IST-Africa

IST-Africa 2010 Conference Proceedings
Paul Cunningham and Miriam Cunningham (Eds)
IIMC International Information Management Corporation, 2010
ISBN: 978-1-905824-15-1

Measuring the Public Value of e-Government: Methodology of a South African Case Study

Carsten FRIEDLAND[1], Tom GROSS[2]
[1]*SAP Research, Vincenz-Prießnitz-Str. 1, Karlsruhe, 76131, Germany*
Tel: +49 6227 752575, Fax: +49 6227 78-38995, Email: carsten.friedland@sap.com
[2]*Bauhaus-University Weimar, Bauhausstr. 11, Weimar, 99423, Germany*
Tel: +49 3643 58-3733, Fax: +49 3643 58-3709, Email: tom.gross@medien.uni-weimar.de

Abstract: A number of concepts exist to measure the value of ICT-applications within the public sector. Typically, the challenge is to apply such concepts to a real world example. This paper presents a generic approach for measuring the value of e-government projects. Thereafter, it describes the application of these concepts to a case study in South Africa and elaborates on the experiences and results.

Keywords: e-Government, Public Sector Business Software, Value Measurement of ICT

1. Introduction

This paper proposes a methodology to measure the public value of e-government. It further describes the methodology's application in a case study, which investigates the public value of an integrated system for public financial management in a South African national department. Finally, the paper reports on the results of the measurement exercise, elaborates on the lessons learnt and comments on some of the case study specific challenges that arose during the attempt to apply a generic concept in a real life setting in an emerging country.

2. The Public Value of E-Government (PVEG) Methodology

This chapter introduces Public Value of E-Government (PVEG) Methodology—a generic methodology to measure the public value of e-government. It presents the rationale behind our standard measurement approach. This is followed by a proposal for components of generic e-government architecture, elements of a generic value concept for e-government and a causal model to formulate the relationships between those elements.

2.1 Background and Rationale

In recent years a considerable amount of effort has been undertaken both by academia and by practitioners worldwide to develop concepts and methodologies to capture the value creation of ICT-projects within the public sector in a structured way. The following list provides some examples:

- Balanced E-Government Index in Germany [1]
- Demand and Value Assessment Methodology in Australia [2]
- Government Performance Framework of Gartner [3]
- Methode d'analyse et de remontee de la valeur in France [4]

- Performance Reference Model - PRM - in the US [5, 6]
- Public Sector Value Model of Accenture [7]
- Value Measurement Methodology - VMM - in the US [8, 9]
- Value of Investment Methodology of the European Commission [10, 11]

While these methodologies and concepts vary considerably in their respective approaches and degrees of detail, they unanimously challenge the validity and applicability of private sector metrics—such as traditional Return on Investment (ROI) measures—in the public domain.

The reasons for this are manifold and have been elaborated in a considerable number of publications (e.g., [12-19]). In essence the discussion boils down to the fact, that ICT in the public sector supports functions and services, the value of which cannot be expressed in monetary terms only. This necessitates measurement approaches that also include other quantitative and qualitative measures.

All of the above methodologies and frameworks suggest ways of measuring non-monetary quantitative and qualitative returns. In some instances they are quite extensive, covering the entire theoretical range of e-government applications and providing detailed methodological approaches for developing measurement constructs and capturing corresponding indicator values.

Yet in attempting to become all inclusive, some methods run the risk of becoming impractical for measuring returns in real world settings. Many public sector ICT projects simply do not cover the entire range of functionality, actors, and settings proposed by theoretical e-government (measurement) frameworks. Instead, they are very often limited to a subset of all possible areas. In addition, time intensive methodologies run the risk of not being used at all if they do not provide for ways to scale the analysis in order to fit common real world limitations concerning resources, staff and time.

Consequently, the scalability and flexibility of measurement methodologies is an important factor for them to be able to achieve a broad acceptance. Thus it is necessary to consider the use of value measurement methodologies in a more modular way, allowing the user to select those specific elements that are applicable for the ICT project at hand. In terms of this approach, existing methodologies serve as a set of toolkits from which the applicable tools can be selected and utilized depending on the situation and on the demands of the analyst.

This has two major advantages:

- Complementing methodologies: Different methodologies complement each other in components. It is possible to select from various methodologies those tools best suited for the e-government project at hand
- Modularity: The modular approach is very helpful when analyzing ICT projects covering only sub-areas of a full e-government architecture as it is perceived in theory. Currently, many methods compile an aggregate from various indicators in various value areas to come up with an overall value score for the e-government project. In practice this may lead to a situation where a project is judged on areas that actually never formed part of its scope.

This paper therefore suggests a matrix-based framework, which allows the classification of both e-government projects and e-government measurement methodologies along the lines of two concepts:

- components of a generic e-government architecture
- elements of a generic value concept for e-government projects

According to this framework the user can classify an e-government project in terms of both e-government components and the respective values addressed by each of these components. The same matrix can then be used to classify existing value measurement approaches. In this way one can easily select specific tools and approaches for measuring

the value attained by a specific ICT project while at the same time also having a framework according to which this selection can be justified.

2.2 Defining the Components of PVEG

Current literature provides a number of e-government related architectural frameworks. These include the framework for standards and architectures of e-government applications published by the German Federal Agency for Security in IT [20], a report by the same agency on a categorization of e-government services [21], the US Federal Enterprise Architecture [22], the Reference Architecture for E-government RAfEG [23] the e-government classification of Lee et al. [24] and the Governance Enterprise Architecture [25].

While these architectures display some differences in their approaches, emphases, and levels of detail they also have some clear consistencies. This includes the idea of modelling various viewpoints of the public sector such as a business models, ICT component models and data models depending on the purpose of the model. The Federal Enterprise Architecture also provides for a specific model to measure the output of ICT [5, 6].

Following the notion of these architectures, the components of a generic e-government architecture would have to include all those components of a generic public sector business model which are in some or other way supported by ICT. This subset of ICT-supported business areas and processes can than be categorized according to various criteria such as data characteristics, software application characteristics or according to business process areas. The decision which categorization is to be used is to a large extent arbitrary and generally depends on the viewpoint of the observer and the ultimate purpose of the categorization.

The reference framework proposed by this paper will ultimately be used to categorize e-government projects according to their components and according to the values delivered by these components. Secondly it will be used to categorize e-government measurement methodologies. Since ICT projects are very often defined by actors within specific business areas and since their scope is usually strongly influenced by the business processes and business areas the project supports, this reference framework will follow a categorization according to an enterprise viewpoint. In terns of this approach, concepts like business areas, business processes, related services and finally the actors involved will form the core of the categorization.

A high level categorization is suggested in Table 1 (the level of detail of a specific sub-area is to some extent arbitrary and could be extended depending on the situation):

According to this categorization the first level is concerned with matters related to a project's infrastructure. The second level is concerned with a project's business processes *within* a specific public entity. This level differentiates between business areas related to the management of the entity's resources and those business areas supporting the public sector's main purpose: service delivery. The third level is concerned with those business processes that involve actors *outside* the public entity. These actors are subdivided into citizens, business and other public entities.

It is important to note that some e-government projects can cover more than one of these sub-areas. A new system for electronic tax filing for example would cover areas in all three levels (Infrastructure, internal processes supporting service delivery and processes involving citizens and business). However, from a value measurement perspective this subdivision of a project seems sensible since the values generated within these sub-areas could in fact be quite different.

Table 1: Components of PVEG

Areas of e-government	Levels of e-government	Examples
External Reach	Government to Citizen	Electronic tax filing, informational services, some areas of customer relationship management (CRM).
	Government to Business	Informational services, some areas of supply chain management (SCM).
	Government to Government	Budgeting activities involving regional, provincial and national public entities.
Internal Processes	Service Delivery Support	Provision of electricity and water, social grants management, revenue collection, budgeting.
	Management of Resources	Human resources, some areas of SCM, public financial management.
Infrastructure	Hardware / Software platforms	Networks, databases, servers, desktops, mainframe computers, Software platforms.

2.3 Defining the Elements of PVEG

Most of the more mature value assessment methodologies consider three factors: costs, returns and the risks possibly affecting costs and returns. The more profound differences between these methodologies are however often be found in the categorization of returns (or values) that are to be measured. But to a large extent most of these value concepts can nonetheless be categorized fairly well along the lines of one of three notions: operational, political or social value. These concepts are described in more detail below:

- Operational Value: This value is concerned with measures of effectiveness and efficiency. It can be measured in monetary and non-monetary terms and the latter will usually be expressed with the help of quantitative metrics
- Political Value: This value is concerned with the degree to which a public entity achieves its mission and business goals as defined by guidelines and political agendas. Non-monetary metrics (both qualitative and quantitative) usually play an important role here. Contrary to both operational and social value, there need not necessarily be a societal consensus about the nature of a political value. In other words, a political value might be deduced from a specific political or social ideology and cannot be regarded as absolute (e.g. a government's political goal to specifically serve the poor need not necessarily have the same value for different members of society).
- Social Value: This is the value that accrues to the entire society or specific actors within that society. It can be expressed in monetary, non-monetary, quantitative or qualitative terms. An example of social value could be the time, money and efforts saved by citizens when being able to file their tax declaration online.

Table 2 indicates how most of the existing IT value concepts for the public sector can be categorized along the lines of one of three notions: operational, political or social value:

Table 2: Value Concepts for PVEG

Measurement Methodology or Theoretical Concept	**Operational Value** (Efficiency and effectiveness)	**Political Value** (Achieving public entities' missions and goals as defined in terms of political agendas and guidelines)	**Social Value** (Values accruing to society as a whole or to single groups or individuals of society)
Balanced E-government Index (Bertelsmann)	"Efficiency"	"Transparency"	
		Participation	
	"Benefits"		
Demand and Value Assessment Methodology (Australian Government)	"Agency benefits"	"Governance value"	"Community benefits", "Social Value", "User financial Value"
Methode d'analyse et de remontee de la valeur (French Government)	"Profitabilty", "Internal aspects"		"External aspects"
	"Necessitv"		
Performance Reference Model (US Office of Management and Budget)	"Technology", "Processes and activities"		"Customer Results"
		"Mission and Business Results"	
Public Sector Value Model (Accenture)	"Value basket"(balanced scorecard)		
Government Performance Framework (Gartner)	"Intern. Operational efficiency", "Partner effectiveness", "HR responsiveness", "IT responsiveness"	"Policy alignment", "Consensus and participation"	"Social & economic impact", "constituent responsiveness"
	Financial.and regulatory responsiveness		
Value Measurement Methodology (US)	"Government financial value", "Government operational value"	"Strategic Value"	"Direct user value", "Social value"
Value of Investment Methodology (IDABC - European Commission)	"Money: secure and potential benefits", "Time: potential benefits"		"Money: secure and potential benefits", "Time: potential benefits"
	"Quality: potential benefits"		

2.4 Defining a Causal Model for PVEG

In the previous sections a reference framework was introduced which a) categorizes e-government projects according to components of a generic e-government architecture and b) categorises public value along the dimensions of *operational*, *political* and *social value*. This conceptual categorisation was found to be a common denominator implicitly or explicitly running through a number of value measurement methodologies designed for the analysis of electronic government applications. The question now arises how these value categories can be quantified in terms of an empirical measurement construct. In other words: What constructs and indicators are best suited to describe the underlying concepts of operational, political and social value achieved through an e-government application?

Beyond that, measurement constructs of two other important elements which both stand in close relation to the concept of public value need to be considered too, namely those of *cost* and *risk*. Conceptually, achieving public value trough a given application of e-government is associated with certain costs. At the same time both public value and its related costs are prone to certain risk factors which could have an adverse effect on the two. Risk factors thus represent all those variable factors potentially influencing both the public value of an e-government application as well as its associated costs. This conceptual approach is illustrated by Figure 1 and its elements are found in literature [2, 8, 13] in various adaptations.

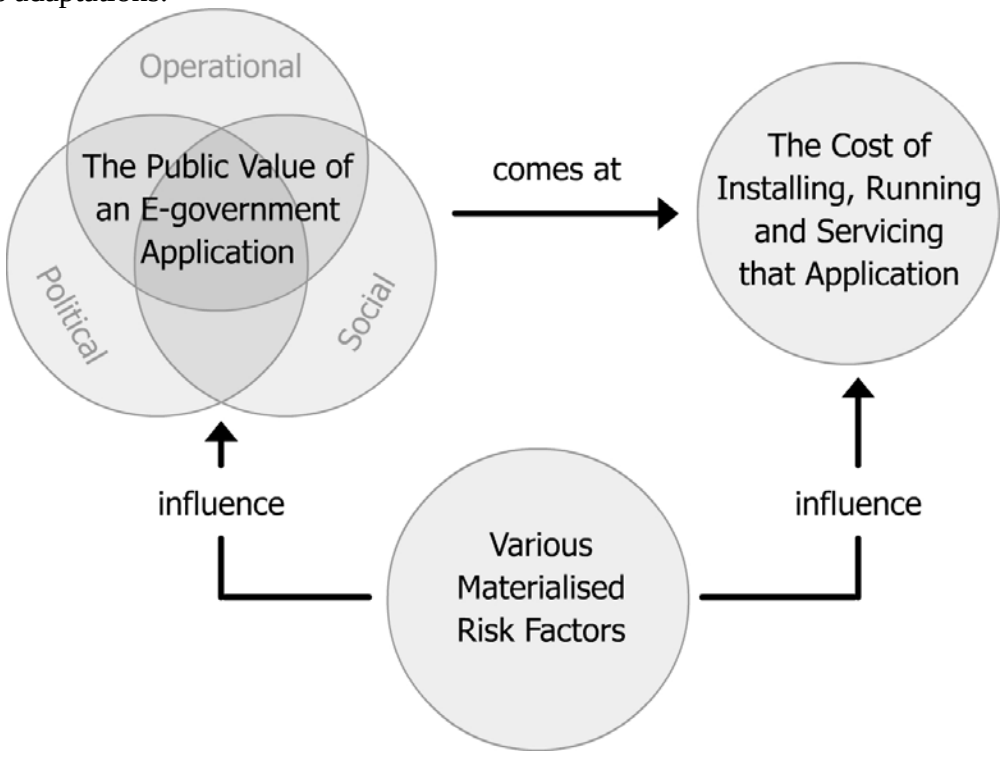

Figure 1: A Causal Model for PVEG

This idea also forms the core of the data modelling exercise conducted in terms of this research. However, before bringing these elements in some relation to each other in order to describe a value totality, ultimately leading to what this research defines as the "Public Value of Electronic Government" (PVEG), it is necessary to first determine ways how they can best be expressed or at least approximated in empirical terms. The proposed PVEG model thus covers five distinct dimensions (operational value, political value, social value, cost and risk), standing in some or other relationship to each other.

A very practical question arising during the research design concerned the development of the actual indicators to be used for each dimension. In other words: "What do we

consider to be representative for e.g. political value?" In fact, the choice of indicators is probably the most intricate and subjective part during the design of a causal model and many issues need to be considered to minimize the danger of distorted results. Jarvis et al [26] provide very convincing concepts in this regard. Through a literature review a number of commonly-used sub-constructs and indicators were determined. Thereafter a subset was chosen for the specific requirements of the South African case study. The details can be found in the following section, specifically in table 6.

3. Applying PVEG to a Case Study

The above concepts have been applied in a case study conducted in a South African national department (ministry). Specifically, the case study investigated 36 business processes covering most areas of public financial management. These processes had been subject to significant changes since May 2006, being migrated from either manual procedures or from procedures supported by numerous legacy systems into one single integrated financial management system of the business software provider SAP. From a process point of view, this migration also entailed a change in financial management practices, moving from a cash-based accounting system to an accrual accounting system.

For each of these 36 processes, measures for various public value indicators were collected along the lines of the theoretical constructs developed in the previous section (where applicable). This data was collected during two stages: 2005-2006 BEFORE the implementation (manual processes / legacy systems) and 2008-2009 AFTER the implementation and after allowing for an initial adoption period of the system during 2007.

3.1 Business Processes Analysed

The table below summarizes the 36 business processes under investigation:

Table 3: The 36 Financial Management Processes Under Investigation

I. Asset Accounting	1	Recording of assets in the asset register	III. G/L - Accounting	19	Administration of General Ledger master data
	2	Asset receipt and distribution		20	General Ledger postings
	3	Retirement of assets		21	Preparation of financial statements
	4	Movement of assets		22	General Ledger Reporting
	5	Periodic & unplanned depreciation of assets	IV. Budgeting	23	Maintenance of budgeting master data
	6	Physical control of assets		24	Budget Planning
	7	Asset losses		25	Budget Execution
	8	Assets under construction		26	Annual preparation of financial statements
	9	Refurbishment of assets used for construction		27	Budget Reporting
	10	Periodic preparation of financial statements with regard to assets	V. Procurement & Provisioning	28	Creation of a requisition
	11	Asset reporting		29	Creation of a purchase order
Revenue Collection	12	Administration of revenue collection master records		30	Request for quotation and administration of tender
	13	Recording customer's monthly use		31	Contract creation and maintenance

	14	Tariff determination		32	Goods receipt
	15	Billing		33	Goods issue
	16	Incoming Payments		34	Capturing of supplier's invoice
	17	Dunning		35	Payment of the supplier
	18	Reporting for Revenue collection		36	Reporting for procurement and provisioning

3.2 Suitable Case Study Indicators for Describing the Model Constructs

In this section, the rationale behind the selection of the case study indicators is explained. The table below positions the South African case study in terms of the reference framework introduced in section 2. As indicated, the case study covers most of the areas of financial management, almost exclusively dealing with internal processes of the department.

Table 4: Mapping the Case Study to the PVEG Reference Framework

			Types of public value addressed		
			Operational Value (Efficiency and effectiveness)	**Political Value** (Achieving public entities' mission and goals)	**Social Value** (Values accruing to society)
Levels of e-government	**External Reach**	Government to Citizen			
		Government to Business			
		Government to Government			
	Internal Processes	Service Delivery Support	**Revenue collection, Budgeting**		
		Management of Resources	**Asset Accounting, Procurement, G/L Accounting**		
	Infrastructure	Hardware / Infrastructure			

= This area enjoys a high priority within the project.

= Although not being a main priority, the project touches this area to a limited extent.

It is evident from the table above that the case study's focus primarily addressed *operational* and *political values*. Although there have been some expected benefits of the project which could be categorized as being of *social value* (such as more equitable procurement practices and an improved revenue collection process indirectly benefiting the department's clients), these values were of a secondary nature. A reliable and representative measurement of these spill-over effects for the constituency is a considerable challenge. In addition, contrary to the indicators for operational and political values which can generally be linked to each of the 36 business processes under investigation, the same is much more difficult for the social value indicators. There were quite a number of case study processes, where this causal relationship could not be readily justified. Thus the social value element of the PVEG model was not considered to be applicable to the case study.

It should also be noted, that for each business process, an interview was conducted with the process owner within the department. While these interview partners usually have a detailed understanding of the process blueprint, they mostly have no means to estimate the portion of total system costs (manual or computerized) that should be allocated to their specific process. Such process specific costs (as propagated by approaches such as activity based costing) have also not been documented by the department. A related analysis is therefore beyond the scope of this research and costs are analyzed on a project level.
Another case study specific requirement is that some process experts were interviewed on up to 7 processes. Thus it was not possible to ask more than approximately 15 questions per process without overstretching the respondent's patience to such extent that the data quality was endangered.

Together, these case specific characteristics lead to the following more formalized requirements catalogue regarding both measurement constructs as well as indicators:

Table 5: Requirements Regarding the Case Study Measurement Constructs and Their Indicators

Requirements regarding the case study measurement constructs
1. Should not exceed 15 indicators in total (averaging 3 per construct)
2. Must exclude the social value dimension due to the project's scope.
3. Must analyse cost on a project level instead of at a process level
Requirements regarding suitable case study indicators
4. Must be process oriented
5. Must preferably not refer to IT specific characteristics, since some "as-is" processes were still on a manual system
6. Must preferably be quantifiable for each of the 36 business processes investigated to allow for comparability (exception: cost)
7. Must be representative for issues considered important by the department (derived from project documentation and preparatory interviews)

After applying the requirements of table 5 to the "shopping basket" of indicators derived through literature review (the details of which are considered to be beyond the scope of this paper), the following case study constructs and indicators were developed and used for process analysis:

Table 6: Constructs and Indicators Utilized for Process Analysis

	Area	Construct	Indicator	Justification
Process specific indicators	**Operational Value**	**Process efficiency**	**Standardization of business process**	**Commonly found in literature, Requirements 4,5,6,7**
			Cycle time / Turn-around time	**Commonly found in literature, Requirements 4,5,6,7**
			Timeliness	**Requirements 4,5,6,7**
		Operational outcome effectiveness	**Quality of Process Outcome**	**Commonly found in literature, Requirements 4,5,6,7**
			Access to data and information	**Commonly found in literature, Requirements 4,5,6,7**
			Errors observed in process outcome	**Commonly found in literature, Requirements 4,5,6,7**
	Political Value	**Political outcome effectiveness**	**Degree of compliance with guidelines and regulations**	**Commonly found in literature, Requirements 4,5,6,7**
			Impact on process if complying with guidelines & regulations	**Requirements 4,5,6,7**
			Degree to which activities are in line with political mission & goals	**Requirements 4,5,6,7**
	Social Value	**Social outcome effectiveness**	**Not applicable**	**Requirement 2**
	Risk	**Risk factor training**	**Impact of insufficient training**	**Commonly found in literature, Requirements 4,5,6,7**
			Likelihood of insufficient training	**Commonly found in literature, Requirement 7**
		Risk factor motivation	**Impact of insufficient motivation**	**Requirements 4,5,6,7**
			Likelihood of insufficient motivation	**Commonly found in literature, Requirement 7**
		Risk factor technology	**Impact of technology failure**	**Commonly found in literature, Requirements 4,5,6,7**
			Likelihood of technology failure	**Commonly found in literature, Requirement 7**

4. Results and Conclusions

Altogether, 104 process interviews have been conducted during the data collection phase of the research. Where possible, each process was covered by two respondents (process owners) answering independently of each other.

The interviews with the process owners followed a semi-structured approach, combining a brief discussion on the business process with a standardized question catalogue derived from the applied indicators summarized in table 6. Some of the questions in that catalogue were also specified in more detail to be meaningful for the specific process.

Below is a summary of the steps that have been completed during the data collection for a single business process.

- *Literature review on the business process*. Special emphasis on the single process steps, the outcome of the process and the political motivation behind that process (bigger picture). The following documentation was of importance during this step: (i) process blueprints, (ii) procedural delegations and rules of the Department and (iii) the underlying national legislation such as the South African Public Finance Management Act (PFMA) of 1999, the Preferential Procurement Policy Framework Act (PPPFA) of 2000, the Municipal Finance Management Act (MFMA) of 2003 and the Broad-Based Black Economic Empowerment Act (BBBEEA) of 2003. Informal preparatory interviews with process owners also flow in at this stage.
- *Process specific fine-tuning of the questionnaire*. Altogether, the question catalogue contained four questions that needed to be specified in more detail for each of the business processes, before they could be answered in a meaningful way. Some (regarding the political mission of an entire process area) are applicable for a subgroup of processes. This specification of questions was guided by the inputs summarized in the previous step.
- *Pre-interview discussion with the respondent of the questionnaire*. A short dialogue ensures that there is a consensus between the interviewer and the respondent about the details of the business process (concerning the definition and delimitation of the process, its most important outputs and outcomes and its current pain points).
- *Answering of the questionnaire*. Together, the interviewer and the respondent went through the questionnaire. A rating scale was used for most of the indicators. Where necessary, the interpretation of generic questions was briefly discussed regarding their relevance for the specific business process at stake. This additional information was documented with a process specific note sheet.

The collection of standardized indicators across a range of different processes poses distinct challenges. Specifically, there is always a compromise to be found between including enough details specific to the process on the one hand and yet ensuring comparability through more general indicators on the other. These are conflicting requirements which need a well-balanced approach. In the research described above, this entailed the use of a common set of constructs combined with some general indicators as well as some indicators that were process specific or process area specific. In addition, process specific notes were taken during the application of the standardized questionnaire. This approach proved practical in its application.

During the data collection phase, the choice of suitable interviewees proved to be a challenge at times. The South African public sector is characterized by a high turn-over of staff and staff recruitment is not solely based on qualification. It was very evident, that in some sections of the department, the successful operations depended on a few single individuals where as other sections were entirely unable to execute certain functions due to a complete lack of staff. Therefore, especially during the ex-post data collection, there was often only one process expert to be interviewed, where-as during the ex-ante data collection two persons were usually interviewed.

During the upcoming data analysis a specific emphasis will have to be put on the issue of integrating both data collected through indicators as well as the informal notes taken during the process interview. The latter have a high potential to influence the interpretation of the indicator values.

Altogether, the case study has shown that the PVEG methodology is able to follow a generic concept of e-government architectures and value notions, while at the same time being flexible enough to accommodate case study specific requirements.

References

[1] Bertelsmann foundation and Booz Allen & Hamilton. Balanced E-Government Index - Messung von E-Government / E-Democracy: Hintergrundinformationen zur Methode. 2002.

[2] AGIMO. Demand and Value Assessment Methodology. 2004. Canberra, Australian Government Information Management Office.

[3] Di Maio, A. New Performance Framework Measures Public Value of IT. 2003.

[4] ADAE and BearingPoint. Guide méthodologique MAREVA :Analyse de la valeur des projets d'administration électronique (ADELE). 2005. Agence pour le développement de l'administration électronique.

[5] FEAPMO. The Performance Reference Model Version 1.0: A Standardized Approach to IT Performance - Volume I: Version 1.0 Release Document. 2003. The Federal Enterprise Architecture Program Management Office.

[6] FEAPMO. The Performance Reference Model Version 1.0: A Standardized Approach to IT Performance - Volume II: How to use the PRM. 2003. The Federal Enterprise Architecture Program Management Office.

[7] Accenture. Public Sector Value Model (PSV) White Paper. 2004.

[8] Federal CIO council. The Value Measuring Methodology: How-To-Guide. 2002. Federal CIO Best Practice Committee.

[9] Federal CIO council. The Value Measuring Methodology: Highlights. 2002. Federal CIO Best Practice Committee.

[10] IDABC. IDA Value of Investment Method - version 2.1. 2003.

[11] IDABC. Cost and Benefit Analysis of TESTA. 2003.

[12] Di Maio, A. Beyond ROI in e-government: introducing the Public Value of IT. 1-12-2003. European Commission.

[13] Booz Allen & Hamilton and Harvard Kennedy School of Government. Building a Methodology for Measuring the Value of E-Services. 2002. U.S. Social Security Administration, U.S. General Services Administration.

[14] AGIMO. E-Government Benefits Study. 2003. Australian Government Information Management Office.

[15] IAB. High Payoff in Electronic Government: Measuring the Return on E-Government Investments. 2003. US Intergovernmental Advisory Board (IAB).

[16] Peters, R. M., Janssen, M., and van Engers, T. M., 2004, Measuring e-Government Impact: Existing practices and shortcomings: Communications of the ACM, v. 46, p. 24-27.

[17] GAO. Measuring Performance and Demonstrating Results of Information Technology Investments. 1998. United States General Accounting Office.

[18] Steyaert, J. C., 2004, Measuring the performance of electronic government services: Information & Management, v. 41, p. 369-375.

[19] OMB. Performance Measurement Challenges and Strategies. 18-6-2003. U.S. Office of Management and Budget.

[20] BSI. SAGA - Standards und Architekturen für E-Government-Anwendungen (Version 2.1). 2005. Bundesamt für Sicherheit in der Informationstechnik.

[21] BSI. E-government Handbuch: Klassifikationsschema für E-Government-Dienstleistungen. 2005. Bundesamt für Sicherheit in der Informationstechnik.

[22] FEAPMO. Federal Enterprise Architecture Consolidated Reference Model. 2005.

[23] Beer, D., Höhne, S., Rünger, G., and Voigt, M. Software- und Kriterienkatalog zu RAfEG - Referenzarchitektur für E-Government. 2005.

[24] Lee, S. M., Tan, X., and Trimi, S., 2005, Current practices of leading e-government countries: Communications of the ACM, v. 48, p. 99.

[25] Peristeras, V. and Tarabanis, K. Governance enterprise architecture (GEA): domain models for e-governance. 60 , 471-479. 2004. ACM Press. ACM International Conference Proceeding Series.

[26] Jarvis, C. B., Mackenzie, S. B., and Posakoff, P. M., 2003, A critical review of construct indicators and measurement model misspecification in marketing and consumer research: Journal of Consumer Research, v. 30 , p. 199-218.