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TOWARDS E-GOVERNMENT POLICY FORMATION: A MULTI-FACET TAXONOMY OF E-GOVERNMENT PROJECTS

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Abstract

This article is an investigation of the complex phenomenon of national e-Government policy formation. Therefore it contains a literature review of e-Government policy frameworks and a dimensional analysis based on case studies review of the specific management aspects of projects. An e-Government project management taxonomy is proposed consisted from four specific e-Government management dimensions: the project type, the domain sector, the administration level and the beneficiary. The taxonomy is used to map some of the fundamental dimensions required during a national e-Government policy composition. The implications of the taxonomy's application are discussed. This taxonomy is to assist policy-makers and stakeholders in adapting e-Government strategies for successful e-Government implementation.

Keywords: *E-Government, Taxonomy, Project Management, E-Government Policy*

1 INTRODUCTION

From the aspect of world-wide development, the advancement of e-Government is general trend. Especially in the 21st century many countries have attached importance to e-Government, from government gateways (Directgov UK, USA.gov, eCitizen Singapore etc.) and e-Government Frameworks (SAGA Germany, eGIF UK, BELGIF Belgium, Australia, Greece etc.) to local municipality portals and public process reengineering projects. European Commission has established several initiatives to encourage developments in the field of e-Government, providing huge funding to stimulate the creation of the next generation of user-friendly cost-effective and interoperable public services and systems for the different user groups of public administrations.

Although many studies have been done to analyze how public organizations use information technologies for internal operational needs (Hood and Margetts, 2007; Norris & Kraemer, 1996; Pandey & Bretschneider, 1997), and more recent studies have emerged to document the rising trend of e-Government development (Dugdale et al, 2005; Ho, 2002; Moon, 2002; Thomas & Streib, 2003), very few focus specifically on the question of how a Government will be assisted and guided in shaping the appropriate national e-Government policy.

In spite of the considerable literature on digital or e-Government, a clear understanding of the dimensions along which the e-Government projects can be classified is still lacking (Carbo & Williams, 2004). This is a critical issue as it has a direct bearing on the application of the desired e-Government

policy and on the effectiveness of e-Government implementation. Without some method of projects' categorization, the formation of good implementation policy and strategic planning capable of leveraging the existing capacity of organizations to implement projects and furthermore of countries to implement policies is simply hard if not infeasible.

However, even among those who focused on the implementation of e-Government, very few took an interest in conducting a macro analysis of the e-Government implementation issues. Most of the existing empirical studies on e-Government implementation either assumed a single e-Government project as the unit of analysis or focused exclusively on the issue of e-Government adoption. Given such a deficiency of knowledge, it is understandable that many countries experienced difficulty in attaining any significant degree of success in their e-Government policy implementation effort. Moreover, there have also been appeals for more empirical and practice-relevant research to be done as it is observed that the bulk of existing e-Government literature is too theoretical in nature (Devadoss et al., 2003).

In this paper, a list of key e-Government management dimensions is derived for the justification and implementation of e-Government policies by studying successful e-Government solutions, and choosing the most important ones according to expert opinions. We explain how these key success factors are appropriate for e-Government initiatives in light of the specific needs of government, and summarise the results with a taxonomy for e-Government management.

This article addresses the following key question: Given the wide variety of visions, strategic agendas, and contexts of application, how may we categorize, classify, assess, compare, discuss and prioritise the e-Government efforts of various government administrations? In answering this question, we see the need for a mechanism that will facilitate the articulation and discussion of current issues and concepts related to managing e-Government endeavours. Such an approach, rather than seeking to rigidly constrain or categorize e-Government activities, should act as a lens to focus attention and awareness on underlying management issues and elements that could be debated, discussed, and further developed.

The remainder of this paper is structured as follows: Section 2 illustrates existing attempts to classify e-Government projects gained from literature review. In Section 3, the proposed e-Government projects facets are identified and described. Section 4 populates indicatively the proposed taxonomy, discloses its usefulness and analyses the expected implications. The paper concludes with section 5 by drawing a result and depicting consequences for future research.

2 E-GOVERNMENT MODELS: IMPLEMENTATION AND CHALLENGES

In recent years, some researchers have concentrated on proposing comprehensive frameworks for the implementation of e-Government. Regarding electronic services development Balutis (Balutis , 2001), Layne and Lee (Layne & Lee, 2001) and the Gartner Group as presented in Baum and DiMaio (Baum & DiMaio, 2001) propose four incremental stages approaches (publishing, interacting, transacting, transforming). Esteves and Joseph propose three dimensions in an ex-post framework for the assessment of eGovernment initiatives (Esteves and Joseph, 2008). The components of their framework include constructs from both a social and technical perspective. The three dimensions are e-Government maturity level, stakeholders, and assessment levels. The STOPE model (Bakry, 2004) identifies strategy, technology, organizations, people, and environment as the core components for the development of eGovernment in the digital age.

Given the wide variety of visions, strategic agendas, and contexts of application, Grant and Chau (Grant & Chau, 2005) propose a generic framework for the purposes of assessment, categorization, classification, comparison, and discussion of the e-government efforts of various government administrations. The above framework contributes to our proposed taxonomy as it identifies specific national e-Government policy strategic profiles. The implementation of each of those profiles could be assisted considering our proposed dimensions during the selection of the appropriate e-Government initiatives.

Kawalek and Wastall (Kawalek & Wastall, 2005) introduce the SPRINT process reengineering method to explore the ways to pursue radical transformation through an incremental implementation plan. Others turn to managerial measures, proposing solutions for on strengthening the competence of adaptation as well as change management in order to address the uncertainty in IT project implementation (Clark, 2003; Nilsson & Ranerup, 2002).

Chan, Lau and Pan framework (Chan et al, 2006) can either be used as a descriptive tool to organize and coordinate various e-Government initiatives, or be used as a prescriptive structure to plan and strategize e-Government implementation. Their analysis leads to the identification of four main components in the implementation of e-Government, namely (i) information content, (ii) ICT infrastructure, (iii) e-Government infostructure, and (iv) e-Government promotion. These four components were then conceptually integrated into the e-Government Implementation Framework.

Other models of e-Government have appeared in the literature, however, they are generally descriptive(Davison et al., 2005; Janssen & Kuk, 2008; Moon, 2002; Edmiston, 2002; Holden et al., 2003) in nature and they concentrate on development of a specific e-Government project. From these models, some basic propositions for the successful development of e-Government have been posited. Each of these frameworks provides important insights into a specific angle of e-Government and it addresses the core of e-Government initiatives. These values are, as should be expected, professed or intended policy goals behind specific e-Government initiatives. These research strands are not independent of each other; on the contrary, they are closely interrelated and complementary.

While this is valuable work at the infancy of e-Government, we argue that for e-Government to systematically and successfully progress a more strategic model is required. Further, the majority of e-Government models propose a sort of linear progression as e-Government evolves, generally beginning with dissemination, then transactions, and finally to some form of integration. We believe that e-Government initiatives need not necessarily follow this path. In fact, some may achieve their strategic purpose at the dissemination stage and need not go any further. Since the majority of models are based on existing e-Government applications, which admittedly have been developed on a piecemeal basic, little thought has been given to the development of a coherent strategic portfolio of projects. A model that begins to broach this topic is sorely needed at this point in the development of the literature. What can be recognized from the many initiatives and strategies towards e-Government is a huge demand for holistic approaches going far beyond present-day technical developments.

3 MANAGEMENT FACETS OF AN E-GOVERNMENT PROJECT: EGTPM TAXONOMY

The intention of this exploratory study is to understand the implementation of e-Government from a macro perspective through an analysis of the concerted e-Government implementation effort deduced from the relative case studies (Yin, 2002). As such, the data for such a macro oriented study were obtained from a variety of sources. The primary source of data was collated from publicly available government documents and publications as well as press reports. The core of the examined documents belong to project plans, project schedules, project evaluation reports and countries' e-Government strategy documents. The specific documents were selected because they provide an inside view of the exact needs of the e-Government projects, The e-Government strategies documents provide the governmental point of view regarding the considered aspects during the plot of an e-Government policy. Furthermore, interviews were also conducted, in the premises of the relative public organisations, with officers from the Greek Ministry of Interior, the Greek Ministry of Justice and the Greek Managing Authority concerning public sector IT projects. Relevant insights were revealed in some of these interviews and were used in supplementing the primary source of data. The aim of the conducted interviews was on the one hand to affirm the validity of the inferences extracted from the material and on the other hand to complete the taxonomy with issues and aspects those have not been considered or have been misunderstood.

One of the main criticisms of e-Government theoretical approaches is their over-simplification of real-world constructs (Esteves and Joseph, 2008). To overcome this problem the proposed taxonomy, e-Government Transformation Project Management (eGTPM) taxonomy intends to remain comprehensive, compact and easy applicable, in the e-Government implementation landscape. The e-Government project implementation aspects presented in this section allows us to develop a taxonomy. The taxonomy describes the relationship between the dimensions which can be seen as elements of a classification. These dimensions represent management aspects of e-Government project, in what way different stakeholders view them.

To define a suitable classification scheme an analysis of e-Government implementation projects from a macro perspective took place in order to identify the essential determining characteristics. The issues of an e-Government project are manifold (Maumbe et al., 2008) (politics-driven, multi-dimensional, antagonistic behavior among policy makers, inter-agency coordination, broad-based, inclusive, people-driven etc.) and raise varied problems. To clarify the phenomenon of e-Government project implementation, it might be useful to understand which issues describe the e-Government project itself. The analysis of the case studies brings to light at least four specific aspects, reflecting in turn the e-Government project management perspectives. These perspectives were found to be parsimoniously sufficient in encompassing the various e-Government implementation initiatives undertaken by national governments and public organisations. These four perspectives are i) Project Type ii) Domain Sector iii) Administrative Coverage and iv) Beneficiary. Each of these perspectives will be described in further details in the following subsections with direct references made to how each is essentially manifested in the experience of e-Government project implementation.

Project Type

Project types are defined for providing more precise specifications on projects which present similar problems and for which similar results can be expected. Based on their nature e-Government projects are divided in policy and technical oriented types (Finger & Pécoud, 2003). A technical e-Government project could provide a system that is extroversive offering services through a public interface (front office systems) or introvert interoperating with other systems in the background (back office systems). Furthermore an e-Government project could be of policy type providing a study (e.g. framework, reengineering) or services (e.g. training). Those two fields (Technical, Policy) are the first level classification of project type dimension. They can be further analysed in a more detailed structure decomposing in more levels the nature of the e-Government project.

Domain Sector

Domains (Akman et al, 2005) (Interior, Finance, Social Security, Agriculture, Education etc.) refers to large well-defined areas of the public sector where the tasks to be performed in relation to citizens and businesses are delivered by several different authorities cutting across tiers of authority. The domains can consist of parts of or one or more ministries and municipal and regional spheres of responsibility. In the individual domain sectors action plans are drawn up, ensuring coordinated, efficient and targeted digital development. The link between the individual domain and the national level will be achieved by articulating action plans for the respective domains and implementing them within the framework of the overall strategy for digitalizing the public sector.

Administration Level

e-Government structures reflect overall government structures. In most countries (e.g. USA, Australia, Germany etc.) there are three distinct levels of government (Finger & Pécoud, 2003), there is the federal government on the national level, each state or prefecture is an independent unit of government and there are a number of local governments. An e-Government project can cover the whole country (national level), a part of it (regional level) or a municipality (local level) in such a way determining its administration coverage. On top of those, there are collaborative initiatives among countries (international level) in order to provide interoperable services to citizens and businesses. Realising that ICTs are not limited by borders, e-Government strategies are formulated and implemented at national,

regional and local levels. The policy and implementation procedure depends of each country's political system and administrative structure and regional and local e-Government projects are undertaken in such a way that they link and are compatible to national policy and simultaneously address regional communications policy, financing and regulatory issues in a way that promotes harmonization.

Beneficiary

Based on the e-Government practice, beneficiaries can be classified in four major groups. They are government (G2G), business (G2B), citizen (G2C) and international government (G2I) (Akman et al, 2005). This approach to the cataloguing of beneficiaries insures that the organisations will be fully cognizant of who is to be gained. It should be noticed that a large number of e-Government projects perform poorly because of the irrelevance to beneficiaries and stakeholders (Flak et al., 2003; Heeks, 2005; Langford & Roy, 2006).

4 APPLYING EGTPM TAXONOMY

While the proposed frameworks and approaches regarding e-Government implementation play a vital role in the development of e-Government, they provide little strategic guidance for public organizations. Clear, measurable targets should be set for digitalization, and the outcomes followed up among authorities, as well as performing proper e-Government policy monitoring and control.

The development of e-Government is an evolutionary process. An efficient and integrated eGovernment policy (Finger & Pécoud, 2003) should grow over time to include a variety of features, functions, and services. For a comprehensive view of the evolutionary process, an understanding of constituent elements and overall objectives is necessary. This requires difficult, long-term, strategic change in the government angle of view on how national governments programme and manage their endeavours. There must be broadening and deepening of government's professionalism in terms of the planning, delivery, management and governance of IT enabled change. This will result in more successful outcomes; fewer costly delivery failures; increased confidence by citizens; and increased effectiveness by politicians in the delivery of e-Government benefits.

Populating eGTPM Taxonomy

eGTPM classification helps to better understand the goals of e-Government and formulate strategies for e-Government initiatives. A holistic e-Government planning approach has to integrate the proposed perspectives throughout the whole policy development phase. The classification (Table 1) provides an analytical device for better organization of e-Government implementation strategy. Depending on government political priorities eGTPM dimensions can assist policy makers to design specific e-Government policies. Decisions could be received and e-Government policies could be designated matching the political priorities with eGTPM dimensions.

Following on the work of discovering and analyzing the e-Government project dimensions, e-Government projects have been inserted in the eGTPM multi-facet classification scheme, yielding a taxonomy that can now be viewed, enriched and exploited, providing interesting input for the construction of an e-Government policy.

Project Title	Project Type	Domain Sector	Administration Level	Beneficiary
e-Government Framework	Policy	Horizontal	National/International	Government/ International
National Services Provision Portal	Technical	Horizontal	National	Citizen/Business
Electronic Criminal Record	Technical	Justice & Public Safety	Local/Regional/National/ International	Government/ International
National Citizen Registry	Technical	Citizenship	National	Government
Tax Payments System	Technical	Finance	Local/Regional/National	Citizen/Business

Digital Development Support	Policy	Horizontal	Local/Regional	Government
e-Participation system	Technical	Citizenship	Local/Regional/National	Citizen
Voting system	Technical	Citizenship	Local/Regional/National	Citizen
Electronic vehicle registration system	Technical	Transportation	Local/Regional/National	Citizen/Business
Employment centre	Technical	Social Security & Health	Local/Regional/National	Citizen
Legal Framework	Policy	Horizontal	National	Government
e-Government Committee	Policy	Horizontal	National	Government
e-Government Dissemination	Policy	Horizontal	Local/Regional	Government
Reorganisation	Policy	Horizontal	Local/Regional/National	Government
Employee Training	Policy	Horizontal	Local/Regional/National	Government
e-Procurement	Technical	Finance	National	Government/Business
Police on-line system	Technical	Justice & Public Safety	National	Citizen
Driver license system	Technical	Transportation	Regional/National	Citizen
National Telecom Network	Technical	Horizontal	National	Government
National Authentication System	Technical	Horizontal	National	Citizen

Table 1: Indicative population of the eGTPM taxonomy

Although governments differ in the pace and nature of reforms required to bring about the transformation to e-Government, many of the underlying issues are the same for most governments. A classification scheme (Table 1) for e-Government projects is shaped by using the eGTPM taxonomy's classification dimensions. This entails identifying the essential determining characteristics of the projects, with a view to project management. The assignment itself, i.e. the actual classification, has several aims:

- The defined project management characteristics in the form of classification dimensions define a uniform parlance which will help avoid misunderstandings between the various stakeholders in e-Government initiatives implementation.
- Differentiation of e-Government projects into different dimensions can be used in the organisations or national e-Government implementation strategy to assign priorities.
- The classification can be used to define a value (and hence comparability) to the various e-Government projects.
- The formation of dimensions makes possible a first introductory querying methodology for ascertaining suitable e-Government projects while candidates are sought for each dimension.

In the case of e-Government, it is important to have realistic notions of the effort required to make e-Government a reality. e-Government will not happen at the same pace for every agency at every level of government. The transformation to e-Government must be part of an overall strategy (Burn & Robins, 2003) and policy of government reform. In other words, e-Government should focus on strategic innovation and not simply tactical automation. This strategy must derive from a vision of e-Government that is driven from the top and reflected at all levels of the public administration. The e-Government strategy, seconded by eGTPM taxonomy, could articulate a conscious plan about how the public administration is going to change, what its goals will be, what policies it will follow to achieve these goals, and how they will be put into operation. At the same time, each public agency must develop its information technology and internal organization to assure that the new e-Government strategy will work.

In this research, a set of strategic implementation dimensions which has most likely the greatest effectiveness on the development of e-Government was proposed. According to the findings, there are

some points which can help policy-makers regarding effectively and efficiently planning of e-Government initiatives. It is worth mentioning that simultaneously considering of all these factors in the planning stage, with the appropriate investment and attention to each of them, can lead to acceleration of e-Government development in national level. Furthermore, each dimension generally has effects on other which should be considered, for instance, project type has a great effect on project size. The authors believe that proportional consideration of all these dimensions may most likely lead to successful implementation of e-Government and prevailing possible problems.

Design and Monitor of e-Government Policy

A pivotal point following a specific e-Government strategy is laying down goals and following up e-Government transformation through well-documented objectives and the systematic use of project control methods. Continued support for modernization through digitalization requires the individual digitalization initiatives to be feasible and worthwhile in the form of better service and cost reduction. eGTPM taxonomy could be used as a tool aligned with systematic project management methods prioritizing digitalization efforts and providing a close follow-up on the specific key e-Government targets. The above alignment could be achieved if the eGTPM taxonomy is integrated in the project management method/approach that is used

eGTPM taxonomy could be exploited to set country's overall e-Government operational strategy and its policy framework allowing decision makers to focus on the practical mechanisms to deliver service transformation.

Policy makers based on the selected e-Government strategy will select projects that satisfy specific dimension values. A government that decides to focus on a central e-Government infrastructure program will select projects with the following values in the dimensions: Project Type: Technical, Domain Sector: Horizontal, Administration Level: National, Beneficiary: Government/Business/Citizen. In particular, it could set overarching e-Government policy design principles; promote best practice; signpost the potential of technology; identify common design and development needs; and challenge inconsistency or deviation from the agreed path.

e-Government Strategic Profile	Service Delivery	Citizen Empowerment	Market Enhancement & Development	Exposure and Outreach	Infrastructure Consolidation and Standardization
e-Government Initiatives	Service Automation & Info Interactive Services CRM	eParticpation/ Democracy Collaboration/ Partnership	Collaboration/ Partnership Global Business Development	Global Business Development Marketing e-Government	Internal efficiencies and procurement

Table 2: Grant's and Chau e-Government strategic profiles

The proposed classification can be used for e-Government strategic purposes. Several generic strategy profiles can be supported by the help of the taxonomy depending on each government's policy. Grant's and Chau generic e-Government strategic profiles could be applied and implemented through the appropriate e-Government initiatives and projects selection based on eGTPM's proposed dimensions.

Sharing a Common Direction

The public sector is characterized by a high degree of complexity viewing the number of services for citizens and businesses, the number of employees and the amount of different administrative processes and IT support systems. This high level of complexity and the interdependencies in the public sector make it increasingly important to obtain a general overview of digitalization on the part of the public organisations. In order to ensure cohesion and be able to efficiently and effectively prioritize

digitalization efforts better more decisions should be made in binding collective efforts. Considering the same project dimensions those decisions will be based on a better overview and more thorough insight into which initiatives it will be most valuable to digitalize, and which solutions can be reused at different levels. Usually, the focus is on the e-Government project itself, applying the proposed taxonomy, projects can be distributed among the dimensions and the dimensions are interrelated and influence each other.

Reliable Project Delivery

Using eGTPM taxonomy, a more systematic planning of work on the management and control of e-Government projects could be put in place to build upon the foundations established by the national e-Government policy. Public managers will be facilitated in order to dissolve the ambiguity often confront when trying to make sense of the value their e-Government project produce (Bonina & Cordella, 2008). In particular use of the proposed taxonomy could assist in:

- The development of strengthened scrutiny and intervention in government's most important endeavours.
- Renewed support for politicians and decision makers responsible for critical e-Government projects.
- The implementation of a new process to manage better the transition from policy to practical implementation.
- Closer co-operation among the central co-ordination and managing authority and other public organisations
- A continuous improvement approach to learn and disseminate emerging best practice.

5 CONCLUSION

In this paper, we have presented and analyzed several dimensions of the e-Government projects setting a contextual framework under which public organisations and countries need to build their e-Government policy. In this paper, we have discussed the nature of e-Government project – its dimensions and related challenges. In particular, the purpose has been to provide a basis for discussing the appliance of specific e-Government management dimensions in e-Government planning. We hope it can accelerate the construction and implementation of e-Government.

The planning and implementation policy of e-Government, as it continues to develop and grow around the world, will have to focus on finding methods to address issues regarding e-Government management knowledge reuse and experiences exploitation binding IT aspects with managerial and organizational context (Poulymenakou & Holmes, 1996).

Case studies regarding e-Government projects implementation have been studied and evaluated, and a proposal for a taxonomy of e-Government projects' management aspects has been presented. Most of the literature is much focused and discusses single aspects of e-Government projects. Their analysis was very helpful for this study, since it provides a deep insight in e-Government development issues and hints for the dimensions presented here. The identified dimensions are discussed regarding their impact on e-Government project implementation or how they are affected by it. For example, they discuss the project nature and the related administration model as well as the sector type and their receiver groups.

The dimensions of e-Government project can be applied for evaluating project development practices against distributed project settings. In addition, underlying goals or values can be evaluated whether they fit or contradict. It could also improve performance showing links to the national e-Government strategic plan and organisations performance goals, avoiding duplication, managing risk, improving efficiency and achieving specific objectives. The taxonomy developed in this paper is flexible enough to be adopted by governments at different levels; federal, state, or local and by developed and developing countries around the world. Further, it realizes the importance of having an integrated plan for e-Government projects.

The taxonomy presented here can be criticized. For example, the taxonomy is based on a case study review that could be broadened – be it within the discussed areas or by consulting literature on virtual teams or project management. In addition, the selected reports do not include social or organizational theories. This might be a weakness since it makes the model probably incomplete. It might also be a strength since the dimensions are grounded in practical challenges. Further on, the correlations between the dimensions as well as single challenges should be discussed in more detail.

Therefore, further work has to be done in two areas:

- The dimensional description of e-Government projects should be verified or modified by further studies.
- The usefulness of the dimensional description should be analyzed by applying it to e-Government development methods, tools or processes.

Future work in this area could focus on integrating the identified dimensions to one comprehensive e-Government project management framework. Such a framework will enable policy makers, practitioners and researchers to point out the potential priority areas that need to be achieved first and also yield a realistic estimate of resources needed to achieve such transformation.

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