



Technology knowledge and governance: Empowering citizen engagement and participation[☆]



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ABSTRACT

The term technology knowledge (T-knowledge) is used to describe knowledge about and the ability to operate specific technologies such as the internet. T-knowledge also includes the ability required to operate particular technologies. T-knowledge can potentially improve engagement by helping the user to make his/her personal decision in an increasing range of domains. The main purpose of this paper is to investigate the extent to which an extended Technology Acceptance Model (TAM) facilitates t-knowledge in e-government services offered by City Halls. We also investigate whether t-knowledge has an effect on citizen engagement in government initiatives. In this research, an extended TAM is developed to test t-knowledge in online e-government services employing a sample of 307 citizens who used the benefits advisor tool provided by a Spanish City Hall. The results suggest that the core constructs of TAM (perceived usefulness, ease of use and attitude) significantly affect t-knowledge. This study also reveals a general support for t-knowledge as a determinant of citizen engagement.

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1. Introduction

Citizen engagement has been defined as individual and collective actions designed to identify and address issues of public concern (Adler & Goggin, 2005). Citizen engagement refers to the ways in which citizens participate in the life of a community in order to improve conditions for others or to help shape the community's future. A common theme in the field of local governments refers to the use of information and communication technologies (ICT) as a means to foster citizen engagement (Ferro, Loukis, Charalabidis, & Osella, 2013; Jennings & Zeitner, 2003). There are enough positive things about ICT as enablers for citizens to get more involved in public life (Linders, 2012), provide timely and actionable information (Chatfield, Scholl, & Brajawidagda, 2013; Fuentes-Bautista, 2014), facilitate formation of social networks (Bonsón, Torres, Royo, & Flores, 2012), and contribute to participatory and deliberative democracy (e.g., Åström, Karlsson, Linde, & Pirannejad, 2012; Hong & Nadler, 2012; Park & Perry, 2008).

The above considerations lead us to argue that ICT help make valid and reliable information available to citizens for better governance, supporting new forms of collective action which lead to a new form of collaborative democracy (Noveck, 2010). A closer examination, however, shows that most

initiatives facilitated by ICT have been characterised by low levels of citizen engagement (e.g., De-Miguel-Molina, 2010; SIPA, 2011; Torres, Pina, & Acerete, 2005). With respect to this issue Reddick and Norris (2013) have argued that social media today do not appear to be moving local governments in the direction of Web 2.0, but perhaps in the direction of Web 1.5. 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 & Norris, 2005; Norris & Moon, 2005), there has been no emphasis on developing the knowledge required to use such technologies.

The term technology knowledge (T-knowledge) refers to those capabilities which potentially enable technology users to find the right answer in the right place at the right time with the support of a specific technology (Cegarra, Cepeda-Carrión, & Eldridge, 2011). In the case of ICT this t-knowledge includes knowledge of operating systems and application software, as well as knowledge of computer hardware and the ability to instal and remove peripheral devices, instal and remove software programs, create and archive documents (Nohria & Gulati, 1996; Sharma, 2000; Szulanski, 1996).

T-knowledge, then, is not only content to be learned but also the vehicle through which the intellectual processes embedded in technological activity can themselves be used. T-knowledge can potentially, improve the skills required to operate particular technologies, which in turn helps citizens make their personal decisions in a growing range of domains including governance. In the context of this paper, t-knowledge is understood to be created, used, and communicated through such processes as perception, attitude or understanding of the technology (Martinez-Caro, Cegarra-Navarro, & Solano-Lorente,

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2012). Furthermore, it is our understanding that without the support provided by a positive attitude towards technologies, t-knowledge may not be created. Attitude in this context is that part of learning process that allows people to understand the value of technologies (Davis, Brannon, & Whitman, 2009), and it allows individuals to make judgments and impressions about ICT and, by extension, the creation of t-knowledge.

The Technology Acceptance Model (TAM) provides a good basis to explain the adoption of new technologies. The TAM was originally conceived by Davis (1989) and suggests that perceived usefulness of ICT and perceived ease of use are major determinants that affect individual's attitude and intention to use ICT. Perceived ease of use is also suggested to have an impact on the perceived usefulness. However, despite the opportunities that TAM potentially offers for the understanding of t-knowledge, few, if any, studies have considered the ways in which the creation and use of t-knowledge can be facilitated through the implementation and use of the TAM. Despite the amount of academic research dedicated to examining the determinants of information technology acceptance, and to TAM in particular, very little research has been conducted on City Halls to help identify how t-knowledge may be created by citizens.

This study will therefore address the following research questions: "What is the nature and strength of the relationship between citizen engagement and t-knowledge?" and "What role –if any, does the core concepts of TAM play in such a relationship?" These questions are examined through an empirical investigation including 307 citizens who used a particular e-government tool, that is the Benefits Adviser tool, within a Spanish City Hall. A modified TAM is developed and tested by using the Structural Equation Modelling (SEM) approach. The concepts of citizen engagement and t-knowledge are discussed in detail in the following section. Section 3 investigates the development of hypotheses as to how the TAM contributes to t-knowledge. Details of the survey which was used to collect data required to test the models is presented in Section 4. The results of testing the models are presented in Section 5 which are subsequently discussed Section 6.

2. The proposed research model

2.1. The research context

T-knowledge refers to a fuzzy set of skills including information resources enabling better utilization of technology infrastructures (see Cross, 2001; Ropohl, 1997; Vries, 2003). T-knowledge may be viewed not only as previous experience of how to instal and remove peripheral devices, but it also includes skills required in individuals to operate particular technologies. Put another way, it is through activity that t-knowledge is defined; it is activity which establishes and orders the framework within which technology infrastructure is used (Herschbach, 1995). This means that t-knowledge includes both technical know-how as well as a systematic knowledge about the interrelationship between technical objects, the natural environment and social practice (Bennett, 2008; Jennings & Zeitner, 2003). For example, t-knowledge about online council services such as bingo and tombola can help older people by preventing and alleviating social isolation and loneliness among older people. In this paper, t-knowledge involves not only the skills citizens need to achieve a minimum utilization of Spanish city council websites, but also involves making the citizen aware of electronic policies, processes, programs, and services and generating some positive feelings.

In countries like Spain, the factors that influence the nature and structure of the Spanish Public Administration (e.g., demand, costs, regulations, organisation, etc.) are undergoing rapid change. Recent reforms have regionalised the Spanish Public Administration in order to improve response times and increase the participation of communities in the development and management of public services –including electronic online services, at regional and local levels (Cohen & Nijkamp,

2004). In Spain, most if not all municipalities (called "municipios") are engaged in the development and delivery of efficient services to the public. According to a report released by the Press Office of the Spanish Ministry for Public Administrations in September 2011 (Gabinete de Prensa del MAP, 2011), Spain found itself among the ten most advanced countries in this area and ranked fifth in Europe in terms of both availability and sophistication of online public services (SIPA, 2011).

2.2. ICT and citizen engagement with public services

Researchers agree that ICT has considerable potential to contribute to learning efficiency, gains and cost reductions for local governments (e.g., Badri & Alshare, 2008; Carter & Bélanger, 2005; Criado & Ramilo, 2003; Lean, Zailani, Ramayah, & Fernando, 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 ICT as a driver for public administration to become more open and transparent, to enable democratic participation and networked activism (Land, 2009), to become more service-oriented by providing personalised and inclusive services to each citizen (e.g., Åström et al., 2012; Hong & Nadler, 2012), to become more productive and to deliver maximum value for taxpayers' money as well as for any ICT investment (Park & Perry, 2008). It should be noted here that the absence of extensive participation by citizens on government websites also raises questions about what citizens want, as well as what government should do (Mossberger, Wu, & Crawford, 2013).

The term user engagement can be defined as a phenomenon through which individuals formulate meanings and actions that reflect their desired degree of participation in individual and societal decision-making processes (Gatautis, Stravinskiene, & Gudauskas, 2011). A particular type of user engagement is citizen engagement. It may be defined as individual and collective courses of action that are designed to identify and address matters of public concern (Hays, 2007). From this perspective, 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. Another way of describing this concept is the sense of personal responsibility individuals should feel to uphold their obligations as part of any community (Bennett, 2008). This means that citizen engagement can take many forms, from organisational involvement to electoral participation, individual volunteerism or engagement with new activities of the government. Gaventa and Barrett (2010) classify the outcomes of citizen engagement in four broad areas: 1) the construction of citizenship; 2) the strengthening of practices of participation; 3) the strengthening of responsive and accountable states; and 4), the development of inclusive and cohesive societies.

The above definitions suggest that there are different definitions of citizen engagement but common elements include knowledge of and discussion of public affairs (Jennings & Zeitner, 2003; Mossberger et al., 2013). In the context of this paper the term citizen engagement refers to the use of modern ICTs to empower the socio-technological and cultural capabilities of citizens giving the possibility to individuals to deal with local affairs concerning issues such as e-government services or technology tools offered by the City Hall (Lim, 2007). Nowadays, Spanish city council websites encompass any type of mutual communication or interaction between citizens, business and public organisations and because of this, the city council website is perceived as the use of ICT for controlling electronically public administration processes from both internal and external perspectives (Claver-Cortés, Juana-Espinosa, & Tarí, 2008; Criado & Ramilo, 2003). With this in mind, citizen engagement can be supported by the use of city council websites in local government affairs, for example, weblogs provide 'guides', 'resources' and 'reviews' for particular citizens to contribute their own ideas, suggestions, and requests.

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