

Photo Diaries – A Peek into a Mobile Worker’s Life

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Abstract. Understanding mobile users and their behaviors in context, across multiple countries and cultures, is challenging and costly. However, the reward of creating a mobile application that meets mobile users’ needs (and is actually used - not deleted within days of being downloaded) is priceless to the user in terms of productivity, the employer by keeping data updated, and the developer by producing a successful application.

To develop such applications, mobile HCI professionals need to identify mobile users’ daily mobile habits and tasks completed with their devices. To uncover unexpected uses and a range of contexts, we recommend using a photo diary technique in conjunction with other ethnographic methods. Conducting mobile photo diaries will help mobile HCI professionals in their application decision making process, by giving them additional insights into their users that may have been inaccessible or unthought-of before, and visually rich deliverables to share with management.

Keywords: Diary, Photographs, Ethnography, Research, User-Centered Design, Mobile.

1 Introduction

HCI researchers need to look at cultural differences in behavior because many products today are developed for a global market. National laws, cultural backgrounds, socio-economic backgrounds, religion, and language can all affect how people interact with a product in different countries [1]. The rise of global products has created new groups of users that we need to understand more clearly. Mobile users fall clearly into this category. Mobile application adoption is extremely sensitive to cultural demands and requires an understanding of each culture one is going to ship their product to. Getting an insider’s view, a documentation of what folks are doing with their mobile devices in context, is crucial to understanding their culture and adoption of it. The photo diary method lends itself nicely to collecting this valuable data. More so, since studying mobile behaviors often includes travel and a number of locations, this technique allows mobile HCI researchers to gather information and insights that are generally hidden from us. While diary studies have been frequently used in HCI [2, 3, 4, 5, 6], they rarely have been used to assess cultural differences among users.

1.1 The Diary Method

Diary studies are an established method [7] that can be used for capturing all kinds of information, from shopping behavior [8] to the behavior of business professionals [9] to identifying interesting uses and contexts of mobile devices. Most commonly, this method has required participants to capture (through written descriptions, audio recordings, and pictures) information about experiences that happen during the day. Diary studies might require participants to capture data at particular times, specified time intervals, or when particular events occur [10, 11, 12]. Diary studies can range from relatively unstructured accounts, with some blank lines to write in information [13], to highly structured accounts, with detailed activity checklists [14].

Diary Method Advantages. Diary studies are advantageous to other methods of data collection for many reasons. Diary studies allow information to be captured from the participant’s perspective, in their own form of communication, and in the context of the real-world. Information that can be hard to gather because it occurs infrequently, is socially or contextually restricted, or is difficult or impossible to observe can easily be collected if the diary is oriented appropriately. Furthermore, because the participants are generally explaining their behaviors or experiences in the diary, the diary enables researchers to gain a deeper perspective on the impact that situations or events have on participants.

Diary studies can be extremely useful in examining mobile and cross-cultural issues for a multitude of reasons. Diary studies are inexpensive to run compared to other methods. Costs are minimal compared to the high costs of international travel and accommodations (often necessary to collect data using other methods). Because other methods are generally more expensive, their associated data collection phase is often shorter and involves soliciting data from fewer locations (that is, countries). For instance, a field study may occur only for a few hours per day, for a few days, and in only one country. A diary study, however, can more easily be conducted over a longer period of time, in more countries, allowing for a wider and more diverse set of data to be collected.

Diaries also enable researchers to gather data at time intervals that are often potentially difficult to capture using other methods. For example, when a person wakes up she may perform a task, such as making a call during breakfast, which could be of interest. Another example may be a task like watching a video late in the evening before going to bed. These are potentially times when important differences in behavior may occur. This is especially true in the mobile space, because mobile devices are used ubiquitously (as they can easily be transported from place to place and in many cases remain at person’s side 24 hours a day). By collecting data at these different time intervals and environments, researchers can capture data from the cultural perspective of the participant, without the interpretation of a researcher who may not be from that culture.

Lastly, a diary study tends to be less intrusive because participants can typically fill out a diary on their own time at their own comfort level. This can make it easier to recruit a larger number of participants.

The Photo Aspect. Diaries that include taken photos are especially good for HCI professionals studying mobile users from different cultures. Most present-day phones have built in digital cameras. This allows for easy data capture while a person is using their mobile phone with little interference of their mobile use. Furthermore, photos capture a lot of information and often more clearly and fully document places and cultures. This comprehensive account becomes especially important if the cultures or locations are places where a researcher can't follow or is relatively unfamiliar (such as a different culture). Visual deliverables, such as pictures, serve as illustrative and compelling data (compared to written documentation [15]). They can also be extremely informative when explaining one culture to another. Miscommunications between different cultures happen frequently. When photos or other visual aids are shared in conjunction with verbal or written descriptions, miscommunications are less likely to occur.

1.2 International Mobile Study Objectives

The present photo diary study was one part of a larger mobile, international ethnographic research project aiming to observe where, when, and how enterprise workers use their mobile devices and to understand key aspects of the mobile culture. We particularly wanted to get participants' perspectives on certain aspects of mobile usage (rather than the view of a researcher looking in on participants). We also knew that we would be limited in the times and places that we could follow participants; wanting to collect a robust set of data, we needed to expand the scope of places and behaviors captured. This was particularly important because a mobile device is with users nearly all the time, in nearly every location. Finally, we wanted to collect pictorial data to contribute to visual deliverables that we were planning (such as personas, culture boards, and a calendar). This case study will be presented to show how a photo diary was used to gather cross-cultural data.

2 Procedure

The photo diary was administered in conjunction with a larger international ethnographic research project, conducted in India, Singapore, and the U.S. The entire study aimed to (1) understand users across technologically advanced cultures, diverse mobile workforces, and emerging markets and to (2) observe where, when, and how mobile workers used their mobile devices. The photo diary was administered to support those goals and to accomplish the following:

- Collect pictorial data to help create visually based deliverables
- Get participants' perspective and personal insights
- Expand the scope of places and behaviors observed

Twenty-four of 33 people given the diary returned it via e-mail, postal mail, or during a subsequent meeting with the researchers. The participants represented seven different business roles from India ($n = 6$), Singapore ($n = 11$), and the U.S. ($n = 7$).

Participants were either e-mailed a soft copy of the diary or were handed a paper copy during an associated follow-along activity. In paper form, the diary was 10.8

centimeters wide, 14 centimeters tall, and less than $\frac{1}{2}$ centimeter thick, so the diary was small enough and light enough for participants to easily carry around with them wherever they went. Participants were asked to complete the photo diary over a week’s time. Completing the diary required participants to document mobile activities about scenarios predetermined by the researchers. Participants documented such activities by taking pictures (either with disposable digital cameras given to the participants by the researchers or with their own personal cameras) and providing written descriptions to support the pictures. The written descriptions documented information about the activities themselves, the environments, and any other necessary information about the context of the tasks.

The diary scenarios focused on where the participants used their mobile devices (for example, the most crowded places and loudest places), how they used their mobile devices (for example, the tasks that they performed), challenges they faced while using their mobile devices (for example, the most difficult place to use their mobile devices), and work versus personal usage (for example, the most common places used to complete work tasks and the most common places used to complete personal tasks).

Data came in two forms: 1) photos taken by the respondents, and 2) the associated short answer responses that described the picture, context, and mobile activities (see Figure 1). The data was examined by tallying frequencies of common responses and by identifying common themes. Themes were focused around common responses, common places, common tasks, and common challenges.

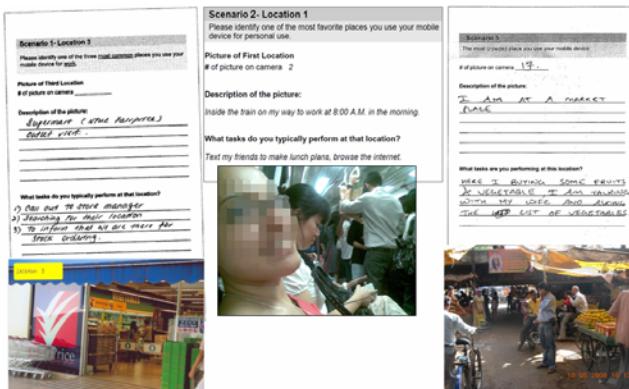


Fig. 1. Examples of diary entries

3 Findings

This study yielded rich results that went beyond the original goals of the study. The photo diary method provided us with four types of findings that would have been difficult or costly to obtain with other methods.

3.1 Information Normally Observed

The first type of finding was a private and personal perspective that captured information about places and times where we could not typically observe a mobile participant. For instance, we found that bathrooms were a place where people heavily used mobile devices across all three countries studied. Many participants provided information about how they used mobile devices while in a bathroom; a lot of pictures of bathrooms or toilets were submitted. Another example is the wealth of information about their bedrooms and living quarters. Of note was the frequency of use of mobile devices within the home. We had not considered this; we thought that mobile was when people were on the move, etc. Pictures were extremely useful for this project because mobile behaviors are often subtle, quick, or small, which makes them challenging to capture when a researcher is observing a participant in the field.

3.2 Cross Cultural Similarities

One of the goals in creating the personas was to highlight cross-cultural differences. The second type of finding gained from this study was the common mobile themes across the cultures. We found similarities across the cultures regarding the type of places that people use their mobile devices, along with some reasons why mobile devices were used. Much of the work life among the cultures was similar, including work tasks. Pictures were extremely useful because they could be spread out, making it easier for researchers to scan and detect common themes in the data. These themes were then validated by further analysis.

3.3 Cross Cultural Differences

The third type of finding illustrated the differences among the cultures. For example, some methods that were used to accomplish particular tasks, such as gathering information about business locations, varied. India varied from the U.S. and Singapore in that people would SMS to particular services the name of the business they were looking for and the service would send a return SMS with the address. In the U.S. and Singapore participants were much more likely to browse the web for that information. Pictures were valuable in helping detect subtle differences among the cultures. For instance, respondents indicated that they used their mobile device when buying things (for example, to call and ask his wife a question). The pictures showed differences in the types of locations where people purchased items in the different countries (for example, in outdoor markets, stalls, and stores). The pictures also revealed valuable data about the infrastructures and environments of the three countries. For example, Indian participants often provided pictures that portrayed chaotic streets with cows and goats intermingled with cars and a high density of people. The pictures taken in the U.S. and Singapore revealed more organization and a lower density of people.

3.4 Validation of Ethnographic Research Findings

The fourth type of finding was supplementation and validation of the following-along data we collected as a part of the larger ethnographic research project. The photo

diary supplemented our other observational data by providing times and places where we didn’t observe and by providing a participant’s eye-view on the data. The photos and details captured in the photo diary also served to validate a lot of conclusions we reached from observing the participants.

4 Application of Findings

One of the most important issues in the collection of the data is the ability to present and convey the findings in a way that can be used and disseminated through an organization. While Word, Excel, and PowerPoint can create a means of documenting a research project, they are basic deliverables at best. We wanted to take the visual nature of the photo diary data and showcase the wide range of different pictures and information in a variety of visual deliverables targeted at various audiences, ranging from product development to executives, to maximize the impact of the data. The pictures taken by participants worked well for these deliverables because they had a sense of authenticity about them that we did not get from photos taken by us during the follow along research. Pictures, themes, and quotes were heavily used in developing three types of deliverables: personas, culture boards (visual representation of mobile culture), and a mobile research themed calendar.

The pictures were used in the creation of a set of mobile personas, which developers and product teams use to help them build mobile applications for a global audience. The persona provided a way to capture information on mobile work environment, mobile tasks, and a day in the life using a mobile, demographics. One of the primary goals of the personas was to help product teams understand the cultural similarities and differences in how people accomplish mobile tasks across different countries. This in turn will help ensure that teams develop successful products that can be used across many cultures. The pictures from the diary study were excellent in conveying a lot of cultural information and added a very personal perspective to the personas.

Many of the diary pictures were also used in the creation of culture boards. Culture boards are large-scale displays used to elicit the feeling of a particular place and people, typically through pictures, facts, quotes, and keywords. A separate culture board was created for each county visited, and each culture board contained information on the mobile infrastructure, phone-buying habits, food, entertainment, landscape, and work environment. The diary photos were particularly good at capturing and displaying information about tasks that we had not gathered with other ethnographic methods.

Researchers created a 13-month calendar using many of the pictures collected. The calendar focused on key mobile findings and themes found in the research. The visual appeal of the calendar relies partially on its daily repetition, with periodic changes that introduce new mobile themes. Each month, a research topic is revealed within a design of a bright background, interesting pictures, study results, and succinct quotes that reinforce the research theme. Photographs from the photo diaries made the calendar visually rich and unique; they also served to initiate and maintain interest in the calendar.



Fig. 2. Snapshots of visual deliverables created

5 Conclusion

With the shift towards globalization of products and mobile devices allowing usage in previously inaccessible places, the need to understand new use cases and the similarities and differences among different cultures is increasing. Gathering this type of data can be difficult and costly. We provided a case study to show how a photo diary could be used to supplement ethnographic research. The photo diary allowed for data to be inexpensively collected in times and places where researchers couldn't follow. The diaries put a participant's eye-view on the data, allowing insight into the respondents' personal lives. Data collected through the diaries supplemented and validated the findings from the ethnography and contributed to visually rich deliverables.

While we use the photo diary as a supplemental technique, there are situations where this technique could be used as the sole means of data collection. If researchers are particularly interested in personal events (especially those that occur in times or places that make observation difficult) or want to collect end-user perspectives (as in sales or marketing), a photo diary could potentially provide all the necessary information. The photo diary can provide a snapshot that unveils findings perhaps inaccessible or unthought-of before, taking us beyond our original questions and subsequent conclusions.

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