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THE BUSINESS CASE FOR E-GOVERNMENT

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The text of this paper is included in the chapter “The business case for e-government” contained in the OECD report “E-government for better government” (2005). This chapter is based on a paper prepared for the OECD by Professor Paul Foley, de Montfort University, UK, and Shazad Ghani, UK.

The first part of the chapter looks at the impacts of e-government and the studies that have been undertaken to investigate its costs and benefits. It then provides an overview of OECD countries that have evaluated e-government projects and the methods they have adopted. A checklist of key elements of evaluation studies is provided and the strengths and weaknesses of different approaches are reviewed. Finally, an overview of the benefits to government and users of e-government projects is presented.

Introduction

E-government is now widely regarded as being fundamental to reform, modernisation and improvement of government. The OECD defines e-government as “the use of information and communication technologies (ICTs), and particularly the Internet, as a tool to achieve better government”. However, the real costs of and benefits of e-government have rarely been soundly and systematically evaluated.

During the ‘dot.com’ boom, e-government enjoyed a healthy level of political and financial support. ICTs and e-government were seen as key tools for modernising public administrations and providing better government. However, the next stage of e-government is likely to require investment in the development of services and systems whose benefits will sometimes be less readily apparent to politicians and policy makers, and to the public.

This means that robust evaluation and monitoring of the costs and benefits of e-government needs to be better incorporated into e-government planning and investment. This is commonly referred as the need for e-government to be supported by a strong ‘business case’. Without this, e-government implementers will find it increasingly difficult to obtain support for making the investments required to enable them to achieve the objectives that governments set for them. This chapter looks at some aspects of how countries can address this issue.

THE BUSINESS CASE FOR E-GOVERNMENT: AN OVERVIEW

Why examine the business case for e-government?

The business case for e-government projects has rarely been evaluated or systematically monitored, and OECD countries acknowledge the need for improvement in this area (OECD, 2003). Decision-makers, policy advisers and practitioners need to be better informed about the costs, benefits, risks and outcomes of e-government in order to be able to assess the merits of proposed e-government initiatives and their likely effectiveness in meeting stated objectives, and also to improve their implementation.

In 2003, it was suggested that e-government had enjoyed a healthy level of political and financial support among OECD governments (OECD, 2003, p. 155). Many initiatives, such as the establishment of national Web portals, have had a high profile and support has been easy to find. The next stage of e-government activity is likely to involve more e-government initiatives that develop services and solutions based on the redesign and joining-up of back-office business process and IT systems. This will be more complex and challenging, possibly more costly, and potentially more risky, especially because they will often require changes that may be quite disruptive of established public sector structures, culture, and management arrangements. Benefits of these initiatives are likely to be less readily apparent to policy makers and the outside observer.

In the face of this, while the priorities of both countries and individual government organisations may differ, the need to better articulate the case for continued investment in e-government drives a need for improved identification, evaluation and monitoring of e-government costs and benefits. Without this, those implementing e-government will find it increasingly difficult to obtain political and public support.

Preparation of robust pre-investment business cases that outline the impacts of e-government initiatives, coupled with sound post-investment evaluation of these impacts, will enable decision-makers to 1) rank and compare proposals for investments in e-government with competing demands for scarce public funds, 2) hold implementers to account for delivering projected benefits within proposed costs and 3) better identify opportunities for benefit from future e-government investments. Overall, successful efforts in this area can assist governments in maximising the benefits of e-government while containing its costs and risks, and in prioritising resource allocation decisions (especially if the approach to evaluation and monitoring is consistent across government).

Impacts of e-government projects

The impacts of e-government are usually divided into two groups: those costs and benefits accruing to government, and those experienced by users. To date, the benefits for government have primarily been seen as relating to gains in efficiency achieved through the application of ICTs by individual agencies, while costs have been seen as those directly related to development and implementation of software applications and IT systems supporting new forms of information or service delivery. However, costs and benefits for employees, investors and other agencies are also important (E-government Workgroup of the Directors General, 2002). User costs and benefits arise for both citizens and businesses. Some observers have suggested that more general costs and benefits to society or the environment might comprise a third group (Rimmer, 2003). An overview of costs and benefits for both government and users is provided in annexes 2.1-2.4.

Benefits arise at each stage of e-government 'maturity'. The four levels of e-government maturity are:

- Level 1: Information.
- Level 2: Interaction.
- Level 3: Transaction.
- Level 4: Transformation.

(OECD, 2003)

The E-government Workgroup of the Directors General (2002) argues that the benefits of e-government increase as e-government activities progress further along the maturity model towards data sharing and transformation. The OECD (2003) highlights the mass processing tasks that present governments with major opportunities for improving efficiency through application of ICTs. The IAB (2003) notes that process improvements and streamlining achieved by e-government can provide significant savings and/or cost avoidance.

So far, only two countries have attempted to move beyond the analysis of the costs and benefits of individual e-government initiatives. Australia and the United Kingdom have examined the aggregate case for e-government projects by using a consistent methodology (different in each country) to investigate a large number of e-government projects.

In Australia, the National Office for the Information Economy surveyed 38 e-government projects (NOIE, 2003). Every project was expected to improve the quality of service delivery, and 87% of projects also expected to generate some financial benefit for service users. A user survey estimated user cost savings of \$14.62AUD per transaction compared to traditional channels. Businesses estimated savings of over \$25 AUD per interaction.

NOIE (2003) found that 24 projects claimed cost reductions (or increased revenues). For an estimated investment of \$108 million, these 24 projects were expected to achieve cost reductions of \$100 million. This represents a benefit/cost ratio of 92.6% (the estimate omits user benefits). Across surveyed projects, including those that had no expectation of generating a financial benefit, the aggregated benefit/cost ratio was 61.1% (again this estimate also omits user benefits).

In a study of 14 'e-government' projects the UK government found that all except one forecast positive returns. Payback periods for projects varied between four months and 11.5 years, with an average of 4.8 years.

Evaluating the economic impact of e-government projects

Several studies have reported results from research evaluating the economic impact of e-government projects (IAB, 2003; NOIE, 2003; OGC, 2003). The range of benefits and returns on investment identified can be seen in Annex 1. These studies provide an interesting overview of the magnitude of savings that can be derived from e-government projects.

However, they raise almost as many questions as they answer. Nearly all use different methodologies and their results are presented in different ways. Some provide details about costs, others do not. This makes it difficult to be certain that benefits exceeded costs and that a positive return on investment was realised. The value of these studies would be enhanced if more was known about the methodologies used to calculate costs and benefits.

Annex 1 shows that many studies have evaluated the economic impact of e-government projects in the early stages of the e-government maturity model (information and interaction). However, there are fewer evaluations of more advanced projects such as transformation initiatives. Many governments indicate that they are not yet near this stage of e-government, or that evaluation of the limited number of such projects that they have conducted has not yet been undertaken.

The studies that do exist have also emphasised total benefits or cost savings, while the particular beneficiaries of these savings have rarely been identified. For information and interaction projects, the reports have placed greater emphasis on benefits to users, given their visibility. Benefits to users indicated by the studies include 24/7 service delivery, improved convenience, and faster turnaround of service delivery.

Previous impact studies of e-government projects have not differentiated between the maturity level of projects, or the distribution of costs and benefits to users and government. However, the tables in Annex 1 suggest that benefits to government from less mature projects appear to be smaller than the benefits from higher level projects. Indeed, UK government studies suggest that as projects move from the information to the transformation level, payback periods on e-government investments decline and net present values rise.

Benchmarking studies

A better understanding of the costs, benefits and beneficiaries of e-government can help policy makers and e-government managers to make e-government more efficient and effective. Benchmarking studies of e-government are regularly undertaken by private sector organisations such as IBM, the Economist Intelligence Unit, Accenture and others. However, these are frequently little more than "bean counting" exercises that measure the number of services provided on line¹. These benchmarking studies are limited for two main reasons. First, they focus on the visible interface between government and users, while neglecting the more complex, and often more significant, back-office aspects of e-government.

Second, they take no account of the cost of e-government. A cost-effective e-government strategy would focus on introducing those services that can provide the greatest benefits while also achieving the greatest cost savings. For some countries it may not be cost-effective to provide some services on line, or may only be sensible to do so when sufficient users can be expected to use the e-government service.

Third, these studies often fail to account for the differing national constitutional, legal, political, economic and administrative contexts that influence how, where and when countries implement e-government initiatives. Finally, existing studies tend to focus on the supply of services and neglect service demand and use. They are output rather than outcome-oriented, their methodologies are not internationally agreed, and countries' overall performance is frequently measured on the basis of only a small number of elements of their e-government programmes (OECD, 2003).

One way of overcoming these concerns is to work towards an internationally agreed approach to examining the impacts of e-government that governments may use separately or collectively to self-evaluate their e-government initiatives.

The benefits of evaluation

OECD countries are at different stages in their development of e-government evaluation and monitoring tools and methods. The Dutch and Danish case studies (Box 1) show that the benefits of evaluation extend beyond the simple estimation of the costs and benefits or rate of return on an e-government investment. Evaluation can help policy makers to better understand of both the benefits and beneficiaries of e-government projects, and the costs associated with achieving such benefits. They can also be valuable in ensuring the realisation of benefits and project efficiency. Also, more advanced *ex ante* studies often incorporate risk analysis so that the potential impact of things like delays in implementation, unexpected cost-increases or lower levels of service use can be modelled and understood.

It is also important to highlight, as the Dutch example shows, that evaluation methods frequently change and develop in robustness in line with the increasing magnitude of an initiative, or its stage of development. Very detailed and costly evaluation methods are often inappropriate for small projects or for preliminary feasibility studies. The primary benefits of more detailed e-government evaluation include:

- A more robust framework for comparing investment decisions or projects within and between agencies.
- A better understanding of the drivers of project efficiency or factors enhancing return on investment.
- A better understanding of the costs, benefits and beneficiaries of different types of projects.
- A better understanding of whether higher-level projects produce more benefits and/or have greater costs.
- A positive contribution to evaluating the efficiency and effectiveness of e-government programmes.

Box 1. Findings from the Dutch and Danish case studies

Netherlands

The Ministries of Transport and Economic Affairs in the Netherlands have worked with Dutch economic research institutes for a number of years to investigate the impact of major infrastructure projects. These projects are known to affect markets throughout the economy and every effect is systematically estimated using cost-benefit analysis. Effects that cannot be expressed in monetary terms are reported separately.

The information produced by cost-benefit analysis is useful at almost every stage of policy preparation. In the early stages of infrastructure projects, decisions are supported through a broad approach to analysis. Before final decisions are taken, a thorough cost-benefit analysis is carried out. The analysis is an iterative process in which quantitative details and improvements are accumulated as research progresses. Risk aversion is incorporated into the analysis by increasing the discount rate, above the usual value of 4%. In this way less weight is given to benefits that lie further in the future.

Denmark

The development and use of business cases and evaluations in the Danish public sector is at an early stage. In the past the development of some government projects was not based on business cases.

The Digital Taskforce and the Ministry of Science, Technology and Innovation are starting to develop suitable tools and a more systematic approach to e-government evaluation. Best practice is being established through cross-sector projects that involve many different organisations. The taskforce has developed a financial business case tool as well as a cost-estimation tool and made it available to the public sector through their homepage (www.e.gov.dk). The reason for the explicit focus on financial information was the urgent need to alter previous methods and establish evidence of the economic benefits in project evaluations.

TOWARDS A METHODOLOGY FOR EVALUATING E-GOVERNMENT

Why develop a methodology to evaluate e-government?

The development of a robust common methodology to evaluate and compare benefits and costs of different e-government projects can assist in the development of better practice and more effective e-government. This section provides an overview of evaluation activities undertaken in OECD countries, the different methodologies employed and the common problems encountered. A simple equation with supporting checklists of key items for consideration in the preparation of e-government business cases, or the evaluation of projects has been produced by drawing together key elements of the methodologies used by different countries (see Annex 2).

E-government evaluation activity and methods in OECD countries

Nearly half (14) of OECD member countries have evaluated the impact of their e-government projects and policies. Many countries have only begun their evaluation activity in the last two years. Table 1 provides an overview of activities in each country.

Table 1. E-government evaluation activities in OECD countries
Type(s) of e-government evaluation employed

Country ¹	Active in e-government evaluation	Non-economic assessment methods ²	Economic assessment methods ²	Source
Australia	Yes	KPI	NPV, ROI, VA	NOIE (2003)
Austria	Yes	Benchmarking		Federal Chancellery (2004)
Canada	Yes	Capacity check	VA	OECD (2002)
Czech Republic	Yes	Benchmarking		e-Czech (2004)
Denmark	Yes		NPV	e-government workgroup of the Directors General (2002)
Finland	Yes	KPI	CBA	OECD (2003)
Germany	Yes	KPI		Information Society Germany 2006 (2003)
Italy	Yes		CBA	E-mail reply for this study
Japan	Yes			E-mail reply for this study
Netherlands	Yes	KPI		www.elo.nl
New Zealand	Yes	KPI	NPV, Financial analysis	States Services Commission (2003)
Poland	Yes	KPI		ePoland (2003)
United Kingdom	Yes	Benchmarking	BA, NPV, CBA	OGC (2003)
United States	Yes	KPI	ROI, NPV, CBA, IRR, VA	IAB (2003)

1. Evaluation activities for Belgium, France, Greece, Hungary, Iceland, Ireland, Korea, Luxembourg, Mexico, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and Turkey not available.

2. BA = breakeven analysis; CBA = cost benefit analysis; IRR = initial rate of return; KPI = key performance indicators; NPV = net present value; ROI = return on investment; VA = value assessment methods.

Source: Various published studies and responses to OECD requests for information.

Table 1 reveals the range of methods used in OECD countries' evaluations of e-government. Most countries appear to begin by developing methodologies that focus on single e-government projects.

Towards a common framework for evaluation

It is possible to develop an approach or methodology for examining e-government in two ways. One is to start from scratch, and the other is to use the common or best features of existing methods. The latter approach is adopted here. An OECD questionnaire used in preparation of this chapter sought the views of those that have evaluated e-government costs and benefits on the technical and practical opportunities and problems associated with the development of robust approaches for undertaking this work.

Based on the questionnaire and the review of existing studies and approaches to e-government evaluation, it was agreed by an OECD expert group that met to discuss this subject that, at the most basic level, the costs and benefits of e-government can be simply represented as:

$$(\text{Government benefits} + \text{User benefits}) - (\text{Government cost} + \text{User cost}) = \text{Cost/benefit impact}$$

Annex 2 provides a checklist for unpacking and assessing each of the four elements of the above equation. The equation is applicable to both *ex ante* preparation of business cases for investment in new e-government initiatives, and *ex post* evaluations of the costs and benefits of existing ones. Robust

evaluation also requires consideration of risk factors that might cause a project to fail or not reach its full potential. Checklists for evaluating three risk factors – business impact risks, technical risks and change and uncertainty factors – are also provided in Annex 2. An *ex-ante* study needs to consider these risk factors in order to avoid or to minimise impact. Only when the predicted benefits outweigh the potential risks should a project commence.

Table 2 shows the range of methods used by different countries in their evaluation of e-government. The complexity and comprehensiveness of these methods increases as the table progresses towards value assessment methods. Transaction cost methods provide a relatively quick and easy way to estimate potential cost savings related to e-government projects. The method appears to offer a good compromise between the two, often contradictory, components of any evaluation: rigorous assessment and practical reality. Further details about the transaction cost methodology can be found in Annex 3.

Most countries undertaking evaluation have used simple return on investment metrics such as net present value, internal rate of return, savings to investment ratios (see Table 4.1). Such studies tend to focus government costs and benefits, perhaps because they are “controllable” and because it is easier to gather the relevant data.

More complex methodologies developed by countries such as Australia, Finland, the United Kingdom and the United States incorporate methods for estimating costs and benefits to users. The calculation of user costs and benefits (Annexes 4.2.2 and 4.2.4.) is much more complicated owing to problems in producing a monetary or other value for issues such as better service quality or savings of user time.

Table 2. E-government evaluation methodologies

Method	Description	Use
Transaction costs	Uses segmentation methods to calculate use and benefits to different user groups	Quick and easy way to estimate potential cost savings from the introduction of e-government
Net present value	A straightforward method that examines monetary values and measures tangible benefits	Relatively straightforward; use when cash flows are private and benefits tangible
Cost benefit analysis	A flexible method that measures tangible and intangible benefits and assesses these against net total cost	Good consideration of all benefits, but can be expensive and time consuming
Cost effectiveness analysis	Focuses on achieving specific goals in relation to marginal costs	Good for considering incremental benefits against specific goals
Portfolio analysis	A complex method that quantifies aggregate risks relative to expected returns for a portfolio of initiatives	Good for consideration of risk, must use a consistent approach across a portfolio
Value assessment	A complex method that captures and measures benefits unaccounted for in traditional ROI calculations	Used by several governments to consider performance against all policy goals

Several governments (such as Australia, Canada, the United Kingdom and the United States) have lengthy documents describing how e-government user costs and benefits can be calculated. These documents deal with technical issues such as valuation techniques, discount rates and additionality.

Many of the evaluation methodologies currently used are based on the *Demand and Value Assessment Model*, the *Enhanced Framework for Management*, the *Value of Investment Methodology* and the *Value Measurement Methodology* used respectively by Australia, Canada, the European Commission and the United States,.

The Australian case study (Box 2) describes how and why the value assessment method was developed and implemented in Australia. The purpose of the Australian approach is to define, capture and measure value associated with electronic services unaccounted for in traditional ROI calculations. It also fully accounts for costs, and identifies and considers risk.

Box 2. Australia's decision to use the value assessment methodology

The Australian government believes that investment in e-government should deliver tangible returns, whether in the form of real cost reductions, increased efficiency and productivity, or improved services to business and the broader community.

As a first step to measuring the benefit-cost ratio, the Australian Government Information Management Office (AGIMO) developed the Demand and Value Assessment Methodology to assist agencies. The methodology provides a consistent framework for measuring the social and financial benefit-cost ratio and for alignment with broader government and agency objectives for existing and proposed government online programmes. It also provides managers with a framework for determining and then for assessing, on an ongoing basis, the intrinsic worth of online and government online programmes provided as integral components of their overall service delivery strategies.

The components of financial, economic and social benefits flowing from e-government services are documented in a demand and value assessment framework handbook.

All four approaches are slightly different, but nearly all incorporate aspects of traditional business theories and methodologies, as well as newer hybrid approaches (CIO Council, 2002). Important factors for value assessment (Rimmer, 2003) include:

- Economic factors, including agency costs, efficiency and revenue, all provide for a net economic impact.
- Consumer financial value, including user costs, efficiency for users and direct cost savings.
- Social economic value, including increased consumer financial participation in the economy.
- Social factors, including increased education or health outcomes, better access to jobs.
- Whole-of-government benefits that offer increased transparency and accountability.

The New Zealand case study (Box 3) demonstrates that value assessment methods can be used to analyse solutions to problems prior to implementation. Their use is not restricted to simple *ex post* studies of impact.

Box 3. The *ex-ante* application of the value assessment methodology to authentication

The New Zealand government recognises that to deliver many kinds of government services on line agencies need a way to ensure that these services go to the right person and come from an authentic source. Authentication and safe online transactions are important in achieving many of New Zealand's e-government goals.

An all-of-government approach to authentication has been deemed essential. Owing to the magnitude and complexity of this objective a comprehensive value assessment methodology has been used to investigate the business case for online authentication. The Cabinet established an Authentication Project that has consulted widely with citizens and directors of all government agencies. During a thorough six-month study, the value assessment methodology was used to appraise different solutions and provide the vision, solution and implementation steps required to create an all-of-government approach to authentication.

It would obviously be imprudent to propose a best or generic methodology. Evaluation methods must be selected to match the resources available for evaluation, the magnitude of an initiative, and individual country circumstances. In addition, many countries are developing and adapting their own methodologies. Annex 2 provides comprehensive checklists of the costs and benefits examined in the e-government evaluation studies carried out by OECD countries. However, it would be inappropriate to prescribe a specific methodology for examining these factors.

E-government evaluation: additional problems and opportunities

It is important to consider some of the practical problems that have arisen in evaluation studies, because they highlight issues that need to be considered by those who undertake evaluation at agency, country or international level.

One major challenge relates to treatment of the potential costs and benefits of additional organisational changes that may have to be implemented alongside the direct development of e-government initiatives. This is an important factor that should be considered in both individual and aggregate or comparative evaluations of e-government. E-government initiatives often involve cooperation, coordination and collaboration across service or agency boundaries. This is frequently accompanied by organisational restructuring or business process and IT systems reengineering. It is difficult to break down the allocation of the direct and indirect (or spillover) costs and benefits of such initiatives, either to government or users.

In the United States and the United Kingdom there is evidence that both public and private sector projects that involve this type of change produces greater rewards (*e.g.* higher NPVs), partly due to positive spillover effects (Harris and Katz, 1989; Brynjolfsson and Hitt, 1998; IAB, 2003). However, the adoption of a common evaluation methodology makes it possible to compare projects in which e-government activities have been undertaken in isolation, with those in which accompanying changes (such as restructuring or re-engineering) have also been introduced. This creates an opportunity to identify and leverage opportunities for achieving increased benefits or reduced costs related to the spillover effects of e-government initiatives.

Another challenge which may be important to consider when undertaking e-government evaluations of cross-government projects is how to evaluate and account for costs that are sustained by an agency funding an e-government project and benefits that are diffused across government (sometimes called the “sow/harvest” problem). This issue presents a significant challenge to e-government, as it can impact unevenly on the incentives that government agencies face to involve themselves in multi-organisation e-government initiatives. Finding ways to consistently evaluate these costs and benefits can assist governments in creating optimal incentives for collaborative e-government.

Another opportunity arising from robust evaluation of e-government costs and benefits is that can enhance transparency in government as it highlights where savings (or enhanced revenue) have been achieved by e-government projects and increases the cost of ‘dishonest’ behaviour (such as obscuring efficiency gains in order to retain savings from e-government projects). Greater transparency in this regard may enable governments to introduce incentives to enhance savings, and methods to regulate the retention of savings by agencies.

BENEFITS AND BENEFICIARIES

E-government evaluation: analysis of benefits and beneficiaries

Many OECD countries contributed reports and data derived from evaluation studies which have been used in the elaboration of this chapter. It was possible to adopt a common approach to analysing the data provided by some OECD countries and thus to compare evaluation results, quantify costs and benefits, and investigate who receives benefits and bears costs.

The UK case study (Box 4) demonstrates the value of undertaking aggregate analysis to realise benefits and help define the key drivers for e-government efficiency.

Box 4. Undertaking aggregate analysis of the benefits and drivers of e-government

The United Kingdom has undertaken an aggregate review of the business cases for around 30 high-impact e-government services. These services were provided at a variety of levels of sophistication on the OECD maturity model. A common framework for analysis was agreed. A Treasury handbook outlining protocols for evaluation was supplemented by an e-government template, toolkit and guidance notes.

A key objective of the study was to highlight the need to focus on the realisation of benefits. When a business case was completed successfully, it resulted in a high-quality proposal that identified clear and auditable benefits that could be tracked through to their realisation. Performance could then be changed or enhanced to ensure the realisation of benefits. When business cases did not exist (or were undertaken poorly), key performance indicators were rarely identified, no baseline values were collected, no evidence of impact was sought and efficiency and performance remained obscure.

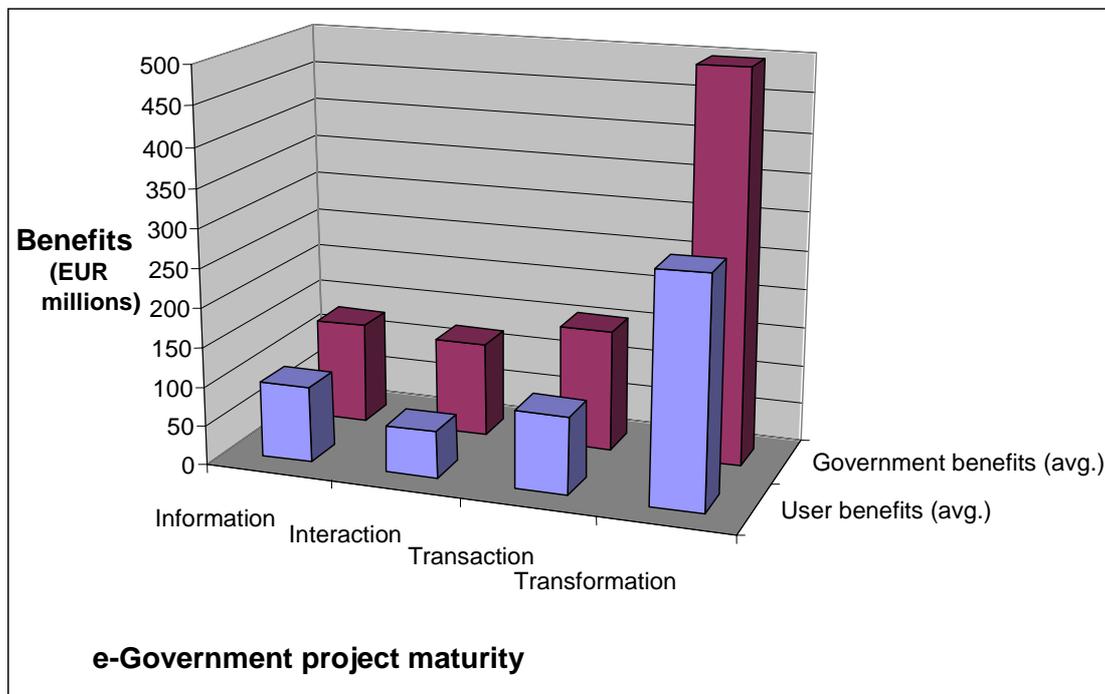
Figure 1 shows the magnitude of benefits and beneficiaries derived from a comparison of 28 e-government services using a very thorough cost-benefit plus net present value (NPV) methodology to examine costs and benefits to government and users. The e-government projects were divided into the four levels of the OECD e-government maturity model (information, interaction, transaction and transformation). The projects analysed included citizen and business taxes, benefits applications, company registration, e-voting, driving tests and hospital and doctor appointments.

The average level of benefits for government and users from projects at each level of sophistication are shown in Figure 1. Benefits for both groups clearly arise for all projects. However, the average value of benefits for government is greater than for users at all levels of sophistication.

Of the projects compared, those at higher levels of the e-government sophistication model achieved greater benefits more quickly than projects at lower levels. The NPV of transformation projects was more than 100 times greater than that for low-level projects. The average payback period for low-level projects was eight years, compared to only four years for transformation projects. Transformation projects produced benefits more than three times greater for government and users than projects at any of the other three levels of sophistication.

Higher benefits and faster payback periods were thought to arise for higher-level projects because they automated back-office operations and were less dependent on user adoption.

Figure 1. The distribution of benefits for users and government for e-government projects at different levels of sophistication



CONCLUSIONS

The need for robust methods to examine the benefits of e-government

It has been observed that the next stage of e-government activity is likely to involve the development of lower-profile services, the joining up of back-office activities and IT systems and the integration of e-government programmes across organisations at all levels of government and beyond (OECD, 2003; IAB, 2003). These developments will provide users with “one-stop” sources of government information and services. They should also enable government to operate more efficiently and effectively.

The amount of complexity and change associated with these more advanced e-government developments will be considerable. High up-front costs may make integrating processes, programmes and systems appear uneconomic, while organisational barriers to change present a daunting challenge. Future costs and benefits will be less apparent to policy-makers than even those arising from the limited number of impact studies already completed (OECD, 2003). It is therefore important to highlight the present costs and benefits of e-government, and to develop robust studies of the overall impact of e-government projects.

This chapter has outlined the range of methodologies that OECD countries have used to evaluate e-government projects. Comparison of methods used in many countries has made it possible to develop clear checklists (see Annex 2) of the factors that can be used for measurement, valuation and risk assessment when developing, comparing or auditing business cases for e-government initiatives. These factors provide a sound basis on which agencies or national governments can develop their own evaluation methods.

Better use of evaluation in e-government will have several benefits, including:

- A robust framework for comparing projects within and among agencies.
- The establishment of auditable figures supporting greater transparency.
- A better understanding of drivers for successful e-government projects.
- A better understanding of the beneficiaries of different types of projects.
- A positive contribution to evaluating the efficiency and effectiveness of e-government programmes.

Finally, using a robust methodology this chapter has shown for the first time that considerable benefits for both government and users arise from e-government projects at the transformation level of e-government, and that these benefits are more significant than those arising from less advanced initiatives. The results of this study and future evaluations will be important in providing evidence that the more complex transformational e-government projects that are likely to become more common in future achieve the objective of creating better government.

ANNEX 1

BENEFITS FROM E-GOVERNMENT PROJECTS PROVIDING SERVICES AT DIFFERENT LEVELS OF SOPHISTICATION

Four tables show the benefits identified in studies of e-government impact. Results are presented by grouping together e-government projects that focus on each of the four levels (information, interaction, transaction and transformation) of the OECD maturity model.

Table 1.1. The impact of information projects

Project	Activity	Economic benefit
Centrelink, Australia	Information service for citizens, started in 2001.	Breakeven over two years. AUD 8.9 million benefit after four years
District of Columbia Business Resource Centre	Business resource centre. Savings by rationalisation of some services.	Saves USD 1.8 million a year
Information Network of Kansas (INK)	State portal of more than 215 000 pages, 90% free, 10% have fees.	Nine years after creation revenue is more than USD 7 million a year.
Iowa Single Contact Repository	Delivers information to the public. Cost USD 277 000	Saves USD 264 000 a year
MyFlorida.com	Search engine that reduces the number of calls to the state's call centre.	Saves USD 1.5 million a year, reduces call centre calls by 1%
New Jersey Portal	Virtual gateway to government information	2.7 million hits per day
North Carolina Security Portal	Gives 24/7 information on ICT security issues to ICT personnel. Cost USD 160 000	Saves USD 2.2 million a year
State of Kansas	Online job listings, enhances job searching, reducing benefit payments.	Saves nearly USD 9 million a year in unemployment compensation
US one-stop for business legal information	Federal government initiative to assist with businesses' legal compliance	Businesses will save at least USD 275 million annually

Table 1.2. The Impact of interactive projects

Project	Activity	Economic benefit
Australia: e-tax	Tax returns can be filed on line	AUD 15.5 million in accrued benefits by 2004 over a five-year period
Colorado Secretary of State Business Centre	Provides business-related information and allows online document filing	Saves USD 2 million a year
Hertfordshire County Council, UK: Services Online	Undertakes queries with customers on line instead of face to face	Reduces transaction costs from GBP 4 per transaction to GBP 0.10 per transaction
Kansas State online nursing license renewal	Delivery of services and information to users	Reduced phone calls by 90% over five years
Massachusetts Educator Licensure and Recruitment Initiative	Streamlined the state licensing process	Saves USD 1.6 million a year
Missouri e-grants	Delivery of services and information to the public	86% reduction in processing time; 360% in technical support
Missouri Internet Online Claims Filing	Unemployment insurance claims can be filed on line	Potential savings of USD 61 250 a year
Nebraska's UIConnect	Delivery of services and information to users	Saving USD 361 000 a year to employers and USD 63 000 to government
Singapore: Tax e-filing	Tax returns can be filed on line or over the phone.	Saves SGD 20 million a year
Virginia Employment Commission (VEC)	A USD 250 000 system that enables claimants to key in unemployment insurance information on line.	USD 821 000 operational savings, USD 6.5 million savings for claimants.

Table 1.3. The Impact of transaction projects

Project	Activity	Economic benefit
CAL-Buy Online Procurement System, US	State of California's procurement project, saving USD 37 per purchase	Cost savings USD 9.7 million a year
Colorado business centre	Delivery of services and information to businesses	USD 2 million a year to businesses
Consip e-procurement project, Italy	Italian government procurement project. Provides savings of up to 30% on goods	Savings on administrative costs estimated to total ITL 1 500 billion in 2001
eMaryland Marketplace	Procurement project	Saves USD 100 per purchase
GSA Advantage!™, US	Federal government's online acquisition programme	Closed six of eight distribution centres and forward supply points in 2001
Iowa single contact repository	Delivery of services and information to the public	Saving USD 132 000 a year to employers and USD 132 000 to government
OGC, UK: E-tendering	Allows tendering to take place on line	GBP 13 million savings over 4 years. Reduces costs to suppliers by GBP 37 million
ServiceArizona	Allows citizens to register vehicles. Online processing is about USD 4 less than a counter transaction	Saves more than USD 1 million a year

Table 1.4. The impact of transformation projects

Project	Activity	Economic benefit
Idaho Paperless Online Personnel and Payroll System	Integrated payroll system costing USD 1.65 million	Saves USD 430 000 a year in administration and another USD 75 000 a year in printing
The Dolphin project, Ohio	Automation of the Ohio Bureau of Workers' Compensation scheme, cost USD 15 million	Saves over USD 120 million a year
Washington State Combined Application programme	Combined the benefit programmes of a few agencies, cost USD 400 000	Saves USD 6.37 million a year
Wisconsin Workers' Compensation Insurers' Web Reports	Enables administrators and insurers to have real-time access to compensation claims	Saves over USD 1.5 million a year

ANNEX 2

CHECKLISTS TO EVALUATE THE ECONOMIC CASE FOR E-GOVERNMENT

Chapter 1 provides a simple framework for investigating the economic case for e-government:

(government benefits + user benefits) - (government cost + user cost) = cost/benefit impact

Four checklists (2.1 to 2.4) document the constituent items of the above equation. These items should be considered in any investigation of the costs and benefits for established e-government projects. In addition, checklists for three risk factors – business impact risks, technical risks and change and uncertainty factors – are provided in checklists 2.5 – 2.7. These should also be included when developing an *ex ante* assessment or business case for future e-government projects. The checklists are adapted from a number of sources, most notably:

- Office of Government Computing (2003), Measuring the Expected Benefits of e-Government
- CIO Council (2003), Value Measuring Methodology: How-to Guide

Finally, the draft checklists were discussed by participants at the OECD Expert Meeting on the Business Case for E-Government, 17 September 2004 in London, who provided considerable input into these final versions.

2.1. Checklist of benefits to government

Direct cash benefits

- Greater tax collection, revenue
- Reduced fraud
- Reduced travel costs, field force expenditure
- Reduced publication and distribution costs
- Lower fines to government from international bodies
- Additional revenue from greater use of commercial services and data (*e.g.* use of electoral roll data)
- Additional revenue from newly available services and newly charged-for services
- Reduced need for benefits, *e.g.* through faster job searches
- Reduced costs through the need for reduced physical presence

Efficiency savings (monetisable benefits)

Time savings

- Reduced processing through common standards for data and processes
- Time saving of public servants
- Reduced error rates, re-work, complaints
- Reduced need for multiple collections of data from single customers
- More flexible working hours

Information benefits

- More accurate, up-to-date and cleaner data and more reliable information
- Capacity for greater information sharing across government

Risk benefits

- Improved risk management
- Improved security and fewer security breaches

Future cost avoidance

- Lower costs for future projects through shared infrastructure and valuable knowledge
- Reduced demand for service (through better information provision), *e.g.* health
- Reduced need for future government capacity expansion
- Encouragement of increased take-up of other e-services

Resource efficiency

- Reduced redundancy through integrated systems
- More effective use of existing (e and non-e) infrastructure and reduced capacity wastage

Other non-monetisable benefits

Improved service delivery

- Enhanced customer service
- Improved service consistency and equality
- Improved user satisfaction
- Improved communication
- Greater take-up of entitlements
- Improved reputation and increased user trust and confidence
- Integrated view of customer

Enhancements to policy process

- Enhanced policy alignment and outcomes
- Better information to facilitate policy making

Enhancements to democracy

- Increased user involvement, participation, contribution and transparency

Allows more, greater and new data to be collected

Improved security

2.2. Checklist of benefits to users

Monetary benefits

- Price reduction of charged-for service, avoidance of future price increases
- Reduced cost of transmitting information – phone, post, paperless interactions, etc.
- Reduced travel costs
- Reduced associated costs (*e.g.* professional advice, software tools, equipment, etc., predominantly for businesses)
- Revenue generating opportunities for citizens, businesses and intermediaries

Time-based non-monetary benefits

- Reduced user time (hours saved)
- Reduced need for multiple submission of data for different services and events
- Reduced travel time
- Reduced user time (hours saved)

Value-based non-monetary benefits

- Quicker response
 - Reduced application processing time (elapsed time saving)
 - Improved response time to events
 - Improved interactive communication, particularly between government and remote communities
- Improved information
 - More reliable and up-to-date
 - Faster and easier access
 - Transparency (*e.g.* status of “live” applications)
 - Can be live or real time
 - Enhanced democracy and empowerment

- Improved reliability
 - Reduced error rates
 - Greater confidence and certainty of transaction
 - Service consistency
 - Overall reliability
- Choice and convenience
 - Range of access channels – increased choice and ease of access
 - Greater user convenience (24/7 service delivery)
 - Decrease in abandoned transactions and complaints
- Premium service
 - Extra tools and functionality for users
 - Improved customer service
 - Personalised service
 - Service integration

2.3. Checklist of costs to government

Market planning and development

- Business planning and options analysis
- Market research
- Due diligence and plan audit
- Tendering

System planning and development

- Hardware
- Software licence fees
- Development support
 - Programme management
 - System engineering architecture design
 - Change management and risk assessment
 - Requirement definition and data architecture
 - Test and evaluation
- Design studies
 - Customer interface and usability
 - Transformation or business process redesign
 - System security
 - User accessibility
 - Data architecture
 - Network architecture

- Other development phase costs
 - Facilities: offices, office equipment, etc.
 - Travel

System acquisition and implementation

- Procurement
 - Hardware
 - Software
 - Customised software
 - Web hosting
- Personnel
 - Additional programme management
 - Internal communications
 - Process redesign
 - System integration
 - System engineering
 - Test and evaluation
 - Data cleaning and conversion
- IT training

System operations and maintenance

- Hardware
 - Maintenance
 - Upgrades and replacement
- Software
 - Maintenance
 - Upgrades
 - Licence fees
- Telecoms network charges
- Operations and management support
 - Programme management
 - Operations
 - Back-up and security
 - IT helpdesk
- On-going training
- On-going monitoring and evaluation
- Other operations and maintenance

Financing costs

Market and process implementation

- Personnel
 - Internal communications
 - Training
 - Redeployment
 - Customer helpdesk
 - Call centres
- Marketing and communications
- Customer inducements and rebates
- Legal advice

2.4. Checklist of costs to users

- Direct costs
 - Computer hardware and software
 - Computer operations and maintenance
 - Telecoms and Web access charges
 - IT training and support
 - Digital signature setup
 - Printing forms and information
- Time factors
 - Web search
 - Reading time
 - E-mail and form completion
 - Phone time

2.5. Checklist of business impact risks

- *Impact on business processes (includes changed processes):* Impact that the project will have on the organisation (during development and after implementation).
- *Impact on government services at implementation:* Impact that the project will have outside the organisation, for example on other agencies, the public and businesses during development and after implementation.
- *Impact on other projects and changes:* Degree to which the project is dependent on and connected to other projects and changes.

2.6. Checklist of technological risks

- *Technological dependence:* Dependence on new technology or new methods.
- *Degree of innovation:* Extent to which the project involves innovative solutions and staff experience to deal with innovation.

- *Impact and integrity with legacy systems*: Degree to which the project will need to develop interfaces to existing systems and data.
- *Security*: Robustness of physical and technological security controls.
- *Scope of IT supply*: Extent of IT consultant and supplier activity, support and maintenance now and in the future.

2.7. Checklist of change and uncertainty factors

Change management	Uncertainty
Culture change required (e.g. working practices)	Inexperience in dealing with third-party suppliers
Leadership direction	Dependence on third-party suppliers
Management resistance	Use of untried methods
Lack of staff experience and inadequate training to accommodate change.	Time constraints and critical deadlines
Lack of motivation	Economic or market changes
Poor communication with appropriate staff	
Lack of responsiveness to change	

ANNEX 3

THE TRANSACTION COST METHODOLOGY

The best source of information about the transaction cost methodology is the report by the Office of Government Computing (2003), entitled “Measuring the Expected Benefits of e-Government”.

The transaction cost methodology is comprised of three key elements:

1. Calculation of the cost of a traditional process.
2. Calculation of the cost of an e-government process.
3. Forecasting customer take-up.

To calculate the cost of an existing or traditional process it is necessary to:

1. Identify each step of the transaction.
2. Identify the cost associated with processing each step of the transaction.
3. Understand how these costs will fall as the number of transactions using the existing process declines.
4. Using 2 and 3, calculate how the total cost of processing transactions will decrease as the number processed falls.

To calculate the cost of an e-government process it is necessary to:

1. Identify each step of the new process.
2. Identify the cost associated with processing each step of the new process.
3. Understand how these costs will fall as the number of transactions using the new process increases.
4. Using 2 and 3, calculate how the total cost of processing transactions will rise as the transactions processed in this way grows.

By breaking a transaction down into discrete steps, it is possible to estimate the time saved by e-enabling a process. The UK government (OGC, 2003) used this method to assess savings from e-enabling the retirement pension process. The process was broken down into eight transaction steps; for each, estimates were made for the time taken before and after e-enablement (Table 3.1.)

Table 3.1. Step-by-step time savings for retirement pensions

Transaction step	Step description	Current time (mins.)	e-enabled time (mins.)	Saving (%)
1	Pre-claim activities	32	13	59
2	Build claim	32	16	50
3	Resolve claim issues	25	18	28
4	Award pension	1	0	100
5	Decide	29	15	48
6	Finalise payment	3	1	67
7	Post award action	16	12	25
8	Pay claim	21	20	5
	Total	159	95	40

Source: OGC (2003), "Measuring the Expected Benefits of e-Government", p. 26.

The method acknowledges that users and their requirements are not identical; some applications require more human judgement and intervention. Nevertheless, it is possible to focus on "typical" or "straightforward" transactions. The important thing is to make reasonable assumptions about which transaction elements will, for the majority of claims, be transformed by the introduction of an e-government project.

Having identified transaction elements, it is then possible to estimate the costs of performing each transaction step. Tables 3.2 and 3.3 illustrate how these costs can be calculated.

Table 3.2. Example of the cost of an existing process

Cost element	Variability
Postage	GBP 0.25 per transaction. Not required if transaction carried out electronically.
Payment processing	Cheaper processing of payments; saving of GBP 0.10 per transaction.
Staff cost of processing transaction, dealing with enquiries, training, etc.	One processing staff member freed for every 2 000 transactions received electronically. Average saving of GBP 18 000 a year per person
Indirect costs (finance, human resource functions associated with relevant activity, head office overheads)	One administrative staff member freed for every 50 processing staff released. Average saving of GBP 18 000 a year per person
Cost of running legacy systems or other overheads associated with traditional transaction channel.	Total cost of running these systems is saved when old channel is completely switched off. Saving of GBP 4 million a year

Source: OGC (2003), "Measuring the Expected Benefits of e-Government", p. 27.

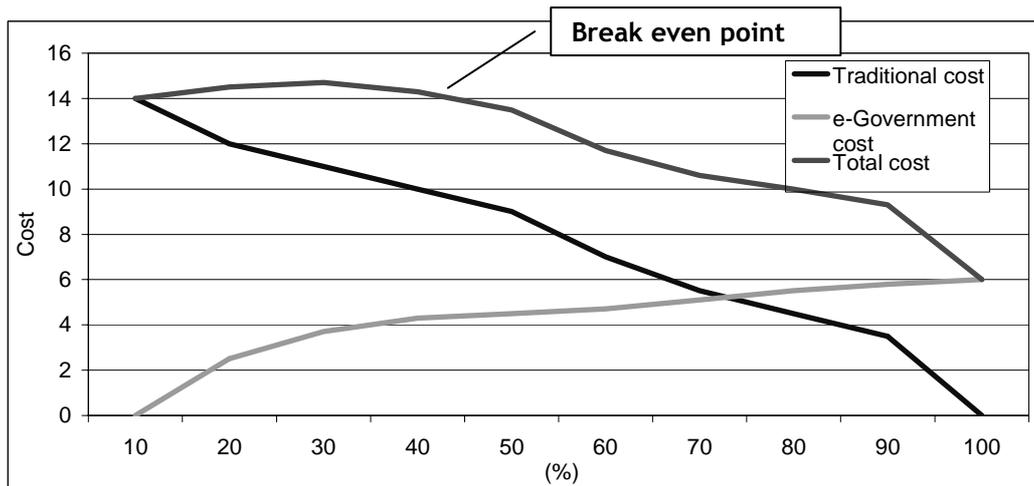
Table 3.3. Example of the cost of a new e-government process

Cost element	Variability
Cost of setting up and running IT systems	Fixed cost of GBP 2 million a year regardless of take-up.
Marketing/ raising awareness of new channel	GBP 5 000 a year for first 3 years.
Staff cost of processing transactions and dealing with enquiries, training, etc.	One member of staff required to process every 4 000 transactions.
Indirect costs (finance and human resource functions associated with relevant activity)	One member of administrative staff required for every 50 processing staff.
Security costs (e.g. costs of providing digital certificates)	GBP 5 per transaction.

Source: OGC (2003), "Measuring the Expected Benefits of e-Government", p. 27.

To calculate cost savings and the break-even point it is necessary to calculate the cost of running the new e-government project and the existing process at varying take-up levels. Adding the two together and plotting the results enables a break-even point to be calculated (Figure 3.1).

Figure 3.1. Example of cost savings and break-even calculation



Source: Adapted from OGC (2003), "Measuring the Expected Benefits of e-Government", p. 28.

Figure 3.1 provides an example of cost savings based on the percentage (between 0% and 100%) of customers who use the new e-government service. The rate at which users start using a new online service will affect the internal benefits and costs that an e-government project is able to realise (and the benefits derived by users). This will have a major impact on the rate of return or the net present value of an e-government project. Take-up differing substantially from forecasts is one of the biggest risks confronting any e-government project.

For many existing e-government projects, the proportion of customers already using the e-government channel can be known and forecasts of future use can be more robustly calculated. As a result, take-up (on the x axis) in Figure 3.1 can be replaced by a time line to plot take-up over time (probably a number of years). Analysis and forecasts of take-up using a time variable make it possible to calculate the rate of return or net present value of an e-government project.

Several countries have developed segmentation methodologies to forecast future use of e-government projects. For each customer segment, data are collected and forecasts are made of the number of people that have access to the channel (e.g. Internet, digital TV, mobile phone, etc.) for the e-government service. These

data are usually collected by government statistics departments. Data for the proportion of each segment using the e-government service are collected and forecast. Data and forecasts for each segment are then combined to estimate take-up for the entire population.

Take-up trends usually follow an S-shape, with demand picking up slowly at first, accelerating as the bulk of customers adopt the service and then slowing as usage saturates and late adopters finally begin to use the service.

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