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# “The Panopticon”: A Method for Observing Inter-Group Interactions

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**Abstract**

In field studies of mobile group applications, it is important for researchers to observe and record the actions of the user groups as they emerge. However, it is practically impossible to shadow each user individually, which means that a user’s unique, initial reactions to events in the system might go unnoticed. This paper showcases a method called “the panopticon”, in which an off-site researcher monitors what takes place in the application and signals observers in the field about the events to be expected (e.g., a particular user going to receive a message from another one). With this information, the researchers may observe chains of interaction as they unfold, beginning from message creation in one place to receiving it and reacting to it in another.

**Keywords**

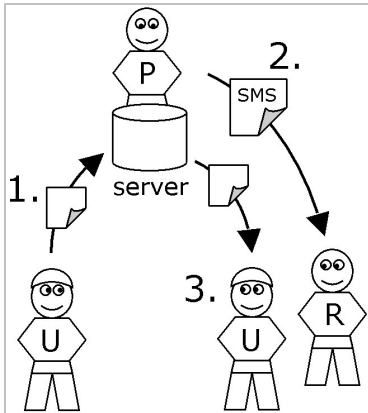
Inter-group interactions, mobile media, user research, methods, field study

**ACM Classification Keywords**

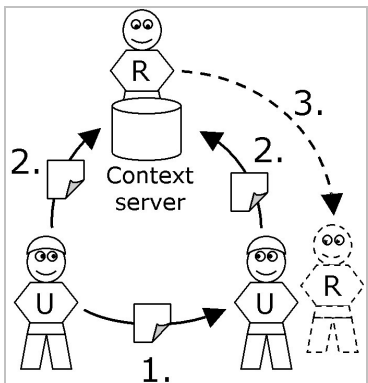
H.5.2 [User Interfaces]: Evaluation/Methodology.

**Introduction**

User mobility, sporadic use, unpredictable and open-ended task settings, privacy issues, and hard-to-probe social aspects are some of the reasons why user research on mobile group applications is difficult with the traditional HCI methodology. When planning field trials



**figure 1.** The panopticon method for mGroup: 1. User (U) sends a message; 2. The panopticon (P) informs the researcher (R) about the upcoming message; 3. R is prepared to record the reactions.



**figure 2.** The panopticon method for Comeks: 1. User (U) sends a message; 2. Both sending and receiving is logged in the server; 3. Researcher (R) reads the messages and interviews the user(s).

for everyday settings, retaining a possibility for finding something unexpected and emergent is often seen important. In order to leave room for new findings, the methods should capture a rich picture of the use while the setting itself posits all the characteristics that complicate such a capture.

Yet mobile devices have potential that makes it possible to gather data about wide range of social situations. In particular, many devices are suitable for *remote* data collection because of their inbuilt communication capabilities. In our studies on mobile groups applications, we have been developing a hybrid method that combines remote data collection with direct data gathering. Here, we present the outline of the method and estimate its applicability scope in mobile HCI research.

### Existing Methods

The most commonly used data gathering methods for field studies rely on analyses of logs and information content or users' self-reports. What comes to the latter type, users have been keeping diaries [2], leaving voice-mails in a receiver [6], or replying to questions presented by a mobile phone [3] or a PDA [1] at specified intervals. However, self-reports always introduce interruptions in the user's activity, altering the flow of actions and constituting a nuisance factor to the users. In addition, guessing the times when user would have useful information to tell about can be a matter of luck.

In studies on mobile messaging and media sharing, a common arrangement is that users first use the system (e.g., send multimedia messages) for a period of time, this way also creating a corpus of content. Then cued-recall interviews are arranged about the content (e.g. [5]). This requires a centralized data collection mecha-

nism. If that is not available, the researcher may meet a user at certain intervals and watch the content directly from the device, posing questions that have been prepared in advance without seeing the data, and improvising more questions on the fly (e.g. [4]). In these methods, data gathering is less obtrusive than in self-reporting, but the delay between a use event and an interview may cause imprecision into answers.

Observational studies have difficulties of their own, particularly in the context of social applications running on mobile devices. The following reasons have surfaced:

- There are more users than researchers, meaning that not every user can be observed. It would also be unnatural to have a dedicated researcher for each user.
- As the use of the system takes place with a mobile device, the interaction has to be recorded from close distance (e.g., in comparison to control rooms).
- As users move, they may split and the researcher does not always know which group or user to follow.
- As the use of the system is sporadic, researchers cannot easily anticipate when to observe an individual.

### Outline of the Method

The panopticon method is based on the following idea (Figures 1 and 2 show examples of implementing this):

1. Data of interactions and content (e.g., MMS) are logged automatically in the background.
2. Logs are transferred in real-time to a server. (Our systems use background GPRS transfer.)
3. A researcher (the panopticon) observes what takes place in the system.



**figure 3.** Screenshots from mGroup with content from the field trial.

4. The panopticon may signal researchers on the field if an interesting event can be expected.

5. Researchers evaluate the need to record the event.

Thus, two kinds of data collection are supported:

- Logged data: Interaction is recorded unobtrusively, thus increasing its objectivity. If this takes place in the application itself, more detailed data is also obtained.
- (More sensitive) observation data: Since the logged data can be analyzed immediately in a remote place, complementary inquiry methods may make use of it. For instance, if users are interviewed during the trial, questions about ongoing use can be prepared.

### Two Case Studies

Next, we describe how the outline has been used in two field trials on mobile group applications. It has been important in both cases to record how messages are reacted to or interpreted by users. This has required researchers adapt their recording behavior accordingly.

#### Case 1: mGroup

mGroup is a mobile group messaging prototype for smart phones that allows groups engage in multimedia chatting in a common discussion space (see Figure 3). It is a client-server system, which allows for monitoring messages at the server side. This enables observing group's messaging behaviour in the background.

In a user trial with a spectator group at a rally, we used shadowing with videotaping to gather the complementary data. That is, one researcher ("the panopticon") monitored content as it arrived at the server and informed with text messages the two shadowing researchers whenever anything interesting was being delivered. The method is visualized in Figure 1. With

this arrangement, the shadowers could record reactions when arriving messages were being read.

The trial was successful in uncovering an approach on collocated, collective use of media [8]. During the 4-day field trial, the panopticon sent 117 text messages to the field researchers. These messages helped the researchers on-site to capture the initial individual reactions to messages before they turned into group discussions among the co-present people.

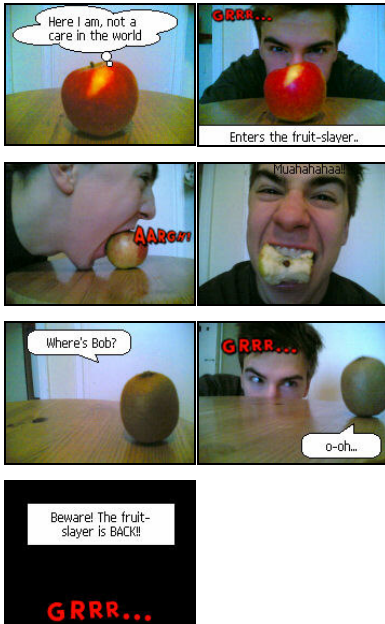
Messages enabled the researchers coordinate their actions invisibly from the users. We learned that it helps if a shorthand communication scheme is prepared that quickens informing about the key user actions.

#### Case 2: Comeks

Comeks runs in smart phones and extends the capabilities of MMS with comic-like message creation (see figure 4). Users may create multi-part messages and add speech bubbles and other accessories to camera phone pictures. The messages are sent as standard MMS.

At the time of writing, a field trial with 7 high school students has been ongoing for 4 weeks. MMS communication is logged with ContextLogger [7] and transmitted to a server. Researchers view the messages and have bi-weekly interviews individually with each user (see Figure 2). The goal is to study appropriation processes of a new interpersonal communication tool.

Interview questions have been prepared based on the logged messaging content. Frequent interviewing has created cross-effects: based on interviews on others, researchers have often known in advance why certain messages have been sent or how messages have been



**figure 4.** A comic strip created and sent by a user in the Comeks field trial.



**figure 5.** Illustration of Bentham's panopticon.

reacted upon. This has improved interviewing about interpretation processes involved in message reading.

### Discussion

The idea of the panopticon method lies, as did Jeremy Bentham's original idea of prison architecture, on differential possession of knowledge. Here, the researcher (instead of a prison guard) has knowledge that individual users do not have, and can thus adapt data capture to that knowledge. Naturally, automatic data gathering and the experiments like the ones described here must be conducted with users' consent and full transparency. They are mostly useful for small-scale trials in which establishing trustworthy relationships with the users is more easy to achieve. We have also told the users already before the beginning of the trial that they will receive all the data on a CD-ROM after the trial.

For mobile HCI, the hybrid method provides new data gathering solutions beyond observing-and-inquiring exemplified here with two case studies. With slight adaptations, the following setups are possible:

- Extending field trials durations. Traditionally, trials in HCI have been rather short. Remote data gathering enables longer trials, since the complementary data can be gathered in pieces, and real-time logging can be used to ensure that the product is working and trial can be continued. Long trials produce more believable results and can answer new kinds of research questions.
- Content interventions. Information may also travel in the opposite direction. Media content may be fed to the users through the system and reactions can be observed. In some media systems such well-timed interventions may provide new insights if carried out well.

- Prototype updates. Following the same line of thinking in more radical ways, also parameters of the product may be changed by uploading batches unobtrusively to the mobile device.

### Acknowledgements

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