

E-GOVERNMENT MATURITY AT SPANISH LOCAL LEVELS

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Abstract

E-Government practices are no longer strange for most local councils. As a consequence, some of them have reached more mature stages in the interaction between technological abilities and organisational processes. Nevertheless, there seems to be a wide gap between what academics say and practitioners do, so it is believed to be necessary to compare theory and facts. The objective of this paper is to address e-Government maturity by stating the differences between academic theory and the results of a quantitative survey addressed to the Chief Technology Managers (CTO) of the Spanish municipalities with more than 5000 inhabitants that have adopted an official web page to communicate with their citizens. CTOs were to answer a set of dichotomous variables regarding whether the selected services were achievable or not through their web pages. These questions were posed on a web-based questionnaire that had a rate of response of 17% (165 out of 960). Results show that Spanish councils still remain at the most basic levels of e-government maturity.

Keywords: E-government, new technology, levels of maturity, Spain.

1 INTRODUCTION

How does Internet affect local administrations? By enabling local e-Government practices. This is the logical answer to such a trivial question, but there is more than meets the eye. The key word is “enabling”: not every council actually makes it, and not all of them achieve the same degree of development even if the expenditure is the same. E-Government practices must be designed for creating added value to public products and services, thus increasing the administration’s efficacy, efficiency, transparency and security. Consequently, it seems crucial to know more about successful (and not so successful) e-Government practices, as is done by private firms regarding e-business initiatives.

In order to overcome the lack of specific studies about e-government pointed out by Al-Sebie and Irani (2003), both theoretical and empirical methodologies are applied in this paper. The main cause of this shortage of knowledge on this matter could be the scarce development that these strategies have within public administrations, specially city councils, which has been recently born to a sense of quasi-competition (Ferlie, in Pettigrew *et al.*, 2002). Indeed, most current research on e-Government, particularly if it regards local administrations, consists in the exposition of individual, limited initiatives, avoiding theoretical frameworks that may provide them with a solid foundation (Becker *et al.*, 2003).

As a result, practical applications of electronic local administration has profited neither from a suitable body of knowledge, nor from a conceptualisation of its key elements that may improve its performance. It is compulsory, then, to turn to several sources of information, and thus compare what academics and practitioners have to say in the matter of the local e-administration (Ho *et al.*, 2003). This has brought up our interest for introducing an academic perspective that, from a quantitative point of view, will present a general view of local e-government in full.

This paper explores the concept of “e-government maturity levels” and how its application may help city councils to improve the outcomes of their e-government strategies, focusing on the local administration’s point of view. It also intends to establish a classification of city councils according to the maturity level towards which they had developed.

In the second section of the paper, after this introduction, the literature review can be found, followed by the research hypothesis. The theoretical foundation of this research lies on the several models proposed by Layne and Lee (2001), Deloitte Consulting (Wong, 2000), Criado and Ramilo (2003), and Baum and Maio (2000). These are only a selection of the many models existing in literature, as Al-Sebie and Irani (2003) have established.

Section three describes the research methodology. A quantitative survey was addressed to every municipality in the Spanish over 5000 population that have adopted an official web page. According to these limits, 960 councils were considered able subjects ,It has had a 17% rate of response (165 interviews achieved).

The fourth section discloses the empirical results, in which the participant councils are classified according to the stages of the proposed model, by using a cluster analysis. Implications from the presence or absence of the councils in each level are discussed, with the aim of contributing to a better comprehension of the local e-Government phenomenon.

This paper concludes with some suggestions addressed to other local governments and groups of interest, as well as to endow councils with better practices to undertake, and different factors when implementing e-Government strategies are also highlighted. Results show that there is a fail in acknowledging the consequences of deploying these practices, which will affect how councils fulfil their potential as competitive services providers for citizens and other stakeholders.

2 LITERATURE REVIEW ON E- GOVERNMENT MATURITY MODELS

2.1 Local e-Government adoption’s need for strategic thinking

The e-Government concept refers to the relationships established between public organisations and their stakeholders through Internet technologies. Thus, e-government comprehends mutual communication and interactions between citizens, business and public organisations; i.e. the use of NICT (New Information and Communication Technologies) for controlling electronically public administration’s processes from an internal and external perspectives. This is, in addition to offering on-line forms and services, public administrations should seize the opportunity to think over how these services are produced and delivered, and make them closer to their stakeholders’ needs. Therefore, e-government practices are not a goal by themselves, as happens with many other ‘e-‘ terms, but a means for public administrations to improve their performance by increasing the efficiency of their management processes and reducing costs in the provision of public services.

Given that it is a concept that integrates strategy, process, organisation and technology (Lieber, as cited in Whitson and Davis, 2000), it brings about impacts and changes to the structure and functioning of the public administration (Snellen, 2000). The development and implementation of adequate e-government policies requires then a thorough knowledge of the particularities of the public sector, as well as the competitive potential that NICT may provide in the context of the information society.

Focusing on a local point of view, e-Government involves managing all municipal processes, in and outside administrative premises, and deploying Intranet and Extranet applications. To do so, both managers and managed must be endowed with the proper software to achieve such integration, besides developing whatever changes in the internal workflow may be necessary to make the city council's administration run smoothly (Waisanen, 2002). As a consequence of trying to lessen e-Government's risk as much as possible, local governments tend to imitate "successful" initiatives, as long as their costs do not overcome the savings generated by its implementation.

Anyhow, to ensure the effectiveness of a local e-Government project, it seems crucial that the city councils question themselves about how to comply with these budgetary and acceptance issues. This is, local organisations must clarify beforehand the strategic intent (if there is any) of their e-government policies to ensure that public money is properly invested. Still, this is a political and organisational question, instead of a simple technical concern (Convega, 20004).

2.2 E-government maturity models: proposal and hypothesis

E-government strategies are developed through various stages from scratch to full online interaction between stakeholders and government from a single operation point. These levels of e-government maturity have been addressed by many scholars, although almost each one has established its own classification. Nevertheless, these models have several features in common. For instance, they all agree in stating that the higher the level, the more complex is the technology deployed, the larger the number of e-services provided and the more benefits that all stakeholders are entitled to. A comprehensive exposition of the principal classifications can be found in Ebrahim *et al.* (2003).

Stages	Definition	Practices	Concordance with:
<i>Stage 1: Informative</i>	Static web page, one-way external communication Lower level of strategic implication and less resources needed Most common occurrence (89% according to West, 2003)	Web page On-line advertising E-mail Passive, catalogue-like information	1 st & 2 nd stages of Deloitte Consulting (2000) 1 st stage of Layne and Lee (2001) 1 st & 2 nd stages of Criado and Ramilo (2003)
<i>Stage 2: Interactive</i>	Bidirectional communication and simple administrative tasks online. Allows for a starting e-Democracy and may include Intranets. Needs more resources and strategic intent.	Forums, FAQs, mailboxes Files and forms download Links and search engines	2 nd stage of Baum and Maio (2000) 2 st stage of Layne and Lee (2001) 3 rd stage of Criado and Ramilo (2003)
<i>Stage 3: Transactional</i>	Bidirectional communication and added value operations (money or sensitive information). Internal process re-engineering. Usually top stage achievable for local administrations. Least common occurrence (21% according to West, 2003).	High security measures E-vote E-banking Debts, taxes and licences on line Official certificates	2 nd , 3 rd & 4 th stages of Deloitte Consulting (2000) 3 rd stage of Baum and Maio (2000) 2 st & 3 rd stages of Layne and Lee (2001) 4 th & 5 th stages of Criado and Ramilo (2003)
<i>Stage 4: Integrational</i>	Seamless administration and interoperability in the provision of public services. True strategy intent. Horizontal and vertical cooperation for synergies, even at supranational levels. Very few administrations have reached this stage (The Economist, 2000)	Intranet and extranet Integrated IS between organisations High security measures Real-time file traceability Secure information exchange devices	5 th & 6 th stages of Deloitte Consulting (2000) 4 rd stage of Baum and Maio (2000) 3 rd & 4 th stages of Layne and Lee (2001) 5 th & 6 th stages of Criado and Ramilo (2003)

Table 1. Description of the model

For the purposes of this paper, five of these classifications have been selected, and a model was devised for empirical testing (see table 1): Layne and Lee (2001); Deloitte Research (Wong, 2000), Baum and Mayo (2000), and Criado and Ramilo (2003). This proposed model measures dimensions that indicate the complexity of the local e-government strategies and their orientation towards the public (internal and external). Table 1 also describes the practices included in each stage and its correspondence with the models contemplated.

In order to see whether the implications of this model do represent the Spanish municipalities' reality, this research aims to test the following propositions:

1. Those Spanish municipalities that have adopted web presence can be positioned in one of the three first stages of the maturity model.

By choosing only municipalities that already have official web presence, it is ensured that all respondents have taken a conscious step forward in their e-government strategies. This way, simple web presence has been taken as the zero stage of our model, because it is our understanding that e-government maturity is enforced by means of what internal and external stakeholders can or cannot do through the web page. Consequently, all municipalities will be allocated in one of the proposed stages. The actual question is that it is not expected to find positive observations for the fourth stage, according to what is shown in other studies (Huerta and Sánchez, 1999; Norris *et al.*, 2001; McIvor, McHugh and Cadden, 2002; Eyob, 2004). This is a first step necessary to interpret the consequences of belonging to each of these groups. This will be done more extensively in hypothesis 2.

2. The more resources the council endows to manage its NICT, the more mature is their e-Government strategy.

This hypothesis inquires whether, according to Norris and Campillo (2002) and Criado and Ramilo (2001), certain variables have a significant influence on the level of maturity of e-government. Particularly, the size of the municipality (in terms of population), the presence of an internal IS (Information Systems) Department for the management of NICT, or the usability of their web pages are factors to be accounted for when considering the development of e-government strategies.

3 RESEARCH METHODOLOGY AND ANALYTICAL PROCEDURES

This paper shows an empirical research based on the analysis of the contents of the institutional websites that councils with more than 5000 inhabitants consider official. This survey consisted on a web-based questionnaire to the CTO (Chief Technology Officers) of the city council or, if there was not such a post, to the person in charge of IS issues. The questionnaire can be downloaded (in Spanish) from <http://gplsi.dlsi.ua.es/eadmin/index.php?codigo=3a740b2d3fdc68bb7125af931e2a963>. See questions 9-13.

Data was gathered by means of an electronic survey addressed to the 960 councils that meet the web site and population requirements, of which 165 were valid answers, allowing for a response rate of 17.2% (7% error). For 47% of the interviewed cities, it was the CTO himself/herself who answered the questionnaire. An additional 29% of the municipalities did not have a CTO position in their hierarchy, but the questionnaire was answered by a computer qualified expert. Only 7% of the questionnaires were answered by people holding political posts, and the rest of answers were provided by other civil servants in administrative positions. There was no significant relationship found between the position of the person who answered the research and the level of maturity of the municipality.

The variables portrayed in table 2 come from a selection of the e-government practices included in the models shown in table 1. These items have been categorised into two dimensions: on the one hand, DIMINTER is for those practices that only allow one-way or two-way communications and do not require sophisticated security software, as well as some initial e-democracy devices. The DIMTRAN dimension is, on the other hand, for those items related to two-way communication, sensitive data fluxes, and money-managing tools. Within each category, each item has got the same weight because

they are independently considered, and the contingency tables showed no significant priorities in the implementation preferences (besides the respective top positions: e-mail address and firewalls).

Variable	Items included
DIMINTER	Summative of 15 items: e-mail address; citizen's and employee's mail box, virtual communities of citizens, businesses, and employees; e-vote; chats; forums; download of forms; e- forms; licenses and subsidies requests, file's consultation and other devices of the like.
DIMTRAN	Summative of 9 items: Security systems (SSL protocols, e-signature, virtual private networks, firewalls), certificates, tax e-payments, file traceability, and e-banking facilities.

Table 2: Dimensional variables' description

It must be stated that, in contrast with Criado and Ramilo (2003), these findings have not been obtained from direct observation of the websites. As such, it is ensured that the services studied are indeed working, even if they are supported by applications not meant for fulfilling these roles (such as corporate e-mail). Also, it means that the effects of such measures in the performance of the municipalities are not discussed, since the indicators have been designed only from an inside point of view. It is not the purpose of this paper to assess on the effectiveness of the e-government practices, but to analyse the perceived degree of strategic intent of the local councils by means of the implementation of the former listed services in one way or another.

The first hypothesis is tested by performing a hierarchical analysis in order to determine the suitable number of groups and their initial centres, which will be used in order to perform a non-hierarchical analysis and thus obtain a higher fit of the results. The final analysis was validated through the analysis of the variance in one factor (Hair *et al.*, 1995). Through the combined usage of these methods, it was observed that three groups would be an acceptable number. From the k-means analysis with three groups can be derived the characteristics of each group, and the differences among them. The real scalar values have been used when performing the subsequent analysis.

For the second hypothesis, Chi squared and H of Kruskal-Wallis tests were applied. These techniques helped describing the significant relationships that may relate these groups and the additional variables considered as possible determinants of the municipality's level of maturity.

4 RESULTS

4.1 Application of the model: Stages in Spanish municipalities

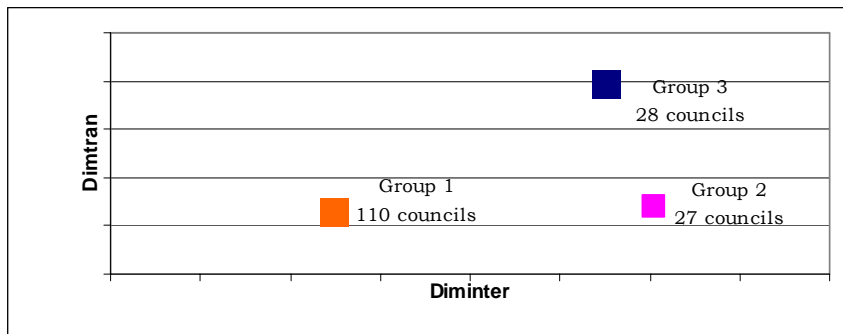


Figure 1. City councils groupings

As it has been stated, the participant municipalities were divided into three groups, depending on the number and type of implemented e-government practices, in order to identify different levels of e-government maturity. This supports hypothesis 1, since all municipalities fit in one of the three groups, and none of them would have reached the fourth stage. Figure 1 shows how this distribution, which has to be interpreted considering that the closer to the down-left corner the group, the lower the degree of strategic development of their e-government policies.

Table 3 shows their distributions and characteristics, according to the working variables DIMINTER and DIMTRAN. It is outstanding the low values of the medians, considering that the range of the variables were [1-15] for DIMINTER, and [1-9] for DIMTRAN. This means that the general level of maturity is not really advanced, for any of the two studied dimensions, which will lead us to think that there is still a lot of room for improvement in the Spanish local e-government strategies.

	Observations	Group 1	Group 2	Group 3	H Kruskal-Wallis (1)	Sign
		110	27	28		
	Median	Means				
Diminter	3	2,480	6,040	5,500	106,706	0,000
Dimtran	2	1,310	1,410	3,960	64,381	0,000

(1) two groups have less than 30 observations.

Table 3. Characteristics of groups according to cluster analysis.

The first group is the most crowded (110 observations), accounting for almost two thirds of the sample. It has the lowest mean values in the cluster analysis (see table 3). Therefore, it is the group of less developed municipalities, regarding the information society environment, and it is made of those councils that have just started to walk in the e-government's path having taken only shy steps in this direction. They have not still developed the adequate strategic intent to start a real, meaningful change in their practices, keeping mainly to simple suggestion applications and static web pages. Given these characteristics, it has been considered as the "informative" stage group.

Regarding the second group, it comprises the 27 city councils that are focused on investing in the interactive applications of their e-government strategies, neglecting the strategic value of the transactional ones. This is why they are assimilated to the Interactive stage of the proposed model. Therefore, these councils are more matures than the ones of the former stage, in terms of technological and strategic development, but their modernisation measures are one-sided (the easy one).

The 28 councils of the third group are characterised for being the most advanced and strategically mature, having worked to enhance both orientations, although with certain prevalence of the interactive side over the transactional, still. This unbalance is the reason why they are catalogued as Transactional stage, because their intention is to increase the added value of their services, but they not have yet developed a global vision of e-government strategy. The success of their practices will rely upon the trust of their citizens and employees in their applications, which is directly related to the deployment of security and confidentiality measures, as well as to the actual performance of the political staff.

In addition, there are no municipalities that have reached a reasonable high count in both dimensions altogether, which confirms the lack of councils that may have got into the Integrational stage proposed by literature (Huerta and Sánchez, 1999; Norris *et al.*, 2001; McIvor, McHugh and Cadden, 2002; Eyob, 2004). It is easier for these organisations to simply implement e-government applications and devices, even those technologically complex such as e-payments. But if there is no strategic intent to actually change the way the organisation works, it makes no sense to speak about an integrational policy, and here lies the true difficulty of a successful e-municipality. Nevertheless, some measures have been developed from non-local institutions. The most recent is the national interactive system SARA (*Sistema de Aplicaciones y Redes para las Administraciones*) in January 2006, which provides

an information technology infrastructure that will enable the connection and exchange of data and software between all national and regional administrations – thus providing considerable savings in both cost and time. It is similar to the systems used in Finland, Norway and the United Kingdom.

4.2 Implications of the model: Other variables that may affect the level of maturity

To see if there are any significant relationships between belonging to one of these groups and other characteristics of the municipalities, several dependency tests have been performed. Table 4 shows these results, which support hypothesis 2.

* <i>p</i> sign. (0,01)** <i>p</i> sign. (0,05)		Means			H Kruskal-Wallis	Sign
Additional variables (scalar)	Informative	Interactive	Transactional			
Municipality population	21425,25	27592,11	58397,64	13,214	0,001**	
Importance of information society	2,98	3,73	3,15	10,782	0,005**	
Page usability	2,44	4	4,43	30,224	0,000**	
Additional variables (cat.)	Observations			Chi squared	Sign	
Own IS Department	79 (72%)	21 (78%)	26 (93%)	17,243	0,028*	
Daily frequency of maintenance	4 (3,6%)	3 (11%)	9 (32%)	26,768	0,021*	

Table 4. Influence of other variables in the level of maturity

It stands out, in first place, the positive relationship between the level of maturity and the size of the municipality (in terms of population). This will turn into more financial resources for the council, as well as a greater workload that may push these councils towards a way to a more efficient management of their processes and services. Another resource supplier that has proved a significant relationship is the presence of a IS Department within the council, because it provides knowledge and capable personnel.

Among the internal characteristics of the city council that are related to the level of maturity are the council's awareness of the implications of the information society on the lives of the people in the municipality, which has a clear implication for local politicians. Technological issues are also at stake, such as the usability of the web page (the ability to find the information in the page) or the frequency of maintenance of the webpage. The web page is the supporting instrument for e-government strategies, and therefore it seems logical to find that the best websites allow more developed strategies, and that, in order to be able to evolve in the model, it is necessary that the web page should be able to support these applications.

In spite of the fact that there is a wide gap between the number and orientation of the deployed e-government practices and the strategic intent of such policies, there is a positive relationship between the endowment of resources and the degree of maturity of the local e-government. It is concluded, as a matter of fact, that the influence of external parameters, being organisational, political or technical, does not necessary mean that the council must be in a less developed stage. Actually, it seems to be the contrary: those councils that aspire to reach more mature levels try to behave as if they already did, impelling strategically oriented practices. This way they look forward to overcoming their handicaps.

A likely cause could be the possibility of having more human and financial resources available, since this will facilitate the municipalities evolve and mature along the e-government model. However, the most important findings at this point are the variables that did not give out as significant relationships; this is which characteristics do not relate to maturity levels. The tested variables were the following: organizational size of the city council in terms of number of workers and annual budget; and geographical location. This reinforces the idea that those municipalities that are endowed with more resources are not the ones that spend more in developing their e-strategies. These results seem to show

that the principal cause for having evolved to one stage or other is the sharp strategic attitude that the politicians running these councils have, as has also been found by Moon and Norris (2005).

In sum, the understanding acquired with this research is that the use of e-government practices for improving the performance and modernize local administrations is a positive, yet slow, strategy. This is not so from what has already been achieved, since the incumbent level is generally low, but from the growth perspectives that are expected to evolve in the foreseeable future.

5 CONCLUSIONS

The findings show in first place that, regardless the commonality of web presence between local councils, only three groups of municipalities can be drawn, each with a well- separated degree of maturity: informative (the biggest group), interactive and transactional (the smallest one). There is not a big disparity between the latter two, in both senses, which we believe it means a different attitude towards the councils' clients more than a real difference in e-government's maturity. There is no evidence of municipalities having evolved to the fourth stage of the model, which is a fact foreseen by literature.

Second, Spanish municipalities, as a result, have enough resources and knowledge to successfully design and implant e-government strategies. The weaknesses of e-government local practices tend to reside on the political and organisational aspects, because those who distribute these resources do not always favour a more strategic management of NICT. Hence, any e-government practices that are developed should be done so coherently and comprehensively, with the complete support of all levels of decision of the city council. Therefore, those councils that would like to increase their level of maturity should take a look at the gap between the e-services that they provide and those that may enhance their ability to communicate with their citizens. The political bodies and the CTOs should come to a common ground in terms of what the municipality may benefit from, and what resources are needed in order to accomplish such goal.

Finally, several recommendations can be derived for other countries on how to develop their e-Government strategies if they pretend to achieve a certain degree of maturity. Particularly, as Huang, *et al.* (2002) have suggested, most e-government strategies and implementation plans in developing countries have been based on theories and experiences of developed countries, which may lead them to hastily imitate them ("me too" effect) with undesirable consequences for their success. Thus, this paper intends to help these countries to compare strategic issues, like the importance of the building a useful webpage, to bridge this gap, or at least to encourage other researchers to carry on similar studies in order to compare different situation from which we can all learn.

Regarding the limitations and future lines of research, another way to look at this phenomenon could be from the citizen's gain point of view. This research would need to take into introduce external variables of a sociological character, as well as financial results that were not considered in the original design of this project. This way, a comparison between what has been done and what is perceived as real benefits (in social and financial terms) will provide a 360° comprehension of the extent of the maturity models presented in literature and tested in this and other papers.

References

- Al-Sebie, M. and Irani, Z. (2003). 'E-Government: Defining Boundaries and Lifecycle maturity', *Proceedings of the 3rd European Conference on e-Government*, Trinity College Dublin, Ireland:19-29.
- Baum, C. and Maio, A.D. 2000. *Gartner's four phases of e-Government model*, Gartner Group, published in: <http://www.gartner11.gartnerweb.com/public/static/hotc/00094235.htm>

- Becker, J.; Algermissen, L. and Niehaves, B. 2003. 'Implementing e-Government Strategies. A procedural model for process oriented e-Government projects', *Proceedings of the 2003 International Business Information Management Conference (IBIMA): "E-Business and organisations in the 21st Century"*, December 16-18, El Cairo.
- Convega. 2004. *Los municipios de la Vega Baja en la Red, Proyecto Vega Baja Digital*, published in <http://www.convega.com/vbd/vbddiagn.html>
- Criado, J.I. and Ramilo, M.C. (2001): 'Definiendo la e-Administración. Las páginas web de las Administraciones Públicas', *Gestión y Análisis de Políticas Públicas*, 22:123-138.
- Criado, J.I. and Ramilo, M.C. 2003. 'E-Government in practice. An analysis of web site orientation to the citizens in Spanish municipalities', *The International Journal of Public Sector Management*, 126(3):191-218.
- Ebrahim, Z.; Irani Z. and Al Shawi S. 2003. 'E-government adoption: Analysis of adoption models', *Proceedings of the 3rd European Conference on e-Government*, Trinity College (Dublin, Ireland): 91-102.
- Eyob, E. 2004. 'E-Government: breaking the frontiers of inefficiencies in the public sector', *Electronic Government*, (1)1:107-114
- Ferlie, E. 2002. 'Quasi strategy: Strategic management in the contemporary public sector', in Pettigrew, A.; Thomas, H. and Whittington, R. (eds): *Handbook of Strategic Management*, Sage Publications Inc., London: 280-298.
- Fundación Auna. 2004. *IV Informe anual sobre el desarrollo de la Sociedad de la Información en España eEspaña 2004*, published in June at <http://www.fundacionauna.org>
- Hair, J.; Anderson, R.; Tatham, R.; and Black, W. (1995): *Multivariate Data Analysis*, Prentice Hall, 5th ed., Englewood Cliffs.
- Ho, V.Y.; Ang, S. and Straub, D. 2003. 'When subordinates become IT contractors: persistent managerial expectations in Outsourcing', *Information Systems Research*, (14) 1: 66-86.
- Holden, S.H.; Norris, D.F. and Fletcher, P.D. 2003. 'Electronic Government at the local level', *Public Performance and Management Review*, (26) 4:325-344.
- Huang, W.; D'Ambra, J. and Bhalla, V. 2002. 'An empirical investigation of the adoption of e-government in Australian citizens: some unexpected research findings', *Journal of Computer Information Systems*, 3(1): 15-22.
- Huerta, E. and Sánchez, P.J. 1999. 'Evaluation models of information technology in Spanish companies: a cluster analysis', *Information and Management*, (36)3:151-164.
- Layne, K. and Lee, J. 2001. 'Developing fully functional E-Government: A four stage model', *Government Information Quarterly*, 18(2):122-136.
- McIvor, R.; McHugh, M. and Cadden, C. 2002. 'Internet technologies. Supporting transparency in the public sector', *The International Journal of Public Sector Management*, (15) 3:170-187.
- Moon, M.J. and Norris, D.F. (2005). "Does managerial orientation matter? The adoption of reinventing government and e-government at the municipal level", *Information Systems Journal* 15 (1): 43-60.
- Norris, D. F. and Campillo, D. 2002. *Factors affecting the adoption of leading edge information technology by local governments*, Baltimore, MD: Maryland Institute for Policy Analysis and Research, University of Maryland, Baltimore, County.
- Norris, D.F.; Fletcher, P.D. and Holden, S.H. 2001. *Is your local government plugged in? Highlights of the 2000 electronic government survey*, International City/County Management Association (ICMA) and Public Technology, Inc. (PTI), Maryland.
- Snellen, I. 2000. 'Electronic commerce and bureaucracies', *Proceedings of the 11th International Workshops on Database and Expert System Application*: 285-288.
- Wong, W.Y. 2000. *At the dawn of E-Government: the citizen as customer*, Deloitte Research, Deloitte and Touche, published in July at <http://www.dc.com>.
- Waisanen, B. 2002. 'The future of E-government: Technology fuelled management toll', *Public Management*, (84) 5:6-9.
- West, D.M. 2003. *Global E-Government 2003*, published in <http://www.INSIDEPolitics.org/egovt03int.pdf>

Whitson, T.L. and Davis, L. 2001. 'Best practices in electronic Government: Comprehensive electronic information dissemination for science and technology', *Government Information Quarterly* (18): 79-91.