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Factors affecting the intention to use a web-based learning system among blue-collar workers in the automotive industry

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ABSTRACT

This study aims to identify, using an extended Technology-Acceptance Model (TAM), the factors affecting the decision of using a web-based learning system among blue-collar workers in the automotive industry. A structural equation–modeling approach was applied to identify the variables that significantly affect the decision of using the system. Using LISREL 8.54, data collected from 546 blue-collar workers were used to test the proposed research model. Empirical testing of the extended TAM found all paths to be significant in the hypothesized directions, that is, the results of the study strongly support the application of extended TAM in predicting the blue-collar workers' intention to use a web-based learning system. Among the factors, social influence is a much stronger predictor of user intention compared to others. The study concludes with the implications of this study for managers and recommendations for possible future research.

1. Introduction

Competitiveness requires highly competent employees with up-to date knowledge. However, traditional training methods are not sufficient to satisfy the demand for continuous personal development (Little, 2001). To enable competent workers to continually update their skills and remain competent in the performance of their jobs, workers must be able to access training on demand (Wagner & Flannery, 2004). Web-based learning is an approach that allows employees to access the training environment. "Web-based learning can be defined as material delivered through a web browser over the public Internet, private intranet, or extranet" (Chiu & Wang, 2008, p. 194). Web-based learning is also known as e-learning and is defined as an Internet-enabled learning process (Gunasekaran, McNeil, & Shaul, 2002). The rates of proliferation of network, access to the system, and advances in Internet/Web technology have increased the rapid growth of the e-learning approach. Cortona Consulting, a cross media agency working on marketing and business strategy, has estimated that the e-learning market will reach $50 billion in 2010 (Chiu & Wang, 2008).

Using a web-based learning system offers many advantages to both workers and companies. The concept of "anytime, anywhere learning" enhances lifelong learning among workers and makes distance a past problem (Hamid, 2002, p. 315), and makes learning more accessible than ever before (Little, 2001). It also helps organizations by reducing the cost of training and increasing the availability of training (Chiu & Wang, 2008; Little, 2001). In addition, web-based learning systems offer new possibilities to integrate various types of learning content according to the learners' need and are additionally compatible with the learners' preferred learning styles (Little, 2001). In spite of the great importance of web-based learning systems, some potential users sometimes choose not to use potentially beneficial systems. This represents a large amount of lost investment for companies. Therefore, it is important to explain and understand the factors that affect the use of web-based learning systems because these systems aim at improving the performances of both the company and workers as complements of each other.

Several theoretical models have been used to investigate the determinants of the acceptance-and-use of new information technology (IT) (Venkatesh, Morris, Davis, & Davis, 2003). The Technology-Acceptance Model (TAM) is a powerful, robust, and commonly applied model for predicting and explaining user behavior and IT usage (Agarwal & Prasad, 1999; Davis, 1989; King & He, 2006; Legris, Ingham, & Collerette, 2003). Davis, Bagozzi, and Warshaw (1989) based the Theory of Reasoned Action (TRA) for the development of TAM, which is used for analyzing the individual acceptance of IT. Although TAM is a useful theoretical model that understands and explains user behavior in IT implementation, it has to be integrated into a broader one that includes variables related to both human and social factors (Legris et al., 2003; Lucas & Spitler, 2000).

In the literature, several studies have been used TAM and extended TAM in predicting factors affecting web-based learning

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system use. This paper contributes to the existing literature in the following ways: First, this study provides evidence to the impact of anxiety, facilitating conditions and social influence on intention to use web-based learning system. Second, the studies related with web-based learning acceptance have been mainly focused on the web-based learning system acceptance of the students (Abbad, Morris, & de Nahlik, 2009; Chang & Tung, 2008; Chiu & Wang, 2008; Cho, Cheng, & Hung, 2009; Huang, Lin, & Chuang, 2007; Lee, 2006, 2010; Lee & Lee, 2008; Lee, Yoon, & Lee, 2009; Liaw, Chen, & Huang, 2008; Liu, Liao, & Pratt, 2009; Martinez-Torres et al., 2008; Ndubisi, 2006; Park, 2009; Pituch & Raaij & Schepers, 2008; Saade, 2003; Saade, Nebebe, & Mak, 2009; Saade, Nebebe, & Tan, 2007; Saade, Tan, & Kira, 2008; Saadé & Galloway, 2005; Stoel & Lee, 2003; Tung & Chang, 2008a, 2008b; Zhang, Guo, & Chen, 2007), teachers (Larsen, Sorebo, & Sorebo, 2009; Sanchez-Franco, Martinez-Lopez, & Martin-Velicia, 2009; Sorebo, Halvari, Gulli, & Kristiansen, 2009; Wang & Wang, 2009; Yuen & Ma, 2008), nurses (Chen, Yang, Tang, Huang, & Yu, 2008) and public (Huang, Wei, Yu, & Kuo, 2006). However, little research has analyzed the factors affecting web-based learning system in an organizational setting (Chatzoglou, Sarigiannidis, Vraimaki, & Diamontidis, 2009; Ong & Lai, 2006; Ong, Lai, & Wang, 2004; Roca, Chiu, & Martinez, 2006; Roca & Gagne, 2008; Wagner & Flannery, 2004). Our study differs in that data was taken from blue-collar workers working specifically in automotive industry; on the other hand Chatzoglou et al. (2009) analyze the acceptance of the system among all employees working in the sectors such as manufacturing, trade, construction, banks and services; Ong et al. (2004) and Ong and Lai (2006) collect data only from engineers without specifying a specific sector; Roca et al. (2006) and Roca and Gagne (2008) use the data that were obtained from workers of four international agencies of United Nations such as International Labour Organization (ILO) and United Nations Educational, Scientific and Cultural Organization (UNESCO); Wagner and Flannery (2004) collect data from selected employees at a government agency headquartered in Maryland. Moreover, in our study, users' willingness to use the system was measured in the pre-implementation stage of the system. Few studies in the literature have collected data in the pre-implementation phase to explore the factors affecting system acceptance (Chen et al., 2008; Pituch & Lee, 2006; Zhang et al., 2007). Therefore, this study contributes to the existing e-learning acceptance literature in two ways. The first is that there exist relatively few studies with focus on e-learning in the business sector. The second is that relatively few studies on e-learning acceptance have collected data on users' perceptions in the pre-implementation stage.

As a result, this study aims to explore the acceptance of web-based learning system from the perspective of blue-collar workers in the automotive industry in Turkey by adopting an extended TAM through extension of the factors anxiety, facilitating conditions, and social influence. The next section discusses the research model and hypotheses included. This is followed by the research methodology that is based on a survey of 546 potential users of web-based learning systems. Then, the results of the survey are discussed. This article concludes with a discussion of the findings, resulting in a model that predicts employees' intentions to use web-based learning systems, its managerial implications, and recommendations for areas of future research.

2. Research model and hypotheses

Our research model extends TAM through the factors social influence, facilitating conditions and anxiety. The research model tested in this study is shown in Fig. 1. The following hypotheses were developed based on the findings of previous research on this subject.

2.1. Behavioral intention to use

Behavioral intention is a measure of the likelihood that a person will get involved in a given behavior (Ajzen & Fishbein, 1980). Behavioral intention involves motivational factors that influence a behavior. These factors are "indications of how hard are people planning to try and how much effort they are planning to exert in order to perform the behavior" (Ajzen, 1991, p. 181). Users first intend to use the technology and then actually use it. Therefore, behavioral intention to use becomes the immediate determinant of actual use (Mathieson, 1991); however, behavior can be predicted by behavioral intention only if the person decides to either perform or not perform that behavior (Ajzen, 1991). If an employee strongly intends to use a system, he or she is expected to try more, and thus the likelihood of using the system will be greater (Ajzen & Madden, 1986). In this study, because the use of web-based learning systems is voluntary, determination of the factors affecting behavioral intention to use web-based learning system is crucial for the actual use of the system in the future.

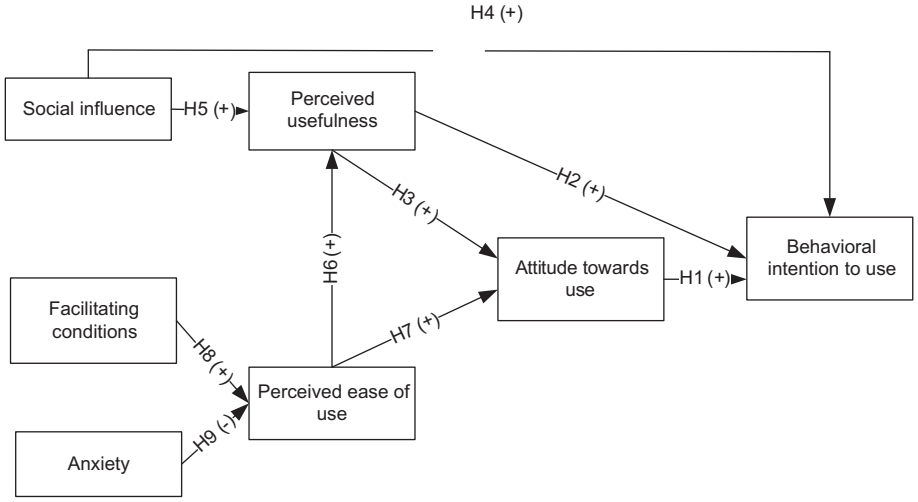

Fig. 1. Research model.