Assessing E-government progress– why and what

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Research in progress paper

Abstract. The aim of this primarely theoretical paper is to discuss the use of e-government frameworks and benchmarking tools. It is frequently clamed that proving an effective e-government assessment framework is a necessary condition for advancing e-government. However, there are major drawbacks in many of the existing e-government surveys, as e.g. lack of a clearly defined purpose, beyond the operational definitions provided. The paper reviews some of these frameworks and discusses to what extent they really can fulfil their intention in acting as guiding tools in the implementation of e-government. It is further argued that these different approaches are not likely to provide adequate framework for fruitful research in this field.

Key words: E-government, framework, assessment, evaluation, benchmarking,

Introduction

Bench marks was originally used in topography, to mark the spots for intermediate points in a survey of an area. They could be found on a permanent object (e.g. in walls and pillars), as a mark indicating elevation and serving as a reference in topographic surveys and tidal observations. Similarly, framework had to be developed in accurate

measurements of the Earth's surfaces; surveying frameworks are erected by measuring the angles and the lengths of the sides of a chain of triangles connecting the points fixed by global positioning. The locations of ground features are then determined in relation to these triangles by less accurate and therefore cheaper methods (Britannica online 2005)

To day, such words have become rather holy in the computerization of the public sector. Various frameworks have been developed to guide the conceptualization and implementation of national e-government programs. Benchmarking departing from these frameworks should help the politicians and other stakeholders to compare their initiatives with similar ones in others countries, to make sure that their efforts are moving the government in the right direction. Thus, appropriate frameworks are intended to serve two purposes; firstly, to help the development of e-government, secondly, as basis for assessments and evaluations.

In this paper, I will review some of these frameworks and discuss to what extent they really can fulfil their intention in acting as guiding frameworks in the implementation of e-government. I do not question the use of these tools as such. I rather want to discuss what extent they really help the politicians and other stakeholders to define the optimal goals and make the best priorities. Could it be so that the strong focus on surveying and ranking of the different nations according to their scores on selected indexes removes the attention from more fundamental issues related to transforming the government by use of ICT? Each nation with its government has its distinct governmental structure, departing from its unique geography, history and culture. Their efforts and initiatives aims at fulfilling the individual goals, taking into consideration their specific national context and priorities. Is it then fruitful to measure their different e-government initiatives and results using standardised indexes? And furthermore, is it feasible to assess and classify national ICT programs according to a common framework?

Perhaps even more important, to what extent can such frameworks constitute a useful basis for research? In this paper, I will argue rather the opposite way, in proposing that one departs from simpler ‘frameworks’ that allows for many different approaches. The primary strategy for research should be to link studies on e-government efforts to overall national goals and political priorities and at the same time taking into consideration specific democratic and political system, governmental structure and culture etc. Rather than regarding e-government as a separate research area, one should see it as a waste area for a variety of empirical studies, in which one should apply existing knowledge and accepted theories from as well IS research as from e.g. organizational studies, political science etc.

The structure of the paper is as follows. Following this introduction, section two discuss definitions and theoretical frameworks for e-government. In section three are presented some empirical studies and evaluations followed by a discussion of some empirical results.

Theoretical background

E-government is becoming a global phenomenon that is consuming the attention of politicians, policy makers and even ordinary citizens. A report by the United Nations (UN World Public Sector Report 2003) indicated that by 2003, over 173 countries had developed government web sites. E-government is predicated on leveraging the capabilities and power of ICT to deliver services provided by governments at local, municipal, state and national levels. Beyond service delivery, e-government offers additional channels of interaction among governments, businesses, and citizens, separately or collectively. However, E-government is more than a technological phenomenon. It is transformative in nature, affecting the management of human, technological, and organisational resources processes. Consequently, the implementation of e-government is a monumental change effort.

What is e-government?

Is it e-possible to agree upon a common definition of e-government? There exits a number of different definitions of e-government in the literature. Some are rather narrow, focusing on using ICT, particularly the Internet, as e.g. "the use of technology to enhance the access to and delivery of government services to citizens, business partners and employees", in (Deloitte Research 2000, p4.) Others view e-government more broadly as efforts to transform government. Such examples can be:

- Electronic information-based services for citizens (e-administration) with reinforcement of participatory elements (e-democracy) to achieve objectives of balanced e-government (Bertelsmann Foundation 2001, p4)
- The use of information and communication technologies, particularly Internet, as a tool to achieve better government (OECD, 2003, p 63).
- The use of ICT in all facets of the operation of a government organization (Koh & Prybutok, p 34).
- The use by the government of Web-based Internet applications and other Its, combined with processes that implement these technologies, to a) enhance the access to and delivery of government information and services to the public, other agencies, and to government entities; or b) bring about improvements in government to operations that may include effectiveness, efficiencies, service quality, or transformation" (US government 2002)

These definitions may be useful in describing e-government in a broad-based manner, but offer little insight into deeper issues and considerations relating to the construct, and fail to capture the more complex aspects of transforming government or acknowledge the role of the ICT elements. Consequently, most implementations activities centre on service delivery concerns with little emphasis on real transformation of the services themselves or the processes associated with their delivery (Grant and Chau 2005). They further claim that 'any conceptualization of e-government needs to address a variety of concerns beyond the service delivery elements. Based on a comprehensive literature review, they suggest this definition:

> "A broad-based transformation initiative, enabled by leveraging the capabilities of information and communication technology; (1) to develop and deliver high quality seamless, and integrated public services; (2) to enable effective constituent relationship management; and (3) to support the economic and social development goals of citizens, businesses and civil society at local, state, national and international level" (Grant and Chau, op.cit: p 9).

This definition focus on as well technological as economic, managerial, organisational and social/cultural issues, while the legal issues are not (at least explicitly) addressed. To furthermore illustrate the complexity e-government efforts, one should not overlook perspectives as i) e-government as a transformational endeavour, ii) a diverse number of solutions, iii) the relation between e-government, information and ICT, iv) integration, service sophistication and maturity, and v) that it is an international phenomenon which not at least a number of consultant companies world wide are heavily involved in.

E-government: politically or scientifically defined?

However, it is necessary to ask what we actually gain from using such broad and extensive definitions? It seems that these definitions are primarily politically motivated, in that they include all initiatives and activities related to the use of ICT in the public sector, aiming at measuring the magnitude and reach of the efforts in various countries. They are related to specific goals and priorities, and there value-laden. It may thus be questionable whether we get a better understanding of the e-government as research area, if we at all can be comprehended in one definition.

As an alternative I propose a simpler framework, defining basically three groups of stakeholders: *politicians, public institutions, citizens, businesses and civil society* and thereby distinguishing between 3 different dimensions (e.g. Grønlund 2000, 2001); 1) the *democratic* dimension, focussing on the political processes and interaction between the constituents and the government, 2) the *service* dimension which comprises the delivery of all types of electronic services, and 3) the *administrative* dimension including various types of management work, internal routines etc. This may be illustrated in this way: Figure 1: Three dimension in e-government initiatives

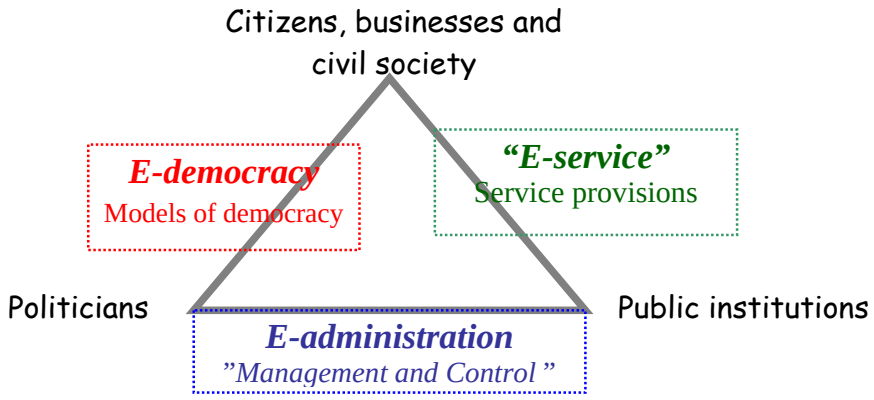

Figure 1: Three major dimension in e-government initiatives

The functions and activities in the different dimension cannot be completely separated, but their focus and priorities is clearly different. And even more important, one cannot use the same theories and models when doing research linked to these different dimensions. Thus, when doing research in each of these areas' we should apply adequate theories and models which we find in well established research fields such

as e.g. organisational studies, business administration, and political science. In addition, we need to study the development and maintenance of the different layers of a common [base of] information and organisational infrastructures and back-office routines that is required to support e-government functions, including basic communication and information services, security measures etc.

Assessment and benchmarking of e-government initiatives

Benchmarking of governmental websites and national e-government initiatives has been conducted in a number of years. There are several well-established surveys on e-government. These surveys employ different assessment models for e-readiness, digital divide and other relevant factors, leading to varying conclusions on the global state of e-government. The grounds for these efforts are well illustrated by a statement from the EU report (EU, 2001): The ministerial declaration on the eGovernment conference, together with benchmarking survey should give political momentum to the development of online public services and to the identification of the needs for these services at pan-European level. This will have to be complemented by a focus on back-office reorganisation, the creation electronic marketplaces for public procurement and investment in new equipment in administration

In order to measure and compare the eEurope 2002 indicator "availability of public services" a four-stage framework (the scoring framework)[1] has been defined, and 20 basic public services have been selected[2]. For 12 of these services, the citizens are the target group while for 8 of them businesses are the target group. The for-stage framework is defined in this way:

i) Stage 1: Information:
ii) Stage 2: One-way Interaction
iii) Stage 3: Two-way interaction: The publicly accessible website offers the possibility an electronic intake with an official electronic form to start the procedure to obtain this service. This implies that there must be a form of authentication of the person (physical or juridical) requesting the service in order to reach stage 3.
iv) Stage 4: Full electronic case handling: The publicly accessible website offers the possibility to completely treat the public service via the website, including decision and delivery. No other formal procedure is necessary for the applicant via "paperwork"

Based on this evaluation scheme, all old and new member countries have been measured. In the report from the fifth measurement was that the overall average score was 65%, which means that it is located between stage 2 (one-way interaction) and stage 3 (two-way –interaction). However, the old 15+[3] member scored 72%, while the10 newcomers achieved corresponding 53%, indicating that these countries are lagging about 2 years behind the old ones. This is not at all surprising.

However, what do we really get from these statistics? In an analysis of these results, it was found that some countries appeared to rather remarkable progress on the last

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[1] E.G. labeled as "The scoring framework", as illustrated in Cap Gemini Ernst &Young's Web based survey on electronic services public services, EU DG Information Society, 2003.

[2] See http://europa.eu.int/information_society/eeurope/2005/doc/all_about/online_availability_public_services_-5th_measurement_fv4.PDF

[3] 15+ means the old 15 member countries + Iceland, Norway and Switzerland

evaluations (e.g. Austria), which have put priorities in improving services that contributed to better ranking, while others (e.g. Belgium) had seemingly far less progress, because they had focussed on infrastructural efforts, in particular a national wide citizen security card (ECEG 2004). It can therefore be argued that this type of one-dimensional framework do not capture the different dimensions of a more development public web site.

In their report, Cap Gemini states that "the survey only analyses the result of the eGovernment efforts from the perspective of online availability of public services. The results should be integrated into a broader perspective of various eGovernment measures: linking services availability, channel selection, back-office fulfilment capability; and service usage and impact of eGovernment". And even more important: "Initiatives develop by government to enhance the quality of their service provision – service integration, from the pull to push service delivery – are not validated in the indicator, but the information provided by the member states concerning concrete cases is covered in this report." (Cap Gemini 2004)

Some experiences from quality evaluations in Norway

The Norwegian government initiated a project together with the research institute Vestforsk[4] to develop a set of quality criteria for evaluating public websites in Norway. The first work started in 2001 and resulted in a set of 21 indicators (Ølnes 2002, 2003). The work has been repeated in the following years, and new set of indicators were developed. The 2004 evaluation was based on an indicator set consisting of 25 items; again some indicators were new, divided in three groups: accessibility, usability and useful services. In all more than 700 public web sites were evaluated (Norge.no, 2005)

A direct comparison between the results in 2001 and 2003 is not possible due to the different indicator sets. However, for the indicators being unchanged from 2001 to 2003 we saw an improvement of more than 10 %. From 2003 to 2004 there have been some improvements (exact figures are not available yet). After the first set of evaluations in 2001 the project group received a lot of feedback, especially from the municipalities, many of them asking for new evaluations since they had changed made changes to their web sites following the evaluation. As such, these evaluations stimulated improvement work, in particular to increase accessibility, but were not very helpful in guiding the development work itself.

How consistent are different evaluation frameworks?

In parallel with this evaluation, the Norwegian Consumer Council carried out a similar evaluation, however based a different set of indicators (FR 2004). The results from this evaluation differs substantially from the ones conducted by Norge.no, due to that these two indicator sets emphasize different aspects and criteria. It is however, not obvious whether the former or the latter of these evaluations that provide the best evaluations. It depends on what aspects you would like to put emphasize on.

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[4] Vestforsk is short for Western Norway Research Institute

In a recent study, a new framework was developed, building on experiences from others (Eikeland and Kongshaug 2005). It was tested on a number of experts. The results showed that the experts interpreted the framework somewhat differently. This illustrates the problems with the results of such evaluation. If not based on very standardised and simple criteria, the results are likely to be depending on the evaluators' background, knowledge and preferences. All types of evaluations measure what we *can* measure, leaving other aspects out. They are accordingly useful only to a limited extent.

The E-democracy dimension

Quite another approach was applied in a study conducted by the University of Oslo in 2003 on how Norwegian local and regional municipalities were using their websites to provide information and get feedback from its citizens (Haug 2003[5]). More than 450 different municipal web-pages were visited[6], with nearly 120 different items for each website. The large database was later supplemented by statistical data describing each municipality, e.g. economic data, size, citizens with access to Internet, etc. The focal point was primarily on to what extent the local municipal websites were used to facilitate what we labeled "political communication". The findings of the study showed that there was large variety in how the municipalities actually were utilizing ICT and Internet for political communication. In general, their web-sites are mostly used for information provision, primarily supporting enlightened understanding, while interaction, supporting effective participation is less frequently available.

The analysis showed, however, that the model can only partly explain the variation across the municipalities. It is therefore important to develop more adequate models and thus offer validated knowledge as basis for practical action, e. g. by identifying factors that seem critical for successful application of Internet for stimulating democratic processes. One conclusion from the study was that in order to collect empirical data that can have stronger explanation power, one need to get access to more specific data about the individual municipalities, e.g. by interviewing key persons about their strategies and background for their decision regarding developing the web-sites. It seems clear that the variety in e-democracy initiatives have to be analyzed by using different models than when evaluating e-service implementations. This is clearly demonstrated in e.g. Hacker (Kenneth and van Dijk 2000)

Use of frameworks in e-government developments

The drive to implement e-government has resulted in the adoption of many e-government visions and strategic and strategic agendas, driven by its own set of social, political and economic factors and requirements (Accentor 2004). Consequently, the missions and objectives that emanate from these e-government visions variously manifest strong focus on selected elements. While some governments' strategic agendas focus primarily on service delivery issues, others may focus more on creating internally

5 Haug,Are (2003) Political communication through municipal web sites. Master thesis, Department of E-government studies, University of Oslo

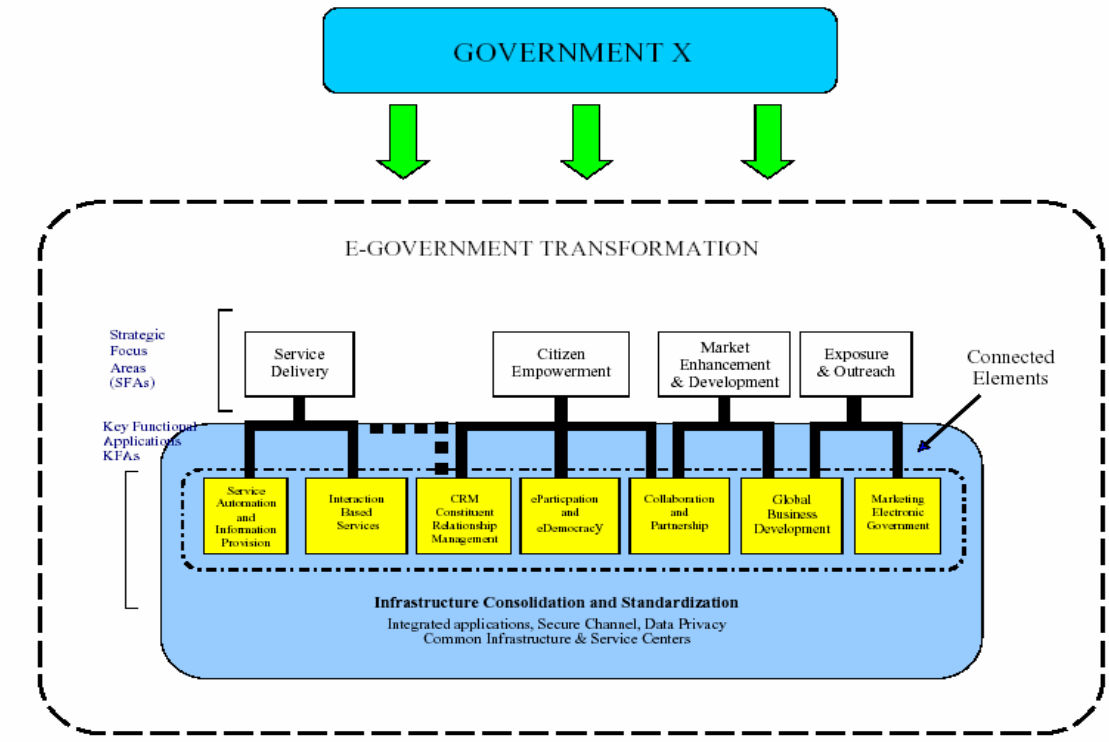
6 The Internet-based examination of all municipality websites in Norway was conducted by Harald Baldersheim and Morten Øgård *et al* at Department of Political Science, University of Oslo.

efficient systems and processing. Still others may adopt a more comprehensive view, incorporating issues as constituent relationship management and e-democracy. Although each of these view of e-government may be legitimate, there is frequently expressed a need for some common understanding to allow for assessment, comparison and explanation of current efforts to vis-à-vis past and future investments in the e-government enterprise, and on increasing cross functional efficiencies (Grant and Chau 2005).

The literature describes a number of frameworks that in various ways conceptualises e-government development and implementation, see Grønlund (2000, 2002), Bertelsmann (2001), Accentor (2004) etc. The most comprehensive model so far (to my knowledge) is described by Grant and Chau (2005), basing their work on a survey of a large number of previous efforts. Even if their framework does not include all dimensions and aspects of e-government, it may very well illustrate the complexity of such generic models.

Their goal when developing this framework was to characterise and identify the different directions and dimensions of different e-government approaches, and that could be used to "categorize, classify and compare electronic visions, strategic agendas and application initiatives". Furthermore, they want to provide a framework that "should act as a lens to focus attention and awareness on underlying issues and elements that could be debated, discussed and further developed".

Their model is outlined in this way:



Grant and Chau have applied there framework on case studies, and finding that framework provided:

- A mapping of diverse electronic government elements to a common perspective

- the ability to compare and differentiate underlying goals and themes between different implementations
- the ability to draw general conclusions and compare differences and similarities across implementations

This framework illustrates an impressive effort in modelling complex factors and relationships, and that can be used for assessing and classifying different e-government initiatives. It illustrates the large variety of areas and elements that such frameworks have to include in order to be applicable across different nations and cultures. This framework has also been used in a small study of a Norwegian state agency (Berg, Refsdal and Holmen 2005), but it turned out that it provided limited usefulness for that study. And more fundamentally, the framework seems primarily to be useful for descriptions and classifications and not for explaining and exploring why and where.

However, what is interesting their framework is the emphasis on i) "enable identification of e-government goals and objectives and ii) be adaptable to country-specific requirements". Every nation has its own functional, social and administrative objects to fulfil. Therefore, every e-government program should be viewed and assessed with respect to its context of application. A greater understanding of motivation and resulting patterns of development in different settings can facilitate the process of comparing approaches and provide a rational means of setting the reform of public administration on course for efficiency and transparency, with clear orientation towards its citizens (Bertelsmann, 2001). It is vitally important to distinguish patterns of development and motivation for e-government and identify transferable elements. Thus, Grant and Chau point to that e-government development and maturity must reflect the changes in the political, social and economic orientation of the hosting nation. New technology and improved organisational infrastructure will need to be developed to meet such requirements.

Determining Progress towards e-Government

Another paper [ECEG2005] presents a comparative study of 11 international surveys on e-government between 2001 and 2004. It identifies a common set of 'core indicators' for assessing e-readiness and suggests ways to determine the weights for them. The paper also introduces the concept of a 'target e-ready state' and examines how it may provide a scale for determining the progress of individual countries.

The paper claims that providing an effective e-government readiness assessment framework is a necessary condition for advancing e-government. This framework should not rely solely on the general e-readiness measures, as clearly e-readiness transcends e-government. In fact, one of the major drawbacks of the past e-readiness surveys is lack of a clearly defined purpose, beyond the operational definitions provided. A framework for effective e-government assessment must instead identify and focus on the critical variables for e-government and consider the peculiarities of the environment assessed.

The paper presents a comparative analysis of the survey series consistently carried out by three organizations between 2001 and 2004: United Nations Department of Economic and Social Affairs (UN-DESA), Accentor, and the Centre for Public Policy of

the Brown University (CPP-BU). The surveys benchmark countries based on different sets of indicators. For instance, UN-DESA provides information on the maturity of online presence, availability of the basic ICT infrastructure, and human development of UN member states. Accenture examines the breadth and depth (sophistication) of online services of a number of selected countries. CPP-BU reviews official government websites across all countries and regions for specific features and online services. The analysis reveals that the use of different sets of indicators and different weights assigned to them (to signify their perceived importance) lead to varying conclusions on the performance of the countries in terms of e-readiness and e-government.

The aim of the e-readiness assessment is to investigate how the different spheres of society- health, security, education, governance, etc. are able to utilize the opportunities created by the ICT, particularly the Internet. The notion of e-readiness broadly covers the political, regularly, organisational, cultural communication and technological factors.

They claim that later stages of web maturity, e-participation, Internet usage and access (online population, Internet users, PC penetration) are all central to advancing e-government. They assert that e-government readiness depends on three crucial factors: mature online presence with transactional services, support for citizens' engagement in consultation and decision making, and availability of the access infrastructure (PCs, Internet, mobile phones).

The conclusion of their study is that the disparity and lack of standards for e-government assessment lead to varying conclusions on the global e-government readiness. It shows that the outcomes from the three e-government surveys by UN-DESA, Accenture and CPP-BU do not in general agree on the relative readiness of countries. To aid the provision of standards in e-government assessment, they identified the set of core indicators that are central to e-government readiness, based on the data provided through the 2004 UN-DESA survey.

Although this study has somewhat different purpose than the previous one, it is built on to a large extent the same type of frameworks and criteria, which is thus used in the assessment of different countries e-government readiness.

Discussions - what type of frameworks do we need?

The aim of this paper has been to review some recent work in this field, and demonstrate the rather large variety of different approaches to modelling and assessing e-governments initiatives. It is thus argued that these different approaches are not likely to provide a comprehensive and unifying framework that may help to assess, classify and compare different e-government programs, even though some of the referred work has shown interesting result. These rather complex frameworks may provide useful external descriptions, but they will no be able to take into account the specific context of each country. Further, many of the different perspectives and interests involved, may be partly conflicting, and thus require difficult political priorities and considerations, e.g. as efficiency versus quality of services and citizens participation. And, how to take into account for differences in legislation and other regulations.

We have also seen that international surveys and ranking can result in that some countries' priorities are given to achieve short terms results rather than long effects. This may in particular delay the building of adequate infrastructures and prevent the provision of adequate security and vulnerability measures. Furthermore, in conducting these various measurements and evaluations there will always be great challenges related to reliability and validity issues.

As a provocative claim, I will argue that we may benefit from having rather simpler than more complex frameworks. Below are some basic elements in such a 'framework', which can guide a wide range of research and development efforts as well as constitute a basis for evaluations of e-government efforts. We should distinguish between these three different dimensions:

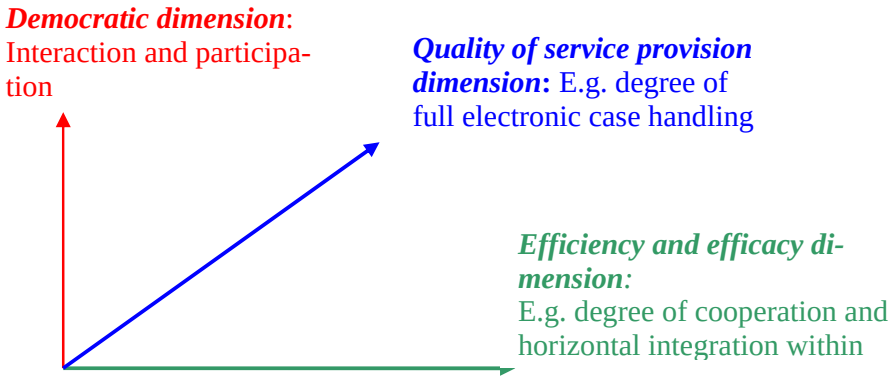


Figure 4: Different dimension of online public services

The quality of the *democratic dimension* should be in indication of to what extent the website really supports the democratic ideals of a municipality or other type of public agency. Such values are *openness and transparency*, services that is *understandable* and *accountable* to the citizens, and open to democratic *involvement* and *scrutiny*. Thus, this dimension does not only include services and facilities that can help the interaction between the civil society and the political system, as it is important to study whether all types of services and functions comply to these ideals.

The study of all Norwegian municipal websites discussed above (Haug 2003, Haug and Jansen 2004) showed that there is large variety in how the municipalities actually are utilizing ICT and Internet for political communication.

The *service provision* dimension should indicate to what extent public electronic services and functions offers the possibility to completely treat the public service via a web-based interface, including decisions and delivery that is the degree of completed electronic case handling, corresponding to stage 4 in the scoring framework.

The *efficiency dimension* should aim at measuring the extent or range of interaction and cooperation between offices (internally) and between different public agencies. This corresponds (partly) to the horizontal integration indicator discussed above.

The quality of governmental services or functions cannot fully be measured by a general, context-free evaluation framework or index, but rather has to be evaluated according to different criteria, depending on its context, primary goal and type of users.

Infrastructural requirements

While much research has focused on the front-office and the use of electronic public services by citizens and businesses, it seems to be less attention on how government need to reorganise to meet the challenges and opportunities represented by Internet.

In a study on back office reorganisation[7] it is claimed that there is a strong link between reorganising government back office and electronic public services experiences by users. This is not surprising, as almost exactly the same conclusion have been drawn from the first phase of the "dot.com" wave in which enterprises went on Internet without changing its internal business organisation.

The back-office functions may be organised in different ways to serve a variety of different user services, spanning from simple interaction services to fulfilled case handling and interaction between different governmental organisation, implying both vertical and horizontal integration, and including both centralised and decentralised solutions.

However, the back-office organisation should be seen as an integral part of national infrastructure supporting e-government services and facilities in general. The infrastructure should be understood in a broad sense, including technical, informational and organisational elements, as e.g.

i) an flexible, secure and reliable technical infrastructure, that is the network and basic system services
ii) the availability of sufficient information resources as e.g. databases and other types of information system and applications
iii) A well functioning organisational infrastructure, which is a back-office organisation that can serve the web site in an adequate way.
iv) Functions and services that can provide secure exchange of all type of information (a public key infrastructure)

However, these requirements do only apply to the supply side. An essential precondition is that the society at large is able to benefit from this e-government structure. Thus, we have to create a necessary social and cultural basis among the citizens, and the whole civil society, (e-readiness, e-maturity) A public sector that is *at the service of all*, being inclusive and exclude no one from its services. The different component may be illustrated in this way:

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[7] The study "Reorganisation of Government Back Offices for Better Electronic Public Services" was conducted by Danish Technological Institute, Copenhagen and Institute for Information management, Bremen and reported to EU in January 2004.

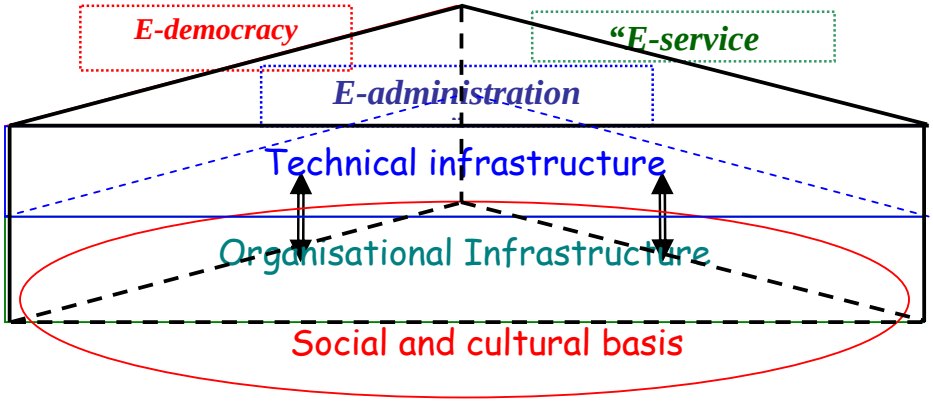

Figure 5: E–government infrastructure - a complicated architecture

This figure aims to illustrate that the quality of a public web services depends on the characteristics of a number of different components:

Conclusions –a 'new' research agenda is needed

Is has been argued that the definitions of e-government are primarily politically motivated and not very helpful as basis for research initiatives. Rather than regarding E-government a separate research field, on should see such efforts as a waste area for empirical studies, offering a broad range of applications and organizational settings.

The limited literature review has shown that there exist a number of different approaches to defining framework for e-government assessment and evaluations, all having weaknesses and lacking a clearly defined purpose, beyond the operational definitions provided. Rather than build standardised framework for assessment and evaluations, one should aim at developing research models that are useful for understanding and explaining the differences in the various nation's implementations of e-governments solutions, linked to their specific national context and priorities.

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