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Integrating trust and personal values into the Technology Acceptance Model: The case of e-government services adoption

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ABSTRACT

The Technology Acceptance Model (TAM) is considered one of the best frameworks to understand technology-related adoptions that can be extended and adapted to the different features of many diverse situations. This work analyzes the adoption of e-government services and proposes that trust and personal values contribute to better understand such adoption. Specifically, this study proposes an integration of trust into the TAM, due to the online context characteristics (i.e., uncertainty). In addition, since these services are provided to the whole citizenry, two personal values very much related to e-government advantages (citizens' time consciousness and environmental concern) are proposed as moderators of the aforementioned relationships. Results reveal the mediating role of trust into the TAM framework which is confirmed by a rival models analysis. Besides, citizens' personal values moderate the influence of some antecedents of the intention to use e-government services, which suggests some interesting implications for public administration strategic marketing.

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Integración de la confianza y los valores personales en el Modelo de Adopción Tecnológica: el caso de la adopción de la administración electrónica

RESUMEN

El Modelo de Aceptación Tecnológica (TAM) es conocido por ser uno de los mejores marcos conceptuales que puede adaptarse a las características de diferentes escenarios de adopción tecnológica. Este trabajo analiza la adopción de servicios de administración electrónica y propone que la confianza y los valores personales contribuyen a entender mejor este proceso. Concretamente, dada las características del entorno online y la variedad de usuarios potenciales, se propone una integración de la confianza en el TAM y se analiza como dos valores personales de los ciudadanos (la conciencia de tiempo y la conciencia medioambiental) moderan las relaciones anteriores en este contexto. Los resultados revelan que la confianza desempeña un papel mediador en el modelo TAM, lo que se confirma con el análisis de modelos rivales. Asimismo, los valores personales moderan la influencia de las variables TAM sobre la intención de uso, sugiriendo algunas implicaciones de interés para el marketing estratégico de las Administraciones Públicas.

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1. Introduction

The need to reduce their costs and increase efficiency compels the majority of organizations to migrate to e-services, including

public administrations (Sahu and Gupta, 2007). Since Information and Communication Technologies have changed the daily life of people, e-government is revealed as a great opportunity to provide better public services adapted to citizens' needs (i.e., ubiquity) (Teerling and Pieterse, 2010). However, despite the numerous benefits for both citizens and governmental agencies (Verdegem and Verleye, 2009), the users of e-government services are still a minority (Coursey and Norris, 2008; Bélanger and Carter, 2008;

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Chen, 2010). For example, approximately a 20% of Internet users in Spain, which is less than 10% of total population, only carried out a public service online (i.e., vehicle registration online) in 2010 (INE, 2011). Considering that a critical mass of e-government users guarantees efficiency in the medium term (Tung and Rieck, 2005), spreading e-government use among citizens is a challenge that needs to be faced without delay, especially in times of continuous public budget cuts. There is, thus, a managerial need to thoroughly understand the factors that affect citizen adoption of e-government services in order to face this lack of success from a managerial perspective.

The TAM developed by Davis (1989) has been traditionally described as one of the best frameworks to understand e-government adoption (Carter and Bélanger, 2005). Certainly, this is the most successful adoption model with regards to the number of studies on online behavior relying on TAM and its high explanatory power (see Schepers and Wetzels, 2007). However, TAM has been criticized because of its parsimony, and the reliability of such a simple and deterministic model has been called into question (Bagozzi, 2007). To solve this limitation, several researchers have proposed new models of adoption adapted to specific contexts by broadening TAM (Venkatesh et al., 2003). Analogous to e-commerce, e-government literature identifies citizen trust on online public services as a crucial aspect for adoption (Gefen et al., 2003; Warkentin et al., 2002). Indeed, because they are being provided online, e-government services feature certain level of perceived (or real) uncertainty and risk of vulnerability for citizens; emphasizing the relevance of trust in e-government adoption (Warkentin et al., 2002; Wu and Chen, 2005). Surprisingly, despite the numerous works relating TAM and trust (see Appendix A), few of them have attempted to justify the integration of trust into the relations proposed by TAM, and almost no one has assessed the suitability of trust or any other variable as an underlying mechanism explaining the original TAM framework (Bagozzi, 2007). As well, empirical assessments of the antecedents of behavioral intentions suggest that their influence may be also subject to cross-sectional heterogeneity across users depending their personal characteristics, such as values or life-styles (e.g. Sun and Zhang, 2006; Jeong et al., 2009).

Therefore, a deep understanding of the aspects beyond the key TAM variables could help managers in public administration and other organizations in their aim to implement an efficient and widely accepted service (Bhattacharjee, 2000; Tung and Rieck, 2005). To move on this topic, this study contributes to the emerging body of literature on e-government services adoption by addressing two issues:

- The first objective of this study is to confirm the validity of the relationships proposed by TAM in the e-government context and to better understand the role of trust into this model. This proposal considers that citizens' trust in the e-service is a partial mediator in the relationship between two basic components of TAM: ease of use and usefulness perceptions. The inclusion of trust in the research is based on the important role that this variable plays in the online context, which is under vulnerability and uncertainty perceptions by many people (Gefen et al., 2003; Harris and Goode, 2004). This fact is especially relevant in this context of analysis due to the wide range of potential e-government users in terms of Internet experience, age or culture (Warkentin et al., 2002).
- Secondly, the study addresses how personal values and citizens' life-styles may interact with the antecedents of the intention to use e-government services in order to form this intention. More specifically, two of the most prominent cited features of e-government services are time efficiency – that results from the ubiquitous nature of Internet, which enables citizens to use

e-services anytime and anywhere – (Carter and Bélanger, 2005), and ecological benefits (Centeno et al., 2005) – i.e., in terms of amount of paper reduced. Therefore, two personal values of citizens (their time consciousness and environmental concern) are considered as moderators of the effect of attitude, usefulness and trust on behavioral intentions. The analysis of these moderating effects might be useful to implement marketing strategies focused on citizens' demands and requirements.

This research thus contributes to better know the trust–TAM relationship proposed theoretically in the literature and to empirically determine the suitability of a trust-inserted model of adoption through a rival model analysis. As well, the study identifies two up-to-day personal life-styles and values which are related to e-services benefits (and particularly to e-government) and remain almost unexplored in previous research on adoption. This article thus clarifies how the inclusion of citizens' time consciousness and environmental concern can raise intentions to use e-government by moderating the effects predicted in TAM.

Bearing these considerations in mind, this article is structured as follows: The first part presents a brief review of relevant literature of e-government adoption and the proposed links between TAM and trust. Then, the research model hypotheses including the partial mediation role of trust are introduced, as well as the moderating effects of environmental concern and time consciousness. After that, data collection and measures validation processes are explained, followed by the results of the causal model. Next, a rival model analysis is carried out to assess the validity of the TAM–Trust model. Finally, the discussion section includes the main conclusions, managerial implications and limitations of the study.

2. Literature review

2.1. The Technology Acceptance Model in e-government adoption

The use of ICT by public administration is known as e-government (OECD, 1998). Literature on e-government development establishes that e-administration, which means the provision of common public services through the Internet (Royo, 2008); represents an initial stage driving to success in further e-government stages such as e-participation (Carter and Bélanger, 2005). Consequently, this study analyses the adoption of e-administration services by citizens as an essential component in the acceptance of e-government. Similar to e-commerce, e-government is heavily technology-driven (Pavlou, 2003) and thus, it has been argued that technology-related variables have become as important as traditional factors in predicting e-services use (Al-Adawi et al., 2005). The TAM, initially proposed by Davis (1989), is surely the most representative of the theories on adoption of technologies flourished in the eighties. Despite TAM was designed initially to be applied to organizational settings (Davis, 1989; Davis et al., 1989) this framework has been employed by numerous researchers to explain the individuals' adoption of many technological advances such as Internet (Moon and Kim, 2001), e-commerce (Gefen and Straub, 2000; Herrero and Rodríguez-del-Bosque, 2010) or e-government (Wang, 2002; Wu and Chen, 2005). Probably the impact of TAM in research analyzing individuals' behavior is supported by its parsimony and predictive explanatory capacity (Bagozzi, 2007). This supremacy relies on the relations among four key constructs explaining the adoption of a technology: attitude, perceived usefulness (PU), perceived ease-of-use (PEOU) and intention to use.

To be precise, attitude toward a certain behavior has been traditionally defined as “the degree to which a person has a favorable or unfavorable evaluation of the behavior in question” (Ajzen, 1991, p. 188). PU was initially defined by Davis (1989, p. 320) as “the

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