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Full Length Research Paper

Research into citizens' attitude towards electronic municipal services (e-local government)

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Use of the internet in the provision of services may prove an important advantage in improving the operation of local government, and an efficient means of providing citizens with better quality services. Although the implementation of corresponding practices depends on the ability of citizens in the community to adopt and use such service-providing systems. Actions taken by local government (1st level) also promote this innovation to the benefit of both parties. The objective of this study is to examine citizens' conduct towards electronic municipal services and to define those factors affecting their conduct. It examines on the basis of a case study the attitude taken by citizens and the problems they face in relation to the provision of electronic services by 1st level local government.

Key words: Local government, e-service, e-government, e-participation.

INTRODUCTION

The internet is a communication tool which has the ability to radically change the appearance of government in the 21st century. Nowadays the installation and production function of technological infrastructure is undoubtedly linked to the development of all sectors in the society. information and communication technologies (ICT) must not simply be regarded as a technocratic issue, but as an essential condition for providing modern services to citizens and for the economic development of Greece.

Information systems and communication networks in combination with electronic government services must be considered from the outset as critically-functioning operational infrastructure. As such, they must function productively and must be designed to be managed based on social benefit, that is; they must be first and foremost concerned with the benefits for users of each system and above all for the citizens themselves.

It is essential for ICTs to be incorporated into a new model of government for Greece, based on de-centralization and participation. This new socio-economic development model will have as its axes knowledge, innovation and investment. Digital technologies make a valuable contribution by promoting citizens'participation, transparency, social accountability and prosperity for all in a just society steered by values and collective effort.

The private sector has steadily created higher standards of services through the internet in Greece and overseas. Corresponding steps must also be taken by the public sector towards a modern government that will lead to growth in the country.

In Greece, over the last few years, significant progress has been made in the sector of electronic services and government. Is the country ready to provide services that will make citizens' lives easier? On the other hand is the citizen ready to use them? Which factors affect his conduct? What difficulties does he face? Is he somewhat mistrustful? For what reasons? How should the state and Local Government itself react?

METHODOLOGY

This article is presented in two parts. In the first part reference is made to previous studies related to electronic government and the electronic services provided by the public sector (Accenture, 2001b Asgarkhani 2002b, 2005a, 2005b, 2005c, 2003c, Bhatangar et al., 2001; ComNet-IT, 2000; Heeks, 1999; Lin et al., 2001; Orrego et al., 2000, 2001; Radic, 2000) in which fundamental concepts of

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electronic government are put forward through case studies conducted in the past.

The second part is based on the present case study concerning 1st level Local Government in the Athens area of Greece. The case study examines the efficiency of electronic services through the attitude held by citizens towards the electronic services provided by the Local Government in Greece.

The aim of this particular research is to investigate citizens' conduct with regard to electronic municipal services and to define the factors affecting their conduct. To this end a questionnaire was used which composed of 19 closed questions of which 6 were demographic and it was collected following simple random sampling of 300 people during September and October, 2009.

The statistic analysis was followed by the codification of data so that it can be entered into the statistic programme SPSS. This includes the descriptive and inductive analysis. The descriptive analysis includes a variety of techniques (frequency tables, graphs, etc) used to provide an image of our data. The techniques used depended directly on the type of variables used (continuous or categorical).

This is then followed by the inductive analysis which includes the statistical analysis of the findings presented previously through the research cases set out in the paragraph and comments on the most significant of these. In other words, apart from the descriptive findings analyzed previously, this section attempts to analyze their statistical significance, through the basic tools of «inductive statistics».This aims at generalizing the results of the research sample and converting them to wider similar groups of the population (Papadimitriou, 1990, pp. 13-14).

Theoretical approach

The concept of electronic government

Electronic government includes the use of information technology and especially the Internet to improve state services for citizens, enterprises and other state services. It has the ability to directly link the State with its citizens in such a way as to create new opportunities and at the same time new challenges. E-government can facilitate citizens' interaction and enable them to receive state services 24 h a day, 7 days a week.

According to the definition given by the European Union, E-Government is «The use of information and telecommunications technologies in public administration, combined with organizational changes and new personnel skills, with the aim of improving services to the public, strengthening democracy and supporting public policies» (European Union).

Electronic government is developing in stages. Yet the relations and stages of electronic government are more complex than the concept of electronic commerce. Over the last few years, conceptual frameworks have been developed for the advancement of electronic government.

Hiller and Belanger (2001) put forward that «Electronic government can be considered through two viewpoints: the type of relation and the stages of integration» and this refer to five stages in the development of electronic government. Layne and Lee (2001) regard electronic government as an evolutionary phenomenon and proposed four stages-models of development: (1) cataloging – recording information, (2) transaction, (3) vertical integration, and (4) horizontal integration. Reddick (2004) carries Layne and Lee's study further, by examining both of the afore-mentioned models and focusing on two of the four stages proposed by Layne and Lee – cataloguing and transaction. Just as Hiller and Belanger, Reddick also agreed that the stages in the development of electronic government are associated with the main forms of relations in electronic government. Electronic government may include electronic relations between various levels of the state and its arms. The first form is the relationship between government and citizen (G2C), the second is between government and government (G2G) and the third, between government and business (G2B).

The role of electronic government

In 2000, Pardo pointed out that the implementation of electronic government does not simply require the introduction of computers and setting up of a website to access information, rather it is a fundamental new relationship that must be built up between government and citizens. In other words, the aim of electronic government via ICT is not only the provision of information but also to support consultation processes that encourage the active participation of citizens in examining and establishing state policies (Pardo, 2000).

Electronic government does not only concern the narrowly defined sector but particular significance is placed on the framework of its implementation in Local Government. Electronic Government does away with the need for citizens to travel to their local authorities to be served. For example, Moon (2002) points out that «following central initiative, many local authorities adopted information technology for local government» (p. 424). On general terms, there has been an increase in the adoption of Electronic Government as since 2000 «most local authorities have had a site on the Internet» (Holden et al., 2003, p. 341).

According to his research, Dr Tan Yigitcanlar in Australia points out that attaining a local electronic government programme requires a certain level of electronic participation and community development. Only by understanding and meeting citizens' needs will local governments be in a position to realize the vision of true electronic government (Dr Tan Yigitcanlar, 2003).

According to Norris (2001, p. 113) "there is widespread concern that the public has lost its faith many years ago in the execution of basic institutions by the representative government, and it is hoped that more open and transparent management and more efficient provision of services could help to restore its confidence". «Electronic government which has been put forward as a solution», refers to (the government's) provision of information and services via the Internet (West, 2000: 2) and may also include the ability for on-line public participation in political debate (Mossberger et al., 2003).

Electronic government promises to improve the provision of public services. This includes online transactions, as well as the dissemination of information on the government's operations. It can improve communication between citizens and government, via email, which allows for direct participation in governmental decision-taking (Thomas and Streib, 2003).

Citizens' participation and public debate are considered to be of crucial significance in promoting greater governmental accountability, transparency and improving responsiveness. Certain researchers regard information technology as the most important component in creating a more participatory democracy and boosting confidence in the government (Toffler 1995; Norris, 2001; Bimber, 2003a, b; Budge, 1996a, b; Rheingold, 1993; Grossman, 1995).

EMPIRICAL INVESTIGATION

Electronic services in the public sector and the interaction of citizens with electronic government: Review

Let us take a look at the implementation of electronic government in practice. More specifically, the results of

older research are presented below. This is related to the benefits a country can gain from implementing electronic government, its problems, difficulties and prospects.

In 2002, Moon just as Edmiston in the same year, discovered that Local Governments had only just passed the stage of information dissemination. The results of Edmiston's research re-vealed that electronic government in cities was mostly informative, although this was shown in the initial stage of online transactions. However during Holden's research in certain American cities, he discovered that electronic government had progressed beyond the initial stage of information dissemination. Some cities had even progressed to horizontal and vertical integration. But this discovery was made in large cities that have more resources to make available for electronic government.

Another study carried out in Georgia, which is related to the interaction between citizens and electronic government is by Thomas and Streib. The findings of their research reveal that citizens use government websites more in order to obtain information, and not to carry out transactions. In addition, the more experienced users were more likely to visit government websites to carry out transactions.

Research carried out by Christopher G. Reddick* in 2005 arrived at the same conclusion as Thomas and Streib. He also revealed the digital divide that exists, as citizens between the ages of 55 and 64 were less likely to seek information electronically than those of a younger age.

Research carried out by Mehdi Asgarkhani in 2005 revealed that citizens' greatest concern when using electronic services was the security of their personal data (Asgarkhani, 2005). In addition, a review of various studies on electronic government and electronic services (Webster 2001; Radic, 2001; NIC, 2000; Asgarkhani 2003b, 2004) proposes that the aims of local government when setting up electronic services should focus on the following:

1. Promoting specific services (increase in efficiency and cost saving).
2. Improving the quality of services.
3. Removing barriers and dealing with social exclusion.
4. Local access points. Up to 20% of customers' queries cannot be dealt with immediately (Webster 2001).

Citizens' attitude to the provision of electronic services by 1st level local government: The city of Athens as a local case study

Participants were chosen from different age groups. More specifically, the largest percentage (32.7%) of those questioned belongs to the age group of between 18 and 30, 20% were aged between 30 and 40, 15% between 40 – 50 and the rest were over 50 years of age. It appears that 94% of those questioned were aware of electronic government services provided by Local Government by direct link. Of these 77% of those questioned make use of municipal electronic services. Majority of those already aware of Local Government's electronic services consider them useful. Of those not aware of the provision of electronic services by Municipalities, a large percentage also considers them useful.

As far as municipal electronic services are concerned, out of those who already knew about the provision of electronic services, majority had learnt of it "by word of mouth" (49%) and through the Internet (39%). 6% of these learnt of the electronic provision of services through advertisements.

Most of those questioned (who had used electronic services) reported that they were satisfied with their latest transaction. As regards to the most significant reasons for using the Municipality of Athens' website, most gave the following reasons: to avoid bureaucracy (32%), to reduce traveling (21%) and a smaller percentage reasoned that it provides better service in relation to the traditional way and also saves money and time.

Some of the problems mentioned by those who had used the Municipality of Athens' website are: difficult navigation, lack of various ways of encouraging town's people to use electronic services, dissatisfaction with service time, fear for the safety of their personal data and general wariness in using municipal electronic services.

Those participating suggested that actions should be taken to encourage citizens to make use of electronic services in municipalities-communities. However 32% of participants are not wary of using electronic services in their Municipalities.

An evaluation of to what extent citizens are satisfied with the general picture of the organization and operation of electronic services provided by Municipalities showed that majority was satisfied or relatively satisfied. That is, the findings showed that online services in Municipalities were graded average. The findings of the research show that the provision of services by Municipalities via the Internet is, despite citizens' fears, welcomed and they favour the improvement of the public's access to services and facilitating the democratic process.

Correlations

There is a link between total satisfaction from electronic services and satisfaction from service time, satisfaction from previous transactions, ease of use, concern for security of personal data and frequency of visits to municipal website.

In order to check the afore-mentioned research case, we must take into consideration these particular variables in their entirety categorical and also whether they present an order, that is, if they are ordinal or only nominal, (Blakie N., 2003, p. 157).

On carrying out the correlations, we observed a strong positive correlation (Spearman's rho = 0.841, p-value<0.01) between satisfaction with the service time duration and satisfaction with the entire picture of municipal electronic services. We also arrived at the same result (Spearman's rho = 0.834, p-value<0.01) between the satisfaction of previous transaction with the State and the overall picture of electronic municipal services. This means that the more/less satisfied someone is with the duration of service time for their request or with their previous transaction with the Municipality, the more/less satisfied he is with the overall picture of electronic municipal services.

In addition, the more those questioned replied that they are not concerned about the security of their personal data (they replied NO), the more they feel satisfied with the overall picture of electronic services (12.1% stated NO and the total percentage VERY SATISFIED is 5.7%, while when 77.1% replied NO the total percentage SATISFIED is 39%). There is statistically a significant link between the concern for the security of personal data and the overall satisfaction of electronic services in the Municipality (Pearson Chi^2=60,905, p-value < 0, 01).

We also observe that the more those questioned admit to using municipal electronic services with ease, the more satisfied they claim to be with the overall picture of these services (VERY SATISFIED those who use the electronic services with great ease 24.1%, while VERY SATISFIED those who use the electronic services with less ease 6.3%). We also observe from the control x^2 that this relation is statistically significant (Pearson's Chi^2 = 299,429, p-value < 0.01). The effect of this relation is positive and strong which can also be seen from (Somer's d = 0.726, p-value = 0.022 < 0.05). In addition, we observe that the more the overall satisfaction those questioned feel, the more often they will visit the Municipality's website for any information/transaction they may require. 30.7% of those who state "relatively satisfied" visit the municipal website, "often" 2.8% and "sometimes" 38.6%. Correspondingly, 39% of those who claimed to be "satisfied" visit the municipal website, "often" 87.5% and "sometimes" 50%. The statistical significance of frequency observed through control ×2 showed us that there is a statistically significant relation between overall satisfaction and the frequency of visits to the municipal website, Pearson's Chi^2 = 490,709, p-value < 0.01. The direction measures also show the strong positive effect of overall satisfaction on the frequency of visits to the municipal website (Somer's d = 0.842, p-value < 0.001). As far as the relationship between age groups and the use of municipal electronic services is concerned, it was found that it is statistically significant but that the influence between them is negligible (lambda = 0,164, p-value = 0,129). In relation to educational level, we observe that the percentage of use of municipal electronic services increases in comparison to the educational level of those questioned (Primary School 54.2%, High School 73.1%, etc) and there is a statistically significant relation between the percentage of use of municipal electronic services and the educational level of those questioned (Pearson's Chi^2 = 88,874, p-value < 0.01). That is the use of municipal electronic services inversely corresponds to the level of their education.

Table 1. Adaptation of model.

Goodness-of-Fit			
	Chi-Square	**df**	**Sig.**
Pearson	23,940	20	0.245
Deviance	25,415	20	0.186

Table 2. Measures R-square.

Pseudo R-Square	
Cox and Snell	0.811
Nagelkerke	0.912
McFadden	0.758

In addition, we observe that school employees (100%), private (95.4%) and public (92.5%) mainly use municipal electronic services. The findings of control x^2 show us that there is a statistically significant relation between the professional status of those questioned and the use of municipal electronic services (Pearson's Chi^2=107,922, p-value < 0.01). We observe that the direction measures showed the statistically significant but moderate influence of the professional status of those questioned on the use of municipal electronic services (lambda = 0.269, p-value = 0.015 < 0.05).

A further observation is that the use of municipal electronic services depends on how easy it is to use them (95% of those who consider electronic services not very easy to use and 72.9% of those who consider them not easy to use at all replied positively). The direction measures showed that there is a positive moderate to strong statistically significant relationship between the use of municipal electronic services and the ease with which they can be used (lambda = -0.448, p-value<0.01).

Finally, we wanted to see if and how the type of service provided by the municipal website (information material, transaction services) depends on age, ease of use and citizens' concern for their personal data. In this research case where our dependent variable is categorical not ordinal, the most suitable technique to use is polynomial logistic regression (Tarling, 2009, p. 78). Essentially it is a generalization of logistic regression in which the dependent variable may have more than 2 categories yet without them being ranked. The results obtained are shown in Tables 1 and 2. We can see the correct adaptation of the model (Pearson's Chi^2=23, 94, p-value < 0.245).

All the above measures correspond to the coefficient of multiple determinations (R^2) in linear regression without having the same interpretation, which interprets the percentage of variability explained by the model. In this particular case they are simply additional indicators of the correct adaptation of the model (Table 3).

Interpretation of model

In order to interpret the results of the table of model parameters that we adapted, it is advisable to observe not the coefficient B but its exponential form exp (B):

a) It is more likely that citizens who use the municipal website for transactions instead of for information material have declared in answer to the question on ease of use “high degree”.

b) Citizens who are accustomed to using the municipal website for transactions and not for information services belong in their majority to the 18 - 30 and 30 - 40 age groups and not to the age group > 60.

c) Citizens who state that they are concerned about the safety of their personal data use the municipal website more for information material and not for transactions, as opposed to citizens who state that they are not concerned about the safety of their personal data.

d) It is more likely that citizens belonging to the 18-30 and 30-40 age groups as compared to citizens belonging to the >60 age group, use the municipal website for both information material and transactions instead of just for information material.

Finally Table 4 shows the predictability of the model of polynomial logistic regression that was adapted to our data. As we can see, the total percentage of the correctly classified replies is particularly high (92.2%) with the result that the predictability of the model is considered very good.

DISCUSSION

We may assert that electronic government provided by Local Government is gradually developing over the last few years in Greece and particularly in the city of Athens, though with a lot of deficiencies - delays. The majority of citizens are aware of the electronic services provided by the 1st level of Local Government, despite the fact that only a small percentage makes use of these services. Nevertheless, this provision of services by the Municipality via the Internet is considered useful by citizens who use these services and also by those who do not.

In particular, the provision of electronic services by Local Government Organizations is useful since it offers:

1. Multiple communication possibilities, mainly due to the transmission and reception of electronic mails – requests - complaints, the attendance of tele-conferences etc.
2. Search for information regarding telephone numbers of various administrative services of the Municipality etc.
3. Multiple information possibilities, by means of access to local newspapers, or by listening to local radio stations.
4. Leisure opportunities at various festivities organized by the Municipality.
5. Payment of Municipal dues and fines.
6. Use of administrative services, the provision of information, affirmations and certificates by the Municipality, and also the forwarding of filled-in requests, certifications.
7. Search for work opportunities regarding new vacancies in the local government organization.

For purely indicative purposes, we could mention that the issue of a certificate via the internet takes only 5 min, while collection of the same certificate from the Municipality would take approximately 1 h (considering also the transportation time required). The increase in the use of public services being provided by the Municipality via the Internet will decrease to a signi-ficant degree the harassment Greek people are subjected to when conducting transactions with state organizations. It will also reduce the problem of bureaucracy in the country.

European Union has significantly contributed to this effort by the e-Europe project (2005), which was submitted to the European Council that took place in Seville in June 2002. The object of this project is the development of "modern public services" that also include Electronic Government (Europa, 2005).

Through the development of Electronic Government, European Union is striving to strengthen the position of citizens, as well as to improve transparency and accoun-tability of public services, and fight corruption and fraud. In other words, European Union is striving for a renew enforcement of democracy (Liikanen, 2003). However the development of electronic government on local level in Greece is not in line with the progress that has been noticed on the level of central public administration (Hahamis et al., 2005).

In an older research carried out in 2005, Hahamis, Iles and Healy had ascertained that there are serious institutional obstacles to the evolution of electronic government on local level in Greece, shortage regarding acquaintance of employees with new technologies, and also deficiencies in terms of management support. The shortage of financial resources and the issues of security/ private life are considered to be extremely important obstacles. In addition, there is no common framework for the design of the websites of Local Government Organizations. (Hahamis et al., 2005)

However, by means of the present research which investigates the evolution of electronic government on local level from the part of citizens-users, one can also

Table 3. Model parameters.

Use of municipal website[a]		B	Std. error	Wald	df	Sig.	Exp(B)
Transaction services	[V17 = 1]	0.92	0.795	484,724	1	0.000	2.51
	[V17 = 2]	0.6	0.594	570,240	1	0.000	1.84
	[V1 = 1]	-0.653	0.259	6,380	1	0.012	0.520
	[V1 = 2]	-0.946	0.734	19,416	1	0.000	0.39
	[V8 = 1]	-1.27	0.944	14,406	1	0.000	0.28
Both	[V17 = 1]	0.198	0.920	219,053	1	0.000	1.22
	[V17 = 2]	0.81	0.804	362,308	1	0.000	2.25
	[V1 = 1]	-1.708	0.366	21,801	1	0.000	0.181
	[V1 = 2]	-0.776	0.570	29,364	1	0.000	0.46

[a]:The reference category is: Information material.

Table 4. Percentage of correct classification of model.

Observed	Classification			
	Predicted			
	Information material	Transaction services	Both	Percentage correct (%)
Information material	169	2	0	98.8
Transactions	2	24	0	92.3
Both	14	0	20	58.8
Total percentage (%)	80.1	11.3	8.7	92.2

reveal that there are also significant obstacles that restrain the work of the Local Government and that of citizens themselves.

There is a digital gap in terms of citizens' age and educational level. Young citizens up to the age of 40 are those more likely to use the website of their municipality. These users belong most of the times to the upper educational level. Many are those who declare that navigation in the websites of Municipalities is difficult, and are cautious in using them. Obviously this happens due to the break down of communication between the municipalities and the citizen with regards to information in terms of the services provided. Also, the fear of many citizens regarding the security of their personal data is mainly due to shortage of information. These citizens use websites to obtain information and not to carry out transactions.

Additionally, some of the factors that affect citizens' attitude towards Local Electronic Government became obvious during the performance of an econometric analysis. Citizens' total satisfaction of electronic services depended on satisfaction derived in relation to servicing time, their belief regarding the security of their personal data, and municipality's website ease of use. Also the ease of use of municipality's electronic services depends on age and educational background.

Finally, it was noticed that the use of each type of municipality's electronic service (informative material or transaction) by citizens depends on age, and their belief in relation to website's use on one hand and the security provided for their personal data on the other. Therefore, local government organizations will have to carry out researches in order to identify the degree to which their citizens are satisfied with the rendered services, the problems they are faced with, and their wishes, so as to proceed with the improvement of electronic services that they provide. In other words, Municipalities should perform a cost-benefit analysis regarding the projects of Electronic Government.

Consequently, there is need for greater citizens' participation in electronic Government, so that the services provided may be improved. However, this may only be achieved with an Electronic Local Government that is friendlier to the user.

Conclusion

It is obvious from this research that quite a large number of citizens are aware of the fact that the Municipalities in Athens provide electronic services via the Internet. However those using these services are mainly persons below the age of 40 and as far as their educational level is concerned, are graduates of high school and tertiary education.

Majority of citizens who use electronic municipal services

and those who do not, believe that actions must be taken to encourage citizens from the municipalities-communities to use the services. This indicates that they probably encounter problems in using municipal electronic services via the Internet, some of which are referred to as follows:

With regard to citizens' interaction with electronic services in the municipalities in Attica, it is mostly re-stricted to the sourcing of information material rather than to the provision of services. Some of the reasons for this attitude revealed in this study include: citizens' concern for the safety of their personal data, low educational level, age and the complexity of municipal electronic services provided.

Research carried out by the Ministry of Education and Religious Affairs revealed that enterprises rather than individual citizens are more likely to use municipal services via the Internet. This shows the need for individual users to be made aware of what the Internet has to offer, so in following the example set by private enterprises, they too will be able to enjoy the advantages it brings (Ministry of National Education and Religious Affairs, General Secretariat for Adult Education, 2005).

An increase in the use of municipal services provided via the Internet will significantly reduce the harassment Greek people are subjected to when conducting transactions with state organizations. It will also reduce the problem of bureaucracy in the country.

To improve municipal electronic services so that they are easily accessible to all citizens, electronic services must be assessed in relation to the benefits of efficiency and productivity and the quality of work and life, taking into consideration the effects on citizens and government. Appropriate infrastructure must also be created so as to eliminate the existing digital division in order to allow all citizens have access regardless of age, educational level and economic status.

Organization of a complete informative campaign regarding what a digitally organized Municipality can offer remains the task of all 1st level local government organizations of our country. By means of a digitally organized Municipality, citizens can save time and money. However, many of these citizens do not know how they can be served by the websites of their municipality. Therefore, local government organizations should sensitize and encourage the participation of their citizens and also provide an avenue for better information. In particular, municipalities can create information technology centers (Municipality Centers) where citizens could be trained without paying fees. This way, citizens are motivated to visit such centers and get informed of the new technologies and also of what their municipality can offer to them via the internet. These centres should be open to all citizens; while access to the municipality's electronic services should be available not only to trained people but also for those wishing to use the internet for various reasons.

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