The Value of Extended Framework of TAM in the Electronic Government Services

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Abstract: Spanish City Halls are making a great effort to develop citizen-targeted online services in an attempt to enhance their effectiveness and reduce expenses. Hence, citizens' engagement is essential for the adoption of e-Government services. In this research, 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 adviser tool within a Spanish City Hall. To achieve this goal, a structuring equation model is developed and tested to confirm the explanatory power of attitude towards a technology on citizen engagement. The results obtained suggest that the core constructs of TAM (perceived usefulness, ease of use and attitude) significantly affect users' citizen engagement. This study also reveals a general support for attitude towards a technology as a determinant of citizen engagement in e-Government services. The implications of the findings are discussed and useful insights are provided on what policy to follow to establish the appropriate conditions to build citizens' engagement intent.

Keywords: citizen engagement, attitude towards a technology, technology acceptance model, end users

1. Introduction

In general terms, local government institutions can be considered repositories of knowledge in the form of laws, regulations or specific cases. These institutions provide and deliver public services that are of key importance to citizens and business. 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 electronic online services at regional and local levels (Cohen & Nijkamp, 2004). According to a report recently released by the Press Office of the Spanish Ministry for Public Administrations (MAP in Spanish, 2011), in September 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 on-line public services (SIPA, 2011). The progress of 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).

In Spain, most if not all 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 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 *et al*., 2009).

Despite the fact that the majority of municipal governments have their own ICT and websites to provide public information to citizens (Moon & Norris, 2005), there has been no emphasis on offering online financial and service transactions nor on providing opportunities for electronic and interactive political and policy participation (Criado & Ramilo, 2003; Norris & Moon, 2005). As Criado and Ramilo noted in a previous study of Spanish local government websites (2003), a low level of two-way interaction between local governments and citizens could be characteristic. To address this, the Law on Citizens' Electronic Access to Public Services

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published in June 2007[1] in Spain sought to strengthen the commitment towards e-Government implementation and use by autonomous communities and local authorities through the improvement of coordination mechanisms between various levels of government in providing e-Government services (eServices) to citizens.

The initial stages of the implementation of ICT-based services in the local government environment can be difficult, but considering that most technical obstacles are gradually being overcome, the question that arises is whether people are willing to use these new technological advancements (Suki & Ramayah, 2011). Acceptance of information technology by users is deemed a necessary condition for its success (Davis, 1989). Regarding this, while customer engagement has been widely studied in the information technology area, research has largely concentrated on customer responses to online retailers (e.g. Reichheld & Schefter, 2000), few, if any, studies have considered the ways in which the use of municipal-portals can be accepted through a municipal's ICT infrastructure (operationalised in this paper as citizen engagement).

There is a considerable volume of work related to technology acceptance. What we employ in this paper is an application of the Technology Acceptance Model (TAM) (Davis 1989). 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 technologies may be accepted by citizens. Hence, the primary aim of this research is to use the core concepts of TAM to test the citizen's engagement towards e-Government services offered by City Halls. To achieve this goal, a modified TAM is developed and tested by using the Structural Equation Modelling (SEM) approach. These relationships are examined through an empirical investigation of 307 citizens who used the benefits adviser tool within a Spanish City Hall. The concept of citizen engagement is discussed in detail in the following section. Section 3 investigates the development of hypotheses as to how the TAM contributes to citizen's engagement in e-Government. Details of the survey which was used to collect appropriate data to test the models is presented in section 4, whilst the results of testing the models are presented in section 5, followed by a discussion in section 6.

2. Conceptual framework

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 Jaeger and Fleischmann (2013), e-Government is about developing a citizen-centred government environment which serves citizens (customers) at any time, regardless of their physical location.

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 (). These perspectives also provide us with an illustration that e-Government is a way for public administration to become more open and transparent, to enable democratic participation, to become more service-oriented, providing personalised and inclusive services to each citizen, to become more productive and to deliver maximum value for taxpayers' money as well as for any ICT investment. Researchers agree that e-Government has considerable potential to contribute to learning efficiency, gains and cost reductions for local government (e.g. Criado & Ramilo, 2003; Carter & Belanger, 2005; Badri & Alshare, 2008; Lean *et al*., 2009). The opportunity to access new knowledge, learn about government and conduct online transactions can reduce red tape and simplify regulatory processes, therefore helping citizens to engage more in issues that are important to local communities (e.g. public transport or street design issues).

Just recently, in countries like the USA a number of e-Government projects have been developed to help communities address their local problems with the use of websites (Bertot *et al*., 2011). In this way, a form of civic engagement is promoted which focuses on public concerns and which includes both political involvement in political institutions as well as community involvement in associational or voluntary activities or institutions (Putnam 2000; Jennings & Zeitner 2003; Bennett 2008). Despite these trends and premises, there are only a

[1] http://www.boe.es/boe/dias/2007/06/23/pdfs/A27150-27166.pdf

few cities around the world that continuously engage with citizens in policy dialogues or work with community organisations to strengthen citizen engagement and participation at the neighbourhood level (Ho, 2002). What seems to be dominating research in the use of e-Government websites is the study of the dynamics of networks of communication that emerge in political campaigns, most of which are dominated by incumbent groups (Hindman, 2009: Araya *et al.*, 2010).

Civic engagement in general may be defined as individual and collective courses of action that are designed to identify and address matters of public concern (Hays, 2007). 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). This means that civic engagement can take many forms, from organisational involvement to electoral participation, individual volunteerism or engagement with new activities of the government. This paper is particularly concerned with the latter. That is, it focuses on those aspects of civic engagement that are mediated through local government websites, rather than formal political institutions or voluntary activities. It should be noted here that in this paper the civic engagement that we refer to is "citizen engagement". More specifically, it is concerned with citizen engagement facilitated by local governments to deal with local affairs concerning pollution issues, school affairs and street design issues (Zukin *et al*. 2006; Lim, 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.

Nowadays, e-Government in Spain encompasses any type of mutual communication or interaction between citizens, business and public organisations and because of this, e-Government is perceived as the use of ICT for controlling electronically public administration's processes from both internal and external perspectives (Criado & Ramilo, 2003; Claver *et al*., 2008). Although initiatives like the *Avanza2*[2] and *Avanza Local* Plans give testimony of how local and regional governments in Spain have been continuous adopters of ICT in recent years (Torres *et al.*, 2005; De-Miguel-Molina, 2010; SIPA, 2011), the digital informative transparency of Spanish city councils is very poor (De-Miguel-Molina, 2010). As Gandía and Archidona (2008) noted, Spanish city councils often use their web sites to diffuse information of a general nature and with promotional or political purposes that do not contribute directly to relevant informative content. Neither do they allow users to take advantage of the relational and interactive capacity of the internet. A possible explanation for the low disclosure levels among Spanish city council web sites may relate to the website strategy and implementation adopted by Spanish city councils, and how such strategies have been associated with low (or non existent) citizen engagement (Gandía & Archidona, 2008).

3. Hypotheses

As noted above, there are different definitions of citizen engagement but common elements include knowledge of and discussion of public affairs (Rose & Grant, 2010; Jennings & Zeitner 2003; Mossberger *et al*., 2008). E-Government may provide new venues for information, enhancing citizen knowledge of government policies, processes, programs, and performance, as well as community issues (Norris 2001). This knowledge, in turn, may also encourage discussion or participation in community issues, including joining a group online and face-to-face interaction with neighbours (Norris, 2001). Information about community affairs available on local government websites might promote discussion and mobilization around these issues with neighbours, both online and offline (Norris, 2001), this points to the information capacity of e-Government as being a potential resource for acquiring knowledge for citizen engagement (Norris 2001; Jennings & Zeitner 2003; Mossberger *et al*., 2008).

However, the knowledge learned through a public service website is likely to be dependent on the gratifications individuals seek from media and their resultant media choices. Uses and gratification theory predicts that people use the Internet or other media in a variety of ways for a range of ends to satisfy different goals (Althaus & Tewksbury, 2000). Put it another way, the achievement of user satisfaction with public service websites requires attention to several earlier levels of user interaction. In this study, the Technology Acceptance Model (TAM) was used to analyze the processes of creating satisfaction with public service websites.

[2] http://www.planavanza.es/avanzalocal/Paginas/Index.aspx

The Technology Acceptance Model (TAM), first introduced by Davis (1989), is one of the most frequently employed models for research into new information technology acceptance. This model applies Fishbein and Ajzen's Theory of Reasoned Action (TRA) to explain the pattern of voluntary information system usage at an individual level (Kim & Chang, 2007). TAM has been the subject of a lot of research in the area of information systems over nearly two decades and has been supported by a number of studies. TAM suggests that when users are presented with a new technology, their decision about how and when they will use it is determined by assessing their beliefs, attitudes and intentions (Davis, 1989). There is a considerable volume of work relating to technology acceptance. What we employ in this paper is an application of the Technology Acceptance Model (TAM) (Davis, 1989).

Attitude toward using a technology (A) was defined by Davis (1989) as "the degree of evaluative affect that an individual associates with using a system in his or her job". Attitude is determined by a function of two beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). PU was defined as "the degree to which a person believes that using a particular system would enhance his or her job performance". PEOU is "the degree to which a person believes that using a particular system would be free from effort" (Davis 1989). PU and PEOU create belief among potential users and subsequently form their attitude. A user that believes the new technology will be useful and relatively easier to implement may be expected to have a more positive attitude towards that particular technology.

On the other hand, perceived ease of use has a direct effect on perceived usefulness. Between two systems that perform an identical set of functions, users find the one that is easier to use more useful. However, perceived usefulness has no impact on perceived ease of use. As Davis (1993) explained, perceived usefulness concerns the expected overall impact of system use on job performance, whereas ease of use pertains only to those performance impacts related to the process of using the systems per se. Moreover, TAM postulates that Behavioural Intention (BI) is viewed as being jointly determined by the person's attitude towards using system (AT) and PU (Davis *et al*., 2009). Finally, actual system use is determined by BI.

The technology acceptance model specifies the causal relationships between perceived ease of use (PEOU), perceived usefulness (PU) and attitude toward using (A). Overall, the TAM provides an informative representation of the mechanisms by which design choices influence user acceptance, and should therefore be helpful in applied contexts for forecasting and evaluating user acceptance of ICT. Therefore, based on Davis (1989), traditional TAM hypotheses were tested as part of their work, and we propose:

H1: Perceived ease of use is positively associated with perceived usefulness

H2: Perceived usefulness is positively associated with attitude

H3: Perceived ease of use is positively associated with attitude

Although, the research model built was based on TAM, several modifications were made to improve use of e-Government services such as satisfaction and citizen engagement.

The above considerations also lead us to argue that satisfaction achieved through local government websites, could be expected to facilitate citizen engagement as well. If citizen engagement includes knowledge, interest, discussion, and participation, then satisfaction with public service websites is one of the resources supporting these different aspects of engagement (Norris, 2001). Regarding this, some prior research shows that online news is a better predictor of citizen engagement than use of traditional media (Mossberger *et al*., 2008), and e-Government also has many features that lower the costs of information acquisition. Thus, satisfaction with public service websites has a positive influence on citizen engagement, likelihood of recommending, word of mouth and reuse/loyalty intentions (Van Riel *et al*., 2001; Taylor & Hunter, 2002; Yoon, 2002). User satisfaction associated with ICT usage can influence subsequent use of information (Yen & Gwinner, 2003; Yang & Peterson, 2004). Regarding this, user satisfaction involves making the citizen aware of the e-Government services and generating some positive feelings through the local government website. If online services meet citizen's expectation, satisfaction occurs. In addition, satisfaction can result in successive use of the online services, which in turn facilitates citizen engagement. Here satisfaction is created first leading to citizen engagement. Therefore, we propose:

H5: Attitude towards a technology is positively associated to citizen's engagement in e-Government

4. Method

4.3 Data collection

Using the records of the Cartagena City Council, we considered 1995 users, who were contacted and asked by the City Council to participate in the study. Of these users, only 307 agreed. Then, during April and May, 2012, we conducted 307 telephone interviews with users using a simple structured questionnaire. Therefore, the data analysis was based on 307 valid responses (a response rate of 15.38%) with a factor of error of 5.15% for p=q=50% and a reliability level of 95% per cent. The large majority of respondents were male (73%) and had studied at university (37%). Additionally, two statistical analyses were conducted to ensure the absence of non-response bias (Armstrong and Overton, 1977). Firstly, the responding and non-responding users in terms of level of education (1 = secondary school; 2 = Bachelor's Degree; and 3 = Master's Degree) were compared and the independent sample *t*-test revealed no significant difference between the two groups (p= .93). Secondly, the respondents were divided into two groups based on telephone interview dates (i.e., 1 = April; and 2 = May). Comparison of the two groups in terms of e-government use again revealed no significant differences based on the independent sample t-test (p = *.71*). Therefore, non-response bias was not considered to be a problem in this study.

Before undertaking the survey, a series of telephone interviews with five users of a pilot sample was undertaken to learn about their understanding about the benefit adviser tools. As shown in Figure 1, these users stated that the benefit adviser tool basically allows them to apply for a census certificate and pays local taxes such as the motor vehicle tax and the property tax. They also stated that the benefit adviser tool helped them to see how payment is being processed, and is also useful for generating more variations of existing scenarios by providing scenario generation hints for each comparison feature. A questionnaire was developed to be the instrument for data collection. All items were measured using a seven-point Likert-type scale with anchors from "Strongly disagree" to "Strongly agree". We combined scales from several other relevant empirical studies with new items to make an initial list of 15 items (3 measuring the range of PEOU; 3 measuring the existence of PU, 3 measuring attitude, 3 measuring satisfaction and 3 relating to citizen engagement). Several items were modified through interviews with colleagues. Table 1 provides an overview of the final 15 questions used in the questionnaire. From an examination of the results shown in Table 1, we can state that all of the constructs are reliable.

Figure 1: The benefit adviser tools

4.4 Measures

Churchill's (1979) approach to questionnaire development was used, combining scales from several other relevant empirical studies with new items to make an initial list of 12 items (3 measuring the range of PEOU; 3 measuring the existence of PU, 3 measuring attitude, and 3 relating to citizen engagement). Several items were modified through interviews with colleagues. The questionnaire constructs were operationalised and measured as follow (see Table 1 for a list of items).

Table 1: Summary of scale items

Construct	Measure
Perceived usefulness	
PU1	The city council's website enhances effectiveness in doing things.
PU2	The city council's website makes it easier to do things.
PU3	The city council's website enables me to accomplish thongs more quickly.
Attitude	
ATT1	In my opinion, it is desirable to use the city council's website.
ATT2	I think it is good for me to use the city council's website.
ATT3	Overall, my attitude toward the city council's website is favourable.
Citizen engagement	
CE1	I am attending a course (virtual or presential) about the correct use of e-government services offered by the City Hall.
CE2	I would be willing to participate in training tutorials about technology tools offered by the City Hall.
CE3	I would be willing to participate in public meetings in which we can discuss on critical technology issues
Perceived ease of use	
PEOU1	Interacting with the city council's website does not require a lot of mental effort.
	I find the city council's website to be easy to use.
PEOU2	I find it easy to get the services to do what I want to do.
PEOU3	

As noted above, the information about PEOU, PU and attitude was collected through a simple structured questionnaire. Studies on perceived usefulness, perceived ease of use, and attitude toward the adoption have been well researched, especially in the context of TAM applications. Measures for these constructs have also been developed, validated, and adopted in many technology adoption studies (Chau and Lai, 2003). In this paper, the items used to measure perceived usefulness, perceived ease of use and attitude were adapted from prior work by Davis (1989). Items were measured using a 7-point Likert scale.

There are many ways in which government agencies can increase citizens' involvement. One is through their web sites, by providing online tutorials that offer concise tips and illustrations of how to search and transact with that site (Carter and Bélanger, 2005). Another way to empower citizens to have a voice is through public meetings in which there is a discussion of technology affairs (Powell and Colin, 2008). In this paper, the survey instrument measures citizens' involvement through a range of questions related to how often citizens attend training tutorials on technology tools or e-government services offered by the City Hall.

4.5 Results

In order to obtain a robust evaluation of the quality of the sixteen items (see Table 2), a confirmatory factor analysis (CFA) was achieved using the covariance matrix as input via the EQS 6.1 robust maximum likelihood method (Bentler, 1988). This can be justified since maximum likelihood (ML) and generalised least squares (GLS) estimators are based on use of normal data, and if the data are not normal, the χ 2 goodness-of-fit test using these estimators can reject too many true models and produce biased parameter estimates (West et al., 1995). Therefore, the robust maximum likelihood (RML) method was used to estimate parameters for this model and fit indices that are less sensitive to non-normal data (Satorra-Bentler χ2, CFI and IFI) were used to interpret the model fit (Olsson et al., 2000). An examination of the results shown in Table 2 suggests that all of the constructs are reliable. For all the measures, Bagozzi and Yi's (1988) composite reliability index and Fornell and Larcker's (1981) average variance extracted index are higher than the evaluation criteria of 0.7 for composite reliability and 0.5 for the average variance extracted.

Table 2: Construct summary: Confirmatory factor analysis and scale reliability

Constructs	Items	Standardized loading	T-value	Reliability (SCR[a]., AVE[b])
PU (Perceived usefulness)	PU1	.91	9.28	SCR= .76
	PU2	.89	10.04	AVE=.51
	PU3	.97	3.45	
ATT (Attitude)	ATT1	.91	7.13	SCR=.80
	ATT2	.94	5.21	AVE=.57
	ATT3	.79	10.99	
Citizen engagement	CE1	.82	6.90	SCR= .85
	CE2	.72	9.49	AVE=.66
	CE3	.72	9.51	
PEOU (Perceived ease of use)	PEOU1	.67	10.50	SCR=.85
	PEOU2	.83	6.74	AVE=.65
	PEOU3	.80	7.80	

Notes:

The fit statistics for the measurement model were:

Satorra-Bentler $\chi^2_{(48)}$=111.27; χ^2/d.f= 2.31; CFI=.94; IFI=.94; RMSEA= .06

[a] SCR= Scale Composite Reliability (SCR) of $p_c = (\Sigma\lambda_i)^2 \text{ var } (\xi) / [(\Sigma\lambda_i)^2 \text{ var } (\xi) + \Sigma \theta_{ii}]$

[b] Average variance extracted (AVE) of $p_c = (\sum\lambda i2 \text{ var } (\xi))/[\sum\lambda i2 \text{ var } (\xi) + \sum\theta ii]$

The asymptotic covariance matrices were generated to obtain the scaled chi-square (Satorra and Bentler, 1988) and robust estimation of standard errors.

Discriminant validity was determined by comparing the square root of the AVE (i.e., the diagonals in Table 3) with the correlations among constructs (i.e. the lower triangle of the matrix in Table 2). On average, each construct related more strongly to its own measures than to others (Fornell & Larcker, 1981).

Table 3: Construct correlation matrix

				Correlation matrix			
	Mean	S.D	CA	1	2	3	4
1. Perceived usefulness (range 1–7)	3.74	1.79	.94	.71			
2. Attitude (range 1–7)	5.29	1.42	.91	.56***	.75		
3. Citizen engagement (range 1–7)	5.25	1.09	.80	.41***	.51***	. .81	
4. Perceived ease of use (range 1–7)	4.78	1.05	.80	.47***	.50***	.47***	.80

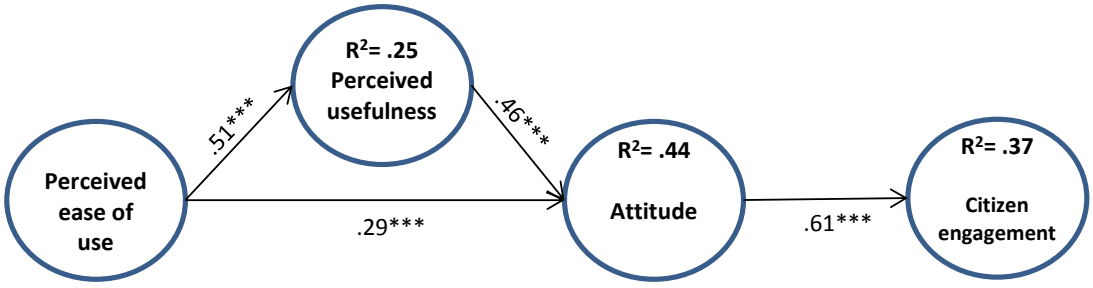
Notes:

*** <.01; n.a. = not applicable

Mean = the average score for all of the items included in this measure; S.D. = Standard Deviation; CA = Cronbach's Alpha;

Intercorrelations are presented in the lower and shady triangle of the matrix. The bold numbers on the diagonal are the square root of the Average Variance Extracted.

Once the psychometric properties of the measures had been checked, the next step was the evaluation of the hypothesised relationships developed from consideration of relevant literature (see Figure 1), discussed in the text as H1–H4. The fit of the model is satisfactory (Theoretical Model (TM): χ^2/d.f= 2.48; CFI=.99; IFI=.99; PNPI= .74; and RMSEA=.07), thereby suggesting that the nomological network of relationships fits our data – another indicator of support for the validity of these scales (Churchill, 1979; Hair et al., 1998). Figure 2 shows that the perceived ease of use had a positive influence on the existence of perceived usefulness at a level of ($p<0.01$) and on the existence of attitude at a level ($p<0.01$). Figure 2 also shows that the perceived usefulness at a level of ($p<0.01$) had a significant effect on the existence of attitude. It is also shown that the existence of attitude at a level of ($p<0.01$) had a significant effect on citizen engagement. . It is interesting to note that the theoretical model explains 37 per cent of the variance in citizen engagement Together, these results provided full support for H1: (*perceived ease of use → perceived usefulness*), H2: (*perceived usefulness → attitude*), H3: (*perceived ease of → attitude*), and also for H4: (*attitude → citizen engagement*).



Theoretical Model (TM): χ^2/d.f= 2.48; CFI=.99; IFI=.99; PNPI= .74; and RMSEA=.07

Figure 2: Structural model

5. Discussion

Relevant e-Government literature has emphasised the fact that citizens who use e-Government will benefit from the services and consequently be encouraged to adopt e-Government as a regular method of accessing and interacting with public services. Therefore, the first contribution of this research is to question the existing models which relate to technology and citizen engagement in online e-Government services. This paper supports or goes in the same direction of previous studies in identifying the value of TAM in the implementation of e-Government services (e.g. Davis, 1989; Kim & Chang, 2007; Suki & Ramayah, 2011). The data indicates that TAM (perceived usefulness, ease of use and attitude) significantly affect user behavioural intention, in our study operationalised as citizen engagement, which implies that the main aspects of TAM apply to this context as well. In addition, perceived usefulness was found to be the most significant effect on attitude, which suggests that a citizen's belief in usefulness is a decisive antecedent of affective variables (i.e. attitude and satisfaction), and consequently, of citizen engagement. This is consistent with previous research which found that perceived usefulness plays a more significant and stronger role than perceived ease of use on the affective variables (Roca *et al*., 2006).

The second contribution is to extend the basic TAM towards the postcedents by adding the variable of citizen engagement. While many researchers have extended the basic TAM by introducing additional variables as antecedents, surprisingly there are few studies that deal with the post-acceptance process beyond the TAM framework (Kim & Chang, 2007). Results indicate that a positive attitude towards e-Government services leads to users' engagement. Hence, it is very important to work to get the highest positive attitude in users by enhancing easiness of use and, mainly, perceives usefulness.

As noted above, the results support the position that through a positive attitude, City Halls will enlarge citizen engagement. Thus, City Halls must continuously work at obtain satisfied users to encourage their continuing using the local government websites. This insight corroborates the notions of Suki and Ramayah (2011), that the acceptance of e-Government services can be explained in terms of attitude towards e-Government services. What this means for e-Government is that when vaguely formed beliefs and attitudes concerning the system to be implemented have already been developed, these vaguely formed attitudes should be taken into account if a local government wishes to give a new system fair consideration (Hartwick & Barki, 1994). These findings support the view of Carter and Belanger (2005), that perceived usefulness has positive and significant effects on citizens' continual usage intentions towards e-Government services. If the utility of e-Government

websites is understood, then mechanisms can be developed for allowing electronic transactions to occur in a controlled and constructive way.

The third contribution of this research is to test the TAM in a citizen context. Previous research on the TAM has mainly been conducted in workplace settings and, in particular, within regional and national contexts (Criado & Ramilo, 2003; Carter & Belanger, 2005; Badri & Alshare, 2008; Lean *et al*., 2009). In this type of environment, people's attitudes, intentions, and behaviours, as well as their interrelationships are likely to be shaped by formal authority and directives (Lanseng & Andreassen 2007). This research has empirically supported the core concepts of TAM in a citizen context, where respondents are free to form their own beliefs, attitudes, and intentions, as the theoretical foundation of the TAM assumes. Thus, the results contribute to the general validity of the model. We think that this is an important finding, as potential for any City Hall to implement e-Government services will depend substantially on its ability to support these dimensions, thus, public administrators may be over-investing in the implementation of e-Government services, and under-investing in (or underestimating) mechanisms and aspects to coordinate them. Put another way, since the population has different levels of technology readiness, reliable, user-friendly services, with good user interface consistency, should be designed. In addition, services should be pre-tested thoroughly and sufficiently across a wide range of users to see if they actually have been designed to be easy to use by the average user. By failing to do so, implementation may prove unsuccessful and more resources may be spent than saved (Lanseng & Andreassen, 2007).

This study has some limitations. Firstly, although the constructs have been defined as precisely as possible by reference to the literature and validated by practitioners, they can realistically only be regarded as proxies for an underlying phenomena that in themselves not fully measurable. Secondly, only a single research methodology was employed and further research through interviews and observational case studies could be undertaken for triangulation. Thirdly, any extrapolation of the conclusions might not be generalisable beyond the sample frame, which could be addressed by cross-sector and cross-cultural studies. Finally, we assumed that use of e-Government was similar for different actors and participants, and that therefore their assessment could be done in the same way as evaluating electronic online services. In other words we do not include the possibility of actors and participants being able to consider alternative uses of services available to them. Therefore, this assumption should be reviewed and explored further and might involve actors and participants whose concerns and interests might differ from ours.

Taking into account this limitation, it would also be interesting to extend the survey to different actors and participants, since they might have a different level of knowledge concerning computers and technology tools, and finally, despite most City Halls in Spain having internet access, there is a lack of awareness of the existence and/or value of e-Government services to citizens' engagement, and this provides an opportunity for further research. In order to ensure that future research is more accurate and reliable, studies should be based on more than the four variables used here as citizen engagement is affected by many factors. We think that this is an important finding, as currently and due to the global economic crisis many overloaded public administrators are cutting back on technology adoption programs by simply publishing information without implementing other forms of citizen engagement. If this is the case it is possible that public administrators are under-investing in (or underestimate) approaches to improve "perceived ease of use, perceived usefulness and attitude".

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