



A framework for the assessment and analysis of electronic government proposals

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Abstract

Electronic government or e-government arises as the way to integrate all Internet and computer networks potentialities into public administration. However, there are many technical, organizational and institutional elements to be considered when making a decision of this kind. These elements prevent decision makers from quickly and efficiently analyzing the critical points to approve an initiative related to e-government. This work presents basic criteria for evaluating specific projects in the context of an electronic government policy. These criteria give rise to a very simple framework that allows determining the elements that support an e-government proposal for the various alternatives in which it may appear: in relation to citizens, to the business environment, or to other government areas. This work considers the grounds for determining electronic government action performance to assess the advantages and benefits that specific proposals can provide to government and society.

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1. Introduction

The Internet has become increasingly popular in different fields due to its huge capacity. There is possibly no human activity in which its transforming effects are not perceived. Government has not

been left aside in this transformation. Under the name of electronic government, a series of efforts are grouped, which tend to introduce the Internet and computer networks into government actions. Taking into account the innumerable potentialities of the Internet and the various activities that are performed in carrying out the governmental task, we gather them by using the term e-government to mean a complex set of applications of this

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technology to the administrative, political, social, and economic government action. But e-government means more than loading information and services on the web. It implies dramatic organizational and institutional changes. Public administration counts on a general purpose technology having many possible applications, many of which have not been even thought of.

The nature of services and the governmental task require changes through Information Technology (IT). However, this transformation is slow. Whereas the private sector has quickly taken advantage of the Internet benefits to transform its value chain, government has used these potentialities more slowly. Its structure is not prepared to face the required kind of changes. Independent of the magnitude of the proposed change, there is a need for an effective government. According to studies presented by Tapscott [1], 30 years ago 76% of the Americans believed that the federal government was doing the right thing, and now this number has dropped to just 20%.

After some failures of isolated efforts, countries that have successfully applied e-government have undertaken global projects to take advantage of new technological possibilities. In this work, we attempt to focus on the assessment of specific electronic government initiatives. Due to quite distinct characteristics of problems, it is important to count on some analysis tool that, in a first approach, allows determining the viability of a proposal as regards e-government. It is intended to find a simple analysis scheme that allows determining whether the considered initiatives are suitable or not for the governmental action and determining the benefits they will provide. Due to the Internet capacity, the wide variety of applications and environments in which these initiatives take place, and the specific characteristics of public administration, it is not easy to perform this analysis [2].

In many cases it is difficult for policymakers to understand what this kind of initiatives implies, and thus it is necessary to count on certain tools to evaluate in which cases they are justified. Many of the changes cannot be considered in the current organizational and technical infrastructure, not only from the government point of view but also from the remaining partners' point of view. Differ-

ent questions arise. Is it convenient to attempt to develop a proposal? For what purpose? Which are the benefits to be attained? A simple contextual scheme is required to guide the analysis of innovations in e-government. The elements on which the governmental action is based must be determined, and we should try to consider to which extent the Internet allows modifying and redesigning them and the advantages that government and citizens can obtain from its application. Each of these elements may be judged from different points of view or assessment criteria.

It is necessary to highlight that it is quite hard to directly transfer results obtained in other environments to the case of public administration. There are social factors, organizational structures and processes, beliefs, cultures, values, norms, etc. that are completely different and this does not allow for generalizing results, for example, from e-commerce. One of the main differences consists of the legal structure of the activities in government that arises from the need of assuring the observance of the Constitution and other laws so as to assure social performance. Many of these factors are the ones that have delayed the Internet introduction into government: whereas in many environments there is an important development of internet applications (universities, private companies, etc.) government is not at similar levels yet. Somehow, government perception and incentives to take advantage of IT potentialities are different [3].

Section 2 of this work presents the basic concepts related to e-government. Section 3 describes some of the main problems brought about by IT incorporation into organizations and particularly into public administration. Section 4 takes into consideration the overall structure of an electronic government policy and the need of counting on tools for evaluating specific initiatives in this context. Section 5 presents records of similar frameworks and the basic characteristics of the approach adopted in this work. E-government dimensions and evaluation criteria are considered in Sections 6 and 7. Finally, Section 8 exemplifies some of the ordinary advantages of this kind of initiatives by using this framework.

2. Electronic government

A simple definition of electronic government is considering as such every governmental action that is based on the use of computer networks. On this basis, different types of interactions can be distinguished: G2C (Government to Citizen), G2B (Government to Business), G2G (Government to Government) and, recently, G2NGO (Government to Non-Governmental Organizations) and G2NPO (Government to Non-Profit Organizations).

There are several definitions of e-government, some of which are extremely wide. For Lenk and Traummuller [4], it can be seen as a guiding vision that includes all proposals for modernization and reorganization of public administration. In a wide interpretation of this term, many authors include projects related to e-Democracy, e-Voting, e-Assistance, e-Healthware, etc. In a more delimited definition that is developed in this work, it refers just to the administrative processes related to what is called e-Administration [5].

In other cases, we come to the concept of e-government starting from e-commerce since in both cases the same infrastructure, hardware and, sometimes, software are used. The Internet has had great influence creating e-services. Boyer et al. [6] define them as “comprising all interactive services that are delivered on the Internet using advanced telecommunications, information and multimedia technologies”. E-services are a unique opportunity to transform the government strategy by developing new services. Perhaps, the main source of relationships in this case comes from e-commerce success, which has led to studying the way to attain similar outcomes in public administration [7]. Somehow, e-commerce has been a kind of inspiration and has provided a successful integral vision on the use of IT. Nevertheless, there are significant differences between public and private sectors that should be taken into consideration. First of all, there are no market forces that condition e-commerce. It is not possible to view public administration as an agency delivering services [3]. For Boyer et al. [6], a key element to justify e-commerce projects is the relationship between customer loyalty and retention with prof-

itability. These criteria cannot be easily applied in the case of e-government.

It may be concluded that the generic and broad term e-government includes many various problems ranging from technical aspects to a series of organizational and management problems: implementation, organizational change and behavior, bureaucracy, etc. It is an environment that is not completely defined from the academic point of view and that has been attacked both from the theoretical point of view by specialists in political sciences, sociology and economics, and from the practical point of view by disciplines such as public politics and management, organizational behavior, etc. [8]. With the same point of view, Wimmer [9] presents a holistic approach where these different perspectives are integrated. Distinct levels of abstraction are analyzed, considering mutual interdependencies between them.

3. Difficulties in introducing IT into public administration and e-government

Many authors ([10,11], etc.) analyze what is related to the productivity paradox that is debated in the private sector. This paradox derives from the fact that in spite of the important investments in Information Technology (IT), there are no significant advances in the outcomes attained by companies. After analyzing an important number of cases, a clear conclusion is reached: for a general purpose technology to be successful in its application, it is necessary to redefine the organizational and operative context that contains it, thus, generating a new work system. Therefore, big organizational investments and efforts are required to attain successful results [12]. In the private sector there are quite controversial results as regards e-services [6]. However, this analysis has not been carried out yet with the same intensity in the public sector.

The Internet provides the technical basis to connect and relate computers in different areas. But, having the Internet is not just enough for public offices to be connected to society. There should be institutional and organizational support that allows for integrated processes, practices, and

cultures based on a system of rules that guide the performance of public departments, also affecting the remaining partners. Fountain [8] finds that many of the innovative uses of IT in government take place in superficial aspects of operations and processes, which are easily accepted and modified taking into account that they leave the organizational structure intact. In general, first applications of a new technology tend to reinforce the current situation so as to improve efficiency but without aiming at qualitative improvements, focusing mainly on task automation. Deeper changes generate greater resistance, although they probably imply more significant achievements.

We ought to start with the understanding of the implications of using IT in public administration. Most governments have not been ready to take advantage of the Internet potentialities or they have managed to do so but too slowly mainly due to their own structure, management style, and type of leadership. Undoubtedly, we are facing a question that has previously existed with other IT elements and in other environments. The policymaker needs to evaluate whether it is appropriate to carry out the arising proposals, taking into consideration their limitations and difficulties from the technical, organizational and institutional points of view. Here, the institutional dimension is incorporated because it plays a powerful role. It constrains the extent and shape of innovations in government. Consequently, it is necessary to carry out an adequate treatment of the relationship between IT and the organization, but also, as it will be seen later on, in the case of government there also exists the institutional perspective, which can prove to be significant [8,13].

For the e-government, the key is the development of a global project, which is a road taken by developed countries, members of the European Commission, the USA, Australia, some Asiatic states, etc. ([3,8,9,14,15], etc.). Government must pose a great transformation taking into account the arising organizational, institutional and cultural difficulties and the required resources and infrastructure, Internet Spreading, etc. [16–18]. Nowadays, it is noted that in many of the first attempts to implement e-government, there is no policy to guide its development, specially when

dealing with projects relating different agencies or functions. A series of errors is brought about by the lack of adequate guidance and best practices [19]. In addition, a high rate of failures is also noted [20]. Seavey [21] poses the problem that arises at the first stages with many agencies that simply put up a Web page without an evident specific objective.

4. An environment for electronic government development

Although in many cases we can detect examples of a shift from traditional activities of public administration to the Web, which have basically reproduced the previous way of working, this is the road that more developed states have left aside. In the framework of a project related to the Information Society, eEurope, the states of the European Commission have generated a basic structure for developing e-government. The various initiatives of the member states are inserted in this core [22]. Devadoss et al. [15] pose a similar situation for the case of Singapore: an infrastructure that has enabled the development of about 1000 projects of e-government. That work highlights the importance of counting on an e-government structure so as to generate the necessary transformation policies, allocate resources, select projects, etc. In 1993, The United States launched its National Performance Review (NPR) Program in order to “create a government that works better and costs less”. By 1998, it had even changed its name for National Partnership for Reinventing Government, which is a more suitable name for the idea of generating a new kind of government [8].

Wimmer [9] describes the work scheme of Fig. 1. At a first level, e-government is a vision, a concept that must be specified in terms of a society development. Taking this vision into account, at the strategic level it is necessary to make the decisions that allow this vision to become real. This includes the development of an appropriate e-government architecture, mainly through IT incorporation, legal update, resolution of general implementation problems (security, etc.), digital

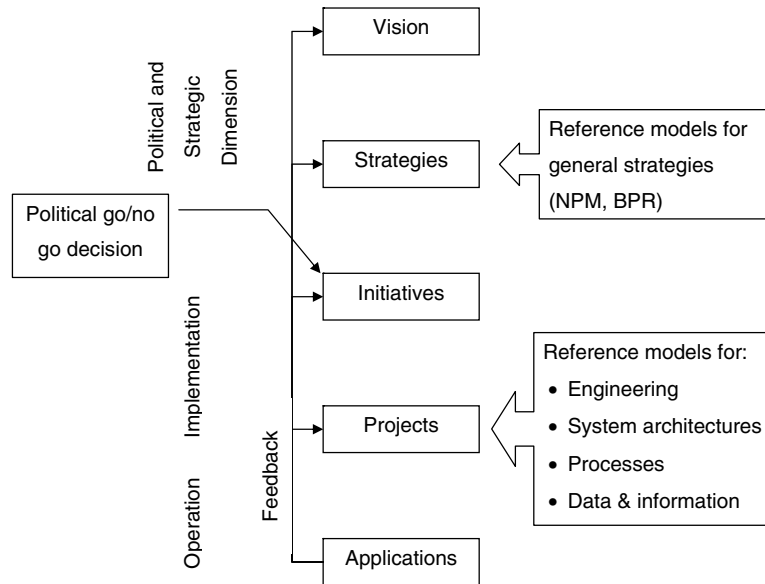


Fig. 1. E-government application layers [9].

breach, definition of the characteristics of the services to be provided, front office/back office architecture, etc. [23].

Following the approach by Wimmer [9], we get to the level at which the framework presented in this article is applied. Once an appropriate infrastructure is ready for the development of e-government, it is necessary to start generating and selecting concrete initiatives. On the one hand, there are human and material resources that must be allocated so as to implement the strategy and make the vision real. At this stage, a critical point is to be able to select the suitable proposals, correctly valuing the advantages and benefits they can provide.

Undoubtedly, at first many agencies will intend to participate and receive resources to reach this end. This is what has happened in several environments with valueless projects that reproduced the current management of the agency by means of simple and static Web sites and that have not transformed governmental action to the extent intended for this kind of initiatives. In many cases, the existing difficulties for integrating agencies have led to defining e-government projects with a

narrow perspective that reduces the impact of the results to be reached. Providing the service without letting citizens recognize which department is participating of its service manipulation is a strong constraint since it makes it compulsory to work on business processes. Organizational, cultural, and legal difficulties arise [24]. Therefore, each proposal should be evaluated to decide on its execution depending on the outcomes it generates. So, there should be a simple and solid base to face this kind of matters.

Then, we come to the project stage at which the approved initiative is implemented. Finally, at the application level, government services are provided through the Web.

Previous steps must be followed before developing specific e-government applications. Particular elements of e-government strengthen an approach like the one above described [25]:

- Government management is structured on the various levels that constitute public administration.
- There is a close relationship in applications between public, private and non-profit sectors.

Then, it is necessary to count on a multi-level cross-sectors program, on which concrete projects are structured. In this way, there can be a better appreciation and understanding of the benefits and results provided by each initiative.

Although with broader objectives than the ones pursued in this work, Heeks [26] describes the contents of a National e-Governance Initiative, which contains similar steps to those proposed by Wimmer [9] at the strategic level. After developing all required elements, e-readiness is achieved. This implies a situation in which barriers have been reduced or have disappeared, and all those elements that favor project development have become stronger. This implies a great deal of effort. It is only at Stage 4 of this proposal, “Building e-Governance Pilot Projects”, that identifying and implementing appropriate proposals is required [26].

5. A framework to assess e-government initiatives

Frameworks are useful because they allow us to organize and integrate the various elements of a problem in a simple and consistent way, assuring the attainment of the pursued outcomes. In addition, they allow holding a common work discipline. The benefits of counting on this kind of frameworks exceed the reached objectives. The framework development process and the associated discussion among participants provide fundamental contributions for e-government initiatives. There are numerous examples of frameworks used for similar purposes to the ones contemplated in this work.

By means of several examples, Boyer et al. [6] highlight the value of counting on frameworks for developing an e-services strategy in the private sector, so as to enable a more grounded and rigorous development. In general, services development remains among the least studied and understood topics in the service management literature [27]. These frameworks allow for determining the grounds and benefits to be expected from a project in its key aspects. A better conceptualization of these elements for the case of public administration will allow for a reduction of the design-reality

gaps considered by Heeks [20] as the main source of failures in e-government projects. The application of this kind of frameworks to specific projects aims at correcting a usual error that leads to failures: to adopt successful solutions of other countries. Heeks [20] describes these situations as country context gaps.

As regards the private sector, Riggins [28] presents a basic framework for analyzing electronic commerce initiatives. It states that firms compete through five dimensions of electronic commerce: they use several ways of *interaction* to settle relationships with their customers, they compete over *time* and *distance* to provide customers with *products* using a *relationships* chain. Riggins (1998) poses that each new investment in information technology can be assessed according to three different criteria: *efficiency*, *effectiveness* and *strategic benefits*. By considering competition dimensions and the assessment criteria, he obtains a grid to assess electronic commerce proposals [28].

In the case of public administration, Pardo et al. [2] present several tools for designing gateways. On the scale of Fig. 1, their work can be placed on a level between Initiatives and Projects. Therefore, it belongs to a lower level than the one presented in this article, since it implies a higher level of detail in the proposal. However, many of the employed documents and tools could be extremely interesting supporting elements.

The guide provided by Pardo et al. [2] is strongly user- and usage-focused. It starts with a Preliminary Program Description that settles the basis for the analysis that follows, including issues such as the purpose of the application, the expected users, laws, regulations or court decisions governing the use of information, etc. Then, the Assessment Tool evaluates 15 different dimensions of the proposal. Eight of these dimensions correspond to users, uses, suppliers, and contents and the remaining seven dimensions consider matters related to the access program and organizational context. Thus, a gross description of the proposal is obtained (a rough “big picture”). On this basis, the Program Design Tool provides assistance in the analysis of the interactions and interrelationships between the assessed dimensions, previously identifying probable benefits of a particular

Table 1
Value grid of electronic government initiatives

Performance criteria	Electronic government dimensions				
	Product	Time	Distance	Interaction	Procedures
Efficiency					
Effectiveness					
Strategic benefits					
Transparency and institutional value					

program. Three categories of general benefits are considered: cheaper, faster and better. *Cheaper* aims at reducing consumed resources through the new services. *Faster* deals with reducing the time required to provide services, streamlining internal processes. Finally, *better* refers to improved performance, which is reflected in measures such as availability, accessibility, greater use of services, etc. Planners can specify key services to be offered, guiding policies, legal requirements, technologies to be used, etc. As a result, a basic and modest design can be presented. Here, the methodology is near Project level in the model of Fig. 1. Following, in the same level, the Cost Estimation Tool uses this basic design to estimate and identify the various costs related to the project.

Lenk and Traunmuller [4] present four perspectives to understand e-government:

1. the addressee's perspective;
2. the process perspective;
3. the cooperation perspective;
4. the knowledge perspective.

In the first case, citizen/business interface is prominent. People can be reached everywhere and processes can be started from anywhere and anytime. Emphasis is placed on a scheme for providing new administrative services. The process perspective aims at redesigning organizations. As regards the third perspective, cooperation, its object consists of supporting collaborative decision making. This leads to tele-cooperation, where work is computer-supported, thus integrating people's activities inside and outside public administration. Finally, the knowledge perspective manages distributed domain knowledge; for example "information gathering, its transformation into

knowledge, availability and (re-)use of this knowledge as well as the regulatory framework in which all this takes place".

Devadoss et al. [15] present a framework to analyze projects for e-government. Based on the structurational analysis, it is applied to projects in order to specially consider social structure and human action in the context of this kind of undertakings.

Table 1 shows the grid on which the framework proposed in this work is based. The most relevant aspects of the quoted examples ([2,4,28], etc.) have been analyzed and included. Emphasis has been also placed on those aspects that are best adjusted to the level of assessment we are working with. On the one hand, it is assumed that there are previous steps in which general matters related to e-government development in public administration have been solved. On the other hand, a scheme that goes deep into details is inadequate for the involved detail level. The policymaker needs to think carefully, but at the same time in a simple way, about the benefits provided by each initiative.

Those dimensions that characterize e-government action have been included in the rows of Table 1: product, time, distance, interaction and procedures. Columns state the criteria for evaluating these elements: efficiency, effectiveness, strategic benefits, and transparency and institutional value. These dimensions and criteria are discussed in detail for the case of e-government in Points 6 and 7.

6. Elements of electronic government

For the purpose of analyzing whether an electronic government proposal is suitable, it is conve-

nient to start by identifying those elements that define the e-government action and constitute the essence of using computer networks in public administration tasks. We can recognize that four of the dimensions posed by Riggins [28] can be used in this framework: product, time, distance and interaction, and a fifth dimension is added: procedures [28].

First of all, there is the idea of *product*. Considering this concept in a broad sense, government provides products or services directed to citizens (G2C), to the business environment (G2B), and to other governmental levels (G2G). Undoubtedly, the possibilities provided by the Internet and computer networks allow redefining the features and the scope of public products, and developing new services. For example, if we think of the services required by a company to set up a new business, new services can be generated through the Web site of the governmental office in charge, thus incorporating training and advising that encompass the whole problem. A Web site, according to its capacity for integrating activities from different already existing offices (tax issues, environmental protection, security, legislation, transport, small and medium size businesses, etc.), provides new services, generating a strong synergy. A similar example of an NPR initiative has been presented for the case of international trade [8].

Another element is *time*. The Internet communicates instantaneously. The possibility of connecting and relating the different partners of the communication process in real time allows altering and modifying work procedures. The possibility of obtaining available information by government enables a reduction in the time required to complete a procedure. The features of the services provided by government change totally if they are thought of as on a 24 h a day basis. Any consult made to a Web site has an impact on time and the need for displacement so as to obtain the information.

As regards *distance*, the Internet communicates globally. Government develops its action on a geographical environment that is determined a priori by the political organization of the nation, state, etc. Unlike electronic commerce that provides advantages from the possibility of expanding mar-

kets using the Internet, in the case of government this dimension is legally pre-determined. However, on generally large territories and with a scattered population, it is intended to access to each individual and company. Distance among government organisms and the remaining partners implies going to different places to complete distinct procedures or expenses for sending the required documentation. The development of the one-stop concept removes the agencies' boundaries since citizens do not need to know the frontiers of organizations on which the workflow is executed. To start with, a citizen that has no access to the Internet is limited in gathering information from government. If we pay attention to operations involving different government levels, communication is needed to homogenize procedures. Getting a driving license in municipal offices implies meeting provincial and national norms. Modifications made to norms generate a high cost for administration and the doubt about whether they have been completely incorporated. The possibility of accessing a site containing the corresponding regulation and forms makes decentralized offices operation easier. This advantage is also transferred to the citizens following that procedure. There is homogeneity in the regulation application. The contact with remote specialists is improved.

The three aforementioned dimensions are related among one another in the addressee's perspective presented by Lenk and Traummuller [4]. For example, now it is possible to deliver off-site highly personalized services on a 24 h a day basis. This is done over the three dimensions simultaneously [29].

As regards *interaction* between government and the other partners, it is a key element for the possibilities of success of e-government. Modern technology provides the means for collaboration and cooperation of government with citizens, businesses, and governments themselves. The possibility of developing new links between government and the other partners allows supporting new services development, the existing procedures improvement, etc. A new political concept is mainly supported as regards government action performance in a customer-oriented approach.

If we analyze the interaction between government, citizens, and companies, we find out that it is too limited since communication between them deals just with generic elements. Government lacked or had few means of gathering specific information about each user, and, according to that information, settles specific links with either a particular partner or a group of partners. A new generation of personalized push services can be developed [5,9]. From different points of view, a new kind of interaction between government and the business sector can be generated where advantages do not consist of saving costs but developing new relationships and partnerships.

Evans and Wurster [30] consider that traditional trade-off between richness (including bandwidth, customization and interactivity) and reach of information has disappeared. By changing communication among actors, new relationships are generated among them. This New Economics of Information affects not only the interaction dimension but also the remaining ones considered in this work.

In the case of citizens, their participation at a governmental level is rather reduced, and in many cases is limited to voting. The possibility of expressing their opinion is too limited for ordinary citizens. Electronic Government stresses active participation of citizens and customers. For example, taking part in forums and thus the possibility of making proposals is a way of enhancing citizens' contribution. In the case of government, it allows counting on a means of communicating with users with a "unique" link since the message it receives is specific to the user's situation, which allows for push e-services. For example, in the case of a property tax, government settles a communication with a message that suits the amount of paid contributions of a tax or obligation, updating index, specific expiration date, installment plan for existing debts, special decrees imposed on each property, etc.

Finally, in the case of relationships among different governments, previous concepts are expanded. We can speak of a forum of municipal governments that participate of a provincial budget discussion or of issues related to provincial funds co-participation. It also allows a higher-level

government to gather information and easily develop specific plans according to the needs of each lower-level government unit. Another example present an Internet-based collaboration writing tool for developing documents among the various government groups [31].

The value of the interaction dimension is so significant that Heeks [26] proposes to speak of "i-governance" – integrated governance – instead of the usual term e-governance, which is more technology-oriented. In the same direction, van Engers et al. [32] state that the change in the relationship between government and its stakeholders is so significant that this new form of communicating and interacting is the real difference between traditional government and e-government.

The Internet has a deep effect on work *procedures* due to the possibility of modifying the information flow and work flow through Business Process Reengineering. In the same line, Lenk and Traummuller [4] pose the process perspective. Paper-based work can be replaced by Web-based work, with the incentive that the work will not be carried out in the same way and important improvements can be achieved. Work processes redesign, first posed as Reengineering [33,34], finds the Internet as a very powerful enabler. The definition of new procedures, which breaks down barriers among functional areas, allows reducing the use of the various involved resources, achieving a better service for customers and, in many cases, showing performed actions, which also leads to a gain in transparency. By using the Internet, the existing procedure costs can be reduced (e.g., getting and filling a form) but new procedures are also generated (consults made to virtual offices that conform the knowledge of many physical agencies).

One of the most outstanding characteristics of the Internet is that it enables and encourages the match between products and process characteristics, simplifying the road towards mass customization. Here, two of the dimensions have been related. For the purpose of providing an example of the relationship between interaction and procedures dimensions, Devadoss et al. [15] describe how the electronic procurement system GeBIZ spans all the ministries and statutory boards in

Singapore, totalling 150 in all. Each one has to streamline its procurement system and procedures to operate with GeBIZ.

These previously mentioned points can be summarized in a proposal of integrated one-stop government [5,9]. In this option, there is only one point to access the various electronic services provided by public administration. It is intended to structure public services according to specific citizens' life-events and business situations. So, new *products* are generated, which must satisfy users' demand for flexible access, without *time* and *distance* restrictions. Thus, a new type of *interaction* with citizens and business and public administration themselves is defined. This kind of project requires the integration of the usually fragmented government agencies so as to create suitable *procedures* for the new business processes.

7. Criteria for assessing e-government projects

Each of the aforementioned dimensions of electronic government can be evaluated from different points of view. Each initiative can be valuable for different reasons. By analyzing each proposal, we can determine different criteria to consider the value contained in government management. Riggins [28] poses three criteria for electronic commerce: efficiency, effectiveness and strategic benefits, which are still valid for electronic government, though on other grounds. However, it is appropriate to add a fourth criterion: contribution to transparency and institutional order, which is valid in relation to the kind of action deployed by government. Somehow, these criteria are included in the definition presented by Tambouris et al. [7]: e-government is the application of information and communications technology (ICT) to transform the efficiency, effectiveness, transparency and accountability of informational and transactional exchanges within government, between government and government agencies at federal, municipal and local levels, citizens and businesses, and to empower citizens through access and use of information.

Taking into account that the analysis being used is similar to that employed for e-commerce,

it is convenient to distinguish why the situation is different in each case for electronic government, and, at the same time, to justify why these criteria are valid for this work. First of all, it is necessary to bear in mind that, unlike electronic commerce, in this case there is no need for direct utilities for the state. Many electronic commerce proposals are favorably evaluated by the possibility of obtaining new or greater benefits since they are developed in a competitive environment. Even proposals that do not present a direct profit are based on more subtle commercial matters (create customers loyalty, impose a trademark, etc.) that will provide benefits in the future. In the case of e-government, we cannot speak of benefits that arise from a competitive environment because there are many issues of public interest. Although many proposals will be accounted for by a better use of public resources, a fundamental value is service for citizens. In many cases, there will be proposals that demand a greater expenditure from the state and that will be completely justified by the benefits brought to society as a whole. The possibility of making government action performance more transparent, informing of the participating government officials, their activities, the involved resources, etc. can be a key element for citizens to feel that they can have real control on government. Many initiatives related to deleting corrupt actions are grounded on greater publicity of government actions, which was unthinkable with the tools that were available before the Internet. Therefore, these criteria will be posed from the government point of view and from the point of view of the receptors of the government action.

In the case of *efficiency*, the first objective posed by the introduction of information technology has been the search for efficiency. Applications that tend to automate offices operations have been useful to reduce the use of material and human resources in performing various tasks. The first notion that arises around computer networks is that they drastically reduce connection costs. In the case of government, every initiative that allows users, contributors or citizens to present documentation through electronic forms reduces data input costs and simplifies their processing. This efficiency is attained both from the public administration

point of view and from the citizen point of view. The possibility of carrying out a procedure over an assistance electronic point, gathering the information needed to take an administrative step, reduces the time required by a citizen to complete an administrative process. Also, the administrative costs required to process these transactions are decreased. Many results from e-government refer to efficiency. For example, we obtain 50% savings in the cost of processing documents by shifting from papers to the Web [8]. All successful results obtained from B2B can be generalized for G2B, even though its implementation in government requires important organizational changes for a complete exploitation of this mechanism.

As regards *effectiveness*, it is intended to attain the pursued goals and objectives. A key element in incorporating IT is that decisions must be made with updated information that is available at any-time and anywhere. This applies to the case of government, in which government officials can adjust offices' functioning to meet their objectives more effectively. It is also valid for getting to know the environment response to distinct proposals. A legislator can guarantee a better law adjusted to the requirements of society by being aware of its needs expressed in Internet forums. But also, from the society point of view, a better performance can be obtained using available government information. Many companies become more effective when accessing to updated information provided by government on economic indicators, future government investments projects, agreements developed with other countries, credit or encouragement lines of various activities, etc. Citizens can achieve a greater development of their capabilities through the possibility of being aware of how government action affects them. If a government site can be accessed to know the timetable to carry out a procedure, requirements, etc., citizens will be able to fulfill their duties more effectively.

As regards *strategic benefits*, e-government does not aim only at developing projects to provide services. At a previous step, it implies carrying out political decisions and a government strategy that meets certain objectives in particular. In this framework, new forms of government must be taken into consideration [8]. The application of IT to

government combines policy goals, organizational processes, and technology that work in an integrated way to achieve public goals. Furthermore, IT has enabled the development of new functions, services and activities that had not been previously contemplated. Perhaps it is in this sense that the bureaucratic government structure has been more greatly shocked. Various reasons have obstructed a faster growth for these initiatives, but the need for "reinventing government" requires re-thinking which are the government functions and how it performs them. New forms of participation and collaboration can be defined, which change the essence of the activities assumed by public administration. Unlike what happens with electronic commerce, here we cannot talk about opening new markets or expanding the existing ones, nor taking advantage over competitors, but we must consider generating the services and activities that strengthen the government action.

For example, the development of the economic sector is often related to the generation of partnership among companies of similar or complementary sectors. The availability of a site on the Internet with suitable characteristics may be the catalyzing element that enables the development of encouraging policies in this sense. Providing services on a 7 days \times 24 h – assistance basis and without geographical restrictions allows generating a new conception of services. Pardo et al. [2] present a list of illustrative benefits under the better performance criterion that can be applied to the strategic category.

Transparency and institutional value is a new criterion adopted in this work. Many of the actions that can be performed through electronic government do not provide results that can be considered as strategic benefits or related to efficiency or effectiveness, but they are truly positive for both government and society. Knowing the expenditures made with the contributors' funds allows for growing transparency and accountability in public management, which is a socially valuable element. In many cases, government used to have information available but it could not be easily accessed by citizens. The large size of the region and the great number of citizens included in government management made it impossible for many proposals,

resolutions, etc. to be known in detail. However, by simply publishing them on the Internet, the situation changes and becomes an extremely positive aspect of many efforts related to e-government.

Taking into account that e-government is a new form of communication between public administration and its environment, one of the first results is law enforcement, just as it is described in POWER project [35].

Here, we should also consider the role of legal aspects. Implementation of new procedures is affected by the ruling legislation. Many proposals must be previously analyzed in relation to their interpretation from a legal perspective. Many existing norms in the current bureaucratic organization act as constraints to the implementation of new alternatives for functioning. From another point of view, an adequate legal structure can be the basis or support for developing electronic government. One of the basic differences between electronic government and e-commerce is a high degree of legal structuring of administrative work [4]. This arises from the characteristics of government activities.

Government must satisfy a complex set of goals. It has no competitors. It must balance strengths from distinct social actors. For this purpose, government bases its action on norms that ensure the attainment of its objectives without excesses. The legislative capacity of government is the binding factor in social performance. Its distinguishable activity is the creation and execution of bodies of law. This strengthens the administrative structure to assure transparency [4]. So, the institutional perspective generates restrictions on government performance. These restrictions are different from those obeyed by another kind of organizations.

Fountain [8] makes a distinction between organizations and institutions. Organizations are technical instruments in which products are created and services are provided and these are exchanged in the market. In this case, benefits are based on efficiency, effectiveness and control of the work process. Contrarily, institutions generate rules and requirements that partners and organizations must meet if they are to receive support and be considered as legitimate in their environment. In

this case, fulfillment of normative requirements is awarded if these requirements are appropriate and adjusted to the legal ordering in force. Procedures, presentations and symbols, etc. are specially considered.

From the previous definitions, it is deduced that public agencies performance has strong elements from both sources and must function adequately under both environments' norms. Undoubtedly, this reinforces the bureaucratic structure adopted by government. It is clear that institutional aspects are valued in different ways by public and private sectors and that their effects range from specific tasks performance to conformation of the state as such.

While different studies conclude that IT effects on the organizational structure have not been completely understood ([10–12], etc.), if we pay attention to institutional aspects, we notice that the academic analysis is even much smaller. The Internet fits in this logic, and its functionalities have strong effects on the institutional order that should be more deeply analyzed and understood. Consequently, the Internet effects on government from the institutional perspective are often unpredictable, and it is necessary to evaluate positive and negative aspects of new initiatives.

8. Examples

Table 1 shows the grid used for the assessment of e-government proposals. It is the core of this work since it allows easily evaluating the reasons for which projects may be encouraged or rejected. This grid can be analyzed both from the government perspective and from the point of view of those partners involved in the activity; citizens, business and government itself.

Several examples present the most usual and common reasons that justify e-government initiatives. Tables 2–6 are generated for the five dimensions defined in this work. The government and partner's points of view are both considered. Taking into account that e-government is an approach which combines internal and external considerations, both perspectives must be considered with this grid. So, performance criteria have to be

Table 2
Examples for the product dimension

Performance criteria	Product
Efficiency	Low cost access to information and knowledge
Effectiveness	Improved quality of the legislation Enhanced communication capacity Services adjusted to citizens needs Easier knowledge and understanding of the legislation in force
Strategic benefits	Reaction to citizens' needs Consolidated services. Gateways. One-stop Push e-services Creation of new and innovative e-services
Transparency and institutional value	Updated on-line information Greater credibility in institutions Improved institutional image

Table 3
Examples for the time dimension

Performance criteria	Time
Efficiency	Reduction of the time required to follow administrative steps Shorten time-to market of legislation Reduced time to access and obtain information
Effectiveness	Available information on a 7 days × 24 h basis Enhanced support for citizen/business activities Control of the process anytime
Strategic benefits	7 days × 24 h operation
Transparency and institutional value	Constant control of actions Inspection of public services

assessed from the citizens', business and government perspectives too, considering the needs of all the addressees' and stakeholders' requirements.

The two previous points describe concrete examples of both dimensions and performance measures. Following, some cases in the literature are presented so as to show how all these elements are critical in specific proposals of the different types of e-government in various environments.

Table 4
Examples for the distance dimension

Performance criteria	Distance
Efficiency	There is no need for accessing to offices Improved answers to questions Control of processes anywhere Reduced distribution and delivery costs, etc.
Effectiveness	Standardize activities performed by disperse agencies Improved formation and training More frequent and better communication
Strategic benefits	Government action over far regions Hybrid centralization/ decentralization schemes
Transparency and institutional value	Government tracking from any place

Table 5
Examples for the interaction dimension

Performance criteria	Interaction
Efficiency	Reduced communication costs
Effectiveness	Generation of suitable relationships to each sector needs Enhanced accessibility to legislation Decisions based on several information sources
Strategic benefits	Closer relationships among partners New communication and operation channels Generation of new links and networks: alliances, communities, etc. More information available to users Obtain a deeper knowledge of citizens/business needs Development of human resources
Transparency and institutional value	More active participation in all government actions. Breakdown of discrimination barriers Law enforcement

Steayert (2004) measures performance of different "citizen-centered" services, which is G2C. From his analysis, several advantages that citizens get by visiting to various web sites of the USA gov-

Table 6
Examples for the procedures dimension

Performance criteria	Procedures
Efficiency	Better use of resources Redesign of the process with higher performance Avoidance of inconsistencies and anomalies Processes streamlining
Effectiveness	Better decision making based on reliable information Reduced workflow fragmentation
Strategic benefits	Indirect strengthening of aspects such as governance, image, etc. Increased use of e-services
Transparency and institutional value	Breakdown of barriers to participation Better control and tracking

ernment can be determined. For example, in the case of the National Institute of Health (NIH), benefits for visitors are noticed as regards high effectivity in getting answers for their queries. This is achieved by means of powerful search engines and customized information by topic. In this way, the posed advantages are attained in relation to the new information economy, as regards the relationship between scope and richness of the information [30]. A high percentage of visitors had a better understanding of their condition and treatment after visiting the NIH site [36].

As regards results related to efficiency, the case of the Internal Revenue Service (IRS) in USA is quite significant. The “one-stop” concept allows improving the velocity in accomplishing various transactions, avoiding movements and waste of time by means of the page download and electronic filing [36].

In the case of G2G, Joia [37] presents interesting results over two examples in Brazil. Even though e-government is presented as a powerful strategic weapon and as an opportunity to reformulate the proceeding being used, the described examples do not wholly match these complex objectives. The first case deals with a project between the Brazilian Central Bank and the Brazilian Federal Senate. Its object was to make the

Senate, which acts as a controlling organism, verify the Central Bank proceedings. Very strong limitations related to data accessibility and problems related to senators’ training prevented the achievement of the pursued goals. In the second case, a link between the Brazilian Central Bank and the Brazilian Justice Department was established. The object of this project was to facilitate the application of judges’ resolutions on freeze or liberate bank accounts, declare the bankruptcy of a company, request financial information, etc. Work was aimed at streamlining the working process. The greatest benefits at this first stage are given by achieving greater efficiency and responsiveness at reduced cost. However, at this first stage, we are far from reaching the initially pursued strategic results.

As it was mentioned, in the case of government, a highlighted criterion is the institutional one. In this aspect, Quinn (2003) performs an interesting analysis about the value of the information policy in the 21st Century for the case of the USA government. Free and ready access to information through a new means, the Internet, has a huge power over democratic values that should be adequately managed [38].

For G2B, Liao et al. [39] present an example of an e-procurement system of the Taiwanese government. Their work describes in detail the followed steps to implement The Electronic Tender Obtaining and Submitting System. It is interesting to highlight the analysis these authors perform over the advantages of this proposal. First of all, this system benefits both government bodies and vendors. As regards efficiency, savings obtained by both parties are detailed. With this system, vendors can download tender forms through the Internet, avoiding paperwork and associated problems, facilitating the tender document preparation with less labor and resources. This electronic government procurement system is also transparent, non-discriminating, and accountable, preventing bid collusion, whose results are also considered in our framework. For the purpose of reaching these benefits, this work analyzes the various dimensions described in our framework, highlighting the need for reengineering internal procurement processes.

9. Conclusions

This work presents a framework for evaluating e-government initiatives. Firstly, this framework is placed in the context of general electronic government projects, which is a road that has proved to be the right one to achieve success. In this way, it is assumed that a series of decisions on the strategic level have been previously made. In the same way, it is assumed that after using the proposed framework, a series of operative tools should be applied for the execution of those initiatives that have been successfully evaluated. The object of the framework is to provide both a simple and solid scheme that allows the policymaker to evaluate the validity of the initiatives presented in the framework of an electronic government policy. It is supposed that many proposals should be considered and before delving into the specific details of their execution, benefits and advantages generated by each proposal must be analyzed. For that purpose, we work on five dimensions that characterize these proposals: product, time, distance, interaction and procedures. Each of them can be evaluated by using four different criteria: efficiency, effectiveness, strategic benefits, and transparency and institutional value. Furthermore, each dimension–criterion relationship must be considered not only from the government perspective, but also from the point of view of partners in the government action: citizen, business, government itself. Using these simple elements, it is possible to consider each project characteristics so as to evaluate its viability and the real contribution it makes to government development.

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