Scenarios of e-Government in 2020 and implications for strategy design

Georg Aichholzer
Institute of Technology Assessment, Austrian Academy of Sciences, Vienna, Austria
aich@oeaw.ac.at
http://www.oeaw.ac.at/ita/welcome.htm

Abstract: This contribution focuses on e-Government as a comprehensive change programme and develops alternative scenarios with a view towards 2020. Empirical evidence of substantial risks to a successful implementation and operation of e-Government calls for a forward-looking approach and possible ways of correcting a wide-spread neglect of long-term innovation risks. The paper explores the scenario method as an established instrument for improving strategic decisions in a context of change, uncertainty and complex environments. Its application in a Europe-wide research project leads to three macro-scenarios with divergent implications for e-Government prospects. The conclusions suggest particular requirements for developing more robust e-Government strategies and encourage a wider use of scenario processes.

Keywords: e-Government, risk, future, scenario method, strategy, Europe.

1. Introduction

Governments around the world have set very ambitious goals and are running programmes with considerable financial volume for the implementation of electronic service delivery in the public sector. The European Commission stimulates and reinforces these innovation programmes with its "eEurope" initiative and related benchmarking studies (CGEY 2004). Measuring progress in e-Government is widely practised and used as a key instrument to motivate implementation efforts through a sense of competition. It is hardly surprising that e-Government has become one of the most widespread terms when it comes to the modernisation of public administrations (Lenk 2002).

Quality and cost of public services and public administrations have indeed become important issues: Every citizen and formal organisations encounter more or less frequent interactions with public agencies throughout their life cycle; public service quality affects quality of life, business activities and political legitimacy; choice of delivery has to match the already widespread use of the Internet in private life and business; service quality counts as an increasingly significant factor in decisions on business locations; and the costs and efficiency of public services and public administrations have become key concerns of public sector reform with the pressure to reduce fiscal deficits and to consolidate public budgets.

The realisation of electronic government and transformation of service delivery (Prins 2001) is accompanied by strategic policy frameworks intended to guide basic decisions and day-to-day practical actions. They set the course for far-reaching changes, but are inevitably confronted with uncertainty regarding their long-term sustainability. The paper explores how scenario methods can be used to cope better with the uncertainties of future macro-environments of e-Government and to arrive at more robust e-Government strategies.

2. Innovation risks and sustainability of e-Government strategies

Numerous studies show that e-Government has gained momentum as an innovation goal of governments world-wide (e.g. TNS 2003; Ronaghan 2002). Practical implementation involves major investments in human resources, technology and change management. They lead to more or less far-reaching interventions into administrative processes, structures and service delivery. The strategic design and realisation of these technological and organisational innovations face manifold challenges and uncertainties. What is more surprising is the low level of attention paid to the sustainability of e-Government strategies and structures in most of these initiatives.
They entail risks on at least two levels: with respect to *implementation success*

and with respect to long-term *sustainability*. Successful implementation and operation of e-Government projects depend on the interplay of a number of elements in each of the main factors – people, technology, organisation and financial resources, legal and political frameworks. In general, implementation risks correlate with the complexity and innovativeness of a project, but as RAENG and BCS (2004: p. 4) note, "… the importance of risk management is poorly understood".

Examples of implementation problems, delays and failures in the area of e-Government can be found in practically all countries (cf. Heeks 1999: pp. 50-58). In Germany, for instance, the failure to set up a satellite-based highway toll system that should have gone into operation as planned in August 2003 has led to a national debacle, a loss of EUR 156 – 180 million per month since then and calls for resignation of the transport minister (Expatica 2004). In the UK, too, a front-runner in e-Government, there is a whole list of problem cases: E.g., Pathway, a social benefit-payment card scheme, is reported to have "collapsed after three years, wasting £300m. The Child Support Agency's £200m system, … is now expected to launch … a year late and £50m over budget. In 1999, problems with the Passport Office's new computer system caused chaos for thousand travellers. It was finally launched … three years late" (Economist 2002: pp. 37-38). Another case to be added concerned the Customs and Excise's switch to paying VAT online, which caused major problems around November 2002. In Austria, the implementation of an electronic insurance card in the health system has been delayed for several years. After the continued failure of an international consortium to provide the e-card, the Federation of Social Insurances finally cancelled the contract in spring 2003 after two years and started a new tender (Hauptverband 2003).

Causes of failures are manifold and range from technical problems to insufficient care for customer relations. However, our main topic here is the second category of risks, those concerning the more long-term sustainability of e-Government structures.
In view of the enormous investments and change impacts on public service delivery which are at stake, it is imperative to take a more long-term perspective. That sustainability is a critical issue is illustrated e.g. by one of the greatest challenges faced by many e-Government initiatives today: the question of sustained service take-up, use and consent by citizens and businesses. At present there are certainly more warning signals indicating that more attention must be paid to these issues than cause for all-clear. For instance the discrepancy between Internet access and use of e-Government services: "Despite nearly two-thirds of Britons having internet access, fewer than one in three has visited even one of the 3,000 government and council websites. And only 5% of internet users say they regularly use government websites to access public services", is reported in a recent UK study carried out by Hedra, a major consulting firm in the UK specialised in government organisations. The almost complete absence of elderly and socially deprived groups adds to the picture. No wonder that the report warns of the danger of creating "online millennium domes with just as few visitors" (Tempest 2002: p.10). As evidenced in the survey by TNS (2003), many other countries have similar usage problems.

It is therefore advisable to anticipate risks concerning the sustainability of e-Government as far as possible as early as during the development of strategies for its implementation, and to search for possibilities to reduce such risks. Unquestioned concentration on current or excessively optimistic views of general conditions endangers the sustainability of any strategy. The failure to identify potential changes in the environment of e-Government severely damages strategic policy. E-Government, like any organisation or project, is faced with complex sets of external drivers of change which create uncertainty about future environments and general conditions. What is required in this situation is an increase in the capabilities to explore and anticipate if not control possible future developments that impact on e-Government structures, and the corresponding adaptation of e-Government strategies. An established instrument to improve strategic decisions in a context of change, uncertainty and complexity is the scenario method (van der Heijden *et al.* 2002: pp. 142).

3. Scenario planning in e-Government

Scenario analysis and scenario planning have evolved into a great diversity of forms and applications over the last 50 years (van Notten *et al.* 2003). Despite the diversity of scenario methods, a common core element is to explore possible development paths and plausible, usually alternative images of the future. Alternative scenarios, i.e. pictures and stories that portray various future states, are able to challenge accustomed lines of thought and assumptions, to question the extrapolation of existing general conditions into the future, and to open up the view towards possible alternative and unexpected developments. This should enable decision-makers to sharpen their attention to critical factors and to take decisions which are better prepared for an uncertain future. In principle a scenario portrays a "possible future" which can then be used to assess strategies regarding its sustainability. An ultimate goal is to promote the design of strategies which are more robust, i.e. which fit different future scenarios.

Scenario approaches may differ in many respects even in their basic dimensions, such as project goal (exploration vs. decision support, descriptive vs. normative), process design (intuitive vs. formal), scenario content (complex vs. simple) and individual characteristics (van Notten *et al.* 2003: pp. 426). Endogenous and exogenous developments play an important role in the process of scenario building. A common approach to structuring and exploring external environments is known as STEEP analysis – the analysis of Societal, Technological, Economic, Ecological and Political variables (van der Heijden *et al.* 2002: pp. 156). Whether a resulting scenario represents a desirable or undesirable future, in any case it needs to fulfil certain criteria:

- "It should be *plausible*, but it does not have to be probable. Indeed, given the uncertainty of the future, it needs to be explicitly stated that the scenario is not a prediction, but only a possibility, as likely as many other possibilities.
- It should be internally *consistent* in order to be plausible and in order to enable a coherent discussion. (……)
- It should contain enough *information* to describe the functioning of a system" (Aichholzer *et al.* 2002: p. 8).

While scenario planning is widely used in many sectors and disciplines (van Notten *et al.* examine around 70 scenario studies), applications in the area of e-Government are less frequent. A case of systematic scenario planning in e-Government has been a project at regional level in the UK: Northshire Council in cooperation with a telecommunications organisation employed a facilitated scenario approach and elaborated four alternative scenarios of e-Government for the time-line from 2001 towards 2006 (van der Heijden *et al.* 2002: pp. 190). Outcomes and the resulting debate informed the strategic e-Government decisions and operational actions of regional government in Northshire in favour of a more viable, integrated and long-term perspective. Another interesting example is the development of four scenarios of "web-enabling government change" by Dunleavy and Margetts (2002). They are mainly differentiated by extent of change and relations to New Public Management (NPM), leading to possible scenarios labelled 'Digital NPM', 'Digital State Paradigm', 'Policy Mess' and 'State Residualization', respectively.

One of the most recent examples of the use of a scenario approach in the field of e-Government is the European research project PRISMA (Providing innovative service models and assessment). Funded by the European Commission's action line on IST within the 5th Framework Programme and completed in spring 2003, this example aimed at enhancing current good practice strategies towards more robust, future-oriented ones (see also http://www.prisma-eu.net/). It allows for a more detailed look at the process and outcomes which should help to assess the strategic value of scenario approaches.

4. Scenario development in the European research project PRISMA

The scenario process took place in 2012 and dealt – among others – with the future of e-Government towards a time horizon of 2020. It used the STEEP approach to analyse the overall contextual environment of e-Government in Europe in a two-stage process (Table 1):

Table 1: Structure of the scenario process in PRISMA

	Stage 1: Macro-scenarios for 2020	Stage 2: Implications for e-Government strategies
Actors	PRISMA scenario team	Scenario team plus external experts
Input	Approx. 100 trends in five categories (STEEP)	3 macro-scenarios developed in stage 1
Output	3 alternative macro-scenarios: (1) "A prosperous and more just Europe" (2) "A turbulent world" (3) "Recession and reorientation"	SWOT analysis of current good practice Expected implications for e-Government Design requirements in favour of more robust strategies

In a first stage the scenario-team identified a large number of empirically grounded influence factors and trends along the STEEP-dimensions which could play a major role for the design and future delivery of e-Government services. Nearly 100 variables were assessed with regard to impact, level of certainty, controllability and significance for Europe. From this analysis four scenario dimensions were determined: economy/society, governance, information technology and environmental sustainability. Eight possible scenarios were considered for development with different characteristics in these dimensions before a set of three was selected as sufficiently differentiated and manageable for further steps of analysis. All three scenarios are independent, internally coherent contextual macro-scenarios of e-Government which were elaborated and labelled as follows: (1) "A prosperous and more just Europe", (2) "A turbulent world", (3) "Recession and re-orientation".

In a second stage, the implications of these macro-scenarios for e-Government services were analysed in workshops with external experts (eight persons from all over Europe, selected for both subject field and ICT expertise, moderated by the scenario team). The experts defined requirements for future-oriented e-Government services by analysing current good practice models against each scenario by way of a SWOT analysis (strength/weakness – opportunities/threats). This allowed both contingent (i.e. scenario-dependent) and robust (i.e. scenario-independent) elements to be identified. Both deserve to be taken into account in strategy development for improving the sustainability of e-Government strategies.

4.1 Macro-scenarios for e-Government in 2020

A graphic presentation of the basic profiles provides a first overview of the three alternative macro-scenarios (Figure 1). Scenario profiles are represented by polygons of different shape, constituted by different values on each of the four basic dimensions which are plotted along the coordinate half axes (economy/society; governance; information technology; environmental sustainability). The symbols + and – denote opposite poles or levels of these variables but should not be interpreted normatively. Positive poles are located outward, negative poles towards the centre (for technical reasons of visibility one unit off the origin). A brief explanation how to read the values of the four constitutive dimensions:

Economy/society:

+ prosperous economic and integrative social climate
0 economic, social and political stagnation
– negative general economic and social climate ('Euro-depression')

Governance:

+ high level of clash between centralised government and private sector
0 balanced relation between government and private sector
– falling apart of central governance, decentralised governance

Information technology:

+ dynamic progress of IT innovations
– slow-down of IT innovations

Environmental sustainability:

+ high support for environmental sustainability
– low/no support for environmental sustainability

The three macro-scenarios represent alternative portrayals of possible contextual conditions for e-Government in Europe. The following are brief outlines with implications for e-Government. They

cannot do full justice to the elaborate versions provided in Aichholzer *et al.* (2002) but should convey the major characteristics.

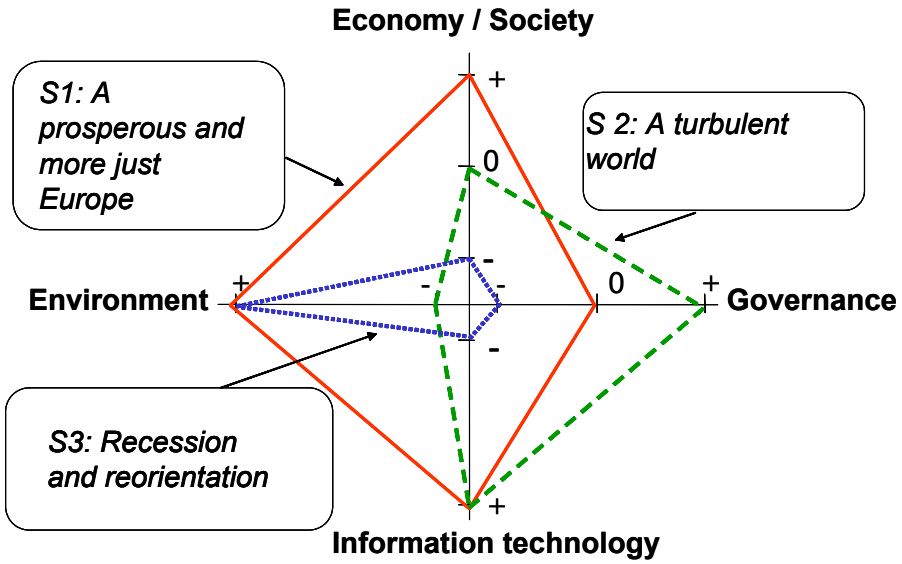

Figure 1: Profiles of alternative macro-scenarios

4.2 Implications of alternative scenarios for e-Government

4.2.1 Scenario 1: "A prosperous and more just Europe"

In this rather utopian, though most desirable scenario of all, Europe experiences an economic upswing in which practically all segments of society participate. Moore's Law is still in force and ICT continues to contribute to the prosperity and sustainable development of Europe.

In the positive general climate citizens are very open-minded towards information and communication technologies (ICT) and trust in security standards and data protection. General prosperity has largely allowed the elimination of the digital divide so that a large majority of Internet users have access to a diverse range of electronic services. Investments in extension on a grand scale, Internet access from home and public access points guarantee the supply of a broad range of e-Government services practically all over Europe. Modernisation and digitalisation of public administration has brought online services which are easily accessible, of high quality and trustful. Internet portals integrate services for citizens according to relevant life events (e.g. birth, marriage, work) and for businesses along major business events (e.g. formation of a company, work contract). Personalised services respond to individual needs of users and the provision of multiple access channels to public services extends individual choice. New human agents offer support to users of e-Government services. Horizontal and vertical integration of back offices is of high priority for public administrations and increases service quality for citizens and businesses. Even under these generally favourable conditions for e-Government some elements of uncertainty and concern remain, e.g. concerning political apathy, centralisation of services through highly integrated networks and privatisation of basic services.

4.2.2 Scenario 2: "A turbulent world"

In this scenario economic growth is not sustained. In response there is a shift towards strong central government direction, while at the same time the market power of the private sector greatly increases. The two forces are frequently in severe conflict. Information technology continues its growth, but regard for sustainability is lost in the combination of economic volatility and conflict.

The private sector extends its range of electronic services and increasingly takes over tasks from the public sector. The administrative apparatus is rationalised by

"lean administration" and "new public management", downsized, modernised with e-Government projects, including improved accessibility to public sector information. However, the enormous costs of securing a permanent level of service quality represent a financial burden and set clear limits. Trust of European citizens in technical systems is given and international security and privacy standards are of public concern. Fragmentation of society penetrates all spheres of life and also has negative impacts on access to and use of ICT: The digital divide has increased rather than reduced. Financial restrictions and skill deficits prevent large parts of the population from using other than simple e-Government services, e.g. accessing information. Only a minority of these segments have access to more complex transaction services or electronic signatures. Wealthy middle and upper class people profit from converging technologies and advanced innovations in the services offered. They carry out their administrative contacts completely online and enjoy the benefits of personalised and premium services. (It seems as if effective policies to counter the strong forces acting towards such a severe divide are still missing).

4.2.3 Scenario 3: "Recession and reorientation"

In the third scenario the European economy is gradually recovering from a severe crisis which had peaked around the middle of the decade. The experiences cause people to rebel against technology, government and markets in favour of decentralisation, environmentalism and de-globalisation. In essence, the scenario assumes slow economic development, a smaller and decentralised role of government, a slow development of ICT, but an increasingly sustainable environmental development.

EU member states have made progress in consolidating their budgets and achieved cost-savings through rationalisation in the public sector and closer cooperation with the private sector. In many countries privatisation and outsourcing of public functions have created "lean administrations". A serious problem for citizens is the lack of transparency of government. The IT industry suffers from more than a lack of government investment. At the same time the dynamics of technology undergo a considerable setback. (Recent indications that overcoming the problem of heat generated by ever faster computer chips might hit a 'technical wall' make this appear even more likely; this could challenge the continued validity of Moore's law). Advances in interactions with computers are also hampered by constraints set by environmental regulations and the increasing turn to life styles which favour personal interaction instead of electronic communication. Most of all, there is a special reason why citizens view IT applications with decided scepticism: Manifest scandals around the misuse of personal data by government agencies as well as private companies have caused a radical loss of trust in e-services. Citizens and smaller companies lack the knowledge and resources to secure data effectively. The result is that many avoid using e-services. Especially advanced transaction services in e-Government requiring authentication or personalised services lose attraction. On the other hand the low value added of many simple information services leads to a sharp decline in usage. Data security becomes a key issue at EU level. Citizens prefer to trust NGOs which deal with privacy, technology issues and democratic participation. In these networks e-services do play a role: Consultations and participation of NGOs in decision processes are increasingly carried out online. A more open question might be the implications for the use of online communication by social movements and political activists under this scenario.

5. Lessons for the design of more robust e-Government strategies

The implications of each scenario for the suitability of current good practice concepts in e-Government has been elaborately discussed in workshops with external experts and examined by means of a SWOT analysis. This exercise looked at the strengths and weaknesses of major good practice principles of today and held them against the opportunities and threats associated with each scenario. One of the results was to derive a number of design strategies which could be regarded as

more or less robust across different scenarios:

5.1 User and target group oriented design

One of the most basic design elements to be prioritised is *demand and user centeredness*. Decisions on the priority of individual services are a special aspect of this, i.e. concerning type, breadth and depth of online services to be developed. It implies investing in instruments such as demand identification, user participation and feed back, analysing frequency and volume of service usage, quality controls and cost/benefit-calculations. Exemplary approaches and practices can be found especially in Canada, whereas their role in many strategy documents is often confined to a mere rhetoric function. This is underlined, e.g. by a critique expressed by the Audit Office in the USA of the lack of citizen-centeredness in many initiatives (GAO 2002: p. 2).

E-Government services should also take account of the *specific needs* of different groups of users. However, except for the business sector where services need to be tailored to fit individual sectors (e.g. tourism vs. industrial companies), the extent of individualisation and personalisation has been assessed as scenario-dependent and therefore needs careful definition in practice. Another aspect is the optimisation of *user friendliness* of e-services by means of usability tests, standardisation and design guidelines (style guides). Good practice cases are e.g., e-Vienna, Bremen Online or single services such as the Family Fund in the UK or the Clermont-Ferrand birth certificate service in France.

5.2 Multi-channel service delivery

It will certainly be necessary to offer alternative forms of interaction with governments in the future, despite the increase of private Internet access. In a Bavarian study almost 80% preferred this form, but a high proportion opted for alterative channels including call centres, electronic kiosks, as well as traditional personal and mail contact (Accenture, 2002: p. 11). In British surveys digital TV and local libraries together with cybercafés are included among the preferred access channels.

"Public access points" in agency offices, libraries, schools, youth and cultural centres etc. are a robust element in all scenarios. They fulfil important social functions. The business sector also profits from publicly accessible electronic service options: Online transactions in situ allow for more flexible and efficient services both for customers and agencies, e.g. in tourism applications. Among good practice cases of electronic kiosk systems are those in Sheffield and Bremen, whereas experiences in Antwerp were negative due to organisational deficiencies. What is important is an environment of support and learning opportunities such as offered in libraries.

5.3 Increasing service quality and efficiency through reorganisation

Integrating e-Government services in the form of *one-stop service* and *portals* is a key characteristic of innovative services. Major advantages are simpler, more flexible and time-saving access and service delivery for users. They also support transparency of governments and – especially in combination with tracking facilities – public administrations. Structuring service offers according to user perspectives in contrast to administrative criteria is a related principle. Good practice cases demonstrate this with *"life events"* or *"business events"* as criteria of organisation. Such improved service quality at the "front office" normally requires substantial process redesign and reorganisation of "back offices". This is especially the case when it comes to the implementation of *one-stop service* portals allowing for complete online transactions, eventually across different levels of government and sectors (CGEY 2004: p. 19).

5.4 Social inclusion

A socially non-exclusive supply of e-services is closely related to target group orientation and multi-channel access. Basic general interest services have to be accessible in simple and affordable forms. For this reason, e-Government strategies need to include elements which avoid the creation or perpetuation of social divisions as a consequence of technology. Disadvantaged groups in society need special attention and support concerning access and use of e-Government services.

The *"design for all"* principle, *multi-lingual* services and special *incentives* such as peer group support are possible means which serve this goal. The importance is underlined by a study in the USA which observed an increase of premium services at higher fees and warned of the creation of a "two class" society for e-Government users (West 2002: p. 13).

5.5 Security, privacy and trust

In all three scenarios the trustful handling of data and related issues of privacy of citizens and businesses play a significant if not central role. The notion of trust concerns several key aspects of data and information: availability, integrity, authenticity, confidentiality, non-contestability (this latter point is pivotal for legal and commercial applications).

Enhancing security, privacy and trust deserves top priority in e-Government strategies and efforts need to include 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. Positive examples are the privacy provisions in Canada or quality seals for e-Government services such as introduced in Austria (see http://www.cio.gv.at/service/brochures/IPIII_ Guetesiegel_final.pdf).

6. Conclusions

This paper focused on the sustainability of e-Government structures and the application of scenario analysis in support of this goal. It showed that scenario planning can raise the awareness of future uncertainties and aligns different frames of reference in a focused and systematic way. The scenario process stimulates active engagement with issues of long-term sustainability and an assessment of today's strategies against alternative futures. The construction of multiple scenarios allows for a testing of robustness of current good practice and policy options. Those strategies, principles and practices which withstand the test of widely different scenarios can be regarded as more robust options than those which only fit specific scenarios. It was shown that the sustainability of particular designs of e-Government depends on a number of future developments and contextual conditions such as the position of e-Government on the political agenda, assignment of resources, attitudes towards technology, data protection and privacy, the development of the digital divide, and technical progress. Scenario exercises permit the exploration and assessment of the vulnerability of strategies against different future environments. Local and sector-specific application of such exercises allows tailoring and fine-tuning of strategies according to different institutional conditions and development states of e-Government.

However, the potential of scenario approaches also has its limits. It is certainly debateable how contradictory requirements suggested by scenario outcomes can be evaded, or how gains in the sense of more 'future-proof' e-Government can be balanced against possible costs such as a slower innovation rate or sub-optimal technical rationalisation. Moreover, it is questionable how far a direct translation of scenario insights into practical strategic measures is at all feasible and on what further elaboration should be based. But in sum, scenario approaches can be a useful tool for drawing attention to neglected risks, thus enhancing strategy development and promoting the sustainability of e-Government, which also helps to transform public administrations into more future-oriented, adaptive learning organisations.

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