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CHALLENGES IN THE IMPLEMENTATION OF PUBLIC ELECTRONIC SERVICES: LESSONS FROM A REGIONAL-BASED STUDY

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Abstract. Building the information and knowledge society has involved the development of numerous projects and initiatives all over the world. Portugal is no exception. This work is based on the analysis of the *ALO Digital Project*, which involves a series of strategies developed at the local e-government level in four Portuguese counties near Lisbon (i.e. Amadora, Loures, Odivelas and Vila Franca de Xira). Having the residents of the four counties involved as the target, this paper aims to identify the level of electronic service use resulting from the implementation of the *ALO Digital Project*. A questionnaire was administered and the results of a regression analysis demonstrate that the project is still at low level of online service sophistication. Additionally, despite users' overall satisfaction, implementation difficulties were noticed. In practical terms, this reveals a type of service more related to information consultation, downloading and printing documentation, and supports the premise that a change of focus and direction of local e-government is needed to substantially improve the life of the individual citizen.

Keywords: *ALO Digital Project*, public services, strategies and initiatives, digital cities and regions, technology management, innovation and challenges.

JEL Classification: M20, O32, O33, O38.

Introduction

Concern over the state of e-government has increased over the last decade. In Portugal, the emergence of new initiatives devoted to the development of the information and knowledge society has occupied a central place in government policies, and the network society has been built through the adoption of strategies and government policies that are being disseminated all over the country (cf. Castells, Cardoso 2005; Ferreira *et al.* 2012). One of these strategies developed under the local e-government policies has focused on an integrated view of four counties near Lisbon (i.e. Amadora, Loures, Odivelas and Vila Franca de Xira), and refers to the *ALO Digital Project*, inserted in POSC (i.e. the Portuguese acronym for Operational Program for the Knowledge Society of Digital Cities and Regions), which aims to foster inter-municipal cooperation in order to boost and develop the quality of services available to local citizens and economic agents (Feliz 2007).

Numerous examples of e-government initiatives (e.g. Phippen 2007; Nour *et al.* 2008; Hsu *et al.* 2010; Nurdin *et al.* 2011), as well as key success factors, advantages and main challenges to their implementation can be found in the literature (e.g. Móran 2007; Lee 2010; Ferreira *et al.* 2012; Joseph 2013; Cordella, Tempini 2015). Nonetheless, it is acknowledged that the studies based on the drivers, barriers and perceptions of citizens regarding the use of e-government services are relatively scarce. In this sense, several studies have been conducted to analyze the extent to which: (a) local governments are showing an increasing interest in monitoring the Information society, based on information and knowledge sharing (drawing on the use of digital format) (e.g. Nour *et al.* 2008); (b) the information and knowledge society is working as a promotion instrument for regional development (e.g. POSI 2003; Hsu *et al.* 2010); and (c) the importance given to the interaction between citizens and local government is adequately discussed (e.g. Skelcher 1992; Sánchez-Pérez *et al.* 2007; European Commission 2007; Mas-Verdu *et al.* 2010). Following this, the main goals of this study are: (1) to understand the current state of maturity of local e-government in the participating counties; (2) to analyze the types of electronic services used by citizens under the *ALO Digital Project*; (3) to determine citizens' level of agreement with the use of local government services; and (4) to identify the challenges, strategies and main factors that influence agreement level in the use of these services.

Methodologically, in order to meet these aims, a questionnaire was administered to 282 respondents and multiple-linear regression was used on the determinants of agreement level with e-government services.

The remainder of this paper is structured as follows: the next section presents the theoretical framework on the information society, e-government and the *Digital Cities and Regions Project*. Next, the *ALO Digital Project* background and the empirical results of our study are presented and discussed. The last section concludes the paper.

1. Information society in Portugal

Information society (IS) is presented as a society that predominantly uses information and communication technology (ICT) for the exchange of information in digital format and that supports the interaction between individuals, using methods and practices in permanent construction (L. Gouveia, J. Gouveia 2002; Ferreira *et al.* 2012). This means that IS requires the use of ICT and digital formats, and so contributes to the network organization. E-government is presented as a component of IS, acting on three major areas of intervention: (1) e-administration, coupled with the improved functioning of the processes of political power and public administration; (2) e-citizens and e-services, based on the relationship between citizens and business activities; and (3) e-society, which is an extended concept, involving public participation and citizenship (for details, see also Misuraca 2009; Hsu *et al.* 2010; Nurdin *et al.* 2011). However, this approach implies, firstly, that there are infrastructures available and, secondly, that people can access them. Moreover, the use of ICT involves a reorganization process as well as adequate training for users.

1.1. The role of information and communication technologies

Following Amaral (2007) and Ferreira *et al.* (2012), ICTs have been assuming a key role in the activities, tasks and competences of government, challenging the traditional channels and guiding the entire structure into the e-commerce or e-government logic. In fact, the *"development of the Internet is an integrating component of the new economics"* (Kažemikaitienė, Bilevičienė 2008: 186) and the need to reduce the cost of transmitting information eventually leads to a *"mass use of PCs* [Personal Computers]*, exponential growth in broadband Internet use, widespread use of mobile telecommunications, convergence between media and content development"* (Amaral 2007: 89). In territorial terms, e-government allows what is called "e-participation", which implies increased information availability, improved ability to query and access that information, ease of interaction in terms of Government-to-Consumer (G2C) and Consumer-to-Government (C2G) and, obviously, public involvement through the use of ICT (Hsu *et al.* 2010; Nurdin *et al.* 2011; Krishnan *et al.* 2013). In this sense, it should be noted that the challenges and opportunities of e-government rely on its ability to electronically mediate and bring together the administrative, social and economic dimensions in order to promote participation and citizenship, usage and sharing. From this premise, the concepts of interoperability and network become important (Posch 2007; Ferreira *et al.* 2012; Wangwe *et al.* 2012), particularly in terms of individual contact with groups. These concepts are expected to surpass power conflicts, include a common language, and be able to facilitate the exchange of information and protocols.

1.2. Levels of maturity in e-government development

The definition of e-government has not been constant across authors and, in addition to being one of the first concepts introduced in the information society, it continues to evolve (Molnár 2008; Misuraca 2009). However, the European Commission (2007) defines it as the combination of ICT, organizational changes and new skills of the

public administration (PA). As such, e-government tries to be based on openness and transparency and should not exclude anyone (Virant 2007; Hsu *et al.* 2010; Molina 2010).

According to Mulgan (2006), Wauters *et al.* (2007), Molnár (2008) and Ferreira *et al.* (2012), among others, there are five levels of maturity in e-government services: (1) *information*, i.e. the reception of general information about processes and documents required; (2) *one-way interaction*, referring to the ability to download and fill out electronic documents; (3) *two-way interaction*, in which information can be inserted without the need to apply with a form in person (but the delivery of public administrative documents (e.g. certificates), receipt of decisions or others are made in traditional ways); (4) *transaction*, involving and ensuring the complete online transaction; and (5) *personalization*, based on proactive citizen-based service where citizens no longer have to submit personal information each time they access services.

Following Wauters *et al.* (2007), OECD (2008) and Capgemini *et al.* (2010), Portugal has been having a remarkable growth in terms of e-government and use of information technologies, which, in turn, have allowed for the achievement of significant improvements in terms of efficiency (Fig. 1).

Figure 1 shows Portugal as one of the top performers (100%) in terms of online sophistication, along with Ireland, Malta and Austria, followed by Sweden, Germany and Italy (with 99%), and with Cyprus and Greece (with 70%) at the bottom of the table. In terms of the availability of public services, the average is 82%. Once again, Portugal leads this field along with Italy, Malta, Austria and Sweden (100%). In particular, Portugal is presented as a success case in services such as electronic voting, citizen's portals, university campuses and e-demand (Fig. 2).

It should be highlighted that the aim of e-government at the local level is to achieve an efficient, inclusive and transparent PA. According to Aykut (2007), Molnár (2008) and Ferreira *et al.* (2012), the changes that have been ongoing to how PA communicates with citizens stem, in large part, from increased citizen supporters of ICT that create new ways of working online. In this context, the transformation of the PA services to electronic services, available anytime and anywhere, requires cooperation/coordination among all participants involved in the context of e-citizenship.

1.3. Digital cities and regions

The *Digital Cities and Regions Project* is based on different initiatives that aim to *"provide each region with a digital infrastructure to enable citizens to access and use technologies in order to meet their daily needs in a digital format"* (Serrano 2007: 18). Following Gávea (in Serrano 2007), the counties included in this project had a very significant increase in maturity compared to those that were not included. Future challenges include improving the quality of local e-government with regard to the information available on the geo-referenced territory, the use of information in real time and the intervention of localized actions (i.e. pilot projects) implemented according to the absorption capacity of the territory.

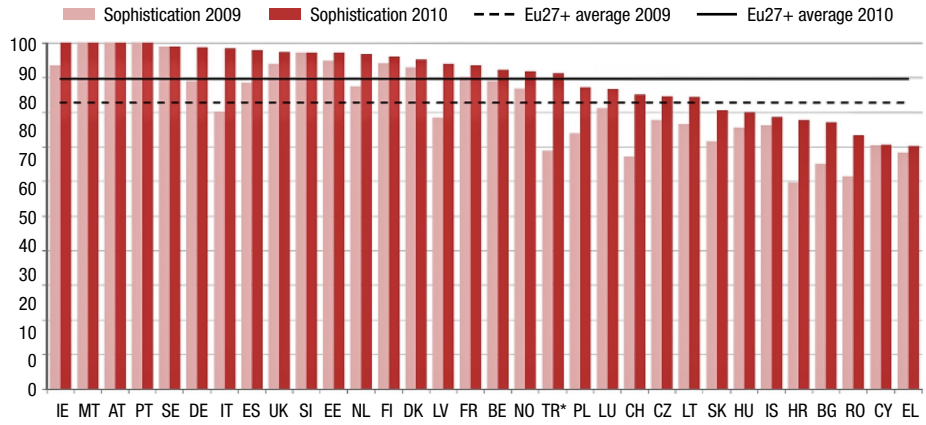

Fig. 1. Portugal's position in the rankings of online sophistication (in %)
Note: Survey not implemented in 2009. The score of 2007 is used in the graph.
Source: Capgemini *et al.* (2010: 7).

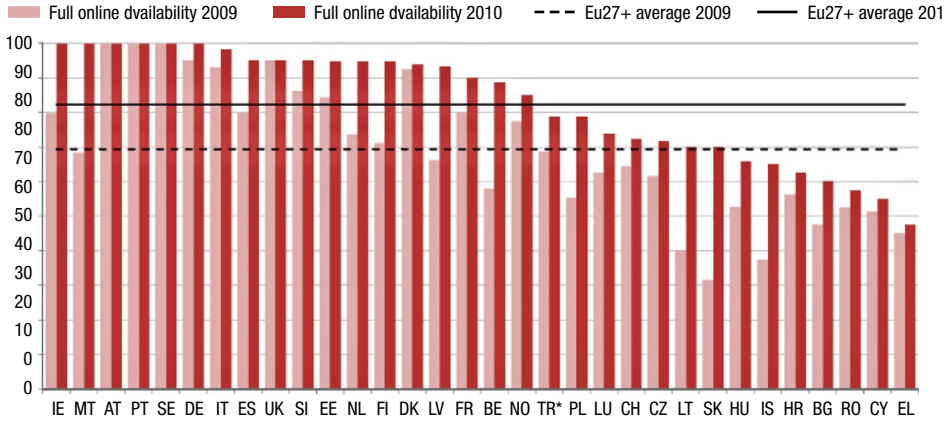

Fig. 2. Portugal's position in the rankings of online public services (in %)
Note: Survey not implemented in 2009. The score of 2007 is used in the graph.
Source: Capgemini *et al.* (2010: 8).

1.4. Previous studies

Several studies have been conducted on local e-government initiatives in recent years. Table 1 summarizes some of those studies, showing that most of them are mainly associated with the Government-to-Government (G2G) dimension, while comparatively little research has been devoted to G2C, such as the advantages and/or barriers to technological adoption by citizens and public administration (for further discussion, see Hsu *et al.* 2010; Nurdin *et al.* 2011). Table 1 also shows that quantitative and/or qualitative studies based on the drivers, barriers and perceptions of citizens regarding the use of e-government are relatively scarce.

Table 1. Resume of e-government studies

E-government studies		
Author(s)	Topic (perspective)	Results/resume
Birch (2003)	Assessment of adopting local e-government strategies	One of the most important resources to achieve the challenges and, thus, the objectives of e-government initiatives will be the skills and competencies of the members and staff involved.
Macintosh (2004)	Characterization of e-participation	The use of technology enables to engage and empower civil society.
Streib & Navarro (2006)	Demand for e-government services	Demand for e-government services (G2C). The desire to find what citizens want and seek allows for better results.
Phippen (2007)	Initiatives of relationship with local e-government	The relationship is central to the future success of e-government.
Bertot *et al.* (2008)	Benefits and costs of e-government services	The citizen-oriented e-government requires a lot of planning and design processes to be successful.
Wessels (2008)	Strategies for promoting e-inclusion	Development of networks in the public sphere and the use of ICT in the private sphere enhance the use of e-government.
Freed (2009)	Perception of American citizens in terms of federal government	E-government, capable of meeting citizens, presents itself as more efficient and effective in operational terms.
Misuraca (2009)	Emerging scenarios of m-government	The paper addresses the importance of looking at the various emerging scenarios of m-government.
Rorissa *et al.* (2011)	Benchmarking practices	Comparison of frameworks for computing e-government.
Ferreira *et al.* (2012)	Development prospects using the Delphi technique	Increased use of ICTs in terms of e-government services (based on perceptions of administrative agents).

Based on the information presented in Table 1, the next subsection presents the definition of our research hypotheses.

1.5. Research definition and hypotheses

Considering that the *ALO Digital Project* is relatively new, the level of service use, as well as the citizens' level of agreement with its use, is not known. To this end, a questionnaire was administered to a representative sample of citizens residing in the four counties previously identified. In particular, we aimed to obtain answers to the following questions:

1. What is the level of citizen use of government services?
2. What are the electronic services most used by citizens?

3. What is the level of citizen agreement with the use of local government services and which factors can influence it?

Thus, the following hypotheses were formulated:

H_0: The level of citizen agreement with e-government services is not influenced by the use and knowledge of those services.

H_1: The level of citizen agreement with e-government services is influenced by the use and knowledge of those services.

2. The *ALO Digital Project*

2.1. Initial background

The *ALO Digital Project* involves four counties near Lisbon (i.e. Amadora, Loures, Odivelas and Vila Franca de Xira). As outlined before, this project was developed under the POSC directive, and rests on two fundamental divisions: (1) the construction of joint projects; and (2) private construction projects. At the strategic level, these divisions were developed for eight major carriers, centered in the e-relationship of the city officials, citizens, businesses, parish councils, marketing services (i.e. in managing and publishing content), and in the sharing of knowledge and technological infrastructures common to the counties (Feliz 2007). We know of no prior work analyzing the implementation results of this local government technology initiative.

2.2. Methodology and sample size

In order to analyze the level of use and compliance with the initiatives of the *ALO Digital Project*, a questionnaire was designed consisting of four main sections: (1) use of municipal services; (2) available information about the county; (3) use of local government electronic services; and (4) characterization of the respondent. The questionnaire was developed from ideas applied in previous studies (e.g. Proença 2005; Phippen 2007). Furthermore, before implementation, the questionnaire was tested with 10 randomly chosen people, and their contribution was important for defining the final structure of the questionnaire. Additionally, it should be noted that closed questions using Likert scales were used.

Due to time and budget, 800 questionnaires were sent by e-mail (of these sent, 368 were filled and delivered back, but only 103 were considered valid for analysis), 250 questionnaires were printed and distributed (of which 179 were considered valid for analysis); and the sample was ultimately focused on a total of 282 respondents. Several questionnaires were considered invalid and, consequently, removed from the analysis based on the following reasons: (1) respondents did not belong to one of the counties under analysis; or (2) respondents did not provide essential information for data analysis (e.g. residence data). Thus, it was possible to extract a total of 282 respondents, aged from 16 to 90 years, living in the Portuguese counties of Amadora, Loures, Odivelas and Vila Franca de Xira.The data were treated using Statistical Package for the Social Sciences (SPSS). Both descriptive univariate and bivariate analyses were performed, as well as multivariate analysis.

2.3. Results

Empirical evidence has shown that related studies on local e-government have been focused on the assessment of maturity and sophistication of online services, and little has been done to evaluate the use, knowledge and/or impact of the services available to citizens. Thus, the questionnaire tried to explore these three concerns. Table 2 presents a summary of data regarding the respondents.

Table 2. Characterization of respondents residents within the *ALO Digital Project*

Sample			
		N	% (≈)
Gender	Female	159	56.4
	Male	123	43.6
	Total	282	100.0
Age	16–24	74	26.2
	25–32	83	29.4
	33–40	77	27.3
	41–50	22	7.8
	51–65	24	8.5
	65–90	2	.7
	Total	282	100.0
Residence	Vila Franca de Xira	79	28.0
	Loures	66	23.4
	Amadora	72	25.5
	Odivelas	65	23.0
	Total	282	100.0
Qualification	Incomplete Primary Education	2	.7
	Complete Primary Education	17	6.0
	Basic Education	39	13.8
	Secondary Education	89	31.6
	Higher Education	135	47.9
	Total	282	100.0

According to the obtained data, most respondents were female (56.4%), and between 25–32 years old (29.4%). The number of respondents was more or less equal in each county, with a small majority from Vila Franca de Xira (28%). With regard to qualifications, most of the respondents held a higher academic degree (47.9%), followed by secondary education (31.6%). In the next subsections, we present the results obtained according to the structure of the questionnaire.

2.3.1. The use of e-government services on the county's website

According to data obtained, most of the respondents said that they had accessed the website of their respective city council (69.1%). However, only 36.5% used the services available online and, among the possible choices provided, the most used services were indicated to be: *consulting cultural organizations, sports and leisure* (18.5%), *downloading and printing forms* (11.4%) and *consulting socio-economic indicators*

(10.2%). Therefore, and continuing to explore the use of the city council's website, a question was asked about the advantages of using those services. Based on multiple response variables, respondents indicated as main advantages: *speed* (36.9%), *easy usability* (18.3%), *cost reduction* (17.8%) and *reducing the level of bureaucracy* (17%). Interestingly, *effective resolution of the problem* and *improving the quality of service* had the lowest values (4.1% and 5.8%, respectively). Moreover, based on the multiple choice answers, it was considered important to analyze the reasons for not using those services, since the percentage of respondents who did not use them (32.6%) was very close to those who responded that they did. The main reason indicated, and perhaps the most notable fact, focused on the *lack of need to use those services* (71.8%), and was followed by a *preference for face-to-face communication with the city council* (8%) and the *difficulty in finding relevant information on goods or services* (5.6%).

Citizens' general opinion about the website of the city council fell on two main dimensions: (1) the modernization of the website; and (2) the difficulty of interaction with it. These two dimensions were extracted after having assessed the degree of adequacy, through Bartlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) statistics (see Table 3), Cronbach's alphas (see Tables 4 and 5), and a Principal Components Factorial Analysis (PCFA), which allowed for the combination of seven different variables (*«available information is relevant»*, *«the website is modern»*, *«available information is recent and updated»*, *«the website is easy to use»*, *«it is difficult to navigate in the website»*, *«the website is disorganized»* and *«the website has too much information»*), that resulted in the extraction of two components explaining 66.6% of the total variance (see Table 6). On a scale ranging from 1 to 5 (1 = strongly disagree and 5 = strongly agree), the answers to these seven variables placed the citizens in a level 3 of agreement.

Table 3. Citizens' opinion on the county's website

Bartlett and KMO tests		
Statistics of Kaiser-Meyer-Olkin		.688
Bartlett's Test of Sphericity	Approx. Chi-Square	502.735
	Df	21
	Sig.	.000

Table 4. Test of the consistency of the dimension of modernization of the county's website

Cronbach's alpha	Cronbach's alpha based on standardized items	N of items
.829	.831	4

Table 5. Test of the consistency of the dimension of difficulty of interaction with the county's website

Cronbach's alpha	Cronbach's alpha based on standardized items	N of items
.650	.643	3

Table 6. Factors influencing citizens' opinion on the county's website (Principal Component Analysis with Varimax Rotation[a])

	Components	
	Modernization	Difficulty of interaction
Available information is relevant	**.858**	–.060
The website is modern	**.819**	–.106
Available information is recent and updated	**.769**	.165
The website is easy to use	**.766**	–.285
It is difficult to navigate in the website	–.148	**.864**
The website is disorganized	–.306	**.767**
The website has too much information	.325	**.635**
Variance explained (%)	42.04	24.62

Notes: Extraction method: Principal Component Analysis; rotation method: Varimax with Kaiser Normalization; [a]Rotation converged in 3 iterations.

The results of the PCFA (with Varimax rotation to order the factors according to their weights) also showed that the city council website has two dimensions that are not very strong from the respondents' point of view: *modernization* and *difficulty of interaction*. These incorporate the variables with strongest correlations between them, which means that these variables have the highest weights. Modernization is comprised of the relevance of the website, its modernity, updating information and ease of use. The results show that the median does not reach 4, which means that the first 50% of respondents fail to totally agree with the modernization of the website (on a 5 point scale, where 1 = strongly disagree and 5 = strongly agree), featuring a modernization index lower than desired. On the other hand, the median level of difficulty of interaction does not reach 3 (neither agree nor disagree), which means that the first 50% fail to agree on the fact that it is difficult to interact with the website.

2.3.2. Level of agreement with citizens' use of e-government services website

One of the objectives of this study is to determine the level of citizen compliance with the use of e-government services in the counties studied. To understand whether such agreement was verified among citizens, an agreement index was created (i.e. a composite variable with a Cronbach's alpha of .922) which included eleven statements related to the position of citizens on a scale ranging from 1 to 5 (1 = strongly disagree, 5 = fully agree). The statements were the following: *«the website is modern»*, *«I easily found what I wanted»*, *«electronic services are reliable, convenient and fast»*, *«I can get the information or services I desire in the way that suits me best»*, *«the relationship with the state is easier»*, *«I use the online services anywhere, anytime»*, *«the State responds more quickly to my needs»*, *«I easily make comments about the service that is being provided»*, *«electronic public services are presenting more attractive conditions»*, *«I know my privacy is being preserved»* and *«I know that the Government is protecting my personal information and delivering services to the appropriate recipients»*.

Later, a multiple linear regression model was tested (using SPSS), which consisted of the analysis of the linear relationship between a dependent variable (*agreement with e-government services*) and eleven independent variables (*modernization of the website of the county*, *difficult interaction with the website of the county*, *using the services of the website of the county*, *services used on the website of the county*, *the advantages of using the services available on the website of the county*, *knowledge of national e-government services*, *use of national e-government services*, *gender* and *county of residence*), in order to understand the extent to which independent variables could explain the variation in the agreement level with government services (dependent variable), as can be seen in Table 7.

Table 7. Effect of independent variables on the agreement level with the e-government services

(Coefficients[a])

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistics	
		B	Std. error	Beta			Tolerance	VIF
1	(Constant)	.751	.262		2.866	.005		
	Modernization of the website	.491	.045	**.531**	**10.981**	**.000**	.892	1.121
	Difficult interaction with the website	.269	.047	**.297**	**5.745**	**.000**	.781	1.280
	Using the services of the website of the county	.452	.103	**.309**	**4.369**	**.000**	.416	2.405
	Index of services used on the website of the county	–.108	.029	**–.259**	**–3.660**	**.000**	.416	2.405
	Index of the advantages of using the services available on the website of the county	.071	.042	.107	1.685	.094	.517	1.932
	Index of the knowledge of national e-government services	.018	.016	.074	1.173	.242	.525	1.904
	Index use of national electronic government services	.092	.021	**.274**	**4.361**	**.000**	.527	1.899
	Female	–.113	.067	–.077	–1.671	.096	.973	1.027
	Loures	–.322	.097	**–.189**	**–3.307**	**.001**	.638	1.569
	Amadora	–.179	.093	**–.111**	**–1.921**	**.056**	.620	1.612
	Odivelas	–.324	.104	**–.181**	**–3.113**	**.002**	.615	1.625

Note: [a]Dependent variable: agreement level with government services.

To understand whether the independent variables could explain the variation in the dependent variable, we tested the quality and suitability of the model (Table 8). It was observed that the variables selected explain about 60% of the model (regarding quality) and, in terms of suitability, the significance test (sig. F) rejected the null hypothesis H_0 (i.e. significance: < 0.05 (H_0 is rejected)), assuming that the model was adequate. Having the model accepted, it was possible to analyze the effect of the independent variables on the dependent variable. In this sense, the variables that had a greater weight in explaining the dependent variable are: *modernization*, *difficulty of interaction with the website*, *use of the services of the website*, *services used on the website*, *use of national e-government services* and *county of residence*. In other words, all independent variables for which the t test is associated with a Sig. ≤ 0.05 are statistically significant in explaining the dependent variable.

According to Table 8, which summarizes the data on the determinants of the agreement level with e-government services, 59.6% of the variability in the level of agreement with the electronic government services is explained by the variability of these variables. Thus, the greater modernity and ease of interaction with the website, and the greater the use of electronic government services, the higher will be the level of agreement with

Table 8. Determinants of agreement level with the e-government services

	Agreement level with e-government services			
	Beta	ΔR^2	F	df
Modernization of the website	.531**			
Difficult interaction with the website	.297**			
Using the services of the website of the county	.309**			
Index of services used on the website of the county	–.259**			
Index of the advantages of using the services available on the website of the county	n.s.			
Index of the knowledge of national e-government services	n.s.			
Index use of national electronic government services	.274**			
Female	n.s.			
Loures	–.189*			
Amadora	–.111***			
Odivelas	–.181*			
		.619	26.999	(11, 183)
Adjusted R^2		.596		

Notes: The beta values that do not have *, correspond to variables with no significant effect on the dependent variable. The tests of residuals showed that errors had a normal distribution, as well as the distribution of residuals remained at a distance more or less constant around 0, presenting homoscedasticity; *p < 0,05; **p < 0,001; ***p < 0,01; n.s.: not significant.

e-government services. This means that experimenting the services becomes a key issue in accepting e-government services and, secondly, that the interaction and the modernity of these services tend to cause a better impression on users and citizens, which, consequently, allow for an increase in the use of those services.

Regarding the option *most used services on the website*, its rate of utilization did not get high values (i.e. lower use index) corresponding to a negative influence on the level of agreement with e-government services. When confronting the index of electronic services' use of the website in relation to the county of residence, the results showed minor differences with regard to citizens residing in these counties, which points to an index of service use that is more or less equitable. This may reflect that the increased number of services used will not lead to an increase in the agreement level with e-government services.

2.4. Study Limitations

Despite the efforts to interview the coordinators of the *ALO Digital Project*, this was not possible due to their lack of response. Moreover, conducting a more thorough study would involve an extension of time devoted to the empirical study for at least six months, particularly in terms of conducting surveys among citizens. Additionally, this study also has limitations due to the fact that it was dedicated to the analysis of only one project and, considering that there are several at the national level, it would be good to explore those too, given the lack of studies based on citizen opinions. Even considering the validity of the results, this study has limitations in terms of number of respondents, since the representation of the citizens of the counties analyzed could have been improved.

Conclusions

Within the objectives outlined for this study, one may assume that they were all met (i.e. it was found that all counties provide a website, Internet access in public spaces or services to citizens, whether through forms or licensing procedures or paying taxes online). However, based on the empirical results, citizens' use of electronic services is still relatively low, which allows the first research question to be answered. In fact, we can conclude that, in terms of the information available on the website of the city council, the counties involved in this project can be located in the levels above the provision of information previously recorded. Regarding the citizens' reaction to the website, despite the small number of users, speed was cited as the greatest advantage from its use, with a decrease in waiting time and an improved quality of the services provided being noted. These results exceed those obtained in previous studies (e.g. Phippen 2007), since in those studies citizens' opinions about the website were highly negative, especially in terms of modernization of the website and difficulties observed in the interaction.

With reference to the second research question, regarding electronic services used by citizens, the results pointed to a type of service more related to information consultation, downloading and printing documentation rather than with services related to greater in-

teractivity (e.g. an interactive map or discussion forums). These results did not support the expectations of using interactive services (i.e. two-way interaction level regarding online sophistication) (see Mulgan 2006; Wauters *et al.* 2007; Molnár 2008). In terms of maturity and sophistication of services, it can be said that the *ALO Digital Project* is at level 3 (cf. subsection about e-government). On the other hand, the reasons given by some of the citizens for not using the services are similar to those found in other studies related to e-government and e-commerce users, indicating the preference for personal contact and the lack of need for using those services.

The last question of the research was intended to analyze the agreement with the e-government services, and the factors that could influence it. It should be noted that the level of agreement with the services is globally positive, implying an agreement with the modern look of the website, the ease of finding information, reliability, speed and convenience of the service, the ease of the relationship with the State, the rapidity of the State's response to citizens' needs, the ease of making comments on the services provided, the preservation and protection of the privacy of citizens' personal information, as well as the delivery of services to the most appropriate recipients.

We conclude that it is difficult, at least in the short/medium term, to describe the *ALO Digital Project* as a project based on administration in real time, while the automation process is still largely based on human intervention. In this sense, the creation of public value (see Mulgan 2006), based on the citizens' needs and demands and in the results, service and reliability, has not been achieved with this project. We expect that this study can raise awareness among managers, policy makers and the project's coordinators, and that, in the future, they can give greater attention to these factors. Considering that this project is still at an early stage of sophistication, it seems important to imply the need for a change of focus and direction of local e-government (i.e. making the Administration more efficient and effective by creating online services is no longer sufficient).

We know of no prior work analyzing the implementation results of this local government technology initiative. In addition, it is worth noting that, at the theoretical level, this research contributes to the stream of theories and methods that argue for the relevance of understanding the role of technology, organization and contextual factors in the development of e-government services (see Siskos *et al.* 2014; Zhang *et al.* 2014; Stier 2015).

In looking ahead to future research, we will seek to demonstrate the importance of such studies with local councils and citizens, for the delivery, implementation and strategic success of similar projects in the future. Thus, it is necessary to develop future research to discuss the needs and assess the best strategies to achieve such levels of sophistication among local organisms and citizens. To maintain a more accurate level of information about the citizens' opinions, it would be relevant to elaborate periodic studies especially devoted to gauging the opinions and needs of local government services, in each county, to better cater to local needs and adapt future actions of service improvement. Such studies could be published periodically and be made available freely on the websites of the respective city councils.

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