Understanding e-learning continuance intention: An extension of the Technology Acceptance Model

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Abstract

Based on the expectancy disconfirmation theory, this study proposes a decomposed technology acceptance model in the context of an e-learning service. In the proposed model, the perceived performance component is decomposed into perceived quality and perceived usability. A sample of 172 respondents took part in this study. The results suggest that users' continuance intention is determined by satisfaction, which in turn is jointly determined by perceived usefulness, information quality, confirmation, service quality, system quality, perceived ease of use and cognitive absorption.
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Keywords: Technology acceptance model; Expectancy disconfirmation theory; Satisfaction

1. Introduction

Information technology (IT) has the potential to transform the means by which we learn and access information in two important ways. First, IT enables us to do many of the things we already do faster, more flexibly, more efficiently and with greater access for all. Second, IT enables us to do things that we cannot now do, or to do them in ways that are significantly different. IT makes possible an entirely new environment and experience of learning that goes well beyond the classrooms, curricula, and text-based formats to which we are accustomed. Like any other information system, the success of e-learning depends largely on user satisfaction and other factors that will eventually increase users' intention to continue using it.

In the information systems (IS) domain, we find a considerable amount of academic research examining the determinants of IT acceptance and utilization among users, (e.g. Venkatesh, 2000; Jiang et al., 2002; Heo and Han, 2003; Hsu and Chiu, 2004a; Shih, 2004). There are some theoretical models that attempt to explain the relations between user attitudes, satisfaction and behavioural intention to use and system usage. Among these models, one of the most widely accepted is the technology acceptance model (TAM) proposed by Davis and his colleagues (Davis, 1989; Davis et al., 1989). TAM is derived from the theory of reasoned action (TRA, Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980) and predicts user acceptance based on the influence of two factors: perceived usefulness and perceived ease of use. TAM posits that user perceptions of usefulness and ease of use determine attitudes toward using the system.

Another significant area of IS research is users' satisfaction because it is considered an important determinant in measuring IS success and use (Bailey and Pearson, 1983; Ives et al., 1983; Doll and Torkzadeh, 1988; Delone and McLean, 1992). Among models developed for measuring user satisfaction are a 39-item tool by Bailey and Pearson (1983), the instrument by Ives et al. (1983), and a 12-item End-user Computing Satisfaction instrument by Doll and Torkzadeh (1988).

In the IS success model (Delone and McLean, 1992; Seddon, 1997), system quality and information quality are expected to affect both use and user satisfaction. In the

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meantime, use and user satisfaction become the antecedents of individual impacts and organizational impacts. Seddon (1997) also included perceived usefulness as a determinant of user satisfaction. Rai et al. (2002) extended the Seddon model in which perceived ease of use, perceived usefulness, and information quality are depicted as the antecedents of satisfaction. Some studies have re-examined the IS success model including service quality as another important antecedent to user satisfaction (e.g. Kettinger and Lee, 1994, 1997; Pitt et al., 1995; Negash et al., 2003; Wang and Tang, 2003; Landrum and Prybutok, 2004).

Recently, the expectancy disconfirmation theory (EDT, Oliver, 1980) has emerged as an important candidate for explaining the variables that motivate individuals to continue using an IT (Bhattacherjee, 2001a, b; Khalifa and Liu, 2002a, b; McKinney et al., 2002; Hayashi et al., 2004; Chiu et al., 2005; Lin et al., 2005). The EDT model proposes the causal relationship among the consumer's perceived performance, perceived disconfirmation, satisfaction and repurchase intention.

We argue that in EDT, satisfaction is an important antecedent of repurchase intentions, and in TAM perceived usefulness, cognitive absorption, perceived ease of use, perceived behavioural control and subjective norm jointly determine usage intentions. Therefore, our research makes important contributions to the growing body of technology acceptance literature by examining the relationships between EDT and TAM variables in the same model. To better identify the factors contributing to the formation of the user's decision to continue using the e-learning system, this study extends TAM and EDT research by dividing perceived performance into two constructs, perceived quality and perceived usability. In this study, perceived quality is represented as information quality, service quality and system quality. Also, perceived usability is divided into perceived usefulness, cognitive absorption and perceived ease of use. In addition, confirmation, perceived behavioural control and subjective norm are included in our model.

2. Theoretical background

2.1. The technology acceptance model

Davis (1989) first introduced the TAM as a theoretical extension of TRA. TRA is a well-known model in the social psychology domain, which suggests that a person's behaviour is determined by the individual's intention to perform the behaviour and that this intention is, in turn, a function of his/her attitude toward the behaviour and his/her subjective norm. Attitudes toward the behaviour describe the positive or negative feelings toward a specific behaviour, and subjective norm assesses the social pressures on the individual to perform or not to perform a behaviour.

The theory of planned behaviour (TPB, Ajzen 1988,1991) can be considered as an extension of the

TRA. It posits that behavioural intention is jointly determined by attitude and subjective norm, similar to TRA, but with the addition of perceived behavioural control. Perceived behavioural control is the individual's "perception of easy or difficult of performing the behaviour of interest" (Ajzen, 1991, p. 183).

TAM adapted from TRA proposes that two particular beliefs, perceived usefulness and perceived ease of use, are the primary drivers for technology acceptance. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his/her job performance", and perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free of physical and mental effort" (Davis, 1989, p. 320). Further, perceived usefulness and perceived ease of use both affect a person's attitude toward using the system, and consistent with TRA, these attitudes toward using the system determine behavioural intentions, which in turn lead to actual system use. The causal relationships have been validated empirically in many studies of user acceptance (Mathieson, 1991; Taylor and Todd, 1995a; Venkatesh and Davis, 1996, 2000; Venkatesh, 2000; Moon and Kim, 2001).

TAM has been extended by the addition of other constructs such as computer self-efficacy (Compeau and Higgins, 1995), Internet self-efficacy (Igbaria and Iivari, 1995; Eastin and LaRose, 2000; Joo et al., 2000; Hsu and Chiu, 2004a), subjective norm (Taylor and Todd, 1995a; Venkatesh and Davis, 2000; Bhattacherjee, 2000) or playfulness (Liu and Arnett, 2000; Moon and Kim, 2001; Hsu and Chiu, 2004a).

2.2. User information satisfaction

In the IS domain, a number of instruments have been developed to measure user information satisfaction (Bailey and Pearson, 1983; Ives et al., 1983) or end-user computing satisfaction (Doll and Torkzadeh, 1988). The instrument developed by Bailey and Pearson (1983) is a questionnaire of 39 items concerned with top management involvement, personal relationship with the EDP staff, vendor support, information quality, volume of output or confidence in the security of data among many other factors. Ives et al. (1983) condensed in short-form the Bailey and Pearson instrument using a sample of production managers. This short form was later empirically validated by Baroudi and Orlikowski (1988). Doll and Torkzadeh (1988) developed an end-user Computing Satisfaction instrument which included 12 items and five components: content, accuracy, format, timeliness and ease of use.

DeLone and McLean (1992) proposed a taxonomy and an interactive model as frameworks for conceptualising and operationalising IS success. They included six main dimensions of IS success: system quality, information quality, use, user satisfaction, individual impacts and organisational impacts, but did not empirically test. In this model, system quality and information quality