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Applying the technology acceptance model to a Spanish City Hall☆

José Luis Moreno Cegarra[a,*], Juan Gabriel Cegarra Navarro[a,1], José Rodrigo Córdoba Pachón[b]

[a] Universidad Politécnica de Cartagena, Facultad de Ciencias de la Empresa, Cartagena, Murcia, Spain
[b] School of Management,Royal Holloway, University of London, Egham Hill, Egham, Surrey TW200EX, UK

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ABSTRACT

This paper examines the relative importance and significance of the four technology enablers introduced by Davis (1989) in the technology acceptance model (TAM) (perceived ease of use, perceived usefulness, attitude towards using and behavioural intention) for use on four different levels of citizen engagement in e-government (null, publish, interact and transact). An extended technology acceptance model (TAM) is developed to test citizen engagement towards online e-government services from a sample of 307 citizens who used the benefits advisor tool within a Spanish City Hall. Although the proposed model follows TAM and explains the intention towards the actual use of e-government by postulating four direct determinants, "A, PU, PEOU and BI" have been considered as parallel processes, meaning that each can have separate influence in different levels of citizen engagement. To achieve this goal, a multinomial logistic regression is developed and tested to confirm the explanatory power of the four technology enablers on the four different levels of e-government. Our findings further suggest that in order to implement e-government, some of the enablers matter more than others to move from one level of citizen engagement to another. The main contribution of the paper is to question the use of existing models which seek to represent the relationship between technology enablers and the adoption of e-government services without considering their impacts on citizens' engagement. The implications of the findings are discussed and useful insights are provided in relation to policy recommendations geared to create appropriate conditions to build citizens' engagement intent of use of e-government services.

1. Introduction

The progress of electronic government (e-government) in Spain has undoubtedly been favoured not only by the greater awareness and predisposition to engagement shown by potential service users but also by the planning and legislative efforts made by Spain's public sector in the last few years (MAP in Spanish, 2011). Recent reforms have decentralised (regionalised) the Spanish Public Administration in order to improve response times and increase participation of citizen communities in the development and management of electronic online services at regional and local levels (Cohen & Nijkamp, 2004). As a result of these reforms, Spain has recently found itself among the ten most advanced countries in this area and ranked fifth in Europe in terms of both availability and sophistication of on-line public services (SIPA, 2011).

In Spain, most if not all local municipalities (called "municipios" in Spain) are engaged in the development and delivery of efficient services to the public. Heichlinger (2004) defines e-government simply as a set of activities supported by information systems with the aim of improving the relationships between government institutions and citizens. These include collecting and paying money according to the laws and bylaws of Spain as well as resolutions of city councils. A key component of local services is that of official town websites (OTW). These are highly visible manifestations of city policy developments and are used for service delivery and information. They enable local governments to provide citizens, business and other organisations with convenient access to local services and opportunities to collaborate via information communication technologies (ICT) (Lean, Zailani, Ramayah, & Fernando, 2009). Websites become representations of local services and their assessment can also give an indication of the degree of satisfaction by citizens (Venkatesh, Chan, & Thong, 2012).

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* Corresponding author.
E-mail addresses: juan.cegarra@upct.es, jlmoreno@ayto-cartagena.es (J.G. Cegarra Navarro), j.r.cordoba-pachon@rhul.ac.uk (J.R. Córdoba Pachón).
[1] Tel.: +34 968326409.

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A closer examination, however, shows that worldwide, most initiatives facilitated by ICT have been characterised by low levels of citizen engagement (e.g. Heeks, 2006; Torres, Pina, & Acerete, 2005; De-Miguel-Molina, 2010; SIPA, 2011). A possible explanation for these findings may relate to the fact that although the majority of municipal governments have their own ICT and websites to provide public information to citizens (Moon and Norris, 2005), there has been no emphasis on developing enablers to the adoption of instructional technology. Put another way, despite many scholars highlighting the fact that those municipal-portals can be very effective tools to achieve a citizen's objectives (see Criado & Ramilo, 2003; Ho, 2002; Suki & Ramayah, 2011; West, 2004), few, if any studies have considered the ways in which the use of municipal-portals can increase their chances of being widely used through a better and more user-sensitive municipal's ICT infrastructure The claim raised by Criado and Ramilo (2003) about the lack of two-way communication noticed in Spanish websites needs to be further investigated. The question that arises is whether people are willing to use these new technological advancements and if so what can be done to address their concerns.

In this regard, the technology acceptance model (TAM) provides a good basis to explain the adoption of new technologies (Davis, 1989). This paper aims to offer an empirically tested TAM model to help identify how technologies at city halls may be accepted through the development of particular aspects and applications. With the development of this paper, we intend to address the following questions: Does availability of ICT imply the use of e-government? How is ICT being accepted by citizens? How can policy to ensure citizens engagement with e-government be informed? This article addresses these questions, and demonstrates that the availability of sophisticated internet-based e-government systems does not necessarily guarantee the effectiveness of e-government in the long term.

The contribution of this paper is to offer an empirically tested model to help identify how ICT may be accepted by citizens. In this paper we consider which of the four technology enablers introduced by Davis (1989), perceived ease of use (PEOU), perceived usefulness (PU), attitude towards using (A) and behavioural intention to use (BI) are more likely to lead to successful use of e-government, through an empirical investigation of 307 citizens who used on-line services within a Spanish City Hall, validated by factor analysis. In the following section we investigate the development of hypotheses as to how the TAM contributes to several levels of e-government adoption (null, publish, interact and transact). Details of the empirical study are presented in Section 3 and the results of testing the hypotheses are presented in Section 4. Finally, the results are discussed in Section 5.

2. Conceptual framework

2.1. Citizen engagement with electronic local services

Tapscott (1996) initially asserted that e-government is an internetworked government, which links ICT with legal systems internally and, in turn, links such government information infrastructure externally with everything digital and with everybody – the tax payer, suppliers, business customers, voters and every other institution in the society. Abramson and Means (2001) define e-government as digital governmental information or a way of engaging in digital transactions with the public (citizens and businesses) and employees. Fraga (2002) suggests that e-government is the transformation of internal and external relationships in the public sector through net-enabled operations. Durrant (2002) defines e-government as "a permanent commitment by government to improve the relationship between the private citizen and the public sector through enhanced, cost-effective and efficient delivery of services, information and knowledge". For Holmes (2001), e-government is about developing a citizen-centred government environment which serves citizens (customers) at any time, regardless of their physical location. For Henman (2010), the term e-government is commonly used to account for different applications including of e-procurement, e-administration and e-voting.

Despite the diversity of e-government manifestations, researchers agree that e-government has considerable potential to help communities address their local problems with the use of websites as well as for gains and cost reductions for local governments (e.g. Badri & Alshare, 2008; Bertot, Jaeger, & McClure, 2011; Carter & Bélanger, 2005; Lean et al., 2009). For example, official town websites are highly visible manifestations of city developments and are used for collecting and paying money according to the regulations of city councils (Lean et al., 2009). These perspectives also provide a view of e-government as a driver for public administration to become more open and transparent, to enable democratic participation and networked activism (Land, 2009; Ciborra & Navarra, 2005), to become more service-oriented by providing personalised and inclusive services to each citizen (e.g. Foot & Schneider, 2006; Holmes, 2001; Ward, Gibson, & Nixon, 2003), to become more productive and to deliver maximum value for taxpayers' money (Park & Perry, 2008).

The above definitions suggest a variety of processes and services that can be supported by the use of ICT in government affairs, as well as the diversity of perspectives that can be adopted to assess their impacts in both governments and citizens. In the context of this paper, the analysis of e-government is limited to the use of websites for controlling electronically public administration's processes from both internal and external perspectives (Claver-Cortés, Juana-Espinosa, & Tarí, 2008). In line with this, another definition is introduced to account for the latter (external) perspectives: Civic engagement can be defined as a phenomenon through which individuals are able to formulate ideas, surface meanings and debate actions that reflect their desired degree of participation in individual and societal decision-making processes (Bennett, 2008; Hays, 2007; Jennings & Zeitner, 2003).

A particular type of civic engagement is citizen engagement. Citizen engagement includes efforts to directly address an issue, work with others in a community to solve a problem or interact with the local institutions (Gatautis, Stravinskiene, & Gudauskas, 2011). Another way of describing this concept is the sense of personal responsibility individuals should feel to uphold their obligations as part of any community (Putnam, 2000). In the context of this paper the term citizen engagement refers to the use of city council websites to empower the socio-technological and cultural capabilities of citizens giving the possibility to citizens to deal with local affairs concerning benefits and tax credits (Lim, 2007).

How the above citizen engagement can be studied has not been fully addressed in the literature, because it is assumed that citizens often constitute a homogeneous (or commercially segmentable) group which are keen to use one-stop website services once they become available (Dunleavy, Margetts, Bastow, & Tinkler, 2006; Holmes, 2001). In this paper and following Layne and Lee (2001) e-government maturity model as well as Torres et al.'s (2005) three types of connections between citizens and electronic government service maturity, three different categories of citizen engagement are proposed:

- *Publish*, where ICTs open up new possibilities for City Halls to be more transparent to citizens, giving access to a greater range of information collected and generated by City Halls. For example, visiting City Hall websites enables citizens to have instantly