

Understanding business-level innovation technology adoption

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Abstract

The implementation of new Internet-based information system and technology (IT/IS) has been recognized as an important process for transforming a business toward electronic business. In line with this perspective, the business attitudes regarding the adoption of innovation IT/IS have been recognized as a critical factor for executing electronic business strategy. Since extant studies attempting to find influences on the individual adoption of IT/IS are dominated by technology acceptance model (TAM), this study attempts to extend TAM to business-level innovation technology adoption. Empirical results indicate that perceived usefulness, subject norm, perceived easy-of-use, and characteristics of the firm itself are very important factors influencing attitudes of businesses at the pre-decision stage, while only perceived usefulness and subject norm significantly affect attitudes of businesses at the in-decision stage. Additionally, the effect of perceived easy-of-use on both perceived usefulness and company attitudes as well as the influence of perceived usefulness on firm attitude are changeable, and rely on the complexity of the innovation IT/IS itself. The theoretical and business implications are discussed. © 2008 Elsevier Ltd. All rights reserved.

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1. Introduction

Accelerated growth of the Internet and electronic commerce (e-commerce) in the recent decade has forced businesses to encounter global competition and encouraged them to establish a presence in global markets via the implementation of new Internet-based information system and technology (IT/IS). Given that the implementation of new Internet-based IT/IS is a continued adoption process for transforming a business toward electronic business (e-business), establishing electronic links with its suppliers and buyers, and executing electronic transactions along value-chain activities, the business attitudes regarding the adoption of innovation IT/IS have been recognized as a critical factor for executing e-business strategy. However, e-business is different from previous traditional technological innovation (Lin and Lin, 2008). In contrast, e-business represents a new innovative approach to incor-

porate core business processes/functions with Internet-based IT/IS (Zhu, 2004; Teo et al., 2006; Lin and Lin, 2008).

Current studies attempting to find the determinants influencing individual-level IT/IS adoption are heavily based on behavioral theories such as technology acceptance model (TAM), theory of planned behavior (TPB), and innovation diffusion theory (IDT) (Hernandez et al., 2008). Literature on business-level technology adoption is scarce compared to general literature on examining individual-level technology adoption, and in particular contains few studies adopting the TAM standpoint. Enterprises allocate significant portions of their budget each year to procuring new IT/IS, and this trend has become more obvious following the advance of IT/IS and the diffusion and development of the e-life, e-society, and e-business. Hence, understanding business-level innovative technology adoption is just as important as understanding individual-level new technology adoption.

This study chooses electronic marketplace (e-marketplace) as the study object, because the e-marketplace is an Internet-based IT/IS innovation and application. Although rapid growth of e-marketplaces appears inevitable, a survey undertaken in early 2004 (Yu, 2006) indicated that

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the adoption rate of e-marketplaces by Taiwanese enterprises was approximately 23.48%, which was well below expectations. Therefore, the reasons why certain enterprises wish to use the e-marketplaces, while others do not, are quite interesting to be investigated. Compared to the vast existing literature on e-marketplaces, relatively few works have studied business to business (B2B) e-marketplaces adoption from behavioral theories, and most such studies are conducted from the economic viewpoint (Bakos, 1991, 1997; Strader and Shaw, 1999; Benslimane et al., 2005; Zhu et al., 2006) which may not fully explain the B2B e-marketplace adoption (Driedonks et al., 2005).

Motivated by the above discussion, this study focuses on three objectives. First, this work examines how business-level attitudes influence innovative Internet-based IT/IS adoption. Second, in contrast to the previous TAM-based literature, which generally takes individual-level users as the survey unit, this study takes collective organizations as the analysis unit to examine whether TAM remains valid at the business-level technology adoption. Third, rather than using an economic perspective, and only providing a static view in examining the influences on e-marketplace adoption by enterprises, this paper integrates TAM and IDT to form a multi-model research structure that reveals a dynamic picture of a firm's attitudes before new technology adoption, decisions to adopt the new technology, and decisions to continue using or rejecting it.

2. Theoretical framework

Compared to the large body of individual-level TAM literature, business-level TAM literature is relatively rare, though studies using TAM to examine organizational-level technology adoption are not entirely novel (Amoako-Gyampah and Salam, 2004; Zain et al., 2005). However, such researches have failed to clarify the relationship between business-level attitude and behavior on innovative technology adoption. This implies that the underlying technology adoption at the firm level has not been discussed and ascertained in sufficient detail.

2.1. TAM

TAM, proposed by Davis in 1986 (Davis, 1989), is used to effectively forecast individual computer acceptance behavior, and was adapted from theory of reasoned action (TRA) developed by Ajzen and Fishbein in 1975 (Ajzen and Fishbein, 1980). In TAM, the actual behavior (AB) of an individual to adopt a technology-based product can be predicted by the perceived usefulness (PU) and perceived ease-of-use (PEOU) of that individual as expressed by the regression model $AB = \beta_1 PU + \beta_2 PEOU + \varepsilon$, where PU is defined as the subjective assessment of a user or prospective user that using the product will provide benefits related to job performance, and PEOU is the degree to which an individual can use the product free of effort (Davis et al., 1989).

Since a business comprises a group of individuals, meaning business behavior is collective behavior of individuals, the usefulness of business-level TAM can be defined as the number of benefits obtainable by the company using the new technology, which is subjectively evaluated by key decision makers in firms. Likewise, ease-of-use can be defined as the degree to which business can effortlessly use the new technology. Effort in this context can refer to monetary investment, employee training time, technology switching barriers, maintenance costs, and so on.

Over the past two decades, enormous studies have used TAM or related extensions to provide empirical evidence on the relationships among PU, PEOU, and AB, or to validate and enhance the reliability and robustness of the TAM questionnaire instrument. Notably, although Davis et al. (1989) argued that the subjective norm (SN) did not significantly influence usage intention, and thus omitted SN in their original TAM, Davis modified this approach (Venkatesh and Davis, 2000) and concluded that SN considerably influences the attitude toward IT product adoption, based on numerous empirical studies demonstrating this (Hartwick and Barki, 1994; Karahanna et al., 1999). From an organizational behavior perspectives, many studies found that organizational decision behavior not only inherits the rational and irrational components of individual decisions but is also a collective perception reflecting the concerns of multi-dimensional stakeholders (Frambach and Schillewaert, 2002; Nelson and Quick, 2006).

Building on the above discussion, the new technology adoption behavior demonstrated by the whole business might resemble that demonstrated by a single individual. Accordingly, generalized business-level technology adoption attitude and behavior maybe can also be effectively explained by TAM, as shown in Fig. 1. Since this study explores the influences of firm attitude, decision, and continuance on e-marketplace adoption/non-adoption, the term “consumer” as used in the remainder of this paper may refer to a business, firm, or organization.

2.2. IDT

IDT, pioneered by Rogers in 1962 (Rogers, 2003), is used as a process-oriented perspective to explain how an innovation can be accepted and disseminated among consumers. IDT contends that the adoption or rejection of an innovation begins with consumer awareness of that

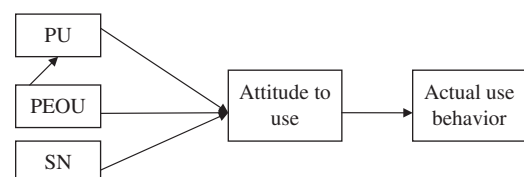


Fig. 1. A business-level technology acceptance model.

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