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Application of experiential locus of control to understand users' judgments toward useful experience

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ABSTRACT

Recently, innovative products and services have been changing the way people live their lives. Human−computer interaction (HCI) plays an important role in the development and design of such products and services. However, prior studies did not fully explain how people evaluate their experience when they use a product and service. The research goal of this study is to propose a conceptual model that explains the judgment of experience quality and the judgment criteria. This study suggested two research questions: First, how can we understand users' judgment of good experience? We will suggest a theoretical model that is based on the concept of locus of control (LoC) for explaining users' evaluation of their experience, including the use result and the use process. Second, what are the representative system factors to affect users' judgment? This study validates the representative system factors that affect the determinants through verifying the conceptual model. Through a pre-study, the representative system features affecting each determinant were derived and hypothesized for the main study. The results showed that experiential LoC was affected both internally and externally by the two determinants. In addition, each of the determinants was affected by the dimension or level of the system features.

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1. Introduction

Recently, innovative products and services have been changing the way people live their lives through pervasive digital technologies (Barnard, Bradley, Hodgson, & Lloyd, 2013; Powell, 2013). As an example of this change, traditional products such as radios, televisions, cars, and computers have been replaced with innovative products such as internet radios, smart TVs, driverless cars, and tablets. In addition, innovative products and services (e.g., social networking services, robot cleaners, drones, and wearable healthcare devices) are emerging in the 21st century (Danelek, 2010a, b).

Human−computer Interaction (HCI) has played a critical role in the above change. Closely related to the user experience, HCI has considered the human factors related to interactive design, system development, and evaluation of the user experience (Hewett et al., 1996). In particular, usefulness has been explained as one of the most important factors in terms of a good user experience in HCI (Finneran & Zhang, 2003; Kourouthanassis, Giaglis, & Vrechopoulos, 2007).

However, previous studies have had common limitations: First, as an evaluation factor of user experience (Wixon, 2003), it is difficult for usefulness to explain why users judge various products or services useful. Each person has markedly different criteria in usefulness evaluation because of their own subjectivity (Hertzum & Jacobsen, 2001). Some people feel usefulness in the process of using products or services, while others feel it through achieving a goal. These differences in evaluating usefulness may depend on the users' judgments of their use experience. Consequently, this has not only reduced the reliability of statistical results but also hindered our understanding of the conception of usefulness. Second, in terms of applicability to the design process of new digital products or services, many studies could not generalize the system factors affecting the judgment of usefulness. They have suggested different system factors for different research domains despite attempts to consider the common system factors for improving practical application, which has reduced the applicability to practical work (Gray & Salzman, 1998; Molich, Ede, Kaasgaard, & Karyukin, 2004).

Though many studies on user experience exist, prior studies did not fully explain how a digital product and service affect users' attitude and behavior. Some people report their experience from the *result* of using products or services, while others report it from the *process* of using products or services. This subjectivity of users' report has confused our understanding of where a good user experience exists in using digital products or services (Hertzum & Jacobsen, 2001). In addition, this has caused the problem of explaining why users have positive/negative attitude through the judgment of use experience on products and services (Wixon, 2003).

This study suggested two research questions: First, how can we fully understand users' attitude and behavior through the user experience of product and service? We suggest a conceptual model that is based on locus of control (LoC) for explaining users' attitude and behavior, including two judgment factors of the use result and process. The LoC concept is effective because LoC explains human personality created from the experience including their use result and process (Milgram & Naaman, 1996; O'Donoghue & Rabin, 2000). This means that people are continually affected by experience in their lives, which can change them. Therefore, we particularly suggest *experiential* LoC, which is an extension from traditional LoC. Since various products and services are strongly linked to our everyday lives nowadays, they are affected by users' perceptions of their experiences. It may be closely related to judgments about users' experiences with things. Consequently, this study investigates the determinants that affect users' experiential LoC.

Second, what are the representative common system factors on useful products and services to affect users' attitude and behavior? This study validates the representative digital system factors that affect the determinants through verifying the conceptual model. To set up the relationships among them, this study takes a psychological approach, focusing on the cognitions of users during the experience, in order to identify the primary forces driving the use and influencing users' judgments of the experience.

In the following section, we first provide theoretical considerations as to how users judge the user experience of a product or service useful from the perspective of experiential LoC. We then briefly suggest the antecedent factors affecting the judgment. Subsequently, we draw the representative system factors that affect the antecedent factors from the results of a qualitative study based on eight case studies. Four of them are popular digital products such as robot vacuum clear, and the other four include popular digital services such as mobile simulation game. From this, we finally construct the causal model between the representative system factors and the judgment by the LoC, which is affected by two dimensions of antecedent factors.

2. Experiential LoC as research background

Theoretically, locus of control (LoC) is defined by Rotter (1954, 1966) as the perception of being able or unable to control what happens to an individual. Prior studies in personality psychology have been conducted to explain LoC with respect to human characteristics. LoC is described as having *two aspects*: internal and external. People who have the tendency of internal LoC in their experiences tend to judge what happens to them by their behavior and tend to have positive and progressive attitudes about their experiences. Accordingly, they think it is possible to control their experiences by themselves (April, Dharani, & Peters, 2012). On the other hand, people who have the tendency of external LoC in their experiences tend to judge what happens to them by external forces and tend to have negative and passive attitudes about their experiences. Accordingly, they think it is impossible to control their

experiences by themselves (Jacobs-Lawson, Waddell, & Webb, 2011). Consequently, people can perceive their experiences differently because of their personal tendencies (Diamond & Shapiro, 1973; Layton, 1985).

However, scholars have inferred various meanings of "control" in Rotter's LoC definition (1966). In particular, there are two different views of internal−external LoC: the perspective of causal attribution explained by attribution theory (Heider, 1958; Kelley, 1967) and the perspective of perceived behavioral outcome contingency (Graybill, 1977; Palenzuela, 1984). The former perspective explains that internal−external LoC can be interpreted as the actual cause of an experience. According to previous studies (Weiner, 1972; Weiner & Kukla, 1970; Weiner, Nierenberg, & Goldstein, 1976), people who have internal or external LoC personalities create judgments of their experiential determinants through the attribution process. On the other hand, the latter perspective explains that internal−external LoC can be interpreted as the perceived cause of an experience. According to Wong and Sproule (1984), people with an internal LoC perceive their behavioral outcomes as contingent on their experiences even if there is no possibility of control. Therefore, they judge the internal−external LoC through the perception of controllability in the process of experience.

Both of these perspectives are important to the user experience in the HCI field, because people ascribe value to their experiences, which are judged by the *process* and *results* of the experience (Bruner & Bruner, 2009; McCarthy & Wright, 2004). Workman, Bommer, and Straub (2008) indicated that users usually have two considerations during judgments: causal attributions and self-efficacy. In a study on security threats, for example, the causal attribution explained that users judge the LoC of their experiences by whether they actually controlled the result of the security threat or not. In the self-efficacy, on the other hand, users judge the LoC of their experience by whether they perceived controllability from the process of the security threat (Bandura, 1991; Bandura & Walters, 1963; Workman et al., 2008). In this study, therefore, we define users' judgments of their experience of using a product or service as *experiential* LoC, integrating both traditional perspectives.

We divide determinants into two categories in the perspective of users' judgments of experiences during use: *goal achievement,* as the determinant of judgments on the result of use, and *autonomy,* as the determinant of judgments on the process of use. The reason why we assume the two determinants is explained as below.

First, people have various goals when using products or services (Hidi & Harackiewicz, 2000). When they achieve their goal, they think that the experience of using a product or service is valuable and useful (Ho, 2010; Li, Ji, & Li, 2006). These thoughts cause users to expect to achieve their goals when they use a product or service (Oliver, 2010). Therefore, *goal achievement* as the determinant of judgments is important to explain the effect on users' experiential LoC. In this study, based on Batra and Ahtola (1991) research, the goal achievement determinant of judgments on use was divided into two dimensions: hedonic goals and utilitarian goals.

Second, many studies referred that user feels their experience by controlling the system (e.g., Lefcourt, 2014). According to self-determination theory, which is related to human motivation, autonomy is referred to as a human need involving willingness to engage in decision making on one's own behavior (Deci & Ryan, 1985, 2002). Related to this, various studies have regarded level of autonomy as related to control (Ryff, 1989) or independence of control (Ji et al., 2010). Therefore, *autonomy* as the determinant of judgments is important to explain the effect on users' experiential LoC. In this study, the autonomy determinant of judgments on use was considered as a level of autonomy, including system automation concept.