
Adaptive Experience Sampling: Addressing the Dynamic Nature of In-Situ User Studies

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Abstract. Experience sampling techniques can be used to study user experiences with products in a natural setting and over time. Nowadays, researchers can use selective sampling to link the timing and questions to relevant product events and contextual events. Existing research has focused on maximizing the quality and quantity of feedback, while at the same time minimizing interruptions and maintaining the motivation of the participants. In practice, however, the optimal timing and content of questions also depends on the changing interests of the researcher, a topic that has not yet been addressed. This position paper introduces ‘adaptive experience sampling’, i.e. a method that enables researchers and designers to change the focus of their experience sampling study on the fly. Using adaptive experience sampling, researchers and designers can better link the sampling to their gradually growing insights.

Keywords: Experience Sampling, In-Situ Research, Evaluative Tools.

1 Introduction

Evaluation of ubicomp products tends to be challenging. Design concepts tend to be radically different from traditional interactive products, and interaction tends to be embedded in everyday life. Feedback from users is needed to evaluate design directions and to iteratively improve design concepts. Traditional evaluation methods, which are valuable when assessing product use in an isolated setting, are inadequate for studying product usage and user experience in relation to everyday activities. User experiences can be highly dynamic and evolve along with the use of a product or services. An evaluation methodology needs to capture the dynamics of the environment as well as the changes in user experience caused by user-

product interaction. At the same time, the user experience could also be affected by external factors; for example the user experience of a social network product could be affected by social interactions external to the product. Longitudinal field studies and subjective analysis are therefore needed to capture how people experience the product concepts, and to understand how a product fits in everyday life.

The experience sampling method (ESM), a research methodology developed by Larson and Csikszentmihalyi [3], was designed to capture user experiences in the field. Initially ESM took advantage of the popularity of earlier mobile devices (e.g. pagers) to ask people for feedback at random times during the day. This configuration aimed to reduce problems that participants might have when recalling events, a problem underlying many self-report techniques. With ESM participants make a quick record close to the moment of interest, rather than having to recall what they did in the past.

As mobile technology evolves, the sampling process becomes more intelligent and sensitive to the context of the product use. Nowadays, researchers can use selective sampling [5, 2], a sampling technique that links the timing and questions to relevant events. Figure 1 shows a typical configuration of selective ESM, in which a portable device is used to collect user feedback. The ESM controller uses sensor data that could capture contextual as well as user-product events to select relevant sampling moments. In addition, the controller, based on the same information, may decide what question or flow of questions should be asked and how should be presented together with the format of the answers.

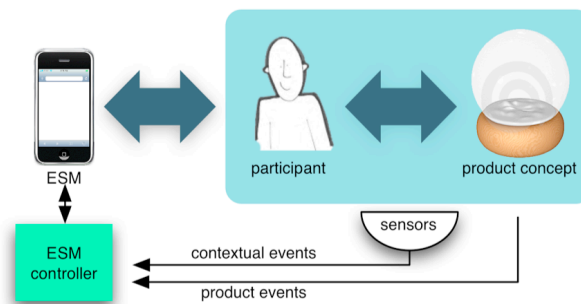


Fig. 1. Typical configuration of selective sampling. The user experience of a participant interacting with a product concept is being studied. Product events and contextual events are used to activate questions on a portable device.

A common challenge when using ESM is to maximize the quality and quantity of the samples while minimizing interruptions and maintaining the motivation of the participants. The development of strategies to optimize sampling, interruptions and motivation has been the key focus in recent ESM research [e.g., 1, 4, 6, 7, 8]. Using these strategies, timing and content of questions can be adapted to the actual state and context of the participants and the product.

The possibility to digitally collect data in-situ opens opportunities for researchers to instantly gain insights in users and product behavior, which might lead to new or improved research questions, thereby changing the initial focus of the

study. In recent field studies using ESM, we have experienced problems adapting ESM to preliminary findings from the field study. For example, when a researcher finds out that certain questions are not being asked, it can be difficult to change the configuration. Researchers need to be able to easily inspect results and to adapt the timing and content of questions in the course of a study. Changing research interests in ESM have not been addressed before. The present position paper introduces the adaptive experience sampling method to include mechanisms that support researchers in adapting timing and content of experience sampling on the fly.

2 Adaptive Experience Sampling

The key assumption underlying adaptive experience sampling is that researchers cannot know all questions nor the detailed product use and context of use in advance. Adaptive ESM (A-ESM) aims to enhance existing experience sampling methods by providing instruments that enable researchers to easily inspect the preliminary findings in relation to context and product usage data, and to easily adapt the questions and the triggers (Figure 2).

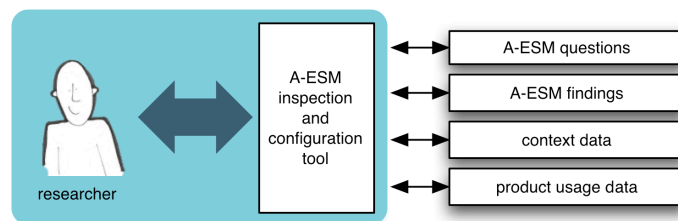


Fig. 2. Adaptive experience sampling configuration. Since researchers cannot know all questions nor the detailed product use and context of use in advance, tools are needed which enable researchers to easily inspect preliminary findings and adapt the questions.

Tools to support adaptive experience sampling are now being developed. The key design challenges are: (1) researchers should be able to detect unexpected behaviors, (2) researchers should be able to detect that anticipated behaviors do not occur, and (3) researchers should be able to view the findings of their experience sampling study in relation to the configuration in time. At the same time, the tools should enable researchers to easily change the behavior of sensors (e.g., changing thresholds and sampling frequency), define triggers and adapt questions.

3 Discussion and Future Work

In this paper we want to position our work on adaptive experience sampling, stating that current ESM studies could be improved by enabling researchers to adapt the ESM protocol according to changes in context of use, user behavior and research interest. The explorative stages of the product design process require a dynamic experience sampling approach. Using adaptive ESM, researchers and designers can use experience sampling methods in a way which better addresses their changing interests as compared to traditional ESM methods. The proposed A-ESM should therefore be considered as a valuable addition to the existing ESM methods. Tools and instruments which support researchers and designers in using the A-ESM methodology are now being developed. Case studies are planned to evaluate and improve the approach in different settings to cover a wide range of user, product and researcher needs.

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