
The Product Ecology: Understanding the Social Experience of Product Use

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Abstract

The field of interaction design has broadened its understanding of user experience to include an understanding of how systems of technology-based products situate socially and culturally among groups of people. Most user-product interaction in interaction design has been conceived as a one-time interaction between one user and one product or service. There is less knowledge about what happens when groups of people interact with or through a product, evoking social behavior, or in how to help designers in thinking about how to design for social interaction. To remedy this situation, this paper presents the Product Ecology, a theoretical framework and an approach for understanding the complex context of use around a product, and the experience that results.

Keywords

Product ecology, user experience, framework, design theory

ACM Classification Keywords

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

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CHI 2009, April 4 – 9, 2009, Boston, MA, USA

ACM 978-1-60558-246-7/09/04.

Introduction

The field of interaction design has broadened its understanding of user experience to include an understanding of how systems of technology-based products situate socially and culturally among groups of people. Most user-product interaction in interaction design has been conceived as a one-time interaction between one user and one product or service [3, 7]. There is less knowledge about what happens when groups of people interact with or through a product, evoking social behavior, or in how to help designers in thinking about how to design for social interaction.

One way to instill this knowledge is through the use of a framework or model, which in its basic form, describes the factors within a problem and their relationship to each other [1, 4]. Frameworks and theories in design and interaction design are relatively new; there are few examples and some disagreement about what constitutes a theory, especially in design. They are not scientific theories in the narrow sense of predicting action irrespective of context and situation. Rather, they are concerned with transforming the conditions and potentials for human action. However, scaffolding design methods with the use of design frameworks and theories is important for interaction design and the related field of user experience design. This is for many reasons: first, design theories are not like scientific theories. While scientific theories often predict action irrespective of context and situation, design theories describe conditions for change, often looking holistically at groups of phenomena together. This represents important problem framing in design that is different than problem framing done by scientific disciplines. Second, design frameworks and theories can liberate the designer from preconceived notions of

how the design process can and should be performed [5]. This is important for those new to design research, new to understanding user experience, or having little experience in working with designers.

This paper attempts to show how design frameworks and theories can be used to help understand user experience in flexible, non-prescriptive ways. To do so, it introduces the Product Ecology framework as one approach for understanding how products evoke experience through social behavior. The Product Ecology is based on social ecology theory, and is useful for obtaining rich, detailed data about how people interact with products.

The Product Ecology Framework

The Product Ecology is a theoretical framework that describes social product use — how products evoke social behavior. The Product Ecology is informed by social ecology theory, which is broadly concerned with the dynamic relationship between an individual and the social environment [8]. The Product Ecology can also be used for selecting a set of design research methods to understand the interactions between people and products.

The product is the central unit of analysis in the Product Ecology. This is because product-centered models often provide the most straightforward application to design practice, assisting designers and non-designers in the process of creating products (for examples and an overview of product-centered, user-centered, and interaction-centered models, see [2]). The functional, aesthetic, symbolic, emotional and social dimensions of a product, combined with other units of analysis, or factors, in the ecology, help to describe how people

make social relationships with products. These include the product; the surrounding products and other systems of products; the people who use it, and their attitudes, disposition, roles, and relationships; the physical structure, norms and routines of the place the product is used; and the social and cultural contexts of the people who use the product and possibly even the people who make the product. A schematic diagram of these factors is shown in Figure 1.

Social ecology theory was used to inform the development of the Product Ecology. In social science, social ecology theory focuses simultaneously on the environment and the social relationships among the people within it. The underlying assumption is that human behavior can be understood as an adaptive fit to an external environment, and that the relationships between the human and environmental factors are complex and dynamic [6]. Context shapes these relationships, and is understood as a complex, dynamic set of factors, including social context (social networks and support systems), historical context, cultural context, and institutional context.

Social ecology theory makes certain assumptions about the dynamics of social relationships (for examples, see [8]). First, human experience is influenced by multiple factors in the physical environment (e.g., geography, architecture, and technology) as well as the social environment (e.g., culture, economics, and politics). Second, analyses of the ecology should address the multidimensional and complex nature of the factors in the environments. Third, just as environments can be described in terms of their relative scale and complexity, their inhabitants can be studied at various levels including individuals and small groups (micro

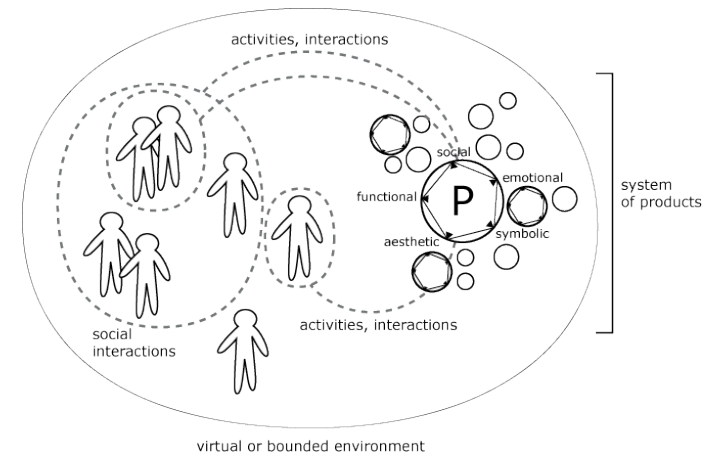


Figure 1. Schematic diagram of the Product Ecology.

level analyses), organizations or neighborhoods (meso level analyses), and regions or populations (macro level analyses). Multiple research methods, including questionnaires, behavioral observations, and environmental recordings should be used to assess contexts, conditions, and the experience of individuals within an ecology. Fourth, the social ecological perspective incorporates a variety of concepts derived from systems theory, including interdependence, homeostasis, and negative feedback [9].

Social ecology theory is by nature multidisciplinary, offering theoretical constructs that integrate concepts from multiple disciplines. They are useful when the approach of one discipline may not offer a well-rounded perspective on a particular problem. For example, strategies for healthcare may be grounded in clinical medicine, and ignore facets of the physical environment in which patients reside. A social ecological view of such a problem might reveal interventions at the individual, organizational, and environmental level.

Key Ideas About the Product Ecology

Just as Social Ecology theory makes certain assumptions about the dynamics of social relationships, the Product Ecology framework makes certain assumptions about social relationships with products, which help to describe the dynamic issues of product use and the experience that results: each instance of a product has its own ecology; the factors in the ecology are adaptive; the factors in the ecology can play different roles; and the product ecology can be geographically or virtually bounded.

First, each product has its own ecology, resulting in subjective and individual experience in using the same product. However, this experience of product use is mediated by other factors in the ecology. Looking at the subjective experience of product use from a range of perspectives can be useful in discovering patterns that lead to generalizable knowledge for design.

Take, for example, the product ecology of a Dyson vacuum cleaner that has been purchased by a family. Each member of the family has different relationships with this particular vacuum depending on their circumstances and relationships with one another. The wife likes it for weekly housecleaning, but finds it too large and overpowered for spot cleaning. The husband loves the engineered quality of the vacuum and participates in an online Dyson owners group. The family uses other products in coordination with the Dyson: a Swiffer for quickly dusting the floor, and a Dustbuster for opportunistic cleanups. However, the Dyson represents two values important to the family in purchase and use of a vacuum: engineered quality and contributing to an allergen-free home.

Second, the factors in the Product Ecology are dynamic, and interconnected in several ways. For example, if someone sprains an ankle and is unable to vacuum, product use within the ecology will change in response. The vacuum might remain unused, and cleaning may be done less, or other people, products and services might come into play, such as spouses or a cleaning service. Additionally, new products can change the existing ecology, as activities are modified and new ones are developed, or in extreme cases cause the ecology to break down.

Third, changes in product use cause changes in other factors of the Product Ecology. Products help people in a variety of activities and experiences, supporting independence and well-being, mediating activities, and helping people to accomplish goals. Fundamental changes in product use contribute to changes in the product ecology. When a product no longer plays a key role, it is marked by events such as people changing roles, or going in and out of the ecology; owning more than one product to do exactly the same task or making modifications to a particular product; allowing products to clutter the environment, unused and without special significance; and modifying the social relationships that exist around a product.

Fourth, the Product Ecology can be delimited by a group of people in close proximity, or a group that is spread out over a great distance. For example, the Product Ecology for the housebound is often the home, surrounded by a small, physically-bounded social network. The community of use for a product such as flickr, a photosharing service (flickr.com), is quite different. This environment is a group of people who may not be physically co-located, but who share the

perceived values and benefits of sharing digital images. The factors in the Product Ecology are the same whether the people using the product are close to or far away from each other.

Conclusions

This paper has presented the Product Ecology, a theoretical framework and an approach for understanding the complex context of use around a product, and the experience that results. Hopefully, it contributes to the growing landscape of tools for articulating and understanding user experience, by articulating the factors and relationships that play a role in how user experience unfolds.

Acknowledgments

This work has been partially funded by NSF HSD 0624275 and NSF IIS 0325251. Thanks to my colleagues and graduate students for ongoing input on this work.

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