

E-GOVERNMENT EVALUATION FACTORS: CITIZEN'S PERSPECTIVE

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Abstract

The e-government field is growing to a considerable size, both in its contents and position with respect to other research fields. The government to citizen segment of e-government is taking the lead in terms of its importance and size.

Like the evaluation of all other information systems initiatives, the evaluation of e-governments in both theory and practice has proved to be important but complex. The complexity of evaluation is mostly due to the multiple perspectives involved, the difficulties of quantifying benefits, and the social and technical context of use. The importance of e-government evaluation is due to the enormous investment of governments on delivering e-government services, and to the considerable pace of growing in the e-government field. However, despite the importance of the evaluation of e-government services, literature shows that e-government evaluation is still an immature area in terms of development and management.

This work is part of a research effort that aims to develop a holistic evaluation framework for e-government systems. The main aim of this paper is to investigate the citizen' perspective in evaluating e-government services, and present a set of evaluating factors that influence citizens' utilization of e-government services. These evaluation factors can serve as part of an e-government evaluation framework. Moreover, the evaluation factors can also be used as means of providing valuable feedback for the planning of future e-government initiatives.

Keywords: *E-government, Citizen's Perspective, E-government evaluation, Evaluation framework, Evaluation factors.*

1. Background

One of the broad and widely accepted definitions of information systems evaluation in the literature (Doherty and King 2004, Walter and Spitta 2004, Willcocks, 1992) is the process of establishing by quantitative and/or qualitative methods the worth or value of the information system.

Considering the elements highlighted in this definition, and the fact that information system evaluation involves a large number of stakeholders, each with their own particular values and objectives, the required evaluation framework should incorporate a number of

elements which are closely interrelated, and are determined in practice by the demands of the situation. These elements are:

1. The subject: What is being evaluated?
2. The Process: How to get accurate results.
3. The method: What are the methodologies and tools used?
4. The stakeholders: Who are the key players?
5. The evaluation factors investigated: What are the key issues which should be considered for the evaluation.

Most of the research in the area of information systems evaluation indicates that it is a complicated and difficult subject (Serafeimidis and Smithson, 2000; Jones and Hughes, 2001). Symons and Walsham (1988) argue that this complexity is due to the multiple perspectives involved, and the difficulties of quantifying benefits. Willcocks (1992) added that the difficulties and the complexity of information systems evaluation has changed, and is becoming more and more complex nowadays. This is because the nature of information systems investments has changed both in terms of technological capability and the benefits they can deliver as well as in terms of diffusion in most aspects of society.

The debate between researchers is not only about the complexity of information systems evaluation, but also about the most appropriate evaluation approach to be used for specific information systems. One sign of the debate is the many IS evaluation approaches developed to represent different interpretations of IS evaluation. Farbey et al. (1993) classified a number of IS evaluation approaches which included quantitative methods that used tangible or direct costs and benefits, and qualitative methods that accounted for intangible or indirect cost and benefits, from the organisational and human perspective.

Some researchers argue that the suitability of an evaluation approach depends mainly on the information system and the organizational context. For example, Khalifa et al. (1999) stated that there is no single IS evaluation approach that can be applied to all situations. Farbey et al. (1993) added that IS evaluation can contribute to the success of the information system when the appropriate approach is applied to the appropriate organisational context.

On the other hand, the evaluation of e-government, being an IS sub-area, has proved to be even more complex, as an accurate evaluation requires consideration of multiple perspectives of the stakeholders and the social and technical context of use. To overcome the complexity and difficulty of e-government evaluation, it is necessary to address and consider the main challenges for developing an evaluation framework for e-government systems.

The first challenge in evaluating e-government is the investigation of various perspectives (Jansen, 2005), which may not only require addressing and meeting the general needs of a target group such as citizens, but also require the inclusion of specific needs of the specific target groups of citizens that are using a particular e-government service, such as the unemployed, families, pensioners, architects, lawyers, students, etc.

The second challenge in evaluating e-government is in identifying and quantifying benefits. Beynon-Davies, (2005) stated that it is difficult to determine the precise benefits associated with e-government. In practice, as e-government initiatives are different in their goals and objectives, the benefits gained by these initiatives will be different as well, and the assessment of these benefits also vary according to the different perspectives of the stakeholders for the value of these benefits.

The third challenge in evaluating e-government is the fact that in order for the evaluation to be proper, it should consider the social and technical context of use. This is a result of the opinion that information systems research and the e-government evaluation as a part of it, is as much a social science as an information systems science (Mingers, and Stowell, 1997).

This work is part of a research study that aims to develop and assess a holistic evaluation framework for e-government systems. The aim of this paper is to investigate the citizens' perspective in evaluating e-government services and to identify the key factors that influence citizens' utilization of e-government services. These evaluation factors can serve as part of e-government evaluation framework, and can also be used as means for providing valuable feedback for the planning of future e-government initiatives.

The selection process of the evaluation factors will take into account the three challenges in evaluating e-government. It will consider the tangible and intangible risks and benefits that influence citizens' utilization of e-government services; it will also consider the social and technical context of use.

2. Research Approach

In order to investigate the citizens' perspective in evaluating e-government services, and to identify the key factors which influence citizens' utilization of e-government services, it is required that an appropriate research approach is chosen which considers the general aims of the research study and the particular aim of this paper.

The research strategy for this paper is mainly based on reviewing and critically analysing a number of comprehensive articles and published empirical case studies provided by researchers and corporations. These articles and empirical case studies were carefully selected, specifically looking at those that intended to evaluate the e-government from citizens' perspective. The need to support literature analysis with the published empirical data is important because of the current and rapidly evolving nature of the e-government field.

The research strategy will consider the multidisciplinary nature of the research domain we are dealing with and the wide range of data required to cover all the aspects of evaluation, including the tangible and intangible risks and benefits that influence citizens' utilization of e-government services. The strategy will also consider the social and technical context of use.

3. Analysis of Current E-government Evaluation Approaches

Government investment on delivering e-government services is usually huge. Many developed and developing countries have put considerable financial resources, estimated

to be greater than 1 per cent of GDP, behind the development of e-government (Petricek et al., 2006). In order to make such investments worthwhile, governments should have the ability to justify these investments, which typically requires evaluation.

Despite the literature claim (Fountain, 2003, Jones et al. 2006, Remenyi et al. 2000) that e-government evaluation is both an under developed and under managed area, the evaluation of governmental systems has been the focus of a number of studies which take different approaches. Each of these approaches was proposed to address a particular aspect of evaluation whether it is 'hard' or 'soft'. The 'hard' aspect usually assesses tangible risks and benefits, while the 'soft' aspect assesses the intangible risks and benefits including organizational, social, political, or cultural impact of the system. So far there are only few evaluation frameworks that combined 'hard' and 'soft' aspects together (Orange et al. 2006).

The most commonly used evaluation approaches are the traditional ones. They include return on investment (ROI), cost/benefit, payback period, and present worth. Using traditional approaches can be problematic in evaluating information systems investments in general and e-government investment in particular. The problems in these approaches include the limited definition of stakeholders, targeting only direct tangible costs and benefits, and they are based on accounting and financial instruments (Farbey et al. 1995). Serafeimidis and Smithson (2000) had also criticize the traditional approaches to information systems evaluation; they argue that traditional approaches are based on narrow technical and accounting terms, ignoring human and organisational components of information system users. Hochestrasser (1992) added that such evaluation approaches run the risk of not identifying all the hidden costs and intangible benefits generated from system users.

Another effort in evaluating e-government services with citizen-centric approach is Wang et al. (2005) model. They have developed a theory model for the evaluation of e-government services and an experiment to test the validity of that approach. The model was designed to evaluate the performance of an e-government system with a citizen centric approach. The model can also serve as a tool for understanding why e-government portals succeed or fail to help citizens find the information they required.

Another approach for evaluating e-government portals that takes into account the social and political context of the information and its value for citizens is Eschenfelder and Miller (2005) methodology. They propose a model for evaluating the openness of e-government portals that they describe as a socio-technical toolkit. The toolkit includes three parts:

1. Internal information characteristics.
2. Elements to capture the social and political context of the information.
3. Assumptions about the roles of citizens and government information.

The socio-technical toolkit assumes that online information are part of the social world, which is delivered by people who hold certain values, assumptions, goals, and power relationships. Therefore judging the openness of the e-government website content requires capturing data about not only the information, but also about the social and

political context of that information, including value of the information to various stakeholders, and the types of citizen participation facilitated by the information. In brief, Eschenfelder and Miller study mainly addressed two evaluation issues: The openness and trust in e-government systems.

Another effort in the evaluation of e-government initiatives is Carter and Belanger (2004) study. The study was intended to evaluate citizen adoption of e-government initiatives. The authors introduced an approach based on Davis (1989) Technology Acceptance Model (TAM), and Rogers (1995) Diffusion of Innovation (DOI) theory. The technology acceptance model (TAM) is widely used to study user acceptance of technology, and was designed to examine the mediating role of perceived ease of use, and perceived usefulness. Paul *et al.* (2003) criticize the technology acceptance model, claiming that using TAM specifically in empirical research may give inconsistent results. They argue that although the technology acceptance model is useful, it is not a conclusive model and is suffering from the absence of significant factors, including considering both human and social change processes. Diffusion of innovation (DOI) theory is another popular model used to explain user adoption of new technologies. According to diffusion of innovation theory, the rates of diffusion are controlled by an innovation's relative advantage, complexity, compatibility, trial ability and observe ability (Carter, and Belanger, 2004). Carter and Belanger study identified seven factors that influence the citizen's perspective of e-government services. These are perceived usefulness, relative advantage, compatibility, perceived ease of use, image and trust in the internet and in governments.

In conclusion, e-government services have been the focus of a number of studies which take different approaches. Although each of these approaches was focusing on specific aspects of e-government evaluation, and using different evaluation models, they succeeded in identifying some evaluation key factors which influence citizen's utilization of e-government services, and failed in addressing others. In the next section, the authors will propose a set of evaluation factors that could be included in a new approach, which may be designed to overcome the limitations of the above described approaches.

4. Proposed E-government Evaluation Factors

Information systems evaluation and e-government evaluation in particular are unable to reveal the full value of e-government projects without considering the perspectives of all the e-government stakeholders and the e-government value measures consisted of all the evaluation factors perceived by each of the stakeholders.

Hence, the proposed evaluation factors are based on examining and critically analysing the current evaluations approaches. While each of these approaches is aiming to address a particular aspect of evaluation, there were only few evaluation studies which combined some of the tangible and intangible risks and benefits of e-government including the organizational, social, political, or cultural impact of the system.

The proposed evaluation factors will be classified into three groups (table 1); these are the technical issues group, the economical Issues group, and the social issues group. Table

(1) summarizes the identified evaluation factors and how they are evaluated and measured.

Groups	Evaluation Factor	Factor Measuring	Measuring Description
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Hence, the proposed evaluation factors are general and cover the technical, economical and social aspects affecting citizen utilization of e-government services. The factors can be adapted to a specific country situation by only analysing the factors that apply in that situation. The relevance of the evaluation factors and the way in which they are evaluated and measured in specific country situation judged by the e-government maturity of that country

The Technical Issues	Performance	Efficiency of services	P1: Measured by the time spent to complete the task, and satisfaction with the outcome. % The optimal time per service+ comprehensiveness per service.
		Personalized information and services	P2: Measured by the degree the system can enable citizens to personalize information and services according to their needs. % enabling personalized information per service.
	Accessibility	Efficient user interface	A1: Judged by the available options of user interfaces (e.g. Graphical interface, Multi-screen interface, Attentive User Interface). % Number of user interfaces per service.
		Disability access & language translation	A2: Is the system offering some form of disability access and foreign language translation features? % Compliance with the website content accessibility guidelines per service+ Number of languages per service.
The Economical Issues	Cost Saving	Money saving	C1: How much money the citizens are saving by using e-government services. % Money saving per service.
		Time Saving	C2: How much time the citizens are saving by using e-government services. % Time Saving per service.
The Social Issues	Openness	Openness	O: Measured by the value of information in terms of amount, quality, and transparency that government organizations provide to the citizens. % the value of information in terms of amount, quality, and transparency per service.
	Trust	Trust in the internet	T1: Measured by the degree of confidence of the citizens in the internet.

			% the degree of citizen's confidence in the internet.
		Trust in government organizations	T2: Judged by the level of security in handling of information and protecting the privacy of citizens. %the degree of citizen's trust in the government organizations.
	Perceived ease of use and perceived usefulness	Perceived ease of use	U1: Judged by the level of complexity of using an e-government service. % level of complexity per service.
		Perceived usefulness	U2: measured by the comprehensiveness and the features of the e-government system. % degree of convenience per service.

Table (1) summary of the constructs of the proposed evaluation factors

4.1 The Technical Group

Performance and accessibility were chosen for the first group of evaluation factors. Performance measurement can be defined as “measurement on a regular basis of the results (outcomes) and efficiency of services or programs” (Hatry, 1999). Performance was considered as a major issue in influencing the citizen's perspective and employed by many researchers in e-government services assessment.

There are different views about how to measure performance in e-government services. Reilly *et al.* (2003) claims that performance in e-government services can be measured by the degree it can enable citizens to personalize information and services according to their own needs and circumstances, and by how fast it can facilitate access to frequently used services and an online record of the citizen's previous dealings with government.

Wang *et al.*, (2005) based their evaluation model on the evaluation of the performance of an e-government system with a citizen centric approach.

Performance in Wang *et al.* model is measured by assessing the transaction between the citizen, the task the citizen is attempting to complete, and the government's web site regarding the information task. The performance of the information-seeking activities by a citizen was used to measure the performance for the e-government service. The performance in this case can be judged by the time spent to complete the information task, quality of the information found, appropriateness of information found, and satisfaction with the outcome.

The second issue chosen for this group is accessibility. According to Terry Ma, and Zaphiris, (2003), accessibility means an effective and efficient user interface which is inclusive of more people in more situations and can achieve user satisfaction. Poskitt,

(2002) has a similar view; he stated that accessibility requires considering the needs of all citizens equally. Otherwise realization of the idealistic vision of all citizens being able to interact freely with a responsive government through a multitude of technological channels runs the risk of increasing social exclusion, and the technologically literate will increase their advantage by monopolizing direct access to government.

Despite the importance of accessibility in influencing the citizens' perspective of e-government services, studies show that governments either ignored or did not pay enough attention to the accessibility importance. According to the Global e-government Survey conducted by World Market Research Centre and Brown University (2001) there is only 2% of government websites worldwide that have some form of disability access and only 7% of the e-government websites were accessible.

Another study by West (2000) show that only 15 percent of American government websites offer some form of disability access, such as TTY (Text Telephone) or TDD (Telephone Device for the Deaf) or are approved by disability organizations. The study also revealed that only 4 percent of American government websites offer foreign language translation features on their websites.

While the accessibility was generally ignored worldwide, the case is different in some countries. Terry Ma and Zaphiris (2003) research study found that the UK e-government websites are rated relatively high in terms of accessibility; the results show a relatively high compliance (62%) with the Website Content Accessibility Guidelines.

4.2 The Economical Group

The second group of evaluation factors contains the economical issues. The economical issues have traditionally dominated the traditional information system evaluation process and they were criticized as we mentioned earlier by many authors for their limited relevance to the role of Information systems. Despite of the limitations of using the economical issues in the evaluation, we believe that it is important to have them as part of the evaluation factors.

Direct costs and benefits, whether they are for government or for citizens are the basis for most evaluation calculations for many governments.

One of the efforts in assessing the direct financial cost and benefits of e-government is the survey of the National Office for the Information Economy.

The survey covered thirty eight Australian e-government projects, and revealed that an estimated investment of 108 million AUD could be expected to generate 100 million AUD in savings for government, as well as 14.62 AUD in savings per transaction for users and over 25 AUD in savings for businesses comparing with the traditional channels (NOIE 2003).

4.3 The Social Group

Openness, trust, and perceived ease of use and perceived usefulness were chosen for the third group of evaluation factors. Openness can be defined in terms of the amount of information that government organizations provide to the citizens, and the value of the information as a tool for citizens to see what government organizations are doing, understand why they are doing it, and potentially participate in the policy deliberation process (Eschenfelder and Miller, 2005).

One of the efforts in assessing the openness of e-government is the socio-technical toolkit proposed by Eschenfelder and Miller. The toolkit is designed to allow a sophisticated user of government information to judge the openness of e-government portal based on the social and political context of the information on the portal.

The second issue in the social evaluation factors is trust. Belanger et al. (2002) define trustworthiness as “the perception of confidence in the electronic marketer’s reliability and integrity. Trust in e-government context associated with security and privacy. Citizen’s trust requires maintaining security in handling of information, protecting the privacy of citizens, and assuring them that their personal information will be treated confidentially. Without this assurance, it will be difficult to promote the use of e-government services (Pascual, 2003).

Enhancing trust involves enhancing security and privacy measures. This requires a large variety of measures and principles, such as collection and use limitation, purpose specification, security safeguards, accountability, encouraging the use of privacy enhancing technologies and quality certificates (Aichholzer, (2003)

Eschenfelder and Miller, (2005) study, addressed trust as an important evaluation issues, they included it with openness in their socio-technical evaluation toolkit. Trust was also used with other six factors in Carter and Belanger (2004) evaluation model. Trust in their model requires assessing trust in the internet and in government organizations. However Carter and Belanger study show that trust in the internet and in government organizations does not have a direct effect on intention to use the e-government services. One of the limitations of Carter and Belanger study that all the people participated in the survey are college students who are frequent and familiar users of internet services. These users are comfortable and confident in the technology used in implementing the e-government services.

In practice, studies show that governments have different level of consideration for trust, security and privacy in their e-government initiatives. According to West (2000) study, there is very low consideration to the security and privacy in the American e-government websites. The study revealed that only 5 percent of American government websites show some form of security policy and 7 percent have a privacy policy. On the other hand there are positive examples for the consideration of security and privacy such as the privacy provisions in Canada or quality seals for e-government services which was introduced in Austria (Aichholzer, (2003)

The Third issue in the social evaluation factors is perceived ease of use and perceived usefulness. Davis (1989) defines perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance”. He also defines perceived ease of use as “the degree to which a person believes that using a particular system would be free of effort” In the proposed evaluation factors, we are considering both ease of use and perceived usefulness as one issue, as perceived ease of use is predicted to influence perceived usefulness, since the easier a system is to use, the more useful it can be.

Perceived ease of use and perceived usefulness were used with other five factors in Carter and Belanger (2004) evaluation model. However their study shows that perceived ease of use does not have a direct effect on the user's intention to use the e-government services, but the perceived usefulness does so. Again, may be the inconsistency of the result is related to the fact that all the people participated in the survey are college students who are frequent and familiar users of Internet services.

5. Conclusion

The work presented in this paper (which is part of wider research) describes an effort to provide a set of clear and useful e-government evaluation factors that can be used to help achieve better citizen services utilization. A critical analysis by the authors of the major current evaluation approaches revealed that although each of these approaches has its strengths and merits, none of them covered the important spectrum of the main factors/issues that affected e-government evaluation. Hence, general holistic evaluation factors were proposed that cover the technical, economical and social aspects affecting citizen utilization of e-government services. The proposed evaluation factors can also be adapted to a specific country situation by only analysing the factors that apply in that situation.

The limitation of this study lies in the absence of empirical validation and examination of the proposed factors that has not been applied in the fieldwork. Hence, the proposed factors require an empirical validation which will be performed by the authors in the next stage of this research using multiple case study strategy and will form the basis for further research.

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