to study:

Research Goals

The goals of the [website].com usability test are to learn:

- How easily and successfully participants can find information that answers their [domain] questions
- Which search and browse tools are of value to participants
- How easily participants can view the information on-screen
- How useful participants find having multiple titles together in one collection
- How easily participants can download information from [website].com to their PDA
- How participants perceive [website].com in comparison to other online [domain] information sites

The second part is a "task matrix" that shows the proposed order of tasks for the study (with estimated durations) and, more important, the issues we plan to investigate during each task. If the issues that we've mapped to tasks overlook a study goal, we need to revise our tasks to make sure we explore it. The following is one small part of a task matrix.

Task or Activity	Duration	Purpose	Issues to Explore
Task 5: Download [website] content to a PDA	15 minutes	The administrator asks the participant to download [website] information to his/her PDA.	1. What kinds of content does the participant say would be useful to download from [website] to his/her PDA? 2. How easily does the participant complete the downloading of content to the PDA? 3. If the participant is reluctant to use this feature, why? What are the barriers? 4. What is the participant's opinion of the content as viewed on the PDA? 5. What would make this feature more useful or usable for the participant?

The study issues are the study goals restated to enable collection of data that, when analyzed and measured, answers the design team's questions. To ensure that we do not become too focused on the data collection and overlook any of the design team's goals, we structure and analyze the data collected after the first session or two to make sure it addresses the goals as well as the specific issues.

A key piece of advice that guides our process is to keep our eye on the "final report" each step of the way. Despite the data structuring method we ultimately choose, our researchers use a common process for handling the data we collect:

- Discuss the session and summarize it right after it is over, either as a story [4] or on a questionnaire, as a "time-deepening strategy." [5]

- Choose a method for structuring the data largely based on study complexity. The elements comprising study complexity include:
  - Number of participant groups
  - Number of products or user interfaces being studied
  - Number of possible "right ways" to use a product or user interface, or number of paths to "correct" information
  - The need to compare outcomes and opinions among different participant groups or products/user interfaces
  - Total number of participants
  - Level of detail in the final report

- Create initial data structures to allow easy viewing and analysis by the researchers, with distinctions between "raw data" and "interpreted data."

- Plan to create separate data structures for viewing and digestion by decision-makers.

The rest of this paper describes three methods we use for structuring the data we have collected during usability studies, whether they are field or lab sessions.

METHOD 1: CREATING HIGH-LEVEL SUMMARIES OF INDIVIDUAL USER SESSIONS

Method 1 is best suited for projects with a tight timeframe and low budget, a fairly small number of participants (6 to 8), and low-complexity study design. It is suitable for compiling quick results, for writing high-level reports during rapid-iterative testing sessions, and for creating personae as part of structuring ethnographic data. It also can serve as the starting point for creating a more detailed report.

One of the benefits of this method is that it can be done between sessions, assuming adequate between-session time. Another benefit is that, by including proper keywords and protocol page numbers in the high-level summary, the data can easily be fleshed out for a more detailed report after all sessions are complete.

Example studies using the method

- A field study with 8 users of a fantasy football application. The primary goal of this study was to learn how fantasy football participants use a stat-tracking feature newly packaged with the latest version of a fantasy football application. Participant groups included users of the prior version, users of the new version, and users of competitor applications unfamiliar with this application. Sessions took place in participants' homes on game days.

- A usability test with 8 users of alternative homepage headers for a portal website. The goals of this study were to learn with which version users were most comfortable (and why), including their initial experience, their reaction to adaptive personalization, and the discoverability and usability of new features. We asked participants to perform a series of typical portal look-up tasks that would trigger changes to the headers at different times, and observed whether they noticed the changes.

- A usability test with 8 cell-phone users of two instant-messaging interfaces. The goal of this study was to collect user feedback on an instant-messaging application for a cell-phone platform. We asked people to perform typical IM chat tasks on the cell phone. Participants were screened for technology adoption including cell phones, IM applications, and mobile data services such as SMS or wireless Web.

Summary of data-organizing method

When we plan a study that fits the profile of low complexity and quick reporting, we schedule 30-45 minutes of "down time" after each user session (excluding the time needed to get ready for the next session) to capture key points from the session. Building this time into the schedule enables us to begin writing the report immediately after the last session is completed and we have debriefed with the client on the focus of the report.

Between user sessions, while events are still fresh in our minds, we capture all high-level "nuggets" and/or show-stopping issues. For each finding, we write one or two statements of description and code them by participant and original note-taking page. For subsequent participant sessions, we annotate our existing list of findings with additional participant codes and note-taking pages and add new findings to the list as appropriate.

High-level findings summary with index pointers into original notes (partial)

Finding	Participants supporting this finding	Page # in protocol
▪ The [X] home page graphics give the page a cluttered, busy, or "overwhelming" feel.	P1, P2, P3, P4, P6, P8	7
▪ Prefers the [Y] home page banner graphic over the [X] banner graphic, but says the other graphics still give the page a busy feel.	P1, P3, P4, P8	7
▪ Did NOT notice or use the new "shortcut" product links feature.	P2, P3, P4, P5, P6, P7	8
▪ Easily used "Shortcut" product links, once shown the new feature (Except P1 and P8 who DID notice them) and were satisfied with the interaction and results.	P1, P3, P4, P5, P6, P7, P8	8, 14, 20
▪ P2 did not use the Shortcut links, preferring to always search or use the Product category.		
▪ Began all three look-up tasks using Search, rather than [product] categories.	P1, P2, P7	8, 14, 20
▪ P1 and P7 also tried the Shortcut links after Search results were unsatisfactory.		

Once all sessions are distilled in this way, we examine the list for patterns that support observed problems with the interface and characteristic comments that help us form personae. This master list also gives us a set of talking points when we debrief with the client before writing the report.

Advantages and tradeoffs

The advantages of this method are that it's quick, it limits reporting to the most salient points—no "fluff"—and we can begin writing the report immediately after the last session. The tradeoffs are that we must summarize each session very soon after it is done, while our memories are still fresh, and therefore must build time for this activity into the session schedule. In addition, if the bulleted text and keywords are insufficient for thoroughly answering a key question or illuminating a new issue raised by a client at the debrief meeting, we have to return to our data-collection notes. However, recording the page numbers where issues occurred helps us find things more quickly.

For rapid-iterative testing, we formalize the bulleted lists into a formal findings list to report quick results. In studies where more detail is required for archival purposes, we use this list of findings as a basis for creating a second data document that captures more detail on participants' behavior and comments. During this second pass through the note-taking instruments, we watch for and often discover lower-level nuggets not captured during the first cycle. In addition, we may find a different "slant" on a quick finding already reported, which we can then clarify. This augmented data document allows us to write a more complete report.

Augmented high-level findings summary (partial)

Pg #	Finding	1	2	3	4	5	6
12	Even after mouse-over text was provided, some ppts still were not clear on the difference between **unavailable and offline** or the meaning of "busy".	x	x	x		x	
12	P2: This should have a legend for the colors.		x				
12	P15: This should have a legend for the colors. It looks busy.					x	
12	P3: I like the mouse-overs because I might forget what the colors mean.			x			
12	P6:These mouse-overs would be very nice and handy.						x

METHOD 2: CREATING TABLES OF ALL STUDY DATA

Method 2 is best suited to studies that investigate high-level questions or perceptions rather than detailed task behavior—for example, ethnographic interviews to learn about information needs or exploratory usability testing of prototypes. Data tables are optimal for studies with fewer than 12 participants in one-hour sessions, although we have also used them for studies with more participants and/or longer sessions. Because creating the data tables can take as much time as the sessions did, this method requires at least a week in the project schedule for data analysis and reporting.

Example studies using the method

- Ethnographic in-home interviews with 10 people about the information they need to buy a new vehicle. The goal of the study was to learn what information people collect during the vehicle research and buying process, how they use the information, their opinions of the information, and barriers to collecting the information they need. We interviewed participants planning to purchase a new truck, a new car, and a new SUV.

- Ethnographic in-office interviews with 9 collegiate athletics directors administrators about their use of an athletic administration association website. The study sought to understand the administrators' environments, their typical tasks, and the role of the website in supporting those tasks. The participants included directors and associate/assistant directors of different-sized athletics programs at institutions belonging to the association in two geographic areas. The study results helped to inform the redesign of the website.

- A laboratory usability test with 18 high-speed Internet users of a prototype video instant-messaging system. The primary goal of this study was to learn how quickly and easily people could begin using the new video IM component of their Web email software and how much they enjoyed the capabilities of the new technology. We observed participants perform typical email and instant-messaging tasks and add video to their chats. Participant groups included current users of our client's email package, some non-customers, some people with instant-messaging experience, and some without.

Summary of data-organizing method

This method of data analysis employs an ordinary word-processing or spreadsheet program to organize the collected data into data tables. The program's Find feature, combined with a disciplined approach to entering descriptors in raw data cells, enables quick building of summary data for entry into summary data cells. (*Raw data* refers to observations or comments as they were captured on the note-taking forms or recording media. *Summary data* refers to the usability researcher's interpretations of what the raw data means; for example, statements about behavior or emerging patterns.)

Data tables are a straightforward but powerful tool for assembling in one place all data on related aspects of a topic or issue. Each data table focuses on a particular issue in the study. If appropriate, each table can consist of sections that organize the data by a major participant characteristic such as product experience, membership level, geographic location, and so on. Each table cell typically maps to a question asked in the session protocol or observation recorded on the note-taking forms. The items in a table may reflect data collected in close proximity in the protocol or many pages apart. (Of course, even consecutive questions in the protocol might be asked at different times and the answers jotted down "outside the lines.")

Data tables easily accommodate raw data, narrative data—including references to photos, video clips, and audio clips that give the product design/development team a sense of "being there" and of the participant's personality—and summaries. They are highly readable and easily printed, enabling usability researchers to put tables or pages side by side for different "views" of the data and to annotate the pages with data interpretations and findings.

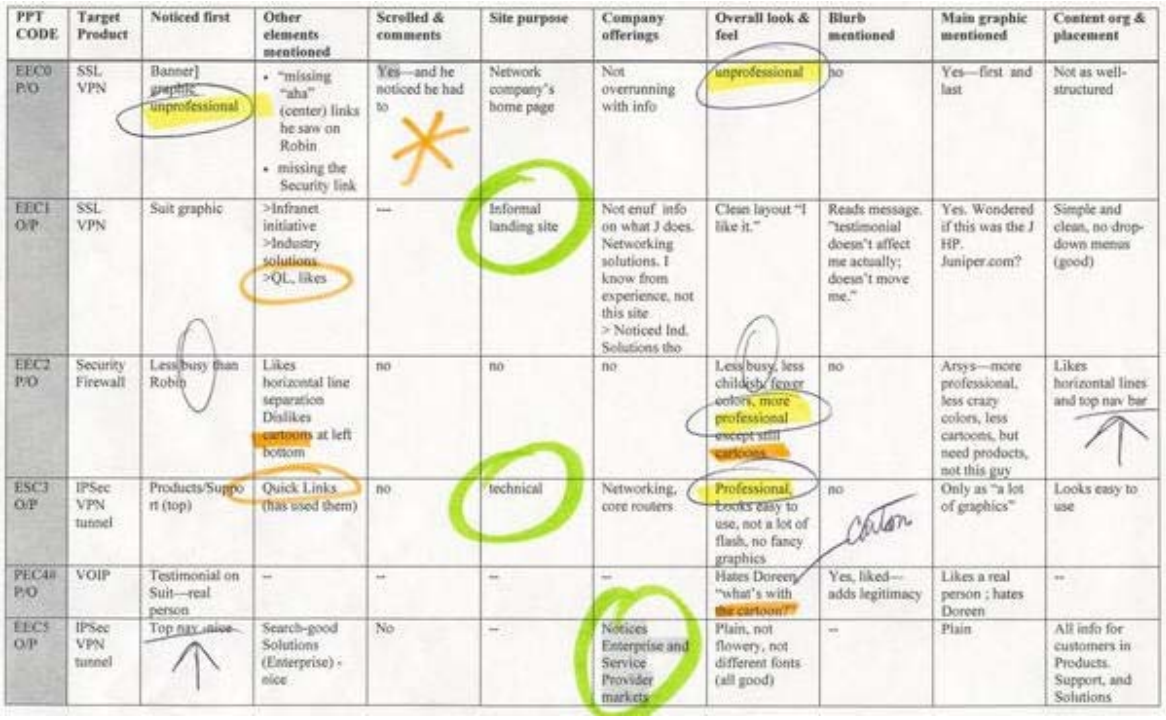
Data Entry Fields placed side-by-side for comparison

Information Needed to Make a Decision Described in Initial In-Home Interview

Ppt. Code	Information Needed by Participant	Information Needed by Other Decision Makers
Current Owners		
C1-TX	Technical specs—"Truck guys like to know all the numbers." "Real-world data" from owners of the vehicle—what they're towing and what it weighs, experience with gasoline and diesel engines, fuel economy, troubles/unscheduled service. Break-even point for diesel vs. gasoline engine.	- Ford, GMC Diesel stop, other owners specialized
C2-TX	No diesel—That's a $6,000 option; he's weighed pros and cons for both Ford and Dodge. Wish list—A gasoline V10, 4WD, limited-slip rear end with a 373 rear axle ratio, Dodge SLT or Ford XLT trim level, loaded with cab clearance lights, tow hooks, skid plate, FX4 off-road package, on/off road tires, and automatic transmission. His wish list is based on his experience and what he knows you need on a 4WD truck not to get stuck.	Ford site, Dodge site, dealer
C3-TX	He knows what he wants: a replacement for his current truck. That means the XLT trim level—not a Lariat, though, because he doesn't need leather seats—with CD player, cruise control, power. A 1-ton truck comes with a towing package. He's contemplating: * Manual vs. automatic transmission; it's a 50/50 coin toss * Dual rear wheels—great for towing, but bad for around town) * 2WD (which he has now) vs. 4WD (nice in the mountains)	- eBay
C4-GA	"The best deal for what I can get." His experiences with his Rangers and the Chevys at work taught him what Ford and Chevy have to offer. Ideally he wants 4 doors, a strong V8, power accessories (he's tired of rolling windows up and down), a comfy seat, cool color, cloth interior. Now that he's looking at a bigger truck, Chevy's interior upped the ante—he does a lot of traveling and wants "creature comforts" like the Chevy provides. Fords are not as comfortable. His friends and family have Ford crew cabs. He doesn't want a bed liner.	All she needs is the lowest price—he can pick the color and options. "She's the money watcher in the family."

Tech specs C1
Real-world data C1
Diesel gas/breakeven C1 (C2)
Best deal C4
What he's already got C3
4WD + off-road C2
Options
Resale value C5
Maint costs C5
Power needed for [illegible] C5
Price C6
Rebates C6
Financing C6
Avail C6
Comfort C6
Big enough for biz C6

High-granularity fields created for deeper analysis



PPT CODE	Target Product	Noticed first	Other elements mentioned	Scrolled & comments	Site purpose	Company offerings	Overall look & feel	Blurb mentioned	Main graphic mentioned	Content org & placement
EEC0 P/O	SSL VPN	Banner] graphic unprofessional	• "missing "aha" (center) links he saw on Robin • missing the Security link	Yes—and he noticed he had to	Network company's home page	Not overrunning with info	unprofessional	no	Yes—first and last	Not as well-structured
EEC1 O/P	SSL VPN	Suit graphic	>Infranet initiative >Industry solutions >QL, likes	---	Informal landing site	Not enuf info on what J does. Networking solutions. I know from experience, not this site > Noticed Ind. Solutions tho	Clean layout "I like it."	Reads message. "testimonial doesn't affect me actually; doesn't move me."	Yes. Wondered if this was the J HP. Juniper.com?	Simple and clean, no drop-down menus (good)
EEC2 P/O	Security Firewall	Less busy than Robin	Likes horizontal line separation Dislikes cartoons at left bottom	no	no	no	Less busy, less childish, fewer colors, more professional except still cartoons	no	Ansys—more professional, less crazy colors, less cartoons, but need products, not this guy	Likes horizontal lines and top nav bar
ESC3 O/P	IPSec VPN tunnel	Products/Support (top)	Quick Links (has used them)	no	technical	Networking, core routers	Professional, looks easy to use, not a lot of flash, no fancy graphics	no	Only as "a lot of graphics"	Looks easy to use
PEC4# P/O	VOIP	Testimonial on Suit—real person	--	--	--	--	Hates Doreen "what's with the cartoon?"	Yes, liked—adds legitimacy	Likes a real person ; hates Doreen	--
EEC5 O/P	IPSec VPN tunnel	Top nav nice	Search-good Solutions (Enterprise) - nice	No	--	Notices Enterprise and Service Provider markets	Plain, not flowery, not different fonts (all good)	--	Plain	All info for customers in Products. Support, and Solutions

Advantages and tradeoffs

Method 2 has the advantage of organizing study data in a way that can be easily incorporated into the final results report, either as individual tables (or subsets) supporting findings or collectively as an appendix. What's more, the data tables can be a convenient, added-value bonus deliverable to product design/development teams eager to compare this data with the results of other research—for example, to confirm existing personas or to understand how this qualitative data supports data collected in other activities such as online surveys and focus groups. Without the data tables, the team would have to review audiotapes or videotapes or decipher the usability researchers' notes to get this information.

Disadvantages of the data-tables method used with a word-processing program include limited sorting and counting functions, as well as no quick mechanism for joining columns from different tables into new views to help answer questions that arise as the data analysis proceeds. However, these drawbacks have minimal effect on highly qualitative, small-sample usability studies that tend to yield rich textual descriptions as well as pithy quotations capturing participants' insights and opinions. Although a spreadsheet program does provide sorting and counting functions that are useful in larger studies, moving the data to another program for reporting may be hampered by the length limits of cells. Using both kinds of programs is sometimes the best solution.

METHOD 3: CREATING A DATABASE FOR DATA ANALYSIS

Method 3 is best suited to studies that investigate a combination of high-level questions or perceptions and detailed task behavior—for example, studies investigating use of searching or finding information. In addition, this method is well suited for studies of 12 or more participants, because larger-size studies often examine multiple participant groups, and Method 3 enables fast cross-tabulation of participant characteristics with behavior and opinions.

Even assuming experience with the selected database program, this method requires somewhat more time to build and populate the database than the total session time. However, as with Method 2, the database can generate tables that can be inserted into the report with minimal editing. For a study of 18 people in 1–hour sessions, the time required for data analysis and reporting using Method 3 was about 55 working hours, or 7 to 8 working days.

The database can also serve administrative functions. For example, it can store the participant scheduling, profile, and contact information that the facilitator refers to when conducting sessions. [6]

Example studies using the method

- Field study with 18 participants of low to medium search skill to explore how they conduct information lookups on the Web. The study combined contextual inquiry (participants demonstrating their normal search activities) with field usability testing (studying a common task—searching) to observe when participants searched versus browsed, which search sites they favored, how they used results, and how much they iterated their searches. All participants were screened to be non-experts at doing searches. We conducted the sessions in two geographic areas, and for each group of 9 participants, we screened for gender, income, employment, and education balance.

- Field study with 10 medical professionals to explore first impressions, ease of use, and perceived usefulness of a medical information website (with the same protocol to be reused in iterative testing). The study combined contextual inquiry with field usability testing to observe how easily participants used the website to answer their own medical questions and download topics to their PDA. Participant groups included regular physicians, residents, nurse practitioners, and students.

- Laboratory test with 10 participants to explore ease of use and understanding of a product-search sorting tool. This lab study explored participants' perceptions of the purpose and correct use of the tool. Participants were screened for familiarity with the electronic product that populated the database for the prototype tool.

- Laboratory test with 18 participants to explore noticeability and ease of use of product-search narrowing tools. Two participant groups were represented, those who were already registered to use the website and those who had not registered but were users of the site. Presentation of three search-narrowing tools was counterbalanced within these two groups.

Summary of data-organizing method

Method 3 employs a database program to store and assist the analysis of the data collected by the usability researcher. The authors use a relational database program that allows free-form text entry and on-the-fly field creation. The researcher creates multiple forms or views within the database to hold and organize the data. If a study is similar to a prior study, some reuse of the forms and views is possible.

Generally, the first form is a data-entry repository for all session activity, with fairly large fields for task behavior, comments, additional observations, and some summarization. Each record reflects one participant session. We create separate forms for the profile data and questionnaire data collected for each participant. If an organization has junior team members or support staff, you can enlist them to enter this more straightforward data.

Secondary relational databases enable analysis of records within records. For example, we used secondary databases to summarize search tasks per participant and iterations of search tasks.

Database of participant profile and session summary information, data entry form (partial)

(Summary fields added later)

Ppt	P13
Persona	Explorer, Young educated
Ppt_Internet_Age_Profile	Computer_eq_Internet_Younger
Ppt_EquipConnectSpeed	High
Ppt_Flexible_Time	Medium
Search Ability	High
Age	21
Employment	Student
Income	$50,000 to $80,000
Education	Some post-high-school
Computer_OS	IBM (1.5 years) / Windows 98
Computer_Location	Bedroom with computer, bed, books, snowboard, luggage, bureau, plants, boombox
Computer_OtherStuff	Lamp, tape dispenser, candles, coffee mug, CD notebook
Computer_YrsUse	4
Internet_YrsUse	4
ISP	Compuserve [but generally plugged into college network]
Browser	Internet Explorer
Internet_Freq	Daily
Internet_HrsWk	12
Internet_Do	School-related research, email (friends and family), IM (with other students for homework; easier than phone, less inhibiting), shopping and buying, news (instead of TV), music chat rooms, music sites for downloading MP3s of his favorites bands' concert music
With_Someone	Alone

Database of search task information, data entry form (partial)

Lookup	13a
Ppt	P13
Goal	A book for class, No More Prisons by William Upski Wimsatt [information about the book]
Info_Buy?	Info
MaxIterations	2
SearchType	Exploratory
Duration_Compare_Lookup	Shorter
SearchStart	Search
CombinedBrowseSearch?	No
SearchScope	Whole Web
SearchComments	
SearchEngine	Google
SearchString1	"no more prisons"
ResultsNo1	1800
ResultsViewed	1
ResultsPagesViewed	1
ResultsChecking	Scrolls down and back up. Clicks #9, No More Prisons, at Columbia.edu-he thinks it will be up-to-date. Scrolls, skims, decides it's not what he needs. He thinks about his search string, about making it more specific. Clicks Back to return to the search results.

Database of search iteration information, data entry form (partial)

Ppt	P13
Lookup	13a
Iteration	2
Description	Adds and criticism
ResultsChecking	Second search nets 65 hits. Clicks #1, No More Prisons, reads the review and nods. Highlights 2 key paragraphs to read. "This is interesting. It tells a bit about how the book got popular-it's good information to know for a report. This is pretty much what I was looking for. It gives me a summary."
ResultsViewed	1
ResultsPgsViewed	1
ResultsComments	
MoreResultsViewed	
#Results	65
SortField	700

The researcher analyzes the data by hypothesizing possible trends or patterns, creating views showing different combinations of fields, and querying the database to see what emerges. As needed, the researcher creates new fields that encode and summarize the patterns observed. For example, if anywhere in the session a participant says she would "bail out" in some way—that is, give up on a task or leave a site—we create a special field to indicate the participant made that comment and when she said it. It's important at this step to exert discipline in coding so that we can perform a thorough yet fair analysis. The researcher continues this process, mining the data for as many insights as time allows.

Summary view of participant profile information

Ppt	Ppt_Internet_Age_Profile	Ppt_EquipConnectSpeed	Ppt_Flexible_Time	Search Ability	Internet YrsUse	Computer YrsUse	Age	Education	Income	Gender
P1	Computer_eq_Internet_Older	Low	High	Low	1.66	1.66	43	High school	$18,000 to $49,000	Female
	Freq_Look_for_Things	[didn't ask]								
	Persona	Lost								
P12	Computer_eq_Internet_Older	High	Low	Medium	3	3	43	Some post-high-school	$50,000 to $80,000	Female
	Freq_Look_for_Things	Daily - Since [starting to plan								
	Persona	First-blush boomer, ebay visitor								
P14	Computer_eq_Internet_Older	Low	High	High	31	31	47	MS	More than $80,000	Female
	Freq_Look_for_Things	Couple of times per month,								
	Persona	Old hand								
P18	Computer_eq_Internet_Older	Low	High	Medium	6	6	53	High School, 4 yr carpenter	$17,000 or less	Male
	Freq_Look_for_Things	Every day								
	Persona	Frugal latecomer								

Summary view of search iterations

Ppt	Lookup	Iteration	String	NextStepCategory	NextStepCategoryExplain
P12	12b	1	lord of the rings	Use Different Search Engine, Same String	Goes back to Yahoo and Shopping
P12	12b	2	lord of the rings	Find Useful Page and Keeps	Bookmarks the page and saves search results
P13	13a	1	"no more prisons"	Lengthen String	
P13	13a	2	"no more prisons" and criticism	Find Useful Page but Does Not Keep	

Summary view combining participant profile, task, and iteration information

Ppt	Lookup	Iteration	String	Narrowing	#Results	Results Checking
P13	13a	1	"no more prisons"		1800	Scrolls down and back up. Clicks #9, No More Prisons, at Columbia.edu-he thinks it will be up-to-date. Scrolls, skims, decides it's not what he needs. He thinks about his search string, about making it more specific. Clicks Back to return to the search results.
			Description	"no more prisons"	*Results Viewed*	1
			SearchEngine	Google		
			SearchEngineIteration	Google	*Misspelling?*	*ResultsPgs Viewed* 1
			NextStepCategory	Lengthen String		
			NextStepCategoryExplain		*Keeps?*	
					SearchType	Exploratory
P13	13a	2	"no more prisons" and criticism		65	Second search nets 65 hits. Clicks #1, No More Prisons, reads the review and nods. Highlights 2 key paragraphs to read. "This is interesting. It tells a bit about how the book got popular-it's good information to know for a report. This is pretty much what I was looking for. It gives me a summary."
			Description	Adds and criticism	*Results Viewed*	1
			SearchEngine	Google		
			SearchEngineIteration	Google	*Misspelling?*	*ResultsPgs Viewed* 1
			NextStepCategory	Find Useful Page but Does Not Keep		
			NextStepCategoryExplain		*Keeps?*	
					SearchType	Exploratory

Advantages and tradeoffs

Advantages of this method are that it moves all of the data into a structure where we can continue exploring relationships between participant characteristics and behavior, behavior from one task to another, and opinions and behavior. The data can be exported easily to a spreadsheet program for further analysis. Having the data structured this way also enables faster response when the development team ingests the initial results and raises additional questions the data might answer.

The primary disadvantage of this method is the "tool training time" to create views and relational databases. Searching across fields is also limited with the tool we use. However, it is fairly painless to enter the data into word-processing tables first and then import it into a database, thus creating a "flat-file database" where all fields can be searched at once. Some database tools also allow searching in all fields.

CONCLUSIONS

Additional methods exist that take the qualitative data structured using the methods in this paper and creating more visual outputs for analysis, including flow charting and affinity diagramming. These methods may add to the time investment of analysis and reporting; their likelihood of increasing the quality of decision-making and reaching audiences who prefer visual or quickly digested outputs must be weighed against the additional time they add to the schedule.

In the business of product development, time is opportunity, and balancing the time required to analyze qualitative usability data with the need to release a product or website soon calls for using the appropriate data structuring method. Complex studies with complex questions benefit from the time required to structure qualitative data in the most flexible way possible—a database, where the questions asked can change as the analysis progresses. Less complex usability studies with more straightforward data can take advantage of the time-savings of flat-file tabulations (using word-processing programs), or even of pencil-and-paper summaries after each sessions.

REFERENCES

1. "A Data-Collection Strategy for Usability Tests" (by Jill Rojek and Amy Kanerva, IEEE Transactions on Professional Communication, Vol. 37, No. 3, September 1994)

2. "Following a Fast-Moving Target: Recording User Behavior in Web Usability Testing" (by Laurie Kantner, UPA 1998 Proceedings)

3. "Data Collection and Analysis: A Look at Process-Oriented and Product-Oriented Field Studies" (by Erin Leanne Schulz, Judith A. Ramey, and Denise Carlevato, Society for Technical Communication 1996 Proceedings)

4. "When the Field is Far Afield: Multiple-Country Observations of Complex System Use" (by Lori Anschuetz, Deborah Hinderer, and Janice Anne Rohn, UPA 1998 Proceedings)

5. "Rapid Ethnography: Time Deepening Strategies for HCI Field Research" (by David R. Millen, ACM 2000 Proceedings of the Conference on Designing Interactive Systems)

6. "Using a Handheld PC to Collect and Analyze Observational Data" (by Clay Spinuzzi, ACM SIGDOC 2003 Proceedings)

ABOUT THE AUTHORS

Laurie Kantner
Senior Usability Consultant
Tec-Ed, Inc.

Voice: 734-995-1010
Fax: 734-995-1025
Email: laurie@teced.com

Laurie Kantner has defined and conducted a wide range of usability research projects as a senior staff member at Tec-Ed, Inc. Laurie has conducted numerous field usability studies using contextual inquiry and ethnographic research methods and, in the past three years, employing usability testing in the field as well as in the lab. Studies have taken her as far as Regina, Saskatchewan, into inner-city Chicago, to the sanctum of computer company help desks and university researchers' labs, and to a rural Indiana county courthouse. Laurie is a member of the Usability Professionals' Association, the Society for Technical Communication, and ACM SIGCHI. She has a B.A. from The University of Michigan.

Deborah Hinderer Sova
Senior Usability Consultant
Tec-Ed, Inc.

Voice: 414-762-6584
Email: deborah@teced.com

Deborah Hinderer Sova has over a dozen years of experience evaluating software and website usability for clients in a variety of industries including financial, medical, bibliographical, wireless, multimedia, enterprise software, security, and insurance. Before rejoining Tec-Ed after a three-year hiatus, she was principal consultant for Sova Consulting Group. Deborah has also worked as a user experience specialist for the Nielsen Norman Group, Optavia Corporation, American Express Financial Advisors, and Compuware Corporation. She is recognized as a participant recruiting expert, having co-authored with Jakob Nielsen an NN/g report titled "233 Tips and Tricks for Recruiting the Right Users as Participants in Usability Studies." Deborah has presented papers and participated on panels and progressions on usability- and recruiting-related subjects. She has served on three UPA conference committees, most recently for the UPA 2005 Idea Market. She holds Bachelor and Master degrees from The University of Michigan.

Lori Anschuetz
Senior Usability Consultant
Tec-Ed, Inc.

Voice: 585-454-7440
Fax: 585-454-5124
Email: lori@teced.com

Lori Anschuetz has conducted scores of laboratory tests, user interviews, focus groups, contextual inquiry, and ethnographic interviews as a senior staff member at Tec-Ed, Inc. She has led research studies of enterprise-wide project management and administration tools, insurance claims processing and customer information systems, telecommunications applications, financial services (including Web-based stock, mutual fund, and foreign exchange trading for financial institutions and consumers), online-information services for audiences ranging from elementary school pupils to customer support personnel to engineers, and more. Lori is a member of the Usability Professionals' Association, the Society for Technical Communication, and CHI Rochester. She has a B.A. from The University of Michigan.