

Future use intentions versus intensity of use: An analysis of corporate technology acceptance

Blanca Hernandez^{*}, Julio Jimenez¹, M. José Martín²

*Faculty of Economics and Business Studies, Marketing and Business Administration Department, University of Zaragoza,
C/ Gran Vía 2, C.P. 50005, Zaragoza, Spain*

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Summary

The objective of our research has been to test whether the motivations behind the acceptance of new technologies explain Intensity of Use and Future Use Intentions indistinguishably or whether, on the contrary, they are two distinct concepts, and thus the estimated parameters change according to which is being explained. To this end, a model was constructed with two formulations, which differ only in the final variable to be studied i.e. Intensity of Use of a technology in one case and Future Use Intentions in the other. The results reveal the differences in the value and even in the significance of the motivations, depending on the kind of concept explained, meaning that Intensity of Use and Future Use Intentions cannot be considered indistinguishably.

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1. Introduction

The new information technologies (IT) have given rise to attractive business opportunities and promising advantages for companies in recent years. However, both the passage of time and experience have clearly demonstrated the slowness of their implementation (Roach, 1992); the real figures bear little relation to the initial expectations contained in some studies (Cannon, 1984; Clemmons & McFarlan, 1986). Thus, many studies have attempted to explain the paradoxical relationship between company adoption of technology and the benefits obtained, arguing that company efficiency can hardly be increased if applications are not used and implemented (indeed, Solow, 1987, states that “computers are everywhere except in productivity statistics”).

The dichotomy existing between the technology available and its assimilation has been analyzed from the organizational

point of view, reaching the conclusion that in order to be able to correctly evaluate the acceptance of IT, a distinction must be made between the simple acquisition of a system and its true exploitation as part of the productive process (Fichman & Kemerer, 1993). On this point, there have emerged new theories which attempt to ascertain the motivations encouraging users to accept a technological application, including perceptions as explanatory variables of behavior (the Theory of Reasoned Action, Technology Acceptance Model or Innovation Diffusion Theory). The majority of such studies propose the same motivations, regardless of the concept intended to be explained, which in some instances is the real Intensity of Use of a technology (e.g. Henderson & Divett, 2003; Shang, Chen, & Shen, 2005; Wu, Chen, & Lin, 2007; Yi & Hwang, 2003), but in others is the Future Use Intentions (e.g. Gefen & Straub, 2000; Lin & Lu, 2000; Luarn & Lin, 2005; Mathieson, 1991). In the final analysis, the two concepts are quite closely related, and consequently the literature usually extrapolates the results produced for one to the other (Chau & Hu, 2002; Lin & Lu, 2000; Van der Heijden & Verhagen, 2004). For these reasons, an overall review of the literature may give the impression that the two concepts are perfect substitutes and can be used indistinguishably to explain the acceptance of a specific technology.

^{*} Corresponding author. Tel.: +34 976 762 718; fax: +34 976 761 767.

E-mail addresses: bhernand@unizar.es (B. Hernandez), jjimenez@unizar.es (J. Jimenez), mjhoyos@unizar.es (M.J. Martin).

¹ Tel.: +34 976 762 718; fax: +34 976 761 767.

² Tel.: +34 976 764 692; fax: +34 976 761 767.

However, other studies have considered that intentions act as a direct antecedent of use (Davis, Bagozzi, & Warshaw, 1989; Taylor & Todd, 1995a; Venkatesh & Davis, 2000; Venkatesh, Morris, & Ackerman, 2000; Yi & Hwang, 2003), i.e. the two variables are different and cannot be explained indiscriminately. Agarwal and Prasad (1997) go further, considering that the motivations behind initial use are not the same as those which determine intentions to continue to use a system in the future. Therefore, a unitary model may not work for both user acceptance outcomes and different models may be necessary to explain and predict current and future usage.

On this point, the objective of our research has been to test whether the motivations behind company acceptance of new technologies explain both Intensity of Use and Future Use Intentions indistinguishably or, on the contrary, they are two distinct concepts, and thus the estimated parameters change according to which is being explained. Moreover, in distinction to other studies, we analyze the type of difference which exists in each relationship, on the basis of the endogenous variable. To this end, a model was constructed with two formulations, which differ only in the final variable to be studied i.e. current Intensity of Use or Future Use Intentions, both measured at the same point in time. The factors included are identical in both formulations, having been obtained from the Technology Acceptance Model (TAM) and the Innovation Diffusion Theory (IDT).

There are two basic reasons for employing these theories as a starting point. On the one hand, the TAM and the IDT establish a series of perceptions which are not modified independently of the technology analyzed, in distinction to others, such as the TRA, which elicits its variables for each innovation. On the other hand, both models have been empirically tested in a considerable number of studies related to new technologies; such research confirms the explanatory power attained with regard to different concepts, namely Future Use Intentions and Intensity of Use (Agarwal & Prasad, 1997; Moore & Benbasat, 1991; Shang et al., 2005; Shih, 2004; Venkatesh & Davis, 2000).

In order to do this, we analyze a specific tool, namely business management softwares, and a sector closely linked to the systems under analysis, i.e. that of new technologies, or IT sector, which has attained enormous importance in the world economy in recent years.³ These business management softwares, in addition to facilitating the execution of basic business functions, allow companies to share information with those agents with whom they interact in the performance of their activity, thereby making the flow of information bidirectional due to the use of the Internet.

The principal motivation driving our study is to demonstrate the importance of correctly choosing the endogenous variable to be used (Future Use Intentions or real use) and to highlight the possibility of making a mistake if a specific final concept is studied but the conclusions reached are subsequently extrapolated to a different concept. A correct choice will permit

companies to understand which factors are important at each point of the adoption process, and to influence one perception or another of the technology in question (as we shall see, ease of use, usefulness and/or compatibility), according to whether Future Use Intentions or the real use made are to be affected. Numerous TAM studies consider that user perceptions explain Future Use Intentions and real use indistinguishably; however, our research concludes that it is important to differentiate between the two in order for decision-making to be as appropriate as possible. However, as the literature states, it is not always possible to apply this differentiation, since in some cases methodological considerations or mere pragmatism (basically, the difficulty of measuring real use) may lead to the employment of Future Use Intentions as a presumably adequate proxy for the real behavior of users (this is the case of the studies by Gefen & Straub, 2000; Chau & Hu, 2002).

In the following section we provide the theoretical analysis of the concepts to be studied, as well as a more detailed explanation of the objective proposed, and then continue with the methodology employed. Subsequently, we present the empirical studies which were successively performed. The study terminates with a discussion of the results obtained and the managerial implications for the firm.

2. Theoretical framework and research objectives

2.1. Factors which influence technology acceptance

The concept of innovation has been defined from diverse theoretical disciplines: marketing (Mahajan, Muller, & Bass, 1990), company organization (Zaltman, Duncan, & Holbek, 1973), social psychology (Ajzen & Fishbein, 1980), etc., producing numerous reflections regarding technology acceptance which attempt to explain the success achieved by an innovation. From among all these approaches, the Technology Acceptance Model (TAM) constructed by Davis (1989), and the Innovation Diffusion Theory (IDT) proposed by Rogers (1983, 1995) are especially prominent in the marketing field.

The former is an adaptation of the Theory of Reasoned Action (TRA), proposed by Fishbein and Ajzen (1975), and focuses exclusively on information technology (Childers, Carr, Peck, & Carson, 2001; Featherman & Pavlov, 2003; Mathieson, Peacock, & Chin, 2001; Taylor & Todd, 1995b). Thus, TAM attempts to predict the degree of implementation achieved by an innovation, establishing *a priori* those factors which condition the behavioral intention of the user: Perceived Usefulness (PU) and Ease of Use (PEOU) (Davis et al., 1989; Davis & Wiedenbeck, 2001; Gefen & Straub, 2000; Lee, Kozar, & Larsen, 2003). Perceived Usefulness is defined as the degree to which an individual considers that the employment of a specific system can improve his or her performance at work, while Perceived Ease of Use refers to the additional effort required to apply a specific technology (Davis, 1989; Lederer, Maupin, Sena, & Zhuang, 2000).

With regard to the Innovation Diffusion Theory, Rogers (1983, 1995) initially bases his analyses on five key variables: relative advantage, complexity, compatibility, triability and

³ According to the European Innovation Technology Observatory, the growth rate of the IT sector at world level has increased from 1.4% in 2003 to 5.09% in 2005, accounting in that year for 6% of GNP.

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