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Field Research in Commercial Product Development

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ABSTRACT

The schedule and budget constraints of commercial product development make field research difficult to justify and integrate into the product lifecycle. As a result, commercial products do not always benefit from the unique and rich qualitative data obtained from field research methods. This paper describes guidelines for applying field research methods successfully in industry, including a compressed contextual inquiry technique.

INTRODUCTION

Field research involves observing people in their everyday situations (homes, workplaces, schools) to learn their normal or natural behavior. Through field research, usability practitioners can develop an in-depth understanding of users by:

- Observing users performing their real activities in their own environments.
- Interviewing users about their goals and tasks while they are surrounded by their own artifacts, in the context of their normal behavior.

Unlike laboratory tests, field research enables usability practitioners to discover, through direct observation and interaction in the users' "real-life" context, how this context affects their product use, including constraints, workarounds, and the way product features and functionality are employed. Unlike usability focus groups and interviews in formal locations, field research makes it easy for users to mention behaviors they have internalized and perform naturally at work or home.

Why Field Research Is Underutilized, Yet Important

Traditionally, contextual inquiry [2, 4] and contextual design [1, 6] have been in-depth qualitative methods, mostly conducted within large organizations that can invest in research for long-term product design improvements. Similarly, the methodology for ethnographic interviewing has been developed through fairly extensive projects [7].

In contrast, usability testing methods are regularly used in short-term data collection projects. The literature on "discount usability" [3] and many other published case histories describe the successful application of usability testing to achieve immediate commercial goals. Usability testing—especially iterative usability testing—is easy to justify and highly productive.

It is often possible and desirable to combine traditional usability testing with field research methods in a highly effective sequential use of multiple methods. A paper on multiple methods [5] listed the potential problems of restricting usability programs to usability testing, which:

- May not evaluate different audience groups; most small-sample usability tests assume a fairly homogenous audience.
- Does not observe users in their context of work unless conducted in the field.
- Does not usually address longitudinal issues; most observations focus on ease of learning and the "out of box" experience.

Field research can address those shortfalls in a usability program by providing richer and more in-depth qualitative data than most usability testing yields. However, the multiple challenges of budget, schedule, and logistics often combine to defeat our efforts to convince management to support field studies. Many usability practitioners—both those working for companies that develop products and individual consultants—recognize and appreciate the value of field research, but have only occasional chances to use these worthwhile methods.

The authors face the same challenges when we recommend a field research project. However, because we define so many projects for a wide variety of companies, since 1996 we have performed a relatively large number of field studies. As a result, we have had the opportunity to evolve and adapt two time-honored field research methods—contextual inquiry and ethnographic interviewing—in ways that are working well to inform commercial product design.

What's Different About Field Research

Field research requires that usability practitioners be (a) in the field and (b) researching users' behavior. That may seem obvious, but it is important to recognize that simply having contact with users in the field is not necessarily "field research." For example, salespeople and corporate trainers also work in the field, but they demonstrate products to customers or teach users about products. Sales and training activities in the field are indeed "site visits," but their purpose is rhetorical—to educate, train, or convince people. In research, we observe people's behavior while exerting care not to influence that behavior.

Field research contrasts with laboratory tests because, in field research, users are surrounded by the artifacts and reminders of their daily life, and they perform tasks or describe tasks using those artifacts and reminders. Instead of an emulated work project in a constrained lab situation, users perform or discuss actual work processes "on their own turf." Thus, field research:

- Collects rich data from interviewing and observing users in the actual context of use.
- Often identifies usability issues not previously recognized.
- Avoids misleading results from placing users in artificial situations.

CONTEXTUAL INQUIRY: CLASSIC AND CONDENSED TECHNIQUES

Contextual inquiry is a qualitative data-gathering and data-analysis methodology adapted from the fields of psychology, anthropology, and sociology. It consists of observing and talking with people in their workplaces and homes as they do normal activities. Key characteristics of classic contextual inquiry include:

- Users become partners in the inquiry with the usability team; an ongoing dialog enhances data collection.
- The inquiry is based on a set of general concerns to guide observation, not on a list of specific questions to ask.
- The result is ongoing, not summary, experience; concrete data, not abstract information.

However, classic contextual inquiry requires hours of time with each user—up to a full day each. While this long session time enables researchers to collect much valuable information, many companies balk at spending the time to collect and analyze so much data. In addition, participating companies cannot spare employees for such a long period of time.

Because the authors wanted to be able to offer companies the benefits of contextual inquiry even when time is short on a commercial project, we developed what we call the "condensed contextual inquiry." It identifies a more constrained set of concerns to investigate than the classic version, allowing researchers to focus on a few critical issues during sessions with users. The condensed method retains the strengths of contextual inquiry:

- Exploring people's use of products within the restrictions of their actual work.
- Seeing when and how companion software and artifacts such as notebooks, yellow stickies, and forms are used to complement the product.
- Clarifying details about tasks while they occur, to avoid misunderstandings about what users did and why.

Methodology for Condensed Contextual Inquiry

Condensed contextual inquiry accommodates the limited time that product development teams have to learn about users' work processes and motivations. As in classic contextual inquiry, the product development team members work with the usability team to identify the characteristics of the users to interview, the tasks to observe, and specific issues of concern, including terminology. Unlike classic contextual inquiry, the actual inquiry team is limited to two people, usually two usability specialists; this approach saves time on subsequent data tabulation and interpretation, as well as saving the time of product development team members, who can continue working on the product. Having only usability team members at the sessions requires a high level of trust between the product developers and the usability team.

Within the session itself, the primary difference between classic and condensed contextual inquiry is the limited nature of the work under observation. Condensed contextual inquiry is not suitable for designing a complex system from the ground up. However, it is very appropriate for examining the flow of tasks in an established routine and identifying workarounds and artifacts that represent opportunities for introducing new features and functions within that routine. As with the classic method, the condensed method steps back from existing tools to look at the bigger picture of the users' motivations and contextual artifacts for accomplishing work. The major difference is the scope of the work under examination.

When product developers do not attend the contextual inquiry sessions, the usability team bears additional responsibility to understand the product development team's assumptions about the users' work processes and to communicate what was learned in light of those assumptions. A summary data report is insufficient; results are best communicated by the usability team explaining the results using anecdotal stories, creating an atmosphere where product developers can ask a barrage of questions that enables them to experience the interviews vicariously. Videotaping is often not an option for field studies because of security and privacy issues, and consequently storytelling rather than videotapes must suffice to communicate the experience. Having a team of two usability specialists makes the storytelling richer.

Case Study of Condensed Contextual Inquiry

A well-known Internet service provider wanted to learn how users of its service searched the Internet from their home computers. The ISP was interested in users who did not know sophisticated search techniques. The project timeline and budget did not allow for classic contextual inquiry.

To prepare for this study, the usability specialists worked with the product development team to identify whom to study. Characteristics that were most important were:

- Low-end searching ability (no computer programmers, researchers, or librarians)
- A mix of business and home users
- Gender balance and diversity in age
- 18 one-hour sessions, 9 in each of two geographic regions

Ads were placed in local newspapers in the two geographic regions. During screening interviews, the participant recruiter asked candidates to describe a recent experience in which they looked for information on the Internet. If the participant described sophisticated searching techniques such as use of Boolean operators, they were excluded from the study. In addition, we limited the number of participants who preferred Google to four, because at that time Google users tended to be more experienced at searching.

The usability specialists worked with the product development team to develop the test protocol. In the protocol, users determined their own information lookup tasks and performed as many as would naturally fit within a 45-minute time period. The remaining 15 minutes were used for questionnaires and debriefing. Tasks were defined as "lookups," not "searching," to encourage natural behavior, which tends to be a mixture of searching and browsing.

The product development team asked the usability specialists to code users' search methods according to goal categories (known item, exploratory, existence, and comprehensive) and according to style (linear vs. berrypicking). The product development team was particularly interested in how users worked with search results. To expedite data tabulation, the session materials contained structured note-taking forms for quick coding of observations. This technique was especially important because the usability specialists chose not to bring videotaping equipment to the interviews, instead relying on notes, audiotapes, and digital photographs of the users' work space.

One of the usability specialists conducted the interview, and the second usability specialist assisted in note-taking and operating the recording equipment.

To build rapport with the participant, the interviewer began by asking some background questions to confirm what was collected during screening. Then she asked the participant to describe a recent experience looking for information on the Internet. This retrospective account provided important background information to the usability team and began to give the participant control of the session. The interviewer then asked the participant to think of something s/he wanted to look up on the Internet and to look for it. At that point, the participant took control of the session. Upon completion of the task, the interviewer asked questions to prompt the participant to recap the experience. Then, if time permitted, the interviewer asked the participant to look up something else s/he wanted to find on the Internet. Most participants completed two lookup tasks; a few completed three and a few completed just one.

The usability team used a database to tabulate the data collected. Interesting relationships emerged between search goals, searching styles, and personas. To convey the depth and richness of the data, the usability team produced a detailed report of findings, with a rather long executive summary that served to structure the initial results presentation to the product development team, who asked many questions. The usability specialists revised the report to answer outstanding questions and presented the findings again to a broader group of designers within the organization.

To help the product development team experience the sessions vicariously, the usability team told many specific stories during the results presentations. In addition, although the study report summarized findings according to patterns, an appendix presented interview-level data. Here is an example of how we structured the interview-level data for easy summarizing into higher-level findings (this data is for one of two lookups this participant performed).

Goal	Goal Category	Lookup Activity	Scope	Style	Summary	Succeed	Duration (min.)	Importance
Website for crockpot recipes; something that contains vegetables and no meat	Explora-tory	Browse	Site: justcrockpotrecipes.com	Berrypicking	Goes to URL she has in torn-out news article, uses links to find recipes, doesn't see the link she had originally articulated as her goal (really her husband's goal), explores other links for newly formed goal (beef recipes). Copies results she wants to keep into WordPad.	Yes	6	Important—dinner

ETHNOGRAPHIC INTERVIEWS: CLASSIC AND CONDENSED TECHNIQUES

Whereas contextual inquiry is primarily an observation of use with inquiry from a usability practitioner, ethnographic interviewing is primarily an interview about use, with a clearly defined set of questions to ask all users in the study.

Methodology for Ethnographic Interviewing

In classic ethnographic research, observers become part of a culture so that they can understand it well and explore and modify their assumptions about it. In product research, ethnographic interviewing helps researchers understand how a person's context of use affects his/her approach to tasks and how the person views his/her own context.

Ethnographic research augments market research by building a deep understanding of the target users' situations and motives. However, classic ethnographic research requires entering the situation with a "blank slate" and spending a great deal of time building sufficient understanding to learn what questions to ask and what issues to research. Because commercial product development does not allow that kind of time to be spent on customer research, condensed ethnographic research methods have evolved [7].

Condensing the ethnographic interviewing method means identifying the scope of what to observe. Rather than learn everything about a user's life, we observe only a small sphere of it as it relates to the tasks we are interested in for product design purposes. In this manner, we can structure the interviews to meet project budget and schedule constraints.

How is this different from contextual inquiry? We choose ethnographic interviewing when the domain we are researching encompasses more than performing tasks, such as how people organize information for specific purposes. We also recommend ethnographic interviews when it is impractical to observe tasks, either because of the length of time the task requires or because it happens infrequently.

As with contextual inquiry, ethnographic interviews benefit from a team of two usability specialists to deepen the note-taking for more effective data interpretation. Because the interview is centered on specific themes and questions developed in conjunction with the product development team, the results are more straightforward to present. Even so, we often find surprises in ethnographic interviewing, as we find in all usability research. [This leads me to expect a surprise to be described in the next case study. Is there one? Could there be?]

Case Study of Ethnographic Interviewing

The authors worked with information architects at the digital design agency for a Big Three automaker to learn how vehicle owners use vehicle records (maintenance, insurance, etc.). The goal was to learn what information to provide on a website for vehicle owners after their purchase.

Ads were placed in local newspapers in three geographic regions. We sought owners of different vehicle types and a mix of people who had purchased the vehicles new or used or were leasing. We also sought gender balance and diversity in age.

We prepared for and conducted 18 one-hour in-home interviews across the country, with 6 interviews in each of the three geographic regions. The first part of the interview explored the specific records people kept and how they used them. The rest of the interview consisted of questions aimed to learn how people viewed vehicle ownership, how they valued certain kinds of information, how they categorized it, and what labels they did and did not recognize. A card-sorting exercise was used for some of the data collection. The information architects were deeply involved in the design of the protocol.

To minimize travel expenses, three different two-person teams conducted the interviews in their respective locations across the nation, working from the same protocol. After the interviews in the first region were completed, all team members met by phone to share knowledge about the process. In addition, the first team wrote interview summaries that described the data collected for each interview, serving as a progress report for the information architects and a means of standardizing the methodology for the interview teams.

The final results were provided in a detailed report with an executive summary, as well as an oral presentation. The report included updates to the personas already in use by the information architects and quotations describing the participants' relationship to their vehicles and their opinions about vehicles and information on the Web.

Here is an example of one of the quotations provided in the final report: "In general, for me, car ownership has been just a car, just a mode of transportation. I don't abuse it. I take care of it so it doesn't cost me an arm and a leg, and therefore I get a lot out of its useful life. I definitely take care of my cars."

GUIDELINES AND TIPS TO HELP PRACTITIONERS USE FIELD RESEARCH IN THEIR OWN WORK

When preparing for and conducting field research:

- **Identify user populations to interview and create a recruiting script**: Work carefully with product marketing to determine high-priority and secondary participant characteristics, as well as characteristics that exclude a candidate. Strive for geographic diversity if appropriate. The number of interviews will depend on the level of diversity desired, as with any usability study. Create a detailed recruiting script that lets you screen out unqualified candidates early in the screening interview, and make sure the product marketing and development teams sign off on the recruiting script before you use it.
- **Decide what topics to cover and, if appropriate, what tasks to observe**: Within their own context, users expect to get real work done (regardless of whether it is at home, work, or school). People will more readily agree to being visited in their own context if the visit duration is limited to 1 or 1.5 hours. Choose a number of topics and tasks (if appropriate) that will not exceed the time duration you are asking for. Work with the product development team to make sure their high-priority concerns and issues will be addressed.
- **Create an interview protocol**: Do not "wing it" in field research. Time spent in a user's own environment is precious, and you want to be alert and open to the subtle influences affecting the user's behavior. You'll address the important issues and notice the unexpected if you are guided by something structured.
- **Recruit users**: Allow sufficient time for this activity—2 weeks to find 8 acceptable users is not unrealistic if you are looking for a very specific profile. You do not want time constraints to be the reason you accept users who do not meet the profile and whose data skews your results. Make sure participants learn during screening about any recording you plan to do (video, audio, or photography), for which they will need to sign permission forms.
- **Pilot-test the interview materials**: As with any usability session, a pilot test helps you identify areas where the flow of questions or activities can be improved. However, with field research it is often difficult to have a spare "user" for this session. In that case, be sure to dry-run the materials with someone unfamiliar with the study, to build your own comfort level and identify anything confusing or awkward.
- **Conduct the interviews**: In contrast with a usability test in which the user is the visitor to your lab, in field research *you* are the visitor. Allow extra time for the possibility that the user is not ready for the interview the moment you show up. Behave as a guest; greet other family members or coworkers. Be at ease with pets. It is a social situation in which you need to build rapport. The participant can still decide to cancel the whole deal, so keep that in mind and show your appreciation every step of the way. Do not exceed the agreed-on time without the user's permission.
- **Record the session**: Be sure to get the recording permission forms signed before you start the interview. Before taking a photograph, let the participant know you are taking it, to maintain the participant's comfort level. Be careful not to photograph any information that violates the person's privacy.
- **Analyze the data**: The information you learn will be interesting and informative at many levels. Be sure to compile your data in a way that will answer questions at all levels. Consider using a database tool if you have many users or many characteristics to cross-tabulate.
- **Report the findings**: Be prepared to elaborate on your more general findings with more detailed anecdotes. The goal is to immerse the product development team in the findings to the extent that they feel they were present at the interviews. With the kind of rich data you collect in a field study, your first presentation of the results will likely raise additional questions. It is reasonable to delay answering those questions until you can analyze your data further, rather than answer off the top of your head. Allow for this kind of iteration when you set the expectations of the product development team. They will appreciate continuing to collaborate with you at this point in the process.

CONCLUSION

Field research is more than usability testing in the field. It is more than learning how someone uses a product. It is learning about the person: how she accomplishes tasks within her own environment, what motivates her to use a product in a certain way, and what she naturally does to compensate for what the product does not help her accomplish. This research builds a deeper understanding of the relationship between users' work and their environment, resulting in designs that increase user satisfaction with products.

This paper described practical ways to design and conduct field research studies within the time and budget constraints of typical commercial product development processes. The information collected from field research cannot be gained from surveys or lab testing. The condensed methods and guidelines described in this paper provide practical ways for usability specialists to incorporate these methods into their toolkit and help product development teams learn from field research to design better products.

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