



Evaluation approaches to e-government applications

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Chapter 6 : Evaluation approaches to e-government applications

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Abstract

This paper goes back to the origins of e-government concept and its definition, characteristics and related issues. Then, putting the accent of IS evaluation stream, this paper provides a description of assessment approaches concerning e-government applications. Building on Prat *et al.* (2015) taxonomy of IS artifacts' evaluation, this paper explores e-government evaluation as it appears in recent publications in a leading journal in the field. The goal is to explore the specificities, if any, of e-government evaluation. This could be seen as a starting point for further research in this area.

1.1 E-government: from online service to government transformation

Electronic government (e-government in short) was introduced in the late 1990s. E-Government is habitually associated with policy choices and refers to the use of information and communication technologies (ICT) to transform relations with citizens and businesses, and to optimize the internal and external functioning of public sector organizations. ICT can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. E-government implementation efforts often started with basic information provisioning and evolved towards more integrated and joined up service offerings. One of the key issues in e-government is public service improvement. The public services offered are highly bureaucratic and siloed where the citizens have no choice of service provider, whereas e-government enables the creation of integrated online service delivery with one single point of interaction (Assar *et al.* 2010).

Literature related to ICT and government goes back to the 1970 (Grönlund and Horan, 2005) even if the first use of ICT in the public sector was during the US presidential campaign in 1954. The origin of the term e-government is correlated with the rise of e-commerce and e-business. Indeed, the first sense of e-government covers the adoption of different e-business applications in the public services sphere - such as online transactions, CRM, electronic marketplaces, e-auction, e-procurement and intranets/extranets (Grönlund and Horan, 2005).

All around the world, significant efforts and progress are made in online public service delivery (Assar *et al.* 2010; Boughzala *et al.* 2015). According to the UNPACS series of e-Government surveys¹, all countries around the world are continuously putting in place e-government initiatives and ICT applications for their citizens and companies to streamline governance systems and further enhance public sector efficiencies. Indeed, citizens and businesses are benefiting from better access to information and improved interactions with governments. Furthermore, governments and public organizations have undergone considerable transformations through ICT (as a strong enabler for change) or because of the rapid ICT development pressure and the context-awareness of Internet users. E-government initiatives were often accompanied by structural and process reorganizations and public agencies reform (Torres *et al.* 2005; Jansen and Lovdal, 2009). This is often denoted as the transformational phase of e-government. This phase involves re-engineering and e-enabling back office processes and information systems to enable more joined-up and citizen-centric e-government services. This phase focuses on cost savings and service improvement through back-office process and IS/IT change (Weerakkody and Dhillon, 2008). This requires a change of institution structures and various social, organizational and technological challenges at both governmental and individual citizen level (Gascó, 2003). It is the transformation of government to provide efficient, convenient and transparent services to the citizens and businesses through ICT. Multiple models have been proposed to describe e-government development stages; the model in Fig.1 is a synthesis of these models.

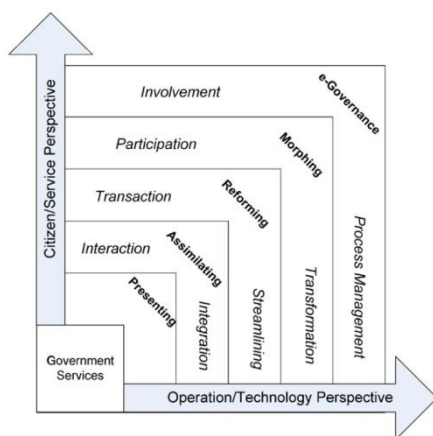


FIG. 1 – A reference frame for e-Government stage models [Source: (Lee 2010), p. 229].

1.2 Evaluation in the context of e-Government

E-Government systems differ from commercial information systems (IS) in that they frequently encompass strategic goals that go beyond efficiency and effectiveness, and include political and social goals such as trust in government, social inclusion, community regeneration, community well-being and sustainability (Grimsley and Meehan 2007). Accordingly, the evaluation of e-government applications is an essential issue and raises specific challenges. The dominant approaches to evaluation-led e-government design and management tend to mirror those of the private sector, focusing predominantly on the

¹ The UNPACS (UN Public Administration Country Studies) has compiled survey data since 2002 about e-Government development, available online at <https://publicadministration.un.org/egovkb/>, [Accessed 07/07/2016].

functional alignment with requirements and economic performance measures such as cost reduction, profit, return on investment and so on.

While such functional and economic measures are clearly important in the context of e-Government, they do not naturally support the attainment of the broader socioeconomic and socio-political goals that characterize so many e-Government projects.

For example, the United Nations UNPACS aforementioned reports rank e-government development in member states according to a quantitative composite index of e-readiness based initially on website assessment, telecommunication infrastructure, and human resource endowment (UN, 2005; UN, 2008; UN, 2010). In its 2010 edition, significant changes to the survey instrument were introduced, focusing more on how governments are using websites and Web portals to deliver public services and expand opportunities for citizens to participate in decision-making (UN, 2010). In the 2012 and 2014 editions, the UNPACS reports make an explicit focus on e-participation as an important indicator of e-government development. These apparent evolutions of e-government assessment indicators raise the following question: are there any specificities when e-government endeavors are evaluated, and if so, what are these specific features?

To explore this issue, we call upon a recent publication in which evaluation approaches are systematically characterized and classified. In Prat *et al.* 2015, the authors have conducted a systematic review of the literature to establish a holistic vision of information systems artifacts evaluation. The review targets exclusively papers published in the eight journals of the AIS basket. A total of 121 articles were selected and discussed. Using an iterative and incremental approach, the authors build a general taxonomy of IS artifact evaluation. An essential element of the analysis is the recognition of two meta-characteristics (i.e. facets, dimensions) for any assessment effort: the “what” and the “how”. The “what” pertains to the objects of evaluation, (aka *evaluands*) and the criteria for evaluating these objects. The “how” pertains to the manner, i.e. the scientific approach and the underlying process, by which the evaluation is conducted. The “how” meta-characteristic unfolds into five group of criteria, i.e. evaluation technique (e.g. observational, experimental), form of evaluation (e.g. quantitative, qualitative), secondary participants (e.g. students, practitioners), level of evaluation (e.g. abstract artifact, instantiation), and relativity of evaluation (e.g. relative, absolute). Concerning the “what” dimension, it unfolds into five main topics: goal, environment, structure, activity, and evolution. The full hierarchy of criteria is presented in Figure 2. An evaluation method is a unique combination of characteristics pertaining to the “what” and “why” dimensions. Accordingly, the authors identify seven most common evaluation styles: (1) demonstration, (2) simulation- and metric-based benchmarking of artifacts, (3) practice-based evaluation of effectiveness, (4) simulation- and metric-based absolute evaluation of artifacts, (5) practice-based evaluation of usefulness or ease of use, (6) laboratory, student-based evaluation of usefulness, and (7) algorithmic complexity analysis.

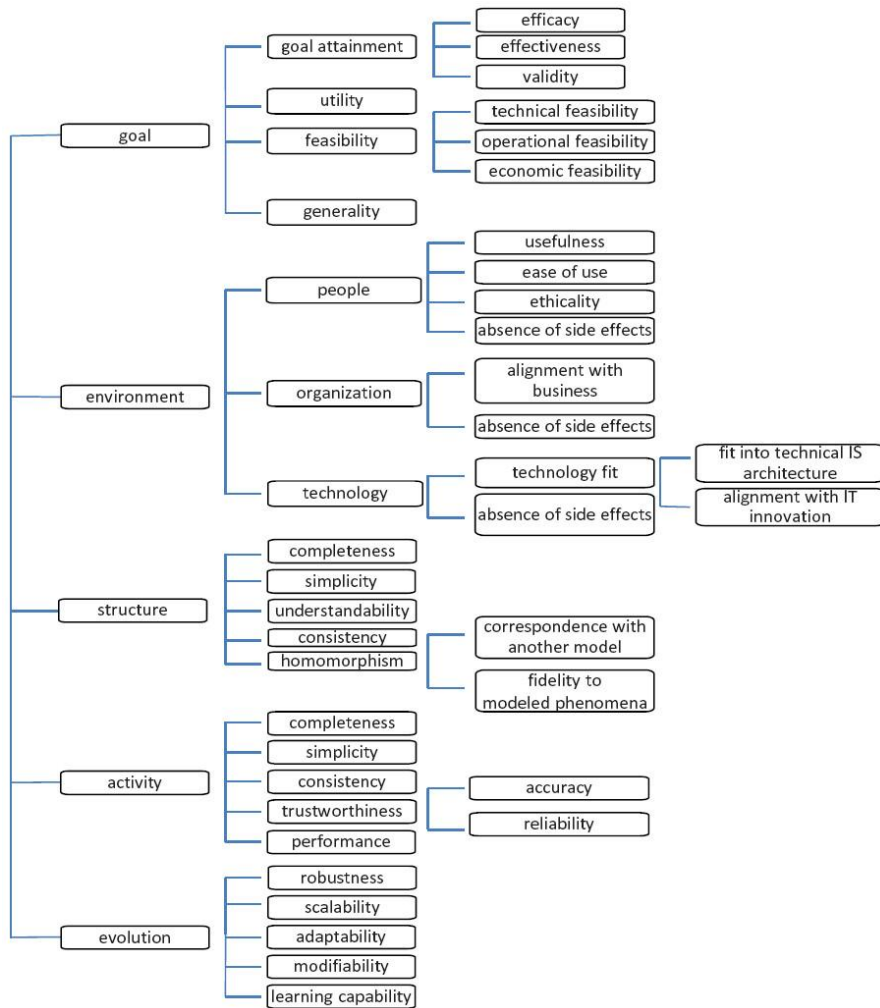


FIG. 2 – *Taxonomy of evaluation criteria*
 [Source: Prat *et al.* 2015, p. 258].

For the purpose of this study, we will focus on the “what” dimension. As mentioned above, e-government projects, in particular those pertaining to the G2C and G2B category, provide online services to citizens and companies on a much larger scale than any enterprise information systems. Moreover, the success of e-government is linked to other public management issues such as system interoperability, government reforms, and democratic practices enhancement. Thus, we intend to explore how e-government endeavors are evaluated and confront the findings with the Prat *et al.* taxonomy with a particular focus on the “what” dimension.

1.3 Exploring e-government evaluation

To explore e-government evaluation, we investigate how evaluation is conducted and discussed in the e-government literature. For this purpose, we select a small set of papers

that present significant evaluation endeavors from a well-known e-government publication, i.e. the *Government Information Quarterly* journal. In the first step, we selected all papers published in GIQ containing the term “evaluation” in their title; the result is a set of 15 articles. In the second step, we selected those papers that were published recently (2013-2015) and that seemed particularly relevant and representative of evaluation in e-government research. The results are four articles; their references appear in Appendix 1.

Each paper was first analyzed by the authors in relation to the question “how e-government is evaluated”. We seek to identify the variables that are measured and their theoretical background or justification (if any). Second, the outcome of the analysis is subsequently confronted with the evaluation taxonomy (cf. Fig. 1) to estimate the extent to which the identified variables fit with the taxonomy above. These results appear in Table 1.

1.4 Discussion

Through this small sample of papers, it can be seen that in early days of e-government prevailed a strong tendency to measure e-government development according to a “benchmarking vision”. The researcher in the e-government field impose a much precise definition which is rooted in IS evaluation theory, and that focuses on actual usage and end-user adoption. Thus, usability becomes an essential variable for measuring e-government success. Moreover, as usability determines usage and adoption, the success of e-government systems depends on how citizens perceive their value and how end-user usage translates into efficiency and effectiveness (Scott *et al.*, 2016). This is in line with the distinction that Misuraca *et al.* (2013) make between output and outcome, the latter being the final goal of e-government development.

1.5 Conclusion

Evaluation is an essential aspect in any artifact development, and in the case of e-government, it has tremendous importance as it is the basis for public policy definition and budget allocation. In this paper, we have discussed and explored e-government evaluation through the lens of a small sample of recent publications in a leading journal. While e-government evaluation was historically restrained to supplier-side measurements with a benchmarking focus, recent research is pointing towards of end-user usage and the importance of usability that, ultimately, determines efficiency and effectiveness. Moreover, the measurement items that are mentioned in the studied sample can be identified in the IS artifacts evaluation taxonomy from Prat *et al.* (2015). We note indeed that e-government impact is directly related to the “Goal attainment” item in the taxonomy.

TAB 1 – *Analysis and commentaries on the selected papers.*

Paper	Analysis	Commentary
Misuraca et al. (2013)	Building on the authors' extensive experience in e-government evaluation, e.g. Codagnone and Undheim (2008), the paper criticizes the general tendency to measure e-government development in terms of supply-side benchmarking, i.e. quantitative measures of infrastructure availability (e.g. broadband internet), service provision (e.g. online passport delivery), and financial results (i.e. cost reduction). They focus instead on <i>causal relationships</i> between infrastructure, service delivery and the extent to which they are used, adopted and have an effect on public service efficiency. Thus, they define a framework that distinguishes <i>output</i> (i.e. supplier side) from <i>outcomes and impacts</i> (i.e. public service qualitative enhancement).	The idea behind the authors' framework can be easily linked to the <i>Goal /Goal attainment</i> and <i>Environment/People/Usefulness</i> criteria categories in the evaluation taxonomy (cf. Fig. 1). Indeed, e-government development has to be correlated with public service enhancement, end-user adoption, and governmental efficiency improvement.
de Róiste (2013).	Using a similar point of view, the author criticizes benchmarking-based approaches to e-government evaluation and proposes to measure <i>usability</i> of online public service. Relying on computer-science literature for its definition, usability is measured with a user survey.	Although it isn't explicitly mentioned, usability can be associated with the <i>Structure</i> category and the criteria's <i>Simplicity</i> and <i>Understandability</i> (cf. Fig. 1).
Venkatesh et al. (2014)	Similarly, this paper considers that usability is an essential attribute of an online public service. Website usability is defined as " <i>the extent to which a website can be used by citizens to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified e-government service context</i> " (p. 670). Applied on the healthcare.gov website, they found that usability strongly predicted website citizen satisfaction and the intention to use it.	Even if the usability concept is considered in a similar fashion as in the previous paper (de Róiste, 2013) and, thus, associates with the <i>Structure</i> category, it is considered here as a determinant of user <i>satisfaction</i> . Satisfaction is to be categorized in the <i>People</i> category (cf. Fig. 1).
Sivarajah et al. (2015)	This paper focuses on Web 2.0 technologies. Building on the literature, the authors define a framework for Web 2.0 assessment comprising an <i>evaluation</i> facet articulated in three dimensions: <i>benefices, costs</i> and <i>risks</i> , and an <i>impact</i> facet articulated in three other aspects: <i>organizational, technological</i> , and <i>social</i> . The framework is used in an interview-based evaluation of Web 2.0 initiatives in a local government in the UK.	The framework is complex, and its variables span multiple items from the taxonomy. Focusing on the <i>impact</i> facet, the variables can be associated with many categories e.g. <i>Goal/utility, Goal /Goal attainment</i> , and <i>Environment/People/Usefulness</i> .

1.6 Appendix 1: Papers selected for review (*Government Information Quarterly*, 2013-2016)

MISURACA, G., CODAGNONE, C., ROSSEL, P., 2013. From Practice to Theory and back to Practice: Reflexivity in Measurement and Evaluation for Evidence-based Policy Making in the Information Society. *Government Information Quarterly*, 30, Supplement 1, S68–S82.

DE RÓISTE, M., 2013. Bringing in the users: The role for usability evaluation in eGovernment. *Government Information Quarterly*, 30(4), 441–449.

VENKATESH, V., HOEHLE, H., ALJAFARI, R., 2014. A usability evaluation of the Obamacare website. *Government Information Quarterly*, 31(4), 669–680.

SIVARAJAH, U., IRANI, Z., WEERAKKODY, V., 2015. Evaluating the use and impact of Web 2.0 technologies in local government. *Government Information Quarterly*, 32(4), 473–487.

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SCOTT, M., DELONE, W., GOLDEN, W., 2015. Measuring eGovernment success: a public value approach. *European Journal of IS (EJIS)*, 25(3), 187–208.

TORRES, L., PINA, V., ROYO, S., 2005. E-government and the transformation of public administrations in EU countries: Beyond NPM or just a second wave of reforms? *Online Information Review*, 29(5), 531-553.

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UN, (2008), Global E-Government Survey available online at

<https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2008>

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