
Domestication of Technology Theory: Conceptual Framework of User Experience

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Abstract

In this paper we present the domestication of technology theory as a conceptual framework to describe and analyze user experiences. We provide some historical and theoretical backgrounds of the theory and demonstrated its' practicality using a case study investigating older adults' experience with mobile phones.

Keywords

User experience, domestication of technology theory, product design

ACM Classification Keywords

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

Introduction

Designing a product that generates a high quality of user experience (UX) is the ultimate goal for product developers; hence, capturing and designing for UX has become a popular research subject in recent years. Although there has been a variety of theoretical accounts of what experience is and how to capture it, conflicting and inconsistent views about UX co-exist in

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literature. It has been argued that that the conflicted view on UX resulted from the lack of conceptual development and empirical research [1,2]. We present the domestication of technology theory as a conceptual framework of user experience, and demonstrate its practicality using a case study that investigated older adults' user experiences with mobile phones.

Domestication of technology theory

Domestication of technology is a concept within studies of the sociology of technology to describe and analyze the processes of technology's acceptance, rejection and use [3,4]. It was developed from the 'social shaping of technology' perspective, where the user is perceived as having a dominant role in defining the nature, scope and functions of the technology [5]. Domestication, in the traditional sense, refers to the taming of a wild animal. Using the same metaphor, the domestication of technology refers to the process where users bring an artifact from the public realm to the private and tame, gain control, shape or ascribe meaning to the artifact in users' lives [4]. According to Silverstone et al. [6], the domestication process is conducted in four phases or dimensions: appropriation, objectification, incorporation, and conversion [3,6].

Dimensions of domestication

The first dimension, appropriation, is the process of possession or ownership of the artifact. This is the point at which an artifact moves from the world of commodity to the owner's possession, thereby, giving it significance [4]. In the appropriation, both actual and potential consumers are engaged in imaginative work where they view or hear about the artifact and the artifact is constructed not only as an object of desire to fulfill specific functions but also as a construction of the

desire for difference and social meaning [3]. Therefore, this dimension involves all transactions included in the passage of artifacts from the market to users' lives and motives for approaching to the product.

Second, through objectification, the users ascribe their cognitive values and aesthetics to the technology [6]. Thus, the technology is given its meaning and place in users' lives. Objectification is expressed in usage but also in the physical dispositions of objects in the spatial environment [4]. For example, after purchasing a technology, a user decides what role the technology should play in his/her life and where it is placed and displayed in the domestic arrangement.

Incorporation is the process during which artifacts are used in everyday life, and the level of functionality depends on how it is incorporated into everyday life [6]. Technologies are selected with specific features in mind and should serve in the way users intend. However, sometimes, some technologies do not comply with users' intentions, and do not fit into the routines of users' everyday lives [4]. Therefore, the incorporation dimension involves a number of usability issues in user experience research.

Fourth, there is the conversion process at which the product reaches a 'taken-for-granted' status to become a part of the user's life [4]. Technologies are brought for a certain feature in users' mind, but they may become functional in ways somewhat different from the intentions of designers or marketers. They may have many functions, but some of functions may change or disappear (e.g., many home computers brought for educational purposes have become game machines). Therefore, this dimension is relevant to unintended

uses of technology, adaptations made by users, or features that users may desire in the future.

Although the domestication of technology theory originated in the social sciences to investigate social consequences of technology use, we believe that the domestication concept along with the four dimensions provides a useful theoretical lens to address user experiences as it broadens the concept of UX to the whole ranging from technology adoption and functional use to detailed user interface design aspects such as usability problems and the learning process.

Case study: Mobile phone user experience

As part of a larger project investigating older adults' experience with mobile phones in the U.S., we conducted existential phenomenology-based interviews with 12 older adult mobile phone users (over age 56) who represented various mobile phone usage levels. We probed their experience using open-ended questions for the several issues such as: 1) experience when purchasing a phone, 2) experience learning how to use a phone, 3) experience with current mobile usage and the role that mobile phones play in their everyday lives, and 4) desires for future mobile phones and mobile applications. The interviews were mainly conversational in nature as guided by [5], starting with questions, such as "Please explain your experience when you bought this phone." However, whenever participants mentioned problems with mobile phones, they were asked to demonstrate them with the phones. The domestication of technology theory was adopted as a framework to describe and organize emerging themes. We identified a number of themes across the four dimensions of domestication, and some of them are summarized briefly below.

Appropriation

- *Reasons for acquisition:* Participants provided similar reasons for buying a mobile phone: to be accessible to family members or close friends and to gain 'peace of mind' while being outside. Participants used a home phone (a landline phone) as the primary communication tool for various purposes such as making an appointment for social activities and getting information from others. Conversely, the mobile phone was a secondary means to communicate with family members or close friends when they were away from home. All participants carried their phone for safety reasons. In particular, a health-related emergency situation was the top concern.
- *Lack of information during acquisition:* Participants expressed that they lacked information resources about mobile handsets and services to choose proper one for their needs. Most of them reported that they had to rely on a sales person's recommendation when purchasing a phone. However, recommendations were often made based on a business purpose and not on users' needs.

Objectification

- *Carrying behavior:* Gender differences in carrying behaviors seemed to exist, which requires differential hardware and external user interface design. Male carry a phone either on a belt clip or in a shirt pocket; hence, they stressed a need for a phone to be thin because the thickness of the phone is a critical factor for the comfort level when worn on their belt or in their shirt pocket. Most female participants carried their phone in their purse or handbag, which led to their preference for a phone with some thickness to ease

locating a phone in their purse. Due to the unique carrying behavior, female participants requested features that facilitate locating their phone in their purse, such as a feature that turns lights on and blinks when ringing.

Incorporation

- *Design errors related to sensory-cognitive aging:* We found a number of faulty product designs that did not reflect older adults' perceptual and cognitive aging: visual, dexterity, reduction of working-memory capacity, general slowing of mental processes, and decline of the ability to repress irrelevant information. The most common problems were related to visual abilities. Although participants did not have severe visual impairments, they experienced difficulty in reading the screen and labels on buttons, and the perceptual barriers prevented even technology experts from using various features.
- *Limited instructional material:* Those with limited experience with mobile phones reported that they could not make use of contemporary instructional manuals properly due to difficulties in following and understanding the instructions. The use of other media, such as video-based instruction, was suggested as an alternative form of the instructional manual.

Conversion

- *Personalized adaptation:* Participants employed various adaptation strategies for the phone book feature. Several participants who were not comfortable with the menu navigation saved phone numbers into their phonebook and wrote down the numbers on a piece of paper with speed dial allocation numbers. Several participants kept the piece of paper in the

leather case along with their phone, and they referred to it to recall the number to press when making a call.

Conclusion

This study revealed that the domestication of technology theory can be a useful analytical framework for describing and understanding user experiences. Given the lack of theoretical basis in recent user experience research, the domestication concept provided the foundation that UX researchers or practitioners can use to address user experiences. We believe that it leads to broad theoretical and practical implications for development of a product that generates the high quality user experience.

Reference

- [1] McCarthy, J., & Wright, P. C. (2005). Putting 'felt-life' at the centre of human-computer interaction (HCI). *Cog Tech Work* 7, 262-271.
- [2] Hassenzahl, M., & Tractinsky, N. (2006). User experience - research agenda. *Behaviour & Information Technology*, 25 (2), 91-97.
- [3] Siverstone, R., & Haddon, L. (1996). Design and the domestication of information and communication technologies: Technical change and everyday life. In R. Siverstone & R. Mansell (Eds.), *Communication by design: The politics of information and communication technologies* (pp. 44-74). Oxford, UK: Oxford university press.
- [4] Haddon, L. (2006). The contribution of domestication research to In-home computing and media consumption. *The information Society*, 22, 195-203.
- [5] MacKenzie, D., & Wajcman, J. (1999). *The social shaping of technology*. Buckingham, UK.: Open university press.

[6] Silverstone, R., Hirsch, E., & Morley, D. (1992). Information and communication technologies and the moral economy of the household. In R. Silverstone & E. Hirsch (Eds.), *Consuming technologies; media and information in domestic spaces*. London, UK: Routledge.