Ecological UX Studies

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CHI'15 workshop on Ecological perspectives in HCI: Promise, Problems, and Potential. April 18, 2015. Seoul, Korea.

Abstract
It is challenging to study user experience (UX), and it is even more challenging to study UX in the wild. In this paper, I discuss the importance of running UX studies in ecological contexts, the three perspectives to ecological validity of UX studies. Finally, I summarize ways to take context into account in UX field studies.

Author Keywords
User experience; Field studies; Ecological validity

Introduction
The field of Human-Computer interaction has moved from making work with computers more efficient and ergonomic towards enabling delightful and meaningful experiences for people in virtually any life contexts. This requires increasing attention to research "in the wild", i.e., contexts that cannot be fully controlled. Although studies in the real use contexts have been popular in HCI for decades, user experience (UX) researchers have to pay attention to special issues of ecological validity. I will examine research validity from the perspective of three properties of UX: subjective, context-sensitive, and dynamic (Law et al. 2009).

An important aspect in conducting UX field studies is to understand how the context affects to UX. In the end of this paper, I summarize our earlier work on capturing context in UX studies in the wild.

Studying subjective UX

Due to subjectivity of user experience, there are several challenges to gain even internal validity in UX evaluations. Measuring emotions with objective measures such as psychophysiological measures is challenging. Even if the resulted data could be interpreted as emotions, the momentary emotions do not always tell about the overall user experience of the episode or the system being tested, since some events are more meaningful to participants than others. Thus, the causal relationship between using an interactive system and the realized experience is difficult to prove.

When participants are invited to a test session, they may lack the motivation that is needed to use and get value from the system. If the system is not relevant for the participant's current needs, UX measures are likely to show worse results than in real usage situations. Especially when ubiquitous systems need to be tested in a laboratory, it is challenging to create a realistic, immersive test setup (Carter et al. 2008). While early testing often needs to take place in laboratory, researchers should be encouraged to find simple ways to test concept ideas in real contexts. An example of such way is carrying a stone in a pocket instead of a mobile device and reflecting on potential use cases (Sproll et al. 2010).

Researchers need new skills for recruiting participants for experience evaluations. They should find a way to screen users who value the kind of experience that the system is designed for, e.g., what content the person considers fun or moving. If the participants are heterogeneous with regards to their experiential preferences, the results of the study may turn out to be hard to interpret. This is why new skills and tools for screening based on experiential preferences are needed.

Studying dynamic UX

The second property of UX is dynamicity, i.e., prior exposure to an artifact shapes consequent experience (Law et al. 2009). This leads us to study UX not only by identifying momentary emotions but also understanding cumulative user experience over time. In laboratory setting, 'long-term' may mean ten minutes, while a long-term field study may take several weeks or months. From industry perspective, UX results of a long-term field study is an excellent predictor of product/service success on the market, but it is very laborious and to set up, run, and analyze long-term field studies. I wish academia would make a radical move and start examining ways to balance rigorousness and laboriousness of field studies.

Most UX studies use retrospective self-reporting methods to collect data on the realized user experience. This approach has been criticized, as people cannot recall their emotions afterwards. It is important to understand, however, that memories are more important than reality when it comes to long-term UX assessment (Roto & Kujala 2012).

Studying Context-sensitive UX

Ecological validity of a study refers to generalizability of the results to real-life settings. Due to my background in industry, ecological validity is what I am most interested in in UX studies. It is the ecological validity that matters in developing real-life products and services that can provide delightful and meaningful experiences.

Since UX is context-sensitive, researchers need to understand the context factors affecting UX. According to Jumisko-Pyykkö & Vainio (2010), the mobile context factors include physical, social, temporal, task, technical and information context. It would be extremely difficult to create a lab experiment that can address all these factors. There have been debates on whether going to the field is worth the hassle (Kjeldskov et al., Kallio & Kaikkonen) but if the idea is to study UX of a mobile system, my expert opinion is that only a real context can enable real experiences.

Capturing context in UX field studies

After making the decision on studying UX in the wild, it is a tricky task to understand how the real life context affects the UX. The following best practices for taking the context factors into account during field studies are a result from analyzing 25 academic publications and 4 case studies of our own (Roto et al. 2011). They are targeted for three different phases of UX studies: planning, executing, and analysing.

When planning UX field studies:

P1. Identify and select realistic contexts for the tasks.

P2. Recruit realistic participants for the selected contexts.

P3. Examine selected contexts in advance.

P4. Identify central context characteristics, and plan how to treat them.

P5. Combine several methods and instruments to collect context data.

P6. Consider the cost-benefit ratio of context data richness.

P7. Prepare for unexpected events and changes in context.

P8. Run a pilot test in the context to ensure fluent capturing of context data.

When collecting data in UX field studies:

C1. Minimize the effects of research setup on participants and the context.

C2. Capture the context with multimedia.

C3. Respect social norms when recording context.

C4. Supplement objective context data with subjective data on participants' context perceptions.

C5. Record the context during use, but collect participants' perceptions of it retrospectively to minimize interference.

C6. Support participants on self-reporting context data.

When analyzing UX field studies:

A1. Synchronize context data with collected UX data.

A2. Pay attention to the different context categories when identifying context characteristics that affected UX.

A3. Use context categories to understand context effects, surprising results in particular.

A4. Communicate the context insights to designers, not only the UX.

The best practices reported here are explained in more detail in Roto et al. (2011). Although they might be most useful for short-term field studies, I hope to encourage UX researchers study experiences in the wild also over long periods.

Acknowledgements

I thank Tekes and FIMECC UXUS programme for funding this research.

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