



Temporal Transitions of User Experience

Daniela Wurhofer

Center for Human-Computer Interaction, University of Salzburg
Sigmund-Haffner Gasse 18, 5020 Salzburg, Austria

daniela.wurhofer@sbg.ac.at

Advisor: Prof. Manfred Tscheligi

manfred.tscheligi@sbg.ac.at

Research area: User Experience, Temporality, Temporal Transitions.

Research topic. In my PhD thesis, I characterize temporal transitions of User Experience (UX) through theoretical and empirical exploration.

Research problem. Research on the temporality of UX has received increased attention within the HCI community over the recent years (e.g., [2], [5]), and different facets or notions of temporal UX have been studied. One such facet is the change of *specific UX factors* over time (e.g., perceived safety, stress, emotions), which has been investigated in different contexts (e.g., HRI [1], mobile phones [4]). Further, different *phases of UX* (i.e., anticipated, actual, or recalled experiences) have been investigated with regard to characteristics of specific phases as well as shifts or differences between the phases. For example, recalled experiences have been discussed by Kujala [5], or Karapanos [3], and the role of anticipated experiences has been investigated by e.g., Olsson [8] or Yogasara [10]. Shifts in UX over time have been investigated for the usage of mobile phones by Karapanos [2]. Besides, different *perspectives on UX* can be taken when investigating temporal UX (i.e., holistic vs. reductionistic perspective), shaping the research process and methods applied. Work on theoretical framings of temporal UX has been for example done by Pohlmeier et al. [9] or Luoju [7].

Despite a range of empirical and theoretical work in the field of temporal UX, the gained insights are not interrelated to each other (i.e., standing alone), missing to frame temporal UX from a more systematic and broader perspective to guide future research in this area.

In my work, I define these different facets and notions of temporal UX as *temporal transitions of UX*, emphasizing temporal UX as a complex and multi-faceted phenomenon. To provide a comprehensive view on the

temporality of UX (including different facets and notions of temporal UX as well as their interrelation), it is necessary to theoretically frame and structure temporal transitions of UX and refine the theoretical framing based on empirical data. Thus, I create a more comprehensive picture of the temporality of UX, allowing to integrate previous insights and guide future research in this area.

Relevance of research. I argue that a more deep systematic theoretical and empirical analysis of temporal UX is needed. In particular, I want to address the following four dimensions: 1) theoretical framings of temporal UX require more empirical data and long-term studies as input [4], 2) to adequately reflect current research processes, there should be a combined holistic-reductionistic perspective on UX [6], 3) changes of specific UX factors in specific contexts need to be investigated systematically, 4) shifts and differences across different phases of UX (i.e., anticipated, actual, or recalled experiences) have to be examined in more detail. By addressing these issues in my work, knowledge on temporal UX as well as UX in general will be advanced.

The research hypothesis (claim). The overall objective of this work is to characterize temporal transitions of UX. I therefore propose the following research questions:

- RQ1: How to theoretically frame temporal transitions of UX?
- RQ2: How to empirically describe and characterize temporal transitions of UX?
 - RQ2a: How do specific UX factors change over time in specific contexts?
 - RQ2b: How can shifts and differences regarding UX phases (i.e., anticipated, actual and recalled UX) be characterized?

A sketch of the proposed solution. In order to answer the research questions, my approach can be divided into three main steps (see Figure 1).

In a first step, I aim at establishing an overall understanding of UX based on a meta analysis of existing literature and a perspective which combines both the holistic and the reductionistic view on UX. This serves as a structural basis for my further research (*RQ 1*).

In a second step, addressing *RQ2*, I focus on the empirical investigation of transitions of UX on two levels: On the one hand, I study changes of selected UX factors (e.g., perceived safety, stress) in two exemplary contexts (i.e., car and factory) (*RQ2a*). On the other hand, I investigate shifts and differences across different phases of UX (i.e., anticipated, actual and recalled UX) as

well as differences between the three phases (*RQ2b*). This will be also done in the two exemplary contexts. For the empirical studies, I apply a mix of qualitative (e.g., narrative interviews) and quantitative (e.g., questionnaires) methods.

In a third step, I will incorporate the empirical insights in the theoretical framework and iterate it based on the insights (*RQ 1*). Thus, I will create a framework which is based on both literature and empirical studies.

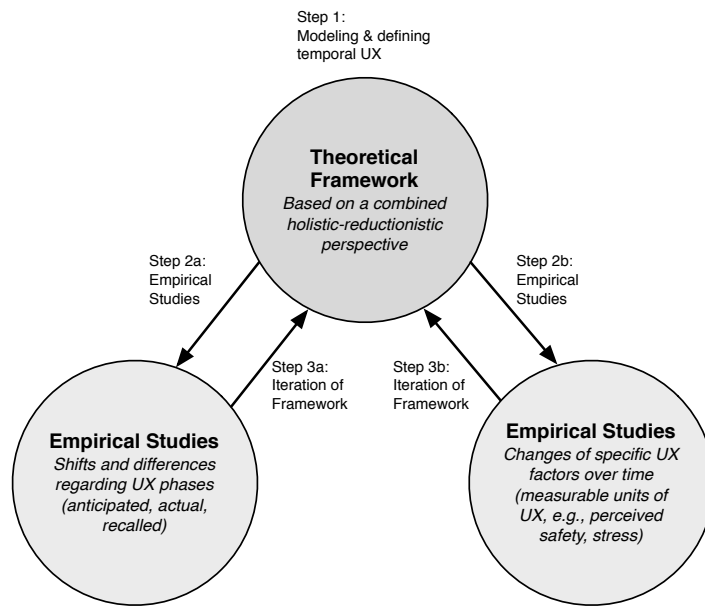


Figure 1. A sketch of the proposed solution.

The expected contributions of the PhD research. My PhD thesis can be split in a theoretical and an empirical contribution, which inform each other iteratively:

- a) A theoretical framework describing temporal transitions of UX, including the different facets of temporal UX (e.g., shifts of UX, phases of UX).
- b) Empirical data providing an improved understanding of temporal transitions of UX

This contributes to the overall objective of creating a more comprehensive picture of the temporality of UX including different facets (e.g., temporal phases of UX, changes of specific UX factors) and their interrelation.

A statement of work to date and open questions/issues for the discussion at the DC. So far, I set up a theoretical framework for UX (*RQ1*), providing a

structural basis for my research. To empirically investigate temporal transitions of UX (RQ2), initial studies in the factory and in the automotive context were performed. Based on the insights of these initial studies, further studies are set up and conducted. Regarding the participation in the doctoral consortium, I expect to get input of how the theoretical and the empirical part of my work can be interrelated optimally. I am curious to get feedback on my two application contexts and how they could be optimally used to provide insights regarding my research questions. Further, I would be happy to discuss how to theoretically model the multi-dimensionality of temporal UX.

Acknowledgements

The financial support by the Austrian Federal Ministry of Science, Research and Economy and the National Foundation for Research, Technology and Development is gratefully acknowledged (Christian Doppler Laboratory for “Contextual Interfaces”).

References

- [1] Buchner, R., Wurhofer, D., Weiss, A. and Tscheligi, M. Robots in Time: How User Experience in Human-Robot Interaction Changes over Time. In ICSR International Conference on Social Robotics (2013).
- [2] Karapanos, E., Zimmerman, J., Forlizzi, J. and Martens, J. (2009). User experience over time: an initial framework. In Proc. CHI '09. ACM, New York, NY, USA, 729-738.
- [3] Karapanos, E. Martens, J. and Hassenzahl, M. (2010). On the retrospective assessment of users' experiences over time: memory or actuality? In CHI EA '10. ACM, New York, NY, USA, 729-738.
- [4] Kujala, S. and Miron-Shatz, T. (2013). Emotions, experiences and usability in real-life mobile phone use. In Proc of CHI '13, pages 1061–1070.
- [5] Kujala, S., Roto, V., Väänänen-Vainio-Mattila, K., Karapanos, E. and Sinnelä, A. (2011). UX Curve: A method for evaluating long-term user experience. *Interact. Comput.* 23(5), 473-483.
- [6] Law, E. (2011). The measurability and predictability of user experience. In Proc. EICS '11. ACM, New York, NY, USA, 1–10.
- [7] Luojus, S. (2010). From a momentary experience to a lasting one - The concept of and research on expanded user experience of mobile devices. PhD thesis, *Acta Universitatis Ouluensis Scientiae Rerum Naturalium*.
- [8] Olsson, T. (2014). Layers of user expectations of future technologies: an early framework. In CHI EA '14. ACM, New York, NY, USA, 1957-1962.
- [9] Pohlmeier, A.E., Hecht, M., and Blessing, L. (2009). User experience lifecycle model continue [continuous user experience]. *Der Mensch im Mittelpunkt technischer Systeme. VDI Reihe*, 22:314–317.

- [10] Yogasara, T. (2014). Anticipated user experience in the early stages of product development. PhD thesis, Queensland University of Technology.