
Managing e-government services: An overview of emergent strategy models

Spyros Angelopoulos, Fotis Kitsios, Vassilis Moustakis

Department of Production Engineering and Management, Technical University of Crete, Greece

Abstract: Management is what makes e-Government successful by coordinating the use of corporate resources, managing relationships and empowering strategic alliances. However, current e-Government methodologies and models used are only tailored to specific requirements. This restrains the ability to compare cases and draw valuable conclusions as to how to improve e-Government and its performance measurements. Therefore, the authors are attempting to address the issues faced by surveying the models consisting of effective practices in e-Government and information technology integration management and support. The study provides in depth overview of the current status of e-government models and links with emerging information technology.

Keywords: e-government, public services, strategic framework

1 Introduction

The current 21st century is perhaps one of the most interesting times in history to be alive. Its dawn has come up with new models of Economics, where global barriers are falling, economies are merging, communication is getting better and cheaper (Salvi & Sahai, 2002) and “knowledge in the world” becomes more important (Dix et al, 2004). There is no doubt that e-government is a phenomenon of our era. E-business is becoming vital in the private sector as well as in governmental institutions. The use of Information and Communication Technologies in order to change the structures and processes of government organizations in an attempt to allow the exchange of information with citizens, businesses and other arms of government, results to improved efficiency, convenience as well as better accessibility of public services. The three segments of e-government services are Government-to-Citizen, Government-to-Business and Government-to-Government in a correspondence to the business model segments.

It is common knowledge that Information and Communication Technologies contribute substantially to the acceleration of financial development as well as the elimination of poverty. Ample and ubiquitous access to new technologies is essential for

uniform and consistent diffusion of innovation. Ubiquity postulates the omnipresence of networking; an unbounded and universal network. (Angelopoulos et al, 2008). This, however, can only be implemented through the sharing of information and communication technology resources across governments and their citizens.

In countries such as the United Kingdom, USA, Canada, Sweden, Singapore, Finland, Sweden and South Africa there is an increasing interest in using electronic government services to re-engage citizens with the political process. The use of Internet capabilities by governments all around the world has increased significantly over the last years. Among all the constituencies that are affected by the development of electronic government, businesses represent one constituency that may experience significant benefits (Thompson, et. al., 2005).

Electronic government projects have a breadth of impact that extends far beyond the agency concerned and where benefits often expand beyond the agency owning the aforementioned project. E-government utilizes technology to accomplish reform by fostering transparency, eliminating distance and other divides, and empowering people to participate in the political processes that affect their lives (CDT, 2002). The usability, the lower cost of communication channels, the function of electronic services as well as the increased participation of citizens will create a socio-economic environment, which could satisfy both the administration and the citizen (Tahinakis et al., 2006).

The rapidly changing business environment of the last years has created uncertainty in the market place and high risk for decisions in the years to come. In order to survive in this demanding market place, service organizations have only one choice, to successfully develop new services. However the failure rate for new services projects is high, because the knowledge about how new services should be developed is limited. The success rate of new service projects is an average 58% (Griffin, 1997). In other words, four out of ten new service projects fail in the market place.

Within this changing business environment there has been a resurgence of interest among researchers regarding the role of innovation in gaining competitive advantage. However services innovation literature has grown significantly over the last decade, reflecting the increased contribution of service industries to the national economy. Although internationally there is a noticeable shift of governmental services provision from traditional channels to web-based ones, restraints due to poor quality of service are apparent. (Papadomichelaki, et al., 2006). New service development has not been widely researched (Martin and Horne, 1993) so there exists a need for further research in this field (John & Storey, 1998).

During the previous years very few academic studies have concentrated on this area, which means that the knowledge of new service development has not advanced very far. The majority of new service development research has concentrated on the financial service sector, but so far there has been no important research on new service development in the public sector. This study leads to a literature review of current strategic and managerial frameworks for electronic government implementation. The overall aim of the research project is to conduct a critical analysis of well-established e-Government models and strategic frameworks. Understanding e-Government integration project management will ultimately help in the development of an effective practice model, which will improve e-Government implementation.

2 Defining e-government

Despite the fact that e-government has emerged as a popular catch phrase in public administration (Yildiz, 2007), it still remains one of those concepts that mean a lot of different things to a lot of different groups (Grant & Chau, 2005). The goal of e-government is to achieve in making government services more accessible, more citizen-focused, more relevant to citizens as well as more responsive to their needs and expectations. Electronic government comprises the use of ICT in order to deliver public services to citizens and businesses. It entails the transformation of public services available to citizens using new organizational processes as well as new technological trends (Gunter, 2006). Furthermore, it is regarded as a player with a significant role in enabling greater citizen involvement in civic and democratic matters in the sense of direct democracy as the one practiced in the city-states of ancient Greece. E-government is also designed to facilitate a more integrated mode of government. It encapsulates the relationships between governments, their customers and their suppliers by the use of electronic means (Means & Schneider, 2000).

Until now, researchers were not able to come up with a universally accepted definition in order to describe the e-government concept (Halchin, 2004). The United Nations and the American Society for Public Administration (2002) defines e-government as the utilization of the World Wide Web for the delivery of government information as well as services to citizens. Jaeger (2003), believes that it may also include the use of other ICT in addition to the Internet and the Web, such as database, networking, discussion support, multimedia, automation, tracking and tracing, and personal identification technologies. As quoted by Mike Herson in an interview with Duffy (2000), e-government is "simply using information technology to deliver government services directly to the customer 24/7. The customer can be a citizen, a business or even another government entity". However, Doty and Erdelez, (2002) propose that e-government should enable an open government with transparency as well as responsiveness.

E-government is the use of technology, especially web-based Internet applications in order to enhance access to and efficiently deliver government information and services (Brown & Brudney, 2001). Balutis (2001) classifies the development of e-government into four phases. These four phases include information dissemination, forms-only, end-to-end electronic transactions, and transforming government. According to his classification, information dissemination is the least-developed and fundamental phase, describing a stage in which information is simply provided online. In the second, forms-only phase, users can download forms electronically. The third, end-to-end electronic transactions involve allowing citizens to commence their transaction digitally and ultimately ending their transaction in the same way. The transaction is hence characterized as being entirely executed digitally. The fourth phase in the development of e-government is the final goal of e-government, in which the government provides all services and information online. In this way, e-government acts as a stand-in for traditional forms of government services as citizens can simply log onto the Internet to meet their needs.

What is also lacking in the treatment of the subject is a more in-depth analysis of the political nature of the e-government process, and a deeper recognition of complex political and institutional environments (Yildiz, 2007). According to the World Bank

(2004), e-government refers to the use by government agencies of information technologies that have the ability to transform relations with citizens, businesses, and other arms of government. Last but not least, according to the Center for Democracy and Technology (2002), “e-government is the use of information and communications technologies in order to transform government by making it more accessible, effective and accountable”. However, e-government is not about the use of technology or technological innovation for its own sake. Certain technologies do not fundamentally define what e-government is and will be (Yildiz, 2007).

3 Barriers in implementation of e-government

Fundamental changes have occurred in the structure of most countries' economies, with services becoming the major sector of economic activity (OECD, 2000). Meeting the challenges of an unstable and unsettled environment is not easy. E-government requires strong political leadership in order to succeed (CDT, 2002). Obviously, there are several economical and political reasons underpinning this move. The utilization of Information and Communication technology in the government section and administration does not constitute a panacea, however, the use of ICTs has been a means to manage the limitations of bounded-rationality and provide the infrastructure for better decision making (Simon, 1976).

In light of the discussion presented above, the most significant limitation of the e-government concept is that there is still no standard definition of it. In other words, it is difficult to define what exactly e-government is. This difficulty stems from many reasons, such as the fact that e-government is a concept defined by the objective of the activity, rather than by the specific technology used, provider of the service/information, or clear-cut activities of the related actors.

Many barriers such as the high cost or the low security can impede its implementation and adoption. The integration of various IT applications and components inside and outside the organizational boundary remains costly and time-consuming due to the heterogeneity of the computing environments involved in public-sector organizations (Themistocleous & Irani, 2002). Bonham et al. (2001), Bourn (2002), Dillon & Pelgrin (2002), McClure (2000) and the National Research Council (2002) agree that governments face a shortage of technical infrastructure. The above-said shortage presents a significant barrier in the development of the capabilities of government organizations to provide online services and transactions. They also agree that unreliable IT infrastructure in public sector organizations will certainly degrade the e-government performance.

A frequently cited barrier in literature seems to be the need for security and privacy in an e-government strategy (Daniels, 2002; James, 2000; Joshi & Ghafour, 2001; Lambrinouidakis & Gritzalis, 2003; Layne & Lee, 2001; Bonham et al, 2001; Gefen & Pavlou, 2002). The shortage of IT skills is also a barrier, which contends many challenges regarding the efficiency of a public administration to provide innovative e-government services (Chen & Gant, 2001; Heeks, 2001; Ho, 2002; Moon, 2002). Finally, a major barrier to the adoption and implementation of e-government is funding (Bonham, Seifert & Thorson, 2001; Heeks, 2001; Ho, 2002), which also relates to the business procedure of government, management strategy, and organizational culture (Lenk & Traunmuller, 2000; McClure, 2000).

Organizational barriers relate to structural issues such as fragmentation, poor relations and communication between the functional departments, and an acceptance of the strategic benefits of new initiatives by the senior management (Aichholzer & Schmutzer, 2000; Fletcher & Wright, 1995). Moon (2002) concludes that, to enhance the effectiveness of e-government practices, public-sector organizations would need to progress toward a higher level of e-government development, which will require a greater number of highly trained technical staff.

4 Current status of Strategic E-government Frameworks literature

Electronic government studies until now, limit themselves by researching the outcomes and outputs of the e-government projects. Thus, understanding the political process behind e-government development is vital for overcoming both definitional and analytical limitations (Yildiz, 2007). During the recent years, many attempts have been done by different research teams around the globe to describe e-government architecture frameworks, in many aspects of the digital side of public services, such as the financial, ethical, strategic, legal, semantic, security, implementation, evaluation as well as interoperability. The most significant frameworks in the are of e-government, categorized according the fore-mentioned architectures, can be seen in the following table.

Table 1: E-government Frameworks literature

Architecture	Year	Author
financial	2007	Johnson
ethical	2004	Mullen & Horner
	2001	Bannister & Lalor
strategic	2000	UK Central IT Unit
	2006	Affisco & Soliman
	2004	Ebrahim & Irani
	2006	Mahapatra & Perumal
	2005	Scholl
	2004	Mittal et. al,
	2004	Abie et al
	2007	Flak et al
legal	2004	Lambert et al
	2005	Giraldo
semantic	2006	Teswanich et. al
	2004	Lenk & Traunmüller
	2001	Fernandes, et. al

S. Angelopoulos, F. Kitsios, V. Moustakis

	2005	Stojanovic & Stojanovic
	2006	Herborn & Wimmer
	2007	Goudos et al
	2006	Abecker et al
	2004	Caituiro-Monge & Rodríguez-Martinez
	2005	Belanger et al
	2006	Mauher & V.Smokvina
	2007	Crichton et al
	2005	Frederic & Michel
	2007	Alkhatib et al
	2008	Chun
	2005	ECS
security	2005	Belanger & Hiller
	2002	Rieke
	2003	Makedon et. al
	2004	Kalloniatis
	2003	Caloyannides
	2003	GovTalk
	2003	Lambrinouidakis et. al
	2003	Sharma & Gupta
	2004	Abie, et. al
implementation	2002	Di Maio et al
	2006	Chen et al
	2005	Evans & Yen
evaluation	2003	Gupta & Jana
	2005	Castellano et al
	2004	Banerjee & Chau
	2005	Montagna
	2005	Williams & Fedorowicz
	2004	Oyomno
	2006	Codagnone & Boccardelli
	2004	Chircu
	2004	Al-Omari & Al-Omari
	2003	Bui et al
	2007	Kumar et al
	2005	Ebrahim & Irani

Managing e-government services: An overview of emergent strategy models

interoperability	2004	European Commission
	2004	Gijarro
	2000	UK Crown
	2005	Neumann & Benda
	2005	Antovski & Gusev
	2007	Charalabidis et al
	2005	Guijarro
	2005	Sundar & Garg
	2005	Mukherjee & Biswas
	2006	Diedrich et al

Management is what makes e-Government successful by coordinating the use of corporate resources, managing relationships and empowering strategic alliances. However, current e-Government methodologies and models used are only tailored to specific requirements. This greatly restrains the ability to compare cases and draw valuable conclusions as to how to improve e-Government and its performance measurements. Therefore, the authors are attempting to address the issues faced by proposing a model consisting of effective practices in e-Government IT integration management and IT support. Moreover an attempt is being made for a description of current status of strategic frameworks for electronic government literature.

The research for strategic frameworks for electronic government implementation begins in 2000 with the Central IT Unit study at United Kingdom. Four years later, in 2004, three new strategic frameworks published by Ebrahim & Irani, Lambert et al as well as Mittal et al. The following year, 2005, Scholl publishes one more study. A year later, Affisco & Soliman as well as Mahapatra & Perumal publish their work on strategic frameworks and the literature continues until Flak et al investigate the insights from 48 Norwegian Government Funded Projects in 2007.

Table 2: Strategic E-government Frameworks literature

Author	Year	Research
UK Central IT Unit	2000	e-Government, a strategic framework for public services in the information age.
Ebrahim & Irani	2004	A Strategic Framework for E-government Adoption in Public Sector Organisations.
Lambert et al	2004	A Framework for Experience Management in e-Government: The Pellucid Project.
Mittal et al	2004	A framework for e-Governance solutions.

S. Angelopoulos, F. Kitsios, V. Moustakis

Author	Year	Research
Scholl	2005	The mobility paradigm in electronic government theory and practice: A strategic framework.
Affisco & Soliman	2006	E-government: a strategic operations management framework for service delivery.
Mahapatra & Perumal	2006	e-governance in India : a strategic framework.
Flak et al	2007	An Exploratory Approach for Benefits Management in e-Government: Insights from 48 Norwegian Government Funded Projects.

e-Government initiatives within this domain deal particularly with improving the internal workings of the public sector by cutting process costs, managing process performance, making strategic connections in government as well as transferring power, authority and resources for processes from their existing locus to new locations (Heeks, 2008).

5 Strategic frameworks

The UK Central IT Unit (2000) framework tries to achieve a segmentation of the public e-services market, which assists in focusing efforts at profitable customers, or alternatively aiming products at subtly different demand characteristics. According to their study, major issues obstructing the development of e-government at present include:

- How to address security and privacy concerns
- Determining which services to integrate
- Deciding whether to outsource the service delivery either entirely or through public-private partnerships.

It is received wisdom that e-government services are targeted at one of four broad constituencies:

- Businesses
- Citizens
- Other governments
- Employees.

It is more than obvious that e-services in the public sector generally apply to all four constituents, but at least citizen and subject services. The most common examples of e-government services are:

- Exchanges of information and payment to obtain some permission
- To register for a service

Managing e-government services: An overview of emergent strategy models

- To claim a benefit giving and receiving of money or information
- Regulation and procurement.

Last but not least, these four constituents must be able access the service. If the infrastructure for the delivery of these services is not available, constituents will not be able to access the services.

Although different researchers propose different solutions for strategic frameworks and e-government implementation, most of them share three fundamental statements (Ebrahim & Irani 2005; Tambouris and Wimmer 2004; Traunmuller and Wimmer 2004):

- Involvement of citizens in the development process
- Proposal of a holistic approach
- A focus on work-processes

As a first step in the holistic approach it is recommended that governments should group the citizens according to their life situation (Tambouris and Wimmer 2004; Traunmuller and Wimmer 2004). The transformation phase encompasses redefining the delivery of government services by providing a single point of contact to citizens' that makes the government completely transparent to citizens and businesses (Affisco and Soliman, 2006). Also, significant social, organisational and technical challenges will need to be understood well and overcome in those efforts that strive to achieve governmental transformation (Affisco and Soliman, 2006).

Organizational mobility is increasingly commonplace in public organizations, and presents both opportunities and challenges: opportunities for improving working practices through the introduction of new perspectives, and challenges arising from the constant loss of experience and the learning curve of the newly arrived staff. Experience management is a special kind of knowledge management, focusing on the dissemination of specific knowledge situated in a particular problem-solving context (Bergmann 2002). The experience management model in Lambert et al (2004) framework, exploits these experience-sharing concepts. The main benefits expected from the Pellucid project (Lambert et al, 2004) are the improvement in efficiency and effectiveness due to the reduction of time spent, and leveraging of experience due to the movement of staff among different roles. The main purpose of this project was to enhance employees' performance by giving them access to the required knowledge by the activity they are performing at the time they are actually performing this specific activity.

The cost of e-government implementation has always been a significant barrier and that is the reason why solutions which promise to lower the cost of developing; deploying and managing e-government projects really deserve researchers' focus. Mittal et al. (2004) study a framework that simplifies the procedures of developing, deploying, as well as managing complex, integrated, and standards-compliant e-government solutions. Their framework enables development, configuration, integration, and management of solutions at a higher semantic level. Furthermore, it provides commonly used services. Some of these services are:

- Access to citizen and property records
- Access control and authentication services
- Public key infrastructure
- Support for digital signatures.

In this framework, the solution components as well as data models, are described at a higher semantic level and they are constructed with customisation points that can be programmed through a policy administration interface, that is fairly intuitive and intended for solution managers who may not be well versed in application development. The ability to manage solutions at a higher semantic level enables participants who are not familiar with programming to customise solutions in order to address specific needs of the different national, state, and local governments. This also embraces the ability to build custom user interfaces for multiple local languages used in governmental transactions as well as to customise workflows in order to comply with the organisational structure and policies to manage access to and retention of government records.

A phase model and a framework of strategic choice that constitutes an addition to the academic knowledge in the field of organizational development and transformation induced by mobile technology diffusion is being discussed by Scholl (2005). With his work, Scholl contributes to the understanding of mobile technology diffusion in government by identifying and assessing the influential forces and the direction in this process. Scholl's study presents a parsimonious phase model of the diffusion process, identifies the various classes of fully mobile wirelessly connected applications and uses, discusses specific challenges in the implementation process, presents a framework of alternative strategic approaches to fully mobile wirelessly connected diffusion, and maps the fully mobile wirelessly connected application classes to the strategic approaches as well as to the diffusion stages. By doing so, it develops an understanding of phase-related strategic choices and presents testable propositions regarding the assumed distribution of approaches over the phases. Finally, it proposes a business-information and user-need-oriented principle to guide the various strategic approaches under consideration, which may also be of utility to practitioners in the field.

While in some cases the implementations are praiseworthy, they are effort-centered rather than being result-centric. Mahapatra & Perumal (2004) provide a strategic framework for the implementation of e-governance projects in Indian context, to achieve a result-centric implementation. By presenting and analyzing the components of good e-government:

- Stakeholder Analysis
- Organizational Structure
- Project Management
- Process Streamlining
- Technological Feasibility and Up-gradation

Mahapatra and Perumal present a workable strategic framework to provide a roadmap for the projects to be sustainable in long-term. Their study concentrates on stake-holders, environment, technology enablers, internal processes as well as delivery mechanisms along with the factors that should be taken care of for scaling-up of the e-government projects and making it self sustainable.

Since, there is no e-government textbook and no e-government theory, knowledge derives from practice and excellence follows best practices (CDT, 2002). E-services in the public sector address the digital divide for citizens and businesses through multiple access channels and have been successful in creating a government without walls, doors and civil servant work shifts. With these in mind, Flak et al (2007) described and

Managing e-government services: An overview of emergent strategy models

summarized a Norwegian approach to benefits management particularly targeting e-Government efforts. Forty-eight government-funded projects have implemented the approach and insights from these projects are used to provide empirical insights on the usefulness of the process. With their work, Flak et al (2007) present rich insights from a large number of projects employing a benefits management approach and thus responds to the lack of empirical studies on benefits management in the e-Government domain. The results provide extensive insights in terms of hindrances for benefits realization, examples of qualitative benefits as well as some indications of quantitative benefits.

6 Conclusion

Defining a model is a complex and multi-faceted issue made even more difficult in the context of e-Government management. This paper has summarised the state of research on the design of a model for e-Government integration management to date and summarised the most common dimensions which can be applied to measure the concept of e-Government management in the context of its use. Understanding e-Government from the point of view of the customer/citizen/public, however, also implies understanding the IT processes of the council prior to applying metrics to assess service quality.

This study does not try to stand out either as a review or as a synthetic summary of past literature concerning managerial and strategic frameworks for e-government implementation, rather, its main objective has been an in-depth overview of the current status of e-government phenomenon. E-government is considered to be one of the key contributors to the development of an information society. However, the application of information and communication technologies in e-government should not be considered as an end in itself.

It has already been clear that a competitive telecommunications market as well as an environment conducive for e-government will enable e-government to become an affordable channel for citizens and businesses to interact with government as long as legal frameworks provide the legitimacy and guarantees needed to secure and protect electronic transactions and data exchanges. In cases that telecommunications infrastructure is already available or affordable, as a result of competition, e-government applications are quickly embraced and its projects are more likely to lead to success. Governments all around the world have seen the rapid evolution of e-government when there is an integrated approach to planning and implementation of public sector reform.

As an addition to the current status of e-government, future works need to give an answer to the dilemma, which derived from this study, whether e-government is really a tool for decentralization and democratization or the result of a sociotechnical process towards a new model of public administration. A scientifically documented answer will certainly boost the evolution of e-government. Finally, in an attempt to focus on the changes in business process that are needed inside governmental institutions in order e-government to be successfully implemented, a second recommendation for future work resides on the need for a holistic model which can embrace the back-office, the front-office as well as the real citizens' needs.

S. Angelopoulos, F. Kitsios, V. Moustakis

Reference

- Abecker, A., Sheth, A., Mentzas, G. & Stojanovic L. (2006). *Semantic Web Meets eGovernment*, Stanford University, March 2006, AAAI Press SS-06-06.
- Abie, H., Foyn, B., Bing, J., Blobel, B., Pharow, P., Delgado, J., Karnouskos, S., Pitkänen, O. & Tzouvaras, D. (2004). *The Need for a Digital Rights Management Framework for the Next Generation of E-Government Services*, *International Journal of Electronic Government*, Vol. 1 No.1, pp 8-28, Inderscience Publishers.
- Affisco, J., & Soliman, K. (2006). *E-government: a strategic operations management framework for service delivery*, *Business Process Management Journal*, Vol. 12, No. 1, pp.13-21.
- Aichholzer, G. & Schmutzer, R. (2000). *Organisational challenges to the development of electronic government*. IEEE Computer Society, London, paper presented at 11th International Workshop on Database and Expert Systems Applications.
- Aldrich, J., Bertot, J.C. & McClure, C.R. (2002). *E-government: initiatives, developments, and issues*. *Government Information Quarterly*, 19, 349-355.
- Alkhatib, G., Bataineh, E., Fraihat, H. & Maamar, Z. (2007). *An Intelligent Integrated e-Government Framework: The Case of Jordan*. *Proceedings of the 7th European Conference on E-Government*.
- Al-Omari, A. & Al-Omari, H. (2004). *A framework model for assessment of e-Government readiness*. *IMTC 2004 - Information Technology Conference Amman, Jordan*.
- Angelopoulos, S., Kitsios, F. & Babulak, E. (2008). *From e to u: Towards an innovative digital era*. accepted for publication in *Heterogeneous Next Generation Networking: Innovations and Platform*. IN PRESS.
- Antovski, L. & Gusev, M. (2005). *M-Government Framework*, EURO mGOV 2005, Brighton, UK, pp. 36-44
- Balutis, A. (2001). *E-government 2001a, Part I: Understanding the challenge and evolving strategies*. *The public manager*, Spring (p. 33).
- Banerjee, P. & Chau P.Y.K. (2004). *An evaluative framework for analysing e-government convergence capability in developing countries*. *Electronic Government*, Vol. 1, No. 1, pp. 29-48.
- Bannister F. & Lalor S., (2001). *Public Service Values: Towards an Ethical Framework for e-Government*, In *proc. European Conference on e-Government*, Trinity College Dublin, pubs: MCIL, Reading, UK.

Managing e-government services: An overview of emergent strategy models

- Belanger, F., Carter, L.D. & Schaupp L.C. (2005). U-government: a framework for the evolution of e-government. *Electronic Government, an International Journal*, Volume 2, Number 4, pp 426-445.
- Belanger F. & Hiller J. (2005). A Framework for e-Government: Privacy Implications. *Business Process Management Journal*, Vol. 11. IN PRESS.
- Bergmann, R. (2002) *Experience Management, Lecture Notes in Artificial Intelligence Series*, Vol 2432. Springer.
- Bonham, G.M., Seifert, J.W. & Thorson, S.J. (2001). The Transformational Potential of e-Government: The Role of Political Leadership. European Consortium for Political Research, which was held at the University of Kent at Canterbury, U.K.
- Bourn, J. (2002). *Better Public Services Through E-Government*. The National Audit Office, London.
- Brown, M.M. & Brudney, J.L. (2001). Achieving advanced electronic government services: An examination of obstacles and implications from an international perspective. Paper presented at the National Public Management Research Conference, Bloomington, IN.
- Bui, T.X., Sankaran, S. & Sebastian, I.M. (2003). A framework for measuring national e-readiness, *Int. J. Electronic Business*, Vol. 1, No. 1, pp. 3-22.
- Caituiro-Monge, H. & Rodríguez-Martinez, M. (2004). Net Traveler: A Framework for Autonomic Web Services Collaboration, Orchestration and Choreography in E-Government Information Systems. ICWS, IEEE, San Diego, California, pp. 2-10.
- Caloyannides M. (2003). US e-government authentication framework and programs, *IT Professional*, Vol. 5, No. 3, pp. 16–21.
- Castellano, M., Pastore, N., Arcieri, F., Summo, V., & Bellone de Grecis, G. (2005). An E-Government Cooperative Framework for Government Agencies. *Proc. Of 38th Intern. Conf. on System Sciences, Hawaii*, 5(5): 121c.
- Center for Democracy and Technology (CDT) (2002). *E-Government Handbook for Developing Countries*. CDT POLICY POST, Vol. 8, No. 26.
- Central IT Unit (2000). *e-government: A strategic framework for public services in the Information Age*, UK Cabinet Office, London.
- Charalabidis Y., Lampathaki F. & Stassis A. (2007). A Second-Generation e-Government Interoperability Framework? 5th Eastern European e|Gov Days 2007 in Prague, Austrian Computer Society.

S. Angelopoulos, F. Kitsios, V. Moustakis

- Chen Y.N., Chen, H.M., Huang, W. & Ching, R.K.H. (2006). E-Government strategies in developed and developing countries: An implementation framework and case study. *Journal of Global Information Management*, Vol. 14, No. 1, pp. 23-46.
- Chen, Y. & Gant, J. (2001). Transforming local e-government services: the use of application service providers. *Government Information Quarterly*, Vol. 18 No.4, pp. 343-55.
- Chircu, A.M. (2004). e-Government Value Assessment: Towards a Multidimensional Framework. online <http://www.informatik.umu.se/~qron/Chircu.doc>
- Chun, A.H.W. (2008). An AI Framework for the Automatic Assessment of e-Government Forms. *AI Magazine*. Spring 2008.
- Codagnone, C. & Boccadelli, P. (2006). Measurement Framework Final Version, eGovernment Economics Project, Rome: eGEP Consortium, retrieved from http://82.187.13.175/eGEP/Static/Contents/final/D.2.4_Measurement_Framework_final_version.pdf
- Crichton, C., Davies, J., Gibbons, J., Harris, S. & Shukla, A. (2007). Semantic frameworks for e-government. Proceedings of the 1st international conference on Theory and practice of electronic governance. WORKSHOP SESSION: Formal engineering methods for electronic governance, pp. 30-39, Macao, China.
- Daniels, M. (2002). E-Government Strategy: Simplified Delivery of Services to Citizens. Office of Management and Budget, Washington, DC.
- Diedrich, E., Schmidt, D. & Wimmer, M. (2006). A Three Dimensional Framework to Realize Interoperability in Public Administrations. Proceeding of the Workshop on Semantic Web for eGovernment. Workshop at the 3rd European Semantic Web Conference 12 June 2006, Budva, Serbia & Montenegro.
- Dillon, J. & Pelgrin, W. (2002). E-Government / Commerce in New York State. Office of Technology. New York, NY.
- Di Maio A., Baum C., Keller B., Kreizman G., Pretali M. & Seabrook D. (2002). Framework for E-government Strategy Assessment: Strategic Analysis Report 8 March 2002. Stamford, Connecticut: Gartner, pl. 2
- Dix, A., Finlay, J., Abowd G. D., & Beale, R., (2004). *Human- Computer Interaction*. Prentice Hall, Harlow, England, third edition.
- Doty, P. & Erdelez, S. (2002). Information micro-practices in Texas rural courts: Methods and issues for E-government. *Government Information Quarterly*, 19, 369-387.
- Duffy, D. (2000). Q&A: Balancing the role of e-government: Interview with Mike Herson, vice president of e-government for New York Citybased Gov Works. Available at: <http://www.cnn.com/2000/TECH/computing/11/13/qna.egov.idg>

Managing e-government services: An overview of emergent strategy models

- Ebrahim, Z. & Irani, Z. (2005). E-government adoption: architecture and barriers. *Business Process Management Journal*. Vol. 11, No. 5, pp. 589-611. Emerald Group Publishing Limited.
- Evans, D. & Yen, D.C. (2005). E-government: An analysis for implementation: Framework for understanding cultural and social impact. *Government Information Quarterly*, Vol. 14, pp. 3-6.
- EUROPEAN COMMITTEE FOR STANDARDIZATION COMITÉ EUROPÉEN DE NORMALISATION EUROPÄISCHES KOMITEE FÜR NORMUNG. EU e-Government METADATA FRAMEWORK (ECS). (2005). EKFÜR NORMUNG <ftp://ftp.cenorm.be/PUBLIC/CWAs/e-Europe/MMI-DC/cwa15245-00-2005-Apr.pdf>
- European Commission (2004). European Interoperability Framework for pan-European e-Government Services, IDA working document, version 2.4, Brussels.
- Fernandes, D., Gorr, W. & Krishnan, R. (2001). Servicenet: An Agent-Based Framework for One-Stop EGovernment Services. *Americas Conference on Information Systems*.
- Flak, L.S., Eikebrokk, T.R. & Dertz, W. (2007). An Exploratory Approach for Benefits Management in e-Government: Insights from 48 Norwegian Government Funded Projects. *Hawaii International Conference on System Sciences, Proceedings of the 41st Annual*. pp. 210 - 210.
- Fletcher, K., Wright, G. (1995). Organizational, Strategic and Technical Barriers to Successful Implementation of Database Marketing. *International Journal of Information Management*, Vol. 15, No. 2, 115-126
- Frederic, C. & Michel, L. (2005). A Semantical Reasoning Framework for eGovernment of French National Retirement System. <http://www.imu.iccs.gr/sweg/papers/Comte+Leclere.pdf>
- Gefen, D. & Pavlou, P. (2002). Egovernment adoption. Paper presented at Americas Conference on Information Systems.
- Gijarro, L. (2004). Analysis of the interoperability frameworks in e-government initiatives. EGOV'04
- Giraldo, R.L. (2005). Public Policy and the new regulatory framework on Electronic Government Procurement in Colombia. *AR: Revista de Derecho Informático*, ISSN 1681-5726, Vol. 88.
- GovTalk (2003). Smart Cards: Enabling e-Government, Draft Policy Framework. (see www.govtalk.gov.uk).
- Goudos, S., Loutas, N., Peristeras, V. & Tarabanis, K. (2007). Public Administration Domain Ontology for a Semantic Web Services EGovernment Framework, *Proceedings of 2007 IEEE SCC*, pp. 270-277.

S. Angelopoulos, F. Kitsios, V. Moustakis

- Grant, G. & Chau, D. (2005). Developing a generic framework for e-government. *Journal of Global Information Management*, 13 (1), 1-30.
- Griffin, A. (1997). PDMA Research on new product development practices: updating trends and benchmarking best practices. *Journal of Product Innovation Management*, Vol. 14, No. 6, pp. 429-458.
- Guijarro, L. (2005). Policy and practice in standards selection for e-government interoperability frameworks, in *Proc. of EGOV 2005 Conference*, pp. 163–173, Copenhagen (Denmark)
- Gunter, B. (2006). Advances in e-democracy: overview. In *ASLIB proceedings*. Vol. 58; No. 5, pp. 361-370. Emerald Group Publishing Limited. Great Britain.
- Gupta, M.P. & Jana, D. (2003). E-government evaluation: a framework and case study. *Government Information Quarterly*, Vol. 20, No. 4, pp. 365-387.
- Halchin, L.E. (2004). Electronic government: Government capability and terrorist resource. *Government Information Quarterly*, 21, 406-419.
- Heeks, R. (2001). Understanding e-governance for development. The University of Manchester, Institute for Development, Policy and Management Information Systems,, Technology and Government: Working Papers Series, Number 12/2001. Available at:
<http://idpm.man.ac.uk/idpm/igov11abs.htm>
- Heeks, R. (2008). Success and Failure in eGovernment Projects. Available online at:
<http://www.egov4dev.org/success/definitions.shtml>, accessed on 28/01/2008
- Herborn, T. & Wimmer, M.A. (2006). Process Ontologies Facilitating Interoperability in eGovernment A Methodological Framework. In: Hinkelmann, K.; Karagiannis, D.; Stojanovic, N.; Wagner, G. (eds.): *Proceeding of the Workshop on Semantics for Business Process Management at the 3rd European Semantic Web Conference 2006, Budva, Montenegro, June 2006*, pp. 76–89.
- Ho, A.T-K. (2002). Reinventing local governments and the e-government initiative. *Public Administration Review*. Vol. 62, No. 4, pp. 434-44.
- Hwang, S.D., Choi, Y. & Myeong, S.H. (1999). Electronic government in South Korea: Conceptual problems. *Government Information Quarterly*, 16 (3), 277-285
- Jaeger, P.T. (2003). The endless wire: E-government as a global phenomenon. *Government Information Quarterly*, 20 (4), 323-331.
- James, G. (2000). Empowering bureaucrats. *MC Technology Marketing Intelligence*, Vol. 20, No.12, pp.62-68.

Managing e-government services: An overview of emergent strategy models

- Johne, A. & Storey, C. (1998). New service development: a review of the literature and annotated bibliography. *European Journal of Marketing*, Vol. 32 No. 3/4, pp. 184-251.
- Joshi, J. & Ghafoor, A. (2001), Digital government security infrastructure design challenges. *IEEE Computer*, Vol. 34, No.1, pp.66-72.
- Kalloniatis, C. (2004). Security Requirements Engineering for e-Government Applications: Analysis of Current Frameworks, Proceedings of the Electronic Government: Third International Conference, EGOV 2004, Zaragoza, Spain. (Lecture Notes in Computer Science, vol. 3183 / 2004). Springer-Verlag, 2004; 66.
- Kumar et al. Factors for Successful e-Government Adoption: a Conceptual Framework. *Electronic Journal of e-Government* (2007) vol. 5 (1) pp. 63-76.
- Lambert, S.C., Arenas, A.E., Delaitre, S., Mena Raposo, J., Ferrentino, P., Majewska, M., Krawczyk, K., Fassone, M. & Procopio, V. (2004). A Framework for Experience Management in e-Government: The Pellucid Project. *Electronic Journal of e-Government* 2 (3) p.167-176 F. Bannister (Eds), Academic Conferences Limited.
- Lambrinouidakis, C., Gritzalis, S., Dridi, F. & Pernul, G. (2003). Security requirements for e-government services: a methodological approach for developing a common PKI-based security policy. *Computer Communications*, vol. 26, No. 16, 1873-1883.
- Layne, K. & Lee, J. (2001). Developing fully functional e-government: a four-stage model. *Government Information Quarterly*, Vol. 18, No.2, pp.122-136.
- Lenk, K. & Traunmüller, R. (2000). A Framework for electronic Government, Database and Expert Systems Applications, 2000. Proceedings. 11th International Workshop on, 2000, 340-345.
- Mahapatra, R. & Perumal, S. (2006). e-governance in India: a strategic framework, *International Journal for Infonomics: Special issue on measuring e-business for development*.
- Makedon, F., Sudborough, C., Baiter, B., Pantziou, G. & Conalis-Kontos, M. (2003). A Safe Information Sharing Framework for E-Government Communication. <http://www.ists.dartmouth.edu/library/sis0903.pdf>.2003
- Martin, C.R. & Home, D.A., (1995). Level of success inputs for service innovations in the same firm. *International Journal of Service Industry Management*, Vol. 6 No. 4, pp. 40- 56.
- Mauher, M. & V.Smokvina: Digital to Intelligent Local Government Transition Framework, Proceedings Vol.5. pp.47., MIPRO 2006, Opatija-Croatia.
- Means, G. & Schneider, D. (2000). Meta-capitalism: The e-business revolution and the design of 21st century companies and markets. New York: John Wiley & Sons Inc.

S. Angelopoulos, F. Kitsios, V. Moustakis

- McClure, D.L. (2000). Government online: Strategies and Challenges. Retrieved February 3, 2005, from The House of Representatives Website: <http://www.house.gov/reform/gmit/hearings/2000hearings/000522dm.htm>
- Mittal, P.A., Kumar, M., Mohania, M.K., Nair, M., Batra, N., Roy, P., Saronwala, A. & Yagnik, L. (2004). A framework for eGovernance solutions, IBM Journal of Research and Development, Vol. 48, No. 5/6, IBM Research in Asia, www.research.ibm.com/journal
- OECD (2000). Annual Report 2000. Retrieved February 3, 2005, from OECD Website: <http://www.oecd.org/dataoecd/30/59/1842666.pdf>
- Montagna, J.M. (2005). A framework for the assessment and analysis of electronic government proposals. *Electronic Commerce Research and Applications*, Vol. 4, No. 3, pp. 204-219.
- Moon, M.J. (2002). The evolution of e-government among municipalities: rhetoric or reality. *Public Administration Review*, Vol. 62 No.4, pp.424-33.
- Mukherjee, A. & Biswas, A. (2005). Simple Implementation Framework for m-Government Services. In *Proceedings of the International Conference on Mobile Business (ICMG'05)*. IEEE, pp. 288-293.
- Mullen, H., Horner, D. S. (2004). Ethical problems for e-Government: An Evaluative Framework. *Electronic Journal of e-Government*, Vol. 2, No. 3, pp. 187-196.
- National Research Council (2002). *Information Technology Research. Innovation, and E-Government*. National Academy Press, Washington, DC.
- Neumann, L. & Benda, P. (2005). Open ICT e-Government Architecture as an Interoperability Framework, *Conference Proceedings, 5th European Conference on E-Government*, University of Antwerp, Belgium, pp. 585-598.
- OECD (2000). Annual Report 2000. Retrieved February 3, 2005, from OECD Website: <http://www.oecd.org/dataoecd/30/59/1842666.pdf>
- Oyomno, G., (2004). Towards a Framework for Assessing the Maturity of Government Capabilities for E-Government, *The Southern African Journal of Information and Communication*, publié par le LINK Centre, no 4, p. 77-97.
- Papadomichelaki X., Magoutas B., Halaris C., Apostolou D. & Mentzas G. (2006). *Designing Government Services, A Review of Quality Dimensions in e-Government Services*. Lecture Notes in Computer Science. Springer Berlin / Heidelberg.
- Rieke, R. (2002). Projects CASENET and SKe - a framework for secure eGovernment. In *Telecities 2002 Winter Conference*, Siena, Italy, Dec. 2002. <http://www.comune.siena.it/telecities/program.html>

Managing e-government services: An overview of emergent strategy models

- Salvi, A. B. & Sahai, S., (2002). Dial m for money. Proceedings of the 2nd international workshop on Mobile commerce WMC '02. ACM Press.
- Simon, H.A. (1976). Administrative behavior (3rd ed). New York, NY: The Free Press.
- Scholl, H.J. (2005). The mobility paradigm in electronic government theory and practice: A strategic framework. Paper presented at Euro Mobile Government (Euro mGov), Brighton, UK.
- Sharma, S.K. & Gupta, J.N.D. (2003). Building Blocks of an E-government – A Framework, Journal of Electronic Commerce in Organizations, Vol. 1, No.4, pp. 34-48.
- Stojanovic, N. & Stojanovic, L. (2005). A Change-Aware Framework for the Knowledge Management in eGovernment, in K. V. Andersen, Å Grönlund, R. Traummüller, M. Wimmer (Eds.): Electronic Government - Workshop and Poster Proceedings of the Fourth International EGOV Conference 2005, Denmark, ISBN 3-85487-830-3, pp. 3-10
- Sundar, D.K., & Garg, S. (2005). M-governance: A framework for indian urban local bodies. Paper presented at the Proceedings of Euro mGov 2005: The First European Mobile Government Conference, Brighton, UK.
- Tahinakis, P., Mylonakis, J. & Protogeris, N. (2006). The contribution of e-government to the modernisation of the Hellenic taxation system, Electronic Government, an International Journal, Vol. 3, No. 2, pp. 139-57.
- Tambouris, E. & M. Wimmer (2004). Online One-Stop Government: A single point of Access to Public Services. Electronic Government Strategies and Implementation. W. Huang. Hershey. PA. USA, Idea Group Publishing: 115-139.
- Teswanich, W., Anutariya, C. & Wuwongse, V. (2006). A Knowledge Management system framework for governmental regulating processes. Electronic Government, an International Journal, Vol. 3, No. 1, pp. 56 - 73.
- Themistocleous, M. & Irani, Z. (2002). Evaluating Enterprise Application Integration Technologies: A Novel Frame of References. European Journal of Operational Research, In Press.
- Thompson, D.V., Rust, R.T. & Rhoda, J. (2005). The business value of e-government for small firms. International Journal of Service Industry Management, Vol. 16, No. 4, pp. 385 – 407.
- Torres, L., Pina, V. & Acerete, B. (2005). E-government developments on delivering public services among EU cities. Government Information Quarterly, 22, 217-238.
- Traummuller, R. & M. Wimmer (2004). E-GOVERNMENT - A ROADMAP FOR PROGRESS. Digital Communities in a Networked Society: E-Commerce, E-Business and E-Government: The Third IFIP Conference on E-Commerce, Hingham, MA, USA, Kluwer Academic Publishers.

S. Angelopoulos, F. Kitsios, V. Moustakis

UK Crown. e-Government Interoperability Framework (e-GIF). Office of the e-Envoy, <http://www.uk-online.gov.uk> (retrieved 2000).

United Nations & American Society for Public Administration (ASPA). (2002). Benchmarking e-government: A global perspective. New York, NY: U.N. Publications.

Williams, C.B. & Fedorowicz, J. (2005). A framework for analysing cross-boundary e-government projects: the CapWin example, Proceedings of the 2005 national conference on Digital government research, May 15-18, 2005, Atlanta, Georgia.

World Bank (2004), E *government: a definition of e-government. Retrieved February 3, 2005 from World Bank Website: www.worldbank.org

Yildiz, M. (2007). E-government Research: Reviewing the Literature, Limitations, and Ways Forward. *Government Information Quarterly*, Vol. 24, pp. 646-665.