

## **A MODEL FOR THE DESIGN OF THE USER EXPERIENCE**

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### **ABSTRACT**

Designing for the user experience has been an important topic in human-computer interaction (HCI) discipline. However, there was no single definition of the user experience (Law et al., 2009). This paper intends to study the concept of the user experience from the perspectives of system design and system practice. A user experience model is proposed in this paper as a framework for information system's user interface design. The attributes in the model could be utilized to enhance user's experience.

**Keywords:** User experience, usability, pragmatic attributes, hedonic attributes

### **INTRODUCTION**

In human-computer interaction (HCI) research, the way of measuring how well a system meets user's requirements is through the users' usability and experience goals. Usability goals typically refer to the systems requirements that enable users to carry out their activities in their work or personal life. Whereas, the user experience goals refers to the feelings of the users while interacting with the systems. Some typical user experience goals can be described in terms of satisfying, enjoyable, pleasurable, helpful, challenging, and motivating (Rogers, et al., 2011).

To design and enhance end users' experience, this paper intends to focus on the information system's user interface design practice from both designers' and end users' perspectives. User-centered design model (Rogers, et al., 2011) will be used to deliberate how designers perform the system design. Hassenzahl's user experience model (2003) will be used to discuss users' perspective of system use. Lastly, a design model is proposed to facilitate the design for user experience.

### **DESIGNER'S PERSPECTIVE ON SYSTEM DESIGN**

Information systems designers typically build information systems (IS) based on both functional and nonfunctional requirements (Satzinger, et al., 2009). Functional requirements describe the activities or processes that a system must perform to meet users' need. For example, users are able to check account balance and pay bill online are important functional requirements of an online banking system. Nonfunctional requirements refer to those needed characteristics that are related to a system's operation other than functional requirements. . Some examples of

nonfunctional requirements are related to technical, performance, usability, reliability, and security requirements.

Based on functional and nonfunctional requirements of a proposed information system, IS designers construct the system characteristics by devising a set of system features. These system features could be the combination of content, presentation, functionality, and interaction. Although IS designers have the intention to communicate with the end users about chosen system's features, there is no guarantee that end users will perceive these system features that designers proposed. It implies that the task of selecting system features is the end user's subjective process during system design stage. The main goal of IS designers is to construct a system that would enhance users' positive experience such as usefulness and satisfaction.

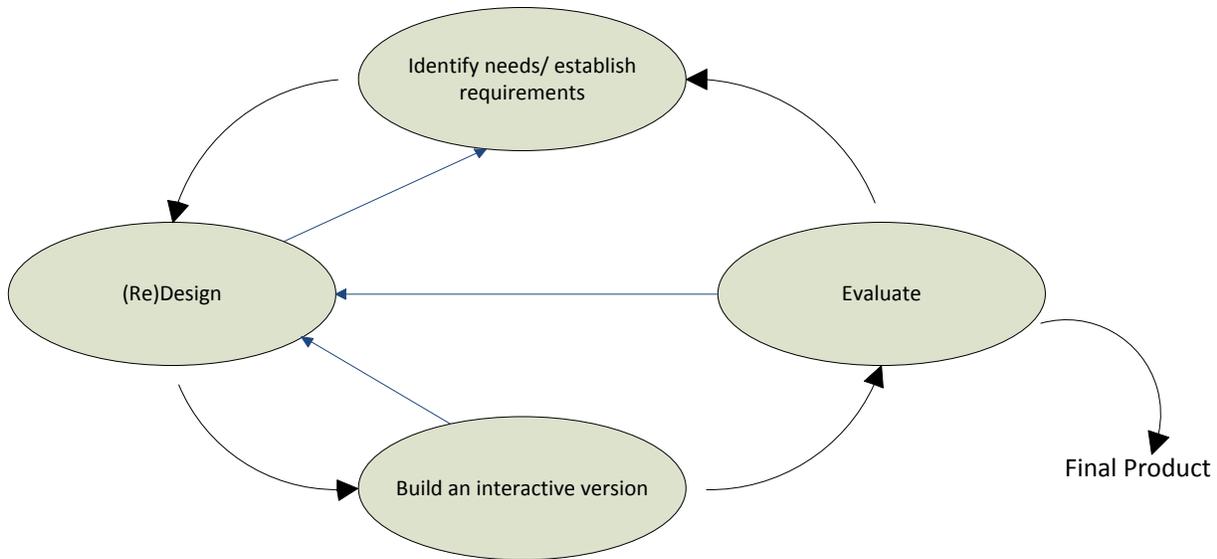
A widely studied Technology Acceptance Model (Davis, 1989) suggested that perceived usefulness and perceived ease of use are two major factors that influence users to decide whether to continue to use the system or not. Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance his or her job performance. Perceived ease of use is defined as the degree to which a person believes that using a particular system would be free from effort. Usefulness and ease of use are closely related to the system features of presentation and functionality.

Human-computer interaction (HCI) discipline describes that IS designers should craft the user interface design to meet user's requirements based on the users' usability and experience. The goal of usability is to optimize users' interaction with the system to enable them to carry out their activities in work or personal life. The goal of usability can be further broken down into more detailed goals, such as effectiveness, efficiency, safety, functionality, learnability, and memorability (Rogers, et al., 2011). Usability goals typically emphasize on the utility features of the IS system. On the other hand, the goals of user experience highlight the non-utilitarian aspects of human-computer interaction, and also emphasize on the affect, sensation, and meaning features of the interaction (Law et al., 2009). User experience's goals also involve emotion and affect, such as feeling enjoyable, pleasurable, exciting, and fun (Rogers, et al., 2007; Hassenzahl, et al., 2010).

To accomplish both usability and user experience's goals IS designers usually follow a methodology to design and build the intended information system. One typical methodology that IS designers may adopt is the user-centered design approach, which is exhibited in Figure 1. The first step of IS design is to identify users' needs, then carry out the design based on the requirements, then build prototype, and lastly evaluate prototype. If the problems are found in the evaluation step, it will trigger another cycle of IS design until the evaluation results are satisfied.

Although IS designers can collect user's requirements for preplanning the design, the user experience is situated. The same system features may trigger dissimilar user's emotions in different situations. According to the structuration theory (Yates and Orlikowski, 1992), the interaction between human agent and technology is interpretively flexible. Human agent who uses technology is an emerging process that is influenced by characteristics of material artifact, characteristics of human agents, and characteristics of context. For example, a novice system

user may feel that such system is difficult to be used and therefore perceives the system as not being useful. Later on, with accumulated experience, users may perceive the same system as more useful because of the familiarity of the system features, and thus having higher degree of satisfaction with such system. Since the use of information systems is situational, this user-centered design model cannot completely address the issue of user experience design. To better understanding the user experience issue, we have to look how users perceive system's features while they use that system.



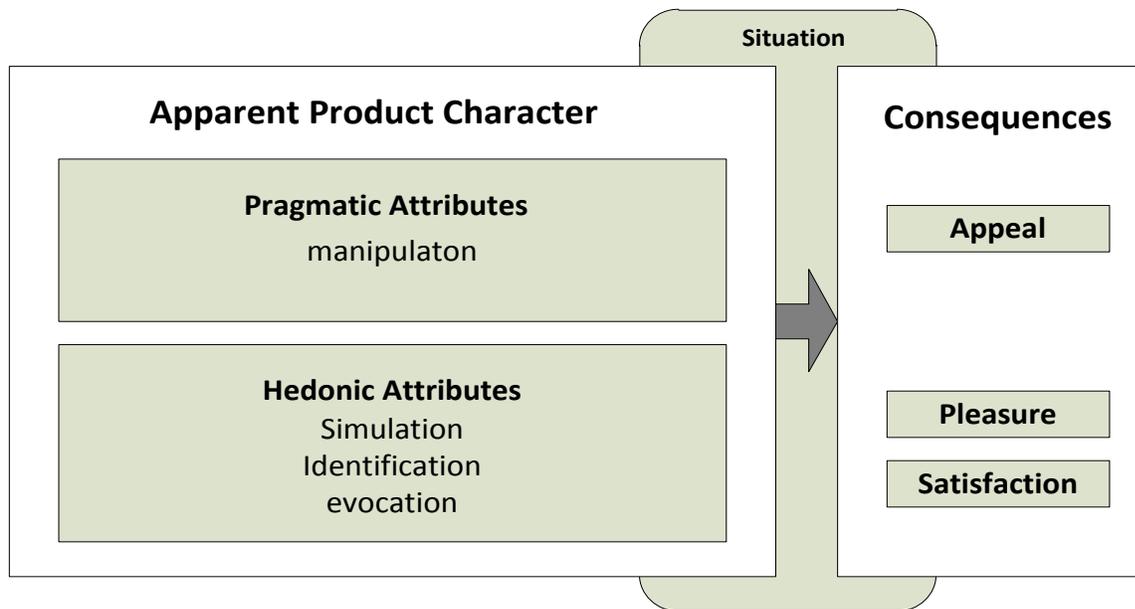
**Figure1: A User-Centered Design Model (Source: Rogers, et al., 2011)**

### USER'S PERSPECTIVE ON SYSTEM'S USE

According to Hassenzahl's user experience model (2003), as users are interacting with a product, an apparent product character will be constructed. Apparent product character is user's personal construction to interpret the intended product character. Users will then try to fit the apparent character of the product into the situation they encounter. The degree of the fit of the product's apparent character and user's situation will affect how users judge the product and hence lead to emotional and behavioral consequences. The user's perspective of Hassenzahl's user experience model is displayed in Figure 2.

In this model, the pragmatic attributes is related to the manipulation of the information system. Essentially, manipulation is about the core functionalities or utilities of a product and the ways to use those functions. Some typical pragmatic attributes of a software product are "clear", "supporting", "useful", and "controllable". These pragmatic attributes are very close to the attributes of usability. Usability is a concept rooted in HCI research. Typically, software engineers identify a set of principles and common practices to ensure usability is the outcome of system design (Shneidermann & Plaisant 2010; Pearrow 2000; Nielsen 1993). The pragmatic

attributes of information systems express the utilitarian aspect of the system and also emphasize the fulfillment of individual's behavioral goals.



**Figure2: A User Perspective of User Experience Model (Source: Hassenzahl, 2003)**

Contrasting to pragmatic attributes, hedonic attributes focus on individuals' psychological states. Some typical hedonic attributes of a software product are "impressive", "exciting", and "interesting". Hedonic functions of a software product can further be divided into three different areas: providing simulation, communicating identity, and provoking valued memories. To address the *simulation* function, the software product may include the functionality that is rarely used by the users. However, when users discover what the function can do for them later, they would be surprised and excited and hence feel being stimulated by the software product. To deliver the *identification* function, a software product has to communicate users' identity. The growth of social media can be exemplified by the identification function. For examples, Facebook, blogs and many other online services are designed to support this identification need. To convey the *evocation* function, a software product should be able to provoke memories. The evocation function helps users remember the past events and relationships that are important to them. For examples, Facebook and Flickr empower users to store a huge number of pictures from the past. These pictures can trigger their memories of some of their important events.

The user experience of a software product comes from the perception of both pragmatic and hedonic attributes. When a software product enables users to manipulate their environment effectively and efficiently, the users will make judgment of the software product as having good appeal (good design). User's judgment of the product design can further trigger the emotion of satisfaction or dissatisfaction of the software product. A software product provides hedonic functions such as providing stimulation, letting users express their identity, and provoking users'

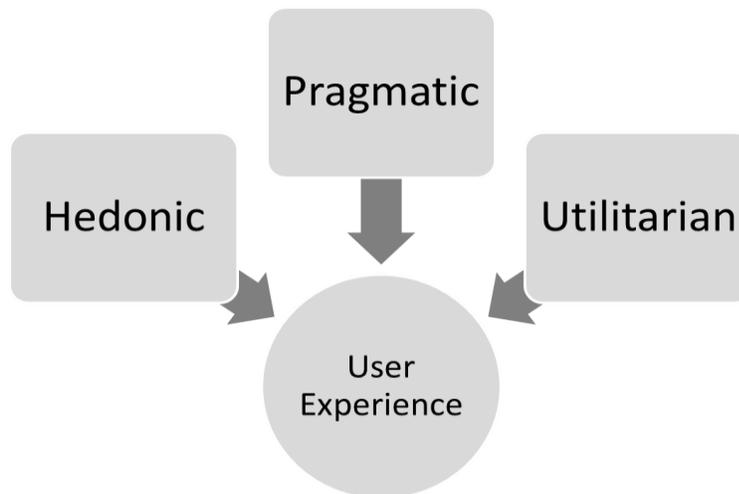
memory, the users may feel the sense of satisfaction and pleasure, and thus continue to use the software product.

Kohler et al. (2011) conducted an action research of co-creation experience in the virtual world to derive the design principles for the user experience. Co-creation is a process during which users take an active role and co-create contents with the system. They suggested that pragmatic (interactive object and immersive environments), usability (intuitive usage and clear navigation structure), and hedonic (playfulness and challenging tasks) attributes are important to trigger positive user experience in designing co-creation system.

### **DESIGN OF THE USER EXPERIENCE**

Users are different and the contexts in which they use the software product are also different. Different users use the same software product may have completely different experience. When users have different goals in mind, they will use the software product in different mode. The user experience not only depends on the features of the product in use, but also depends on the users' previous experience and the context in which the product to be used. It seems impossible for IS designers to design the user experience. But with better understanding of user's goal, IS designers can try to balance the pragmatic, utilitarian, and hedonic attributes of the software design to enhance user experience. Figure 3 shows that both usability design (pragmatic and utilitarian) and emotional design (hedonic) contribute to enhance the user experience. Based on the discussions, we can reach to the following proposition:

*Proposition: The design of the user experience should include hedonic, pragmatic, and utilitarian goals.*



**Figure 3: A Model of the Sources of the User Experience**

The best scenario to enhance the user experience is to design a software product with a high level of utility, pragmatic, and hedonic attributes. When users interact with such product, not only they feel the product is useful but also pleasant and having fun to use it. If the utility, pragmatic, and hedonic goals cannot be attained at the same time, IS designers have to identify and weigh which goal is more important to the users with a given context. Since users may hold different goals in mind when using the software product, understanding the priority of user's goal while using the software product is imperative in the design process.

## **CONCLUSION**

While people think of the concept of the user experience, they often refer to user's emotional responses to the interaction with an information system. Indeed, the user experience is the way a person feels about using a product or a system. Literatures support that the aesthetic attributes of a product or user interface design triggers user's positive emotions such as pleasantness and excitement (Deng and Poole, 2010; Norman, 2004). However, the utility attributes can also trigger user's emotional responses. Imagining that a system cannot efficiently perform the task that a user intends to do, this user would feel frustrated. Alternatively, if a system is easy to use and is able to complete a user's tasks efficiently, this user would feel happy and satisfied. Thus, in order to design for a suitable user experience, IS designers have to consider all three types of goals, including hedonic, pragmatic, and utility goals during the design process. When the IS designers thoroughly understand user's goals, they can design a product that will enhance users' positive experience.

References are available upon request from David C. Chou.