Towards a General Framework of UX Quality

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Abstract

I suggest that at this point in time, general theories are more likely to advance UX research and practice than specific theories. Such a general theory can find its inspiration in the Vitruvian principles of architecture. This statement outlines the motivation for such a theoretical framework, its description, and its initial assessment.

Keywords

User Experience (UX), theory, Vitruvian principles

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design, Human Factors, Theory.

Background

Despite its conceptual ambiguity, the term User experience (UX) is rapidly gaining a foothold as a central notion in the field of HCI. The lack of agreement regarding the term and what it stands for has been noted before (Hassenzahl and Tractinsky, 2006; Law et al., 2009). Thus, we may better approach it as "an umbrella phrase for new ways of understanding and

studying the quality-in use of interactive product" (Bargas-Avila and Hornbaeck, 2011). The notion of "umbrella phrase" is echoed in the multiplicity of meanings of the term as described by the UX White Paper (Roto et al., 2011). In any event, the term UX is commonly understood as an expansion of the (equally ambiguous) concept of "usability" – the former flagship of the HCI community. Such an expansion means, both conceptually and empirically, the existence of additional dimensions that need to be considered when discussing and measuring interactive experiences.

While the exact meaning of UX is not clear, researchers appear to agree that it is a subjective response to the combination of an interactive system or product, the user, and the use context (Roto et al., 2011). Other points of agreement relate to the presence of positive emotional responses; holistic responses to multidimensional system qualities; and the importance of aesthetic design (Bargas-Avila and Hornbaeck, 2011). Beyond that, there is a plethora of concepts, ideas, and measures that are thrown into the discussion about the UX without a coherent theme. The likelihood of these advancing the field in any particular direction appears slim. To start overcoming this confused state of affairs, I submit the following two premises.

(1) Given that the UX is a product of the system-user-context triangle, a first step towards a theory of UX should start with the system. This is for two reasons: First, of the three elements of the triangle, the system is the only component under the control of the developers. Hence it should be designed and developed to accommodate the other two components. (We usually have little control over users and situations;

however, we can analyze them to determine how to design the system.) Second, while we cannot guarantee that a well designed system would fit every user and every context, it is reasonable to expect that given an adequate analysis of the intended users and context of use, a well-designed system is likely to generate, most of the time, positive experience among most of those (intended) users. Thus, I suggest that the long journey towards systematically studying the UX should begin by identifying those aspects of the system which, *in general*, produce high-quality UX.

(2) For initial theories of UX to be effective, they should be general. Much of the literature on UX reports about very specific applications and contexts, or about novel ways of interaction that are geared to elicit peak experiences or very specific reactions from users. For example, a recent paper reports that "the combination of moving [our bodies] fast and interacting with a digital system allows us to create a powerfully intense experience" (Marshall and Benford, 2011, p. 1255). Another paper studied "whether or not the audience's experience is negatively affected as a consequence of the reduced scope for improvisation and experimentation posed by the pre-rendered visuals" at a VJ performance (Hook et al., 2011, p. 1268). This approach is obviously valuable for the purpose of demonstrating the potential of interactive technologies and for testing the limits of interactive experiences. However, because such an approach deals with very specific cases and situations, it is less likely to serve as a basis for theories about other specific UX episodes or about UX in *general*. In contrast, I suggest that in order to come up with an effective theory of UX, we should first try to identify the greatest *common* factors of UX. In other words, to start theorizing about UX, we are

more likely to succeed with a general theory, one that is suitable for the most common and frequent interactive experiences, than with attempts to accommodate all the possible outlying, exceptional, idiosyncratic, and envelope-pushing experiences that one might consider or design for. That is, for a new area of inquiry such as the UX, theorizing should start at the center rather than at the boundary; it should prefer the common over the idiosyncratic; be general rather than specific; and prefer the zone of mass evidence over that of the residuals.

Proposed Framework

Whereas the usability paradigm is criticized for placing too much emphasis on instrumental and pragmatic aspects of HCI, a recent review of the UX literature "suggests a heavy emphasis on art and consumer products" – a narrow focus which may be equally harmful to UX research (Bargas-Avila and Hornbaek, 2011). Moreover, the two paradigms ignore or take for granted other aspects of interactive systems, which may be pertinent to the UX, such as the functionality, stability, and responsiveness of the system. Thus, a more comprehensive perspective of the UX is probably needed at this point.

Law et al. (2009) suggest that "UX is seen as *something* desirable, though what exactly *something* means remains open and debatable" (p. 719, original italics). I suggest that a first reasonable step towards defining this "something" could start with identifying system qualities that reliably and broadly (i.e., across many systems, users and contexts), generate positive experience. A natural starting point for such a theoretical framework would be the oldest design theory known to us. That theory, conceived by

Vitruvius, the 1st BC Roman engineer, includes three basic requirements of artifacts made for human use. Similarities between the architecture and the IT discipline, and the suitability of the Vitruvian principles to Interactive Systems have been noted (Kim et al., 2002; Tractinsky, 2006). The three principles are *Firmitas*, which is the strength and durability of the building; *utilitas* – the utility of the building, its usefulness and its suitability for the needs of its intended inhabitants and users; and *venustas* – the building's beauty. Analogically, these principles also describe the principles of sound design of interactive products. They have to be reliable and dependable; they need to deliver the required functionality in a usable manner; and they need to delight their users with how they appear and behave.

Although the fine details of the Vitruvian elements are not interchangeable with fine-grained elements of interactive systems, the major principles make much sense for two main reasons. First, they abstract many desirable attributes of such systems, which eventually lead to positive reactions by the user -- a major element of UX. Fulfilling those principles may not guarantee specific experiences in specific contexts. Yet, following them would increase the likelihood of positive experiences. Even allowing for user and context differences, it is unlikely that a system that scores high on these principles would produce negative experience.

Second, a UX framework based on these principles has also practical appeal. It encompasses the major elements of interactive system and seems to make common sense. These qualities of the framework increase the likelihood that it will be accepted by practitioners and users alike. An example for the

practical application of a similar framework can be seen in the U.K.'s Construction Industry Council adoption of a Design Quality Indicator to evaluate the design quality of buildings (Gann et al, 2003).

Assessment

The advantages of the proposed theoretical framework include its generality, comprehensiveness, potential practicality, and intuitive appeal. As such it can serve as a first step towards more specific theories of UX, which will account for further variations in contexts and in users. Based on the theoretical framework it would be relatively straightforward to develop appropriate measures of UX quality (partly based on already existing measures). Another strength of the proposed framework is that it is flexible in the sense that it allows for theorizing and measuring not only overall (holistic) effects of the systems on users and experiences but also the distinct effects of each of the multiple distinct system dimensions on the interactive experiences.

The framework has limitations as well. First, it is more concerned with the factors that lead to positive UX than with the core issue of *what is* the UX. However, given the diverse perspectives about what is UX, the likelihood of settling this question appears remote. The proposed framework, on the other hand, presents a manageable theoretical challenge that is likely to contribute to both UX theory and practice. In addition, the general nature of the framework makes it unsuitable to explain the UX of very specific situations. Given that all theories are susceptible to the tradeoff between specificity and generality, such a drawback is inevitable. The choice to concentrate on the general aspects of UX as opposed to specific ones is based on the advantages of this approach as described above.

Referencess

[1]   Bargas-Avila, J.A. and Hornbaeck, K. Old Wine in New Bottles or Novel Challenges? A Critical Analysis of Empirical Studies of User Experience. *Proceedings of CHI 2011*, May 7–12, 2011, Vancouver, BC, Canada.

[2]   Gann, D.M. et al. (2003) Design quality indicator as a tool for thinking. *Building Research & Information*, 31(5), 318-333.

[3]   Hassenzahl, M. and N. Tractinsky. User experience – a research agenda. *Behaviour & Information Technology*, 25(2):91–97, 2006.

[4]   Hook, J. et al., A VJ Centered Exploration of Expressive Interaction. *Proceedings of CHI 2011*, May 7–12, 2011, Vancouver, BC, Canada, pp. 1265-1274

[5]   Kim, J. et al. Business as buildings: metrics for the architecture quality of internet businesses. *Information Systems Research*, 13(3), 2002, 239-254.

[6]   Law, E., V. Roto, M. Hassenzahl, A. Vermeeren, and J. Kort. Understanding, scoping and defining user experience: a survey approach. *Proceedings of CHI 209*, 719–728.

[7]   Marshall, J. and Benford, S. Using Fast Interaction to Create Intense Experiences. Proceedings of CHI 2011, May 7–12, 2011, Vancouver, BC, Canada, pp. 1255-1264.

[8]   Roto, V. et al. *User Experience White Pape*r. Result from Dagstuhl Seminar on Demarcating User Experience, September 15-18, 2010

[9]   Tractinsky, N. (2006) Aesthetics in information technology: Motivation and future research directions, in Zhang, P. and Galletta, D. (eds.) *Human-Computer Interaction in Management Information Systems: Foundations*, pp. 330-347. M. E. Sharpe, Inc.