

MEASURING THE EXPECTED BENEFITS OF E-GOVERNMENT

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Introduction

E-government has the potential to improve greatly the delivery of public services, making them easier to access, more convenient to use, more responsive, more transparent and so on. It also has the potential to free up resources in the public sector by delivering services more efficiently.

However, the government's record on IT projects is not good and the drive towards e-government also comes with risks, so it is important that delivery organisations are clear about the benefits they expect from their investment in electronic delivery. This document is to help government departments and other public sector bodies think about these benefits: how they can quantify them; how they will realise them; and how they will identify the associated risks when they are developing their business cases.

Readers should use this guidance in conjunction with, not in place of, the Green Book, HM Treasury's guide to 'Appraisal and Evaluation in Central Government', which provides a clear explanation of the nature and purpose of an economic appraisal.

Figure 1 shows the generic process for developing a business case. This document focuses on identifying possible options for an e-government project (Stage 3) and reviewing the options (Stage 4). It shows how the guidance in the *Green Book* can be applied and highlights some of the issues that arise in e-government¹.

Figure 1: Stages in Project Appraisal and Evaluation

- 1) Justify government action
- 2) Set objectives
- 3) Develop possible options
- 4) Review the options
 - a) Value the customer benefits and costs of a proposal
 - b) Calculate the exchequer benefits and costs of a proposal
 - c) Take account of risk
 - d) Establish how the proposal impacts different socio-economic groups
 - e) Discount cash flows
 - f) Assess the options for delivery
- 5) Test the lead option
- 6) Address how to manage delivery of the expected net benefits

It is important to develop a thorough business case for any major investment decision; it is not sufficient to justify action solely on the basis that it is needed to meet a target. At a minimum, a thorough business case should prove that the preferred approach is the most cost effective way of delivering against target (e.g. minimises lifecycle costs, maximises cost avoidance and other benefits). e-Government should bring real

¹ This document draws heavily in parts on the 2003 edition of the Green Book.
<http://greenbook.treasury.gov.uk/index.htm>.

benefits - increased efficiency and, in some cases, increased revenue. Business cases need to look creatively at the options of meeting targets and delivering these benefits.

The business cases should be robust so that:

- There is a clear understanding of what is going to be delivered and what benefits it will bring – this will set a firm platform for implementation and realising those benefits
- The costs of implementing the system are well understood, reducing the risk of major cost over-run
- There is a good match between planned and actual use of infrastructure reducing wasted expenditure on over-capacity and limiting the impact of poor performance on customers because of under capacity

As the business case provides the justification for major expenditure, it is not an activity to skimp; solid analysis at this stage can repay many times over during implementation. The private sector would typically spend millions of pounds on developing business cases for major investments and hundreds of thousands of pounds on due diligence and independent audits of the business case.

Additional guidance on developing possible options, including how to work with intermediaries, is available from the Office of the e-Envoy². The Office of Government Commerce is also a useful source of information, expertise and advice on developing business cases and successful IT and project delivery³. The Office of Public Services Reform provides information about developing and maintaining customer focus in government interactions with its users⁴.

In identifying and quantifying the benefits of various options departments face several challenges:

- Identifying the options that are likely to result in the greatest external and internal benefits.
- Estimating customer take-up of e-Government services.
- Estimating customer costs and benefits of using an e-Government service.
- Estimating internal departmental costs and benefits of e-enabling services.
- Evaluating options.

Identifying the options that are likely to result in the greatest external and internal benefit will be key to maximising the value of e-Government. Studies in the UK and abroad have shown that the greatest benefits can be achieved using information technology to re-engineer internal processes, rather than just e-enabling customer interfaces.

Implementing an e-Government initiative will only deliver benefits if customers decide to use the new channels and processes. So developing robust forecasts of take-up will be a key feature of a sound business case.

² http://www.govtalk.gov.uk/policydocs/consult_subject_document.asp?docnum=766

³ <http://www.ogc.gov.uk/sdtoolkit/>

⁴ <http://www.pm.gov.uk/output/page261.asp>

E-Government will create benefits and costs for both customers and government departments and delivery organisations. While delivery organisations can often identify the benefits and costs that electronic service delivery is likely to create for their customers, quantifying those benefits is not always easy.

Whilst delivery organisations are committed to improving service delivery, they have typically directed towards understanding the resource implications of e-government, and the level of savings that could be made in the long-term if investment is targeted correctly.

As the agenda has shifted away from simply providing information online towards delivering the more complex and expensive services online, organisations must estimate the level of savings they expect to make from their e-government strategy.

This document provides guidance in each of these five areas:

- Identifying possible options
- Forecasting customer take-up
- Estimating customer costs and benefits
- Estimating internal costs and benefits
- Evaluating the options

Identifying Possible Options

For any appraisal of e-government project options to be meaningful, it is important to consider the full range of options available to deliver the service. Without properly considering how e-government opens up possibilities for changing the existing supply chain, the danger is that public sector bodies will merely convert existing services rather than enhancing and improving them.

When drawing up a list of project options to review, business case authors should consider five questions:

- Which services with customers is this project going to address and would increasing the scope offer greater benefits?
- Is there scope for joining-up with other departments?
- Which of the multiple interactions involved in providing a service will the project e-enable?
- How much of the process supporting those interactions will the project change?
- Does the department or agency need to control the entire process or are there any alternatives using third parties that could offer advantages?

Which Services?

Government departments provide multiple services to customers and each of those services can involve multiple interactions.

When examining options for e-enabling services, business case authors should consider:

- Which services are we addressing?
- Are there other services we should also consider that will deliver increased internal and external benefits?
 - Reduced data entry and checking for services that require similar information
 - Combining back-office systems and processes may reduce duplication and provide greater data consistency and deliver a single customer view

Working with Other Departments?

Business case authors should explore whether there are there any opportunities for developing cross-departmental plans to deliver more joined-up services to customers or to share infrastructure or processes as there can be considerable benefits:

- Increased take-up and customer retention as providing multiple services through the same channel can provide a more customer focussed delivery
- Joined-up services enable sharing of common processes (sign-on, complaint, change of circumstance etc.) with benefits to user and provider alike

- Economies of scale and scope, in project development, implementation and system maintenance
- Faster implementation where departments can leverage other's existing infrastructure
- Reduced project risk by reusing other department's tried and tested operational systems, and gaining access to lessons learned and experience
- Reduced fraud / increased efficiency. Linking databases between departments can improve efficiency through more accurate data and shared maintenance costs. Linked databases can also reduce fraud through improved crosschecking of entitlements.

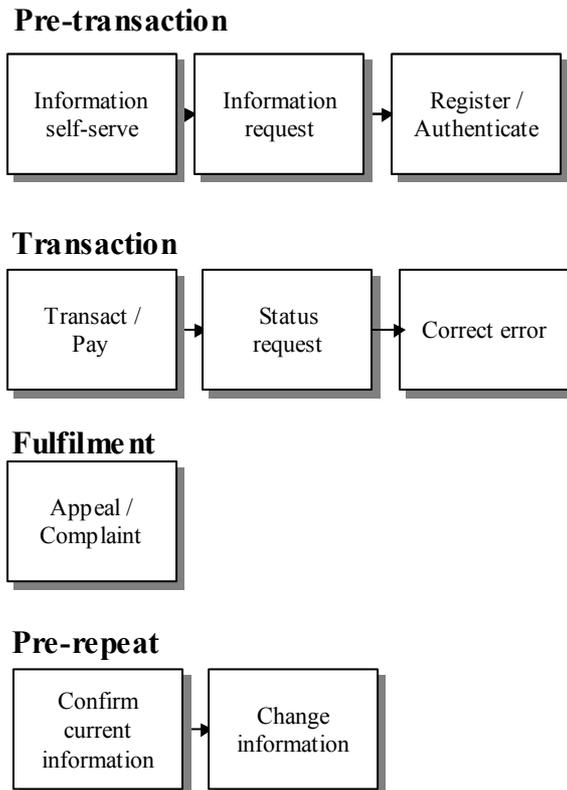
In assessing whether there are any opportunities for cross-departmental planning, business case authors should consider:

- Customer factors:
 - What services from other departments are complementary to the services being considered?
 - What opportunities are there for developing stronger customer propositions, for instance by providing a common access point to services that customers are likely to require at the same time, thereby reducing the amount of duplicate data input and increasing convenience?
- Implementation issues
 - Who are the stakeholders in other Government departments who will be affected by the service and are there opportunities to co-operate with them?
 - What is the scope for sharing project development, implementation and maintenance? For instance, it may be possible to use a common infrastructure or share elements of the service, such as the customer registration and authentication system.
 - Is there common infrastructure that could help avoid costs and reduce life-cycle costs; examples include:
 - Government Gateway; for service enrolment and authentication
 - DotP; for efficient content delivery and management across multiple channels and formats
 - Online Government Store; for customer focused delivery of Government to Citizen services
 - Business.gov; for customer focused delivery of Government to Business services
- Efficiency issues
 - Do databases exist in other government departments with considerable data overlap? What is the potential for joining up databases/ using common databases?
 - Are there opportunities to re-engineer the interactions with other government departments?

Which Interactions?

For each service there may be multiple interactions with customers as they move from finding information to communicating with departments to transacting with departments. Figure 2 shows the generic types of interaction customers may have with departments.

Figure 2: Generic Interactions With Customers



Business case authors should identify all the interactions with customers that occur in delivering a service and then consider options that include all of those interactions.

Interactions fall into three categories: providing information, communicating and transacting.

Simply *providing information* electronically can have a significant impact on efficiency, as clear presentation of the right information can considerably reduce the need for manual contact. Even greater gains can be made through improving *communications* with customers: improving systems for dealing with customer requests and enquiries.

However, the greatest benefit is likely to be from *transactions* as IT has the potential to automate the complex processes that underlie many of them. Many high priority electronic services for government are transactional and whilst electronically providing information across government is quite advanced, progress in implementing transactional services has lagged behind. Implementing transactional services also

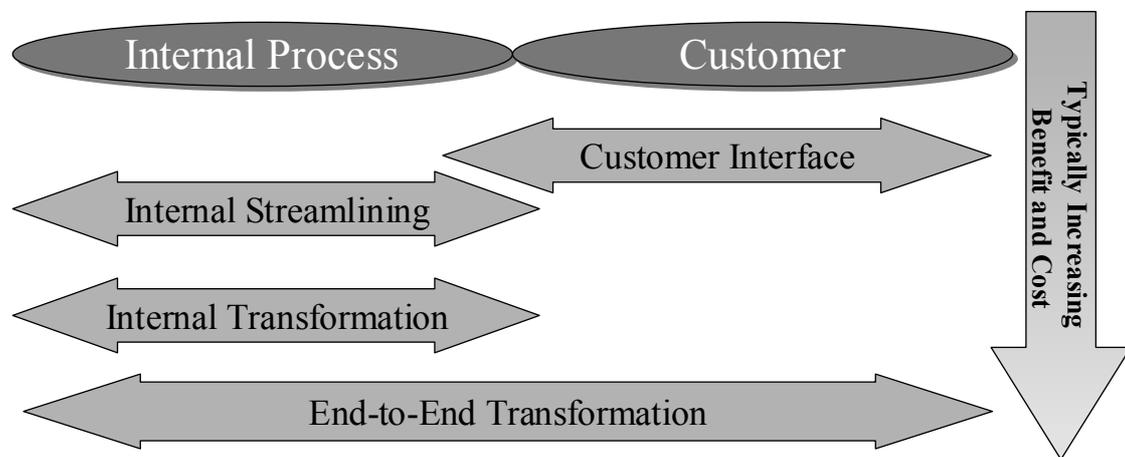
tends to be more expensive than providing information or communication, so it is important that departments clearly understand the potential gains that can be made.

Which Parts of the Process?

In developing options to evaluate, business case authors need to consider the different degrees to which processes can be e-enabled (Figure 3).

- The simplest is often e-enabling the customer interface, but leaving internal processes and operations essentially unchanged
- Automating, but not fundamentally changing, internal processes
- Transforming internal processes
- End-to-end transformation combining internal transformation with e-enabling the customer interaction

Figure 3: Degrees of Change in Interactions



E-Enabling The Customer Interface

E-enabling customer interfaces will produce monetary and non-monetary benefits to both customers and departments. For instance, using online forms can reduce the cost of processing incomplete or incorrectly completed paper forms by prompting users to fill in all necessary sections, validating data-entry, and providing guidance on completing them correctly. This improves the accuracy of data received and reduces the cost of contacting citizens for further details. However, these systems must be easy to use (usually based on detailed customer research), if customers are to adopt them.

Internal Automation

Automating internal processes will be more important in some cases than e-enabling the customer interface. There are good examples of central government departments generating large savings from general back office restructuring and automation, with e-enabling the customer interface producing further savings, but these being smaller.

Internal Transformation

Fundamentally transforming internal processes, rather than just automating existing processes can deliver very large benefits, especially if processes are not already highly efficient.

The challenges and initial investment can be higher when transforming processes, rather than just e-enabling the customer interaction, but the benefits can also be much larger if the risks associated with major change are well managed during implementation.

The need to transform services is implied in a Public Accounts Committee (28 August 2002) report⁵, which calls for “services the public want to use”, and the “use of IT to enhance and improve services and not just to convert existing services”. Reviews of international best practice in e-government by the Office of the e-Envoy also indicate that e-government projects with the highest pay-off are those that transform service delivery by changing internal and external processes, rather than just automating them.

Determining the opportunities for internal transformation requires a thorough understanding of current processes and an exploration of alternative ways of achieving the required outputs. Understanding the existing processes may require a study in its own right to map out each of the steps. Transforming those processes might involve:

- Removing duplicate steps
- Removing steps that do not add value
- Conducting steps in parallel, rather than in series
- Combining steps
- Consolidating operations:
 - Offices
 - Call centres
 - Data centres

End-To-End Transformation

E-enabling the process ‘end-to-end’ (combining changes to the customer interaction with internal transformation) can produce the highest benefits. Consider grant applications; e-enabling only the customer interface is not likely to generate substantial savings if departments print the information submitted online and process them manually as a traditional application. If the front-end connects directly into an automated process there will be significant savings in handling data and automatic “rules-based” processing of the application can dramatically reduce marginal costs to near zero.

End-to-end automation can also enhance the intelligence of the front-end producing further benefits. For example, registered users could download forms pre-populated with their details, saving them from entering their information again and ensuring citizen and government have consistent data.

⁵ HC 845 - *Improving Public Services through e-Government*

Using Intermediaries

Most government departments have owned and managed the entire process of delivering services to customers. In developing options to appraise, business case authors should also explore more innovative, alternative delivery options such as the use of private and voluntary sector intermediaries.

Involving private and voluntary sector intermediaries in public sector service delivery, as recommended in the PIU report on e-government⁶, offers government the opportunity to both improve customer service and the efficiency/effectiveness of service delivery. Involving intermediaries may help government to offer public services in attractive and customer-centric ways that will contribute a drive towards improved and efficient services.

The OeE has developed a 'policy framework for a mixed economy in the supply of e-government services'⁷ and created 'Rules of Engagement' for government departments to engage with businesses and charities to become intermediaries. These rules cover a wide range of aspects including:

- Intermediary qualification and selection
- Negotiations
- Operations standards
- Competition

For example, Inland Revenue encouraged *Digita*, one of the biggest payroll agencies, to develop a facility for submitting Self Assessment returns online. By doing so *Digita* offer an additional service to their customers, whilst simultaneously improving take-up for Inland Revenue.

⁶ e.gov – Electronic Government Services for the 21st Century, September 2000

⁷ <http://www.e-envoy.gov.uk/assetRoot/04/00/31/32/04003132.pdf>

Forecasting Customer Take-Up

The rate at which customers start to use a new online service will be one of the key factors determining whether a business case makes economic sense or not. Take-up will affect the total benefits derived by consumers and the internal benefits and costs that departments will be able to realise, so it will have a major impact on the NPV of the project.

Actual take-up differing substantially from its forecast level is one of the biggest risks confronting any e-services programme.

If take-up is much lower than expected, internal operational savings are likely to be difficult for departments to realise and if customers do not use the service they will not receive the benefits associated with it. With low take-up there will be overcapacity, representing a drain on resources, and a failure to pass on the benefits of improved service delivery.

If take-up of an electronic service is much higher than expected, the IT system supporting it may not be able to cope with the extra demand even if they have been designed to meet forecast peak loads.

If they expect take-up to start off low and rise over time, e-business planners may consider whether to deliver long-term capacity from the outset, or whether it will be more cost effective to scale up an initial system when the need demands it. Getting these decisions right depends on an accurate take-up forecast.

For these reasons, a robust 'take-up strategy' will be a crucial part of a business case for an electronic service⁸. This strategy should contain:

- A market segmentation of the customer base
- A description of the target customer segments and their needs
- A clear definition of the customer proposition and how it meets customer needs
- A quantitative forecasts of customer take-up based on robust assumptions
- A plan to market the new service to customers

Segmenting the Market

The first step in building a take-up strategy is to segment the market, as it is extremely unlikely that the entire market will be homogenous. Segmentation divides the overall customer base into groups with common characteristics. This will provide a clearer understanding of customer wants and needs, help create more effective customer propositions that meet those needs, and give a clearer understanding of the most effective marketing channels to promote the new service.

⁸ The office of the e-envoy has developed a detailed take-up strategy checklist to assist departments in formulating their service take-up strategy

There are many different ways in which departments could segment the market for a service including:

- Geographic – by different areas of the country, urban vs rural, etc
- Demographic – by factors such as:
 - Age
 - Social class
 - Income
 - Ethnic group
 - Marital status
- Psycho-demographics – for instance attitude to information technology, lifestyle, hobbies, personality traits
- Behaviour – usage of service, current channel for accessing a service, which other services do they currently use, benefits sought, etc

Identified segments will be:

- Measurable – you can quantify the number of customers in each segment
- Relevant to the services you are considering
- Substantial – if there are too few people in a segment then it will not be worth addressing separately
- Accessible – there must be a way to communicate specifically with this segment. For instance, a segmentation based on left or right-handedness may not be much use as it will be difficult to identify which customers fall into each segment and to target communications at, say, only the left-handers
- Durable – you should expect the segments to continue to exist beyond the short-term
- Different from each other
- Homogenous

Identifying Customers and Their Needs

If new services are to attain high levels of customer usage, they must be based on a firm understanding of the target customers and their needs.

At the outset, departments designing new on-line services should be clear about the customers for whom the service is designed. They should gather all the information they have about the target segments so that they understand factors such as:

- The size and growth rate of the target segment
- Customer usage of and attitudes toward IT and the Internet
- Customer needs, drivers, fears, aspirations and expectations

Understanding customer needs in detail will help determine the nature of the proposition that will attract the target customers. These needs may differ between segments. For instance there may be differences between early adopters of new services, the majority of adopters and those who are late adopting a service.

Early adopters may enjoy using on-line services and so have the experience and technical skill to overcome any glitches in using the service. However they may also be time-poor and so the biggest selling point to them could be saving time in conducting business with government.

The majority of adopters will not be technically skilled, so they need a service that is easy to use and which could offer them benefits of being simpler than using off-line processes.

The most important consideration for late adopters may be the cost of transactions and so the service may need to offer inducements, reduced charges or some other financial incentive if they are going to use the service.

There is a variety of techniques departments might use to understand customer needs better:

- Conducting focus groups with target customers can often uncover qualitative information about likes / dislikes and desires better than quantitative surveys.
- Creating ‘archetypes’ can help bring customer types or segments to life by personalising them as individuals. This process involves building up a detailed picture of a ‘typical’ person with a name, home, family and friends, occupation, income, lifestyle preferences, attitudes, etc. This can help prompt ideas about needs.
- Conducting a needs brainstorming session with participants ‘wearing the customer’s hat’ can also help identify customer needs. This works best when a team is well acquainted with the customer research and collectively contains a wide range of perspectives and experiences. Inviting non-team members with special skills or market knowledge to participate can often improve the outputs.

Defining and Refining the Customer Proposition

Based on a clear understanding of customers and their needs, departments should develop and test propositions that offer customers clear benefits.

A proposition should answer, from a customer’s viewpoint:

- What is on offer?
- Why is it relevant to me – why do I need or want it?
- What benefits will it give me and why should I buy it or use it?
- Who is offering this to me?
- How does it compare with other services I could use or with other channels?
- Where can I get it, what is it called and what will it cost me?

Summarising the customer proposition on a single sheet of paper can help crystallise it, Appendix 1 shows one possible template.

The process of identifying customer needs should draw out the benefits to the customer group of the new service. Unless these benefits are clear and unambiguous and meet their needs better than existing services and channels, customers are unlikely to adopt the service. For instance, monetary value may not be a key customer benefit when they actually require a reliable, well-designed, customer-centric, service offering. Inland Revenue attempted to encourage customers to use electronic filing of Self-Assessment returns by offering a reduction on any payment due if they submitted their return electronically. However this had very little impact on stimulating demand for e-filing, which, in its initial format, was cumbersome and unreliable. Improved reliability and user-friendliness has since improved take-up.

Conducting market / customer research can help confirm the attractiveness of a customer proposition and refine its detail. Such research is essential to provide an indication of the extent to which a service is likely to be used, though it must be carried out robustly: in particular the sample must be sufficiently large and representative and the nature of the proposition must be clearly explained to participants. Of course what people say they will do can differ substantially from what they will actually do – such research is far from infallible. Market research should usually be conducted by specialist agencies that are experienced in avoiding these pitfalls and can advise on research methodologies.

The proposition should identify the benefits to customers of the delivery channel planned. Using an intermediary can help customers carry out their business with government online, and may have greatest impact in cases where customers are not themselves online. Furthermore intermediaries may reduce switchover costs associated with introducing new systems for infrequent transactions (e.g. vehicle excise duty payments or corporation tax returns).

Making Quantitative Forecasts

Making forecasts of the number of users of an electronic service will be key to quantifying the benefits both to customers and the departments providing them. Forecasts should use a sound methodology that is based on robust input data.

Methodology

In designing the methodology they will use, business case authors should consider the trade-off between complexity and data availability and the requirements of the business case. However a logical ‘bottom-up’ method, rather than a simple ‘top-down’ forecast, is usually necessary to ensure that sufficient research and analysis is carried out to support the business case. A ‘top-down’ approach, perhaps based on examples from other services, can provide a useful sanity check on a more detailed approach, but is rarely sufficient on its own. Simply making unsupported assumptions about take-up is insufficient to justify investment.

There are many ways of developing quantitative forecasts, and models can become extremely complex if their designers try to examine the impact of many different factors on take-up. In general, the more complex the model the larger the number of input data and assumptions required. Designers should consider whether the increased forecast accuracy that might come from a more sophisticated approach will

be achievable if the additional data that is required does not exist or is not available without considerable additional research and / or expense.

Business case authors should usually develop a structured 'bottom-up' forecast.

There are many ways of developing a forecast, but one approach is to:

1. Develop forecasts separately for each target segment
2. Forecast the number of people / users in each segment in each time period
3. Forecast the percentage of users in the segment who have / will have access to the channel chosen for the service e.g. Internet, digital TV, mobile phone, etc (the addressable segment)
4. Forecast the proportion of these whom the marketing and communication about the service will reach
5. Forecast the proportion of these who will use the service
6. Forecast the number of transactions each of the users who take-up the on-line service will generate in each time period

Multiplying the estimates from steps 2-6 together and adding the results from each segment together produces the forecast of the number of transactions on the new service.

The number of segments that need to be considered will depend on how diverse the customers for the service are likely to be in terms of:

- Their access to and use of the Internet and other online channels, such as digital TVs
- The type and effectiveness of the marketing campaign aimed at them
- The value they derive from using the service

In Step 3, the proportion of the market that can access the service will vary greatly depending on the target segment. If customers are large businesses or organisations (e.g., many of those required to complete corporation tax returns), Internet access is unlikely to be a problem. However if the target for a service is single parents, for instance, access will be much more limited. The socio-economic characteristics and the Internet penetration of drivers, pensioners, farmers and so on, will all be quite different.

Step 5 is likely to be the most difficult to forecast accurately. In assessing this take-up, business case authors should consider the factors that will make it more or less likely for customers to use the service and the rate at which take-up grows from zero usage towards a steady state.

There are many factors that could determine whether the target users who do have access to the service will begin to use an electronic service including:

- How well designed it is and how easy it is for customers to learn to use
- Whether customer concerns about using the on-line service have been addressed, for instance security and privacy issues

Most importantly, the value customers derive from using the service will ultimately determine whether a large proportion of customers use the service. This will be determined by:

- The frequency of use
- The complexity and nature of the interaction

The higher the frequency of use, the higher take-up is likely to be. Every time a customer uses a new service, they are likely to have to invest time and effort in learning how to use and set-up a service, e.g. registering, receiving PIN numbers, entering basic data, etc. If customers anticipate that they are only likely to use a service very infrequently, say less than once a year, they may not believe this investment is worthwhile. However if it is a service they will use as part of their daily life, this investment will pay-off quickly.

The complexity and nature of the service is also likely to influence take-up. Customers may be more prepared to use the Internet to obtain information and download forms than they are to communicate with departments. They may be even less likely to want to transact business on-line, particularly complex transactions involving exchanges of property or cash.

The rate at which take-up develops is unlikely to be linear (e.g. 0%, 25%, 50%, 75%, 100%). It is more likely that take-up follows an S-shape, with demand picking up slowly at first, accelerating as the bulk of customers adopt the service and then slowing down as usage saturates and the late adopters finally begin to use it.

Input Data

There are many sources of data that business case authors might use as inputs to their take-up forecasts or to support their own assumptions. In every case, business cases should be clear about where the input data has come from and any underlying assumptions business case authors have made. A template 'assumptions tracker' is shown in Appendix 2.

Forecasts of the size and growth rates of the various market segments can come from sources such as:

- Office of National Statistics⁹
- Departmental statistics
- Published market research
- Pressure groups representing particular segments
- Primary market research commissioned to support a specific business case

The same sources may also provide forecasts of access to the Internet or other on-line channels.

⁹ For Internet statistics the Omnibus survey is particularly relevant
<http://www.nationalstatistics.gov.uk/CCI/nugget.asp?ID=8&Pos=4&ColRank=1&Rank=176>

Forecasts of take-up within the addressable segment could come from:

- Benchmarks of take-up rates of similar services, or take-up of other electronic services by a similar customer group
- Primary market research commissioned to examine customer reaction to a service proposition

Planning Marketing and Communications

Even if an electronic public service can add value to customer's lives, they will not use it unless they know it is there, and appreciate its benefits. An effective marketing and communications strategy is important to inform people that a service is available through a given channel.

Business case authors should consider:

- How they are going to communicate with the target segment and which medium is likely to be most effective for that audience
- What messages they are trying to communicate about the service based on which benefits are likely to appeal to the target segment
- How much this campaign is likely to cost

Communicating with customers need not require an expensive media advertising campaign; existing communication channels can be adapted to alert customers to the new service. For instance, messages describing the benefits of doing the transaction online and encouraging customers to do so can accompany paper forms and reminders departments send out for completion.

Where the service will be delivered through intermediaries, these organisations in the public, voluntary, or private sectors may also have incentives to promote the online service themselves.

Estimating Customer Costs and Benefits

Business case authors will need to consider customer (i.e. non-exchequer) costs and benefits as part of the option review. These must be identified, and, where possible, quantified in any option appraisal.

For any proposed e-government project or programme business case authors should assess these costs and benefits as part of a full Cost-Benefit Analysis (CBA). This analysis seeks to identify the overall benefits and costs associated with an option. It measures and then values all benefits and costs in each time period and then subtracts costs from benefits to estimate the net benefit in each time period. These values are then discounted to determine a present value; the 'Net Present Value' (NPV).

This document does not present a complete guide to Cost-Benefit Analysis, for which other documents such as the *Green Book* should be consulted. Conducting a full CBA can be resource-intensive and, whilst it is important that major costs and benefits are assessed, the resources committed to appraisal should be commensurate with the scale and risk of the project. This document provides pointers on how to carry out such an analysis for a typical e-government proposal.

In assessing customer costs and benefits there are two stages:

- Identifying the costs and benefits
- Valuing the costs and benefits

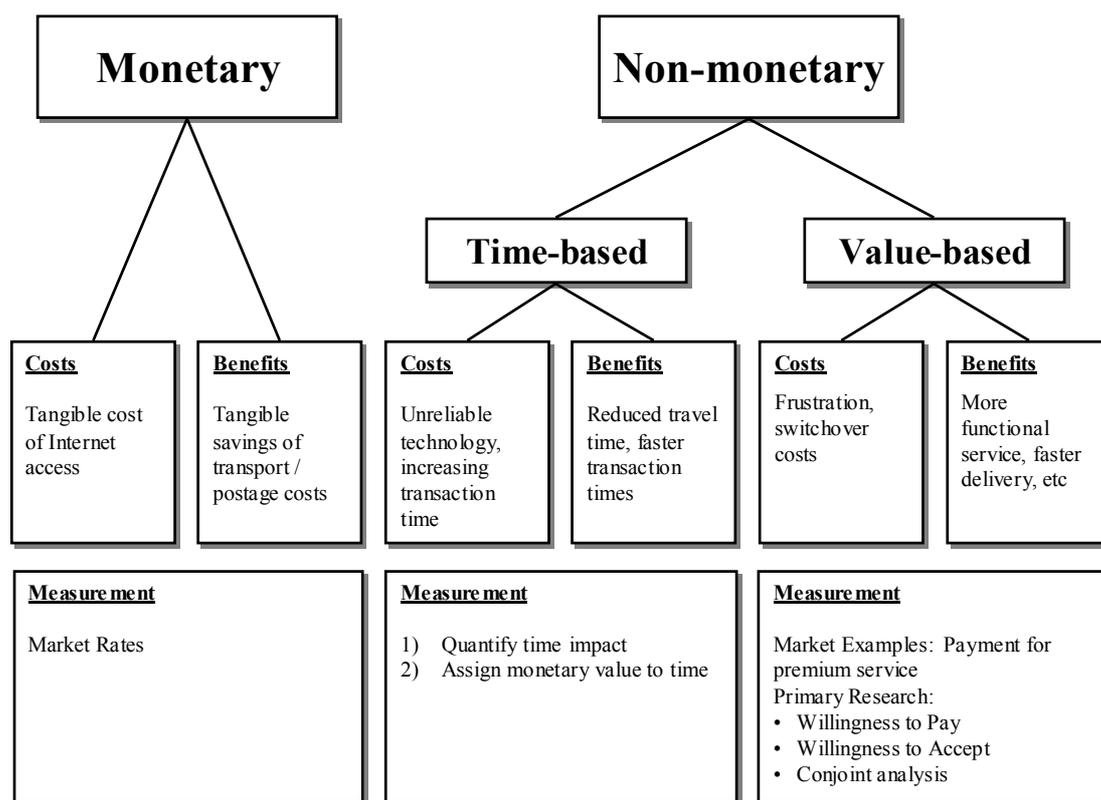
Identifying Customer Costs and Benefits

Business case authors should try and identify all customer costs and benefits. There are many types of cost and benefit and Appendix 3 provides a checklist of benefits.

In identifying costs and benefits, business case authors should identify all potential users and all their interactions with the new service.

Costs and benefits can be divided into monetary and non-monetary categories. The non-monetary costs and benefits are either time-based or value-added costs and benefits (Figure 4).

Figure 4: Measuring Customer Costs and Benefits



Monetary costs and benefits are tangible:

- Monetary costs include the financial cost to customers of conducting a transaction online (a proxy for the cost of internet access could be a market rate e.g. £1 an hour in an internet café).
- Monetary benefits may be savings on stamps or travel tickets not required for online transactions.

The non-monetary benefits of e-government are more difficult to define and measure. They fall into four broad categories: greater choice and functionality; better accessibility; more convenience and faster service delivery¹⁰.

These four categories deliver two types of customer benefit; timesaving for users or adding value in some other way (i.e. they produce a benefit that users could potentially assign some monetary value to). Table 1 gives more detail on these categories and whether they deliver timesaving or other value added benefits

Table 1: Examples of Categories of Customer Benefit

<u>Category of benefit</u>	<u>Basic benefit</u>
<p>Greater choice and functionality</p> <ul style="list-style-type: none"> • Ability to carry out more sophisticated searches / enquiries. • Ability to make enquiries remotely rather than over the phone or in person. 	Added value.

¹⁰ This is the categorisation used in *Better Public Services through e-government* - NAO (March 2002).

<u>Category of benefit</u>	<u>Basic benefit</u>
<ul style="list-style-type: none"> • Immediate confirmation that business is being or has been processed. 	
<p>Better accessibility</p> <ul style="list-style-type: none"> • Numerous services available from a single portal or access point. Means that less time is spent (i) looking for services online; (ii) being transferred between different parts of an organisation on the phone; (iii) travelling to/from numerous different physical locations. 	Time-savings
<ul style="list-style-type: none"> • Ability for customers to monitor, access and alter data that government holds on them. 	Added-value
<p>Greater convenience</p> <ul style="list-style-type: none"> • Services accessible 24 hrs a day from numerous different remote locations. Users have more flexibility to access services when they want i.e. when the cost to them of accessing services is lowest. Thus they can choose to conduct their business at times when time itself is less valuable to them. 	Added-value
<ul style="list-style-type: none"> • Less time spent travelling to/from physical locations. 	Time-savings
<p>Faster service delivery</p> <ul style="list-style-type: none"> • Faster delivery of services being supplied e.g. faster processing of an application for a licence or a grant / quicker receipt of a payment due. (In some cases where the output is required urgently added value could be substantial). 	Added-value
<ul style="list-style-type: none"> • Quicker and easier conduct of business with government e.g. through electronic pre-population of forms, or assurance that a tax return is arithmetically correct. Reduction in employees' time spent on administrative processes (e.g. filing VAT return). Instant electronic communication rather than post of particular benefit for overseas customers. 	Time-savings

Potential non-monetary costs to users of e-government are:

- Time-costs
- Frustration
- Switchover costs

In certain instances conducting business electronically may be more time-consuming than other approaches. This is possible when either the supplier's or the user's technology is not reliable and customers may, for example, lose data they have entered on-line. Badly designed services may also contribute to time wasting; e.g. if it does not allow users to save forms online and return to them later for alteration and addition.

Loss of time and data is likely to induce frustration, an additional non-monetary cost.

Switchover costs represent the cost to customers changing from traditional ways of doing business.

A new service may have multiple customers or users. In identifying costs and benefits, business case authors should try and identify all the groups of people that it will affect and all the different types of interaction they will have. Appendix 4 includes a framework to prompt authors identifying all types of interaction.

For instance, time saving is possible both at the customer front end and also in back end processes. For example, enabling a bank to interact directly with the "back end" of a government process may provide greater benefits than front-end process changes, such as pre-populating forms with customer data.

Valuing Customer Costs and Benefits

Understanding qualitatively customer's costs and benefits from electronic service delivery is important. However it is more valuable if they can be translated into monetary values as they can then form part of an NPV calculation in assessing projects or comparing different options in Cost-Effectiveness Analysis¹¹. The *Green Book* contains more detail on how best to value costs and benefits, however this document contains some general pointers on valuing the non-monetary costs and benefits, first timesaving and then other costs and benefits.

Valuing Timesaving

To value timesaving, organisations need first to estimate the amount of time customers are likely to saving and then place a value on that time.

(i) Quantify time likely to be saved

Organisations will need to estimate the time customers will save by transferring their transactions to the new service.

Estimates of time saved should be based on documented assumptions. For example, where using a pre-populated form saves customers having to fill in some details, an estimate of the time saved should be made. Where possible, estimates should be benchmarked using examples of time saved by similar processes, either in the private or public sector.

Time saved by eliminating the need to travel between physical locations is likely to be significant. To estimate this it will be necessary to estimate the average distance between customers' place of residence and delivery outlet and to estimate the average journey time. To do this analysis well, organisations will have to understand the demographics and characteristics of the target customer group. There could be big benefits for the rural population, farmers etc. for whom physical access to services may be difficult, for instance.

(ii) Assign a value to time

Once business case authors have identified time saved, they need to value it¹².

There is an important distinction between the value of employers' time and 'own' time (i.e. between working and non-working time). The former is relevant to services for business; the latter for services to citizens (depending on whether they are likely to use the service in their own time or when they are at work).

The value of employees' time is the opportunity cost of labour to the employer: the gross wage rate plus non-wage labour costs. Non-wage labour costs include national insurance, pensions and other costs that vary with hours worked – in total about 24% of the gross wage. Most of the research into valuing time has been to assess the value of time to users of different modes of transport. Standard rates from this research are £17.44/hour for car drivers and £25.17/hour for rail passengers. Where it is difficult

¹¹ Cost Effectiveness Analysis is the comparison of alternative ways of producing the same or similar outputs. It is essentially about identifying the least cost option assuming that the benefits from each option considered are more or less the same.

¹² Annex 3 of the *Green Book* gives guidance on valuing time saved, on which this advice is based.

or costly to value working time for particular customers¹³, a conservative approximation of £20/hour (2002 prices) can be used.

For valuing non-working time, business case authors generally use a standard national value of time saved averaged across all modes of transport (the equity value of timesaving). The value is £3.74/hour per person (1998 values).

Observed behaviour and survey data suggest that people place a higher value on saving walking or waiting time than on saving time spent in a vehicle, so walking and waiting time should be valued at twice in-vehicle time. Time saved by e-Government is likely to fall into this category (e.g., time spent walking to a Post Office and waiting in a queue to collect/fill-in a form). Non-working time spent waiting for public transport and cycling also fall into this category.

Valuing Other Costs and Benefits

To assign a monetary value to the ‘added value’ generated by better quality services, business case authors should, wherever possible, use market prices. However this is only feasible when there is a clear price in the market for a particular type of service enhancement.

Alternatively, there are market research techniques that can help estimate the ‘willingness to pay’ (WTP) of target customers. Willingness to pay for a higher level of service reflects the value customers place on that additional aspect of the service and the income or resources they have available. There is a variety of techniques available for eliciting these values (conjoint analysis, revealed preference, stated preference etc). In some cases the expense of conducting these studies will be excessive, in which case government or ‘experts’ may assess the appropriate values.

¹³ Estimates of the value of non-work timesaving are generally obtained by using stated preference techniques. Guidance on commissioning work employing stated preference techniques is available from www.dtlr.gov.uk/about/economics/index.htm.

Estimating Internal Costs and Benefits

Introducing e-government will create costs and financial benefits for central government. Designing, developing and rolling out new services will incur costs (Appendix 5 contains a high-level checklist of potential costs). There will also be benefits¹⁴ from:

- Reduced operating costs
- Reduced rework and less manual checking when intelligent input forms can check data that customers input and automated workflow systems can ensure that transactions are processed correctly
- Reduced fraud (e.g. in overseas cases where the postal service is not secure and there is a market in birth, marriage and death certificates)
- Extra tax receipts (new, easier and automatic ways of paying tax increases compliance and better systems help reduce evasion)
- Revenue from user fees (it may be possible to charge for new or better services¹⁵)
- Revenue from intellectual property rights (for example, the government will receive royalties from Microsoft if it generates revenues from the Government Gateway product)

There will be cost saving from most e-government projects, while there will be additional taxes, fees from intellectual property rights and reduced fraud only in a limited number of cases. Accordingly, this section focuses on cost saving.

Appendix 7 gives some examples of cost saving. One department reported saving up to 45% of total cost through e-enabling one of its services and modernising its back-office, for instance. Of course, not all savings may be this high, especially if departments already have efficient processes. However, there are examples of e-business producing even bigger efficiency gains in the private sector.

Cost saving will depend on factors such as:

- The management information systems already in place
- The characteristics of the transaction, such as the uniformity between cases
- How much new electronic and existing processes share key components
- How e-enabling the transaction depends on e-enabling other parts of the organisation

¹⁴ Appendix 6 contains a checklist of potential cash and monetisable benefits to government.

¹⁵ Providing more services and greater choice can open up new markets and sources of revenue. Land Registry for example, through its Land Registry Direct Service is attracting new users who want to carry out land searches such as large retail companies looking for new sites. E-government also offers potential revenue through selling of information and allowing advertising on websites.

- Whether transactions are processed in a single centre or at several centres
- Whether the new system is based on off-the-shelf or bespoke software

Using off-the-shelf software rather than creating bespoke software is often cheaper, where it is available as:

- Initial acquisition costs are lower
- Implementation is often faster
- The cost of maintaining and supporting the software will be lower

However there will be some additional costs involved in using off-the-shelf software which should be considered. In particular, there is a lot of customisation of COTS packages that departments pay for, to configure or adapt them for a government environment. The costs associated with these enhancements can be reduced by sharing them within government. Departments should therefore consider obtaining full rights to the customisations of COTS software it procures in allow to such sharing. There may also be additional costs associated with organisation and process changes to adapt to the COTS software. Nevertheless this is often the cheapest way forward. In choosing software, departments will need to assess the changes to their ways of working that each of the available software applications would require¹⁶.

To help government organisations quantify cost saving, this section provides a method that will apply in most cases. It has three steps:

- Calculate the existing cost of processing a transaction, and understand how they will fall as the number of transactions declines
- Estimate the cost of processing a transaction using a new e-enabled process and understand how they will rise as the number of transactions rises
- Use the forecast take-up of the new service to examine how total costs will vary as transactions transfer from the current to the new process

Calculate Cost of Existing Process

To understand the cost of an existing process, departments should:

- (a) Identify the cost associated with processing each step of a transaction
- (b) Understand how these costs will fall as the number of transactions using the existing process declines
- (c) Using (a) and (b), calculate how the total cost of processing transactions

¹⁶ In procuring software more generally, departments should primarily seek value for money, and consider lifetime costs. However, the widest range of options should be considered. In July 2002, the government introduced a policy on Open Source Software (see http://www.govtalk.gov.uk/documents/oss_policydocument_2002-07-15.pdf). This policy does not express a preference for OSS or proprietary software, but states that choices be made with regard to interoperability, .i.e. support for open standards, and avoidance of lock-in to proprietary products and services. The policy also says that if an option involves bespoke software development, or bespoke configuration of COTS, departments should consider acquiring intellectual property rights, where this would achieve best value for money. Further, OSS is being considered as a default exploitation route for government funded R&D software. OGC guidance on OSS is available at http://www.ogc.gov.uk/sdtoolkit/reference/ogc_library/generic_guidance/OSSGuidance.pdf.

will fall as the number processed this way declines

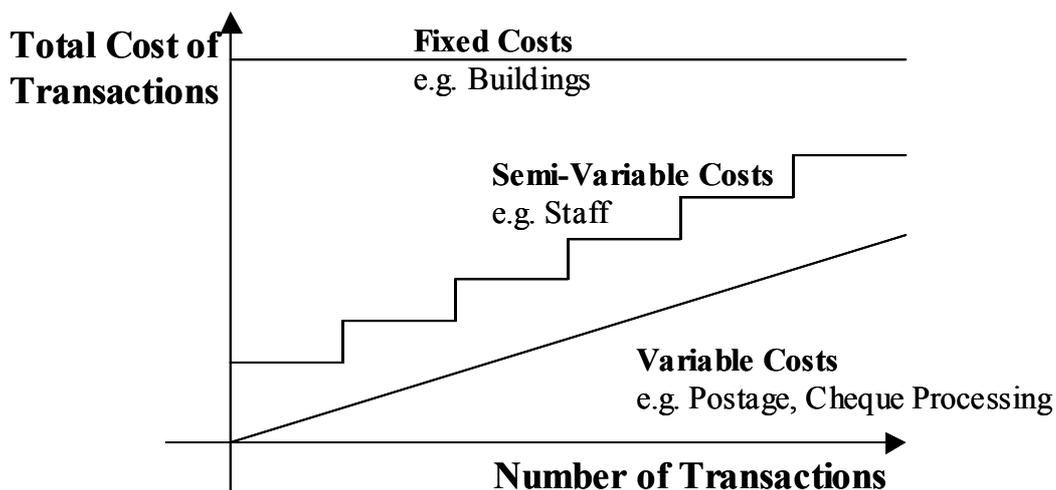
Where cost saving depends on redeploying human resources, departments will need to consider how they will realise the saving.

Data on existing processes should be available as part of an organisation's normal management information. In some cases, where it is not sufficiently detailed to separate out the costs of the process in question, organisations will need to make assumptions to disaggregate costs.

In assessing the cost of existing processes, organisations need to consider indirect costs that might reduce as direct staff costs decline - supervision, personnel services etc.

Organisations then need to understand how costs will change as transaction volumes fall. Some will fall off smoothly as transaction volumes fall (variable costs), some will fall in steps (semi-variable) and some will not fall at all (fixed costs) –Figure 5.

Figure 5: Fixed, Semi-Variable and Variable Costs



Whether a cost is variable, semi-variable or fixed will depend on the timescale for the business plan. All costs are variable in the long term, even buildings. For example, in the short to medium term it is likely that IT systems supporting manual transactions will be necessary to deal the remaining manual transactions and so there will be no immediate saving. However in the longer term these systems may be discontinued and so save cost.

In many cases major cost savings will only be realised through closing existing channels, however this may be difficult as some customers are likely to continue to rely on them.

Realising the cost saving will rely on managers taking the opportunity to redeploy resources, which can be a major change activity with considerable implications for staff. In estimating the potential for cost saving, managers need to be realistic about the speed at which changes can take place.

When considering redeploying resources managers need to consider factors including:

- Robustness of forecast take-up
- Accuracy of projected time saving
- The need for resource flexibility to handle, for example, seasonal peaks
- The cost of staff redeployment, early retirement and redundancy and lost expertise
- Natural wastage rates
- Political and economic climate

Estimate Cost of New Process

Estimating the cost of the new process is similar to that for the existing process, however it is likely to be harder to predict the resources required for a process that is not up and running. The ease will depend on the detailed information available for the new process.

If planning is at an early stage, it may be necessary to estimate the cost of doing business electronically by examining the costs other organisations incurred implementing similar systems. As plans develop, more detail will become available to produce more accurate cost estimates, for instance by reviewing detailed process designs, or from contractor's quotations.

Departments need to:

- (a) Identify the cost associated with processing each step of the new process
- (b) Understand how these costs will fall as the number of transactions using the new process rises
- (c) On the basis of (a) and (b) calculate how the total cost of processing will rise as the transactions processed this way grows

Besides developing and implementing the new systems to e-enable services, there can be additional costs from increased customer contact. The bank, First Direct, experienced a 25% fall in telephone contact, but an overall 125% increase in contact after introducing e-mail, for instance. As a result, Inland Revenue is managing external email carefully through improved contact management processes and better guidance for staff.

In another case, an internet-based service generated 65% additional telephone traffic¹⁷. This rise is often because customers need support using an electronic process, particularly when the customer interface is poorly designed, the technical platform is inadequate or unsuitable or when the customer segment has low IT literacy and little familiarity with web-based services. The complexity and nature of the service will influence the support customers need.

¹⁷ Quoted by BT Exact at presentation at Adastral Park, Martlesham, 26 Sept 01

Estimating staff savings

One of the main benefits from automating processes will be a reduced staff requirement. Rather than estimating how much time each individual transaction requires, it may be easier to think about the overall staff requirement for each step in a transaction.

By breaking a transaction down into discrete steps, you can estimate the time saved by e-enabling a process. This is the approach DWP followed in assessing savings from e-enabling the process to manage Retirement Pensions. They broke the process into eight steps and, for each, estimated the current time taken and the time after e-enablement (Table 2).

Table 2: Step by Step Time Savings for Retirement Pensions

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%

In Step 1 of this example, e-enabling the process is expected to reduce the time spent on pre-claim activities by 59%. This is because data customers input automatically transfers into the new ‘back-end’ processing systems and intelligent forms use pre-held data reducing data collection time and improving completeness and accuracy of information¹⁸.

In Step 6, Finalise Payment, the process is largely automated (calculate first payment, compute ongoing payment amount, determine distribution sequence), and only authorisation is manual, producing a 67% time saving.

Not all claims will be identical; some applications are easier to process than others. For some there may be special issues to resolve that require more human judgement and intervention. Nevertheless it is possible to focus on ‘typical’ or ‘straightforward’ transactions. For example, DWP considered only those steps the majority of new claims followed. The important thing is to make reasonable assumptions about which aspects of the process will, for the majority of claims, be transformed.

Examples

This example provides an illustration of the analysis necessary to compare the costs of old and new processes and estimate the take-up required for the project to break-even.

¹⁸ Note that under full e-enablement, similar savings are made if the transaction is accessed by telephone. In such cases the time taken to process the transaction was estimated to be 16 minutes – more time is needed to talk through the transaction with the customer, but there are still substantial savings from using efficient back-office systems, forms with pre-populated data etc.

It is not an exhaustive description of the types of costs that organisations need to consider.

Identifying Cost Elements

Table 3 and Table 4 outline the costs of performing a transaction and how they vary with take-up using the current process and using a new process after e-enablement. Some costs are completely variable (associated with every transaction e.g. postage costs), others are semi-variable (associated with a certain number of transactions) and others are completely fixed (incurred no matter how many transactions are processed).

Table 3: Cost of the Existing Process

Cost Element	Variability
Postage	25p per transaction. Not required if transaction carried out electronically.
Payment processing	Cheaper processing of payments; saving of 10p per transaction.
Staff cost of processing transaction / dealing with enquiries / training etc	One member of processing staff freed up for every 2000 transactions received electronically > average saving of £18k p.a. per person
Indirect costs (finance, HR functions associated with relevant activity, head office overheads)	One member of administrative staff freed up for every 50 processing staff released > average saving of £18k p.a. per person
Cost of running legacy systems / other overheads associated with traditional transaction channel.	Total cost of running these systems is saved when old channel is completely switched off > saving of £4m p.a.

Table 4: Cost of the New Process

Cost Element	Variability
Cost of setting up and running IT systems	Fixed cost of £2m p.a. regardless of take-up.
Marketing/ raising awareness of new channel	£5k p.a. for first 3 years.
Staff cost of processing transaction / dealing with enquiries / training etc.	One member of staff required processing every 4000 transactions.
Indirect costs (finance and HR 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 to customers if this is the preferred response to security and authentication needs)	£5 per transaction.

Calculating Cost Saving and Break-Even Point

To calculate cost savings and the break-even point, organisations should calculate the cost of running the new process and the existing process at varying take-up levels. Adding the two together and plotting the results shows the take-up required to break-even.

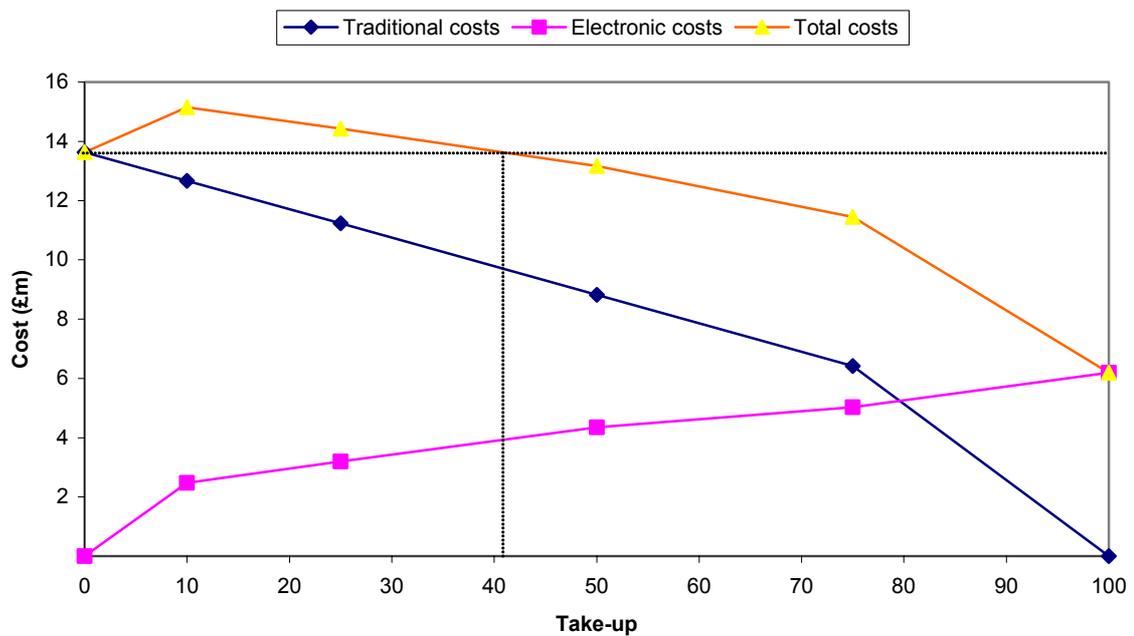
For example, the following calculation (Table 5), estimates the cost of the existing process when it is handling 750,000 transactions a year. In this example, we assume that the total number of transactions is 1,000,000 a year and that the new system is handling 250,000. Note that there are 8 indirect staff; based on the number of staff each can supervise, only 7.5 are required, but this is rounded up as it is not possible to employ half a person.

Table 5: Cost of Existing Process with 750,000 Transactions

Item	Number * Unit Cost	Total Cost
Postage	750,000 * £0.25	187,500
Payments	750,000 * £0.2	150,000
Direct staff	375 * £18,000	6,750,000
Indirect staff	8 * £18,000	144,000
Old systems	£4,000,000	4,000,000
Total cost		11,231,500

By conducting similar calculations for existing and new processes costs at several different take-up levels, the overall impact on costs can be shown. In this example, total costs rise initially, and the new process only delivers cost savings when take-up exceeds 40% (Figure 6).

Figure 6: Breakeven Analysis



Assessing the Options

To develop their estimates of take-up, customer costs / benefits and internal costs / benefits, business case authors should have created a financial model of each option that allows them to calculate a NPV.

This NPV will be based on the various estimates and forecasts of costs and benefits captured in the model. However every input to the model will be subject to variation and the future will never turn out exactly as planned. In appraising the various options, business case authors need to understand how sensitive their results are to changes in key inputs and there are two techniques they should consider using:

- Sensitivity analysis
- Risk analysis

Sensitivity Analysis

Sensitivity analysis examines how changes in assumptions would affect the project, for example, the impact on the NPV, total cost or other project outcome.

In conducting sensitivity analysis, business case authors can change a single variable or multiple variables at a time.

Changing a single variable, while all other variables remain the same, allows users of the financial model to understand, for instance, the percentage change in NPV resulting from a take-up 10% higher or lower than expected.

This sensitivity analysis enables business case authors to understand better which factors have the greatest impact on the viability of the project. If the outputs are particularly sensitive to one of the inputs, such as user take-up of the service, it may be worth investing in further research to understand its likely outcome better. If the variable is outside the control of the project, for instance inflation rates, then business case authors should develop risk-mitigating strategies, such as fixed price contracts with suppliers.

For major projects, business case authors should conduct sensitivity analyses on all the key input variables and pay particular attention to the variables that are most uncertain or which have a particularly strong influence on the outputs by examining the impact of multiple different levels of the variable under consideration. Variables typically included in sensitivity analyses include:

- Take up, including
 - Changes to the final level of take-up achieved
 - Changes to the shape of the take-up curve including delays before take-up begins
- Benefit and cost variables e.g. the time saved per transaction, or the reduced number of staff required
- Discount rate

- Changes in costs and revenues that do not follow the general inflation rate
- Distributional assumptions

When deciding how much to change variables during sensitivity analyses business case authors should consider the likely range of the variable. For instance if take-up is forecast to reach all of the target market segment then there is little point in examining a scenario in which take-up increases by 10%. If a variable is potentially liable to change by up to +/- 30% the sensitivity analysis should examine the impact of change over this entire range and not be restricted to +/- 10%. The likely range of variation need not be symmetrical around the base case; costs of implementing a new system are unlikely to be significantly lower than initial estimates from suppliers but could turn out to be much higher, for instance.

While examining the impact of a change in a single variable helps business case authors understand which variables will have the greatest impact on the project, it does not consider complex changes in variables. It is useful in large projects also to model combinations of variations in assumptions and examine their impact on the project. Presenting these combinations of changes as tables of information, can be useful. Of obvious importance are those combinations of variations that lead to the project's NPV becoming negative.

In real life, many aspects of a project are likely to change simultaneously and project managers take corrective action if results begin to deviate from plan. For instance, if customer take-up turns out to be much less than forecast, managers are likely to take action to reduce costs in line with the reduced transactions. Business case authors should examine the impact of changes in multiple variables that together form a realistic and plausible scenario.

Such scenarios should be realistic and internally consistent; e.g. staffing levels involved in processing transactions are likely to be lower, rather than higher if the overall number of transactions is lower than expected in the base case.

Scenarios typically relate to an easily understandable and realistic situation, for instance delays in implementing the IT systems delaying the overall service. Such a scenario might examine the following changes to variables in the financial model:

- System implementation delayed by 18 months
- User take-up delayed by 18 months due to launch delay
- Payments to IT contractor spread over longer time (assuming the contract is a fixed price based on deliverables rather than time and materials)
- Marketing costs delayed by 18 months
- Staffing maintained at existing levels for an additional 18 months as efficiency benefits realised later
- Operating costs of the new system delayed by 18 months
- Internal project management costs increase to try and put project back on track

While business case authors might typically carry out 10s of sensitivity analyses on individual variables, they usually develop 3-5 detailed scenarios, although there may be many more for large and complex projects.

Risk Analysis

Sensitivity analysis allows business case authors to examine the impact of changes in input variables on a project¹⁹. Typical financial modelling contains only three possible outcomes: best case, worst case, and most likely. It is often based only on "best guess" estimates of factors like take-up and market size, etc. In reality, however, there are a very large number of possible variations in input variables and therefore of outcomes for a project.

Risk analysis considers the likelihood of these different values and builds up a risk weighting of possible outcomes. For example, if there is a central value to an input estimate and a high and low range, risk analysis starts by considering the likelihood or probability of the high or low value occurring. Even a simple three-way variation for input variables gives a large number of possible outcomes to the project NPV (the number of possible outcomes increases exponentially as more input estimates are varied).

Business case authors can use spreadsheet models to calculate these possible outcomes. In large projects, software such as @Risk (an add-in to Excel spreadsheets) allows authors to define the likely range of each of the variable inputs as a probability distribution. The software then simulates many different sets of possible inputs and shows how likely different outcomes are to occur.

An important aspect of risk analysis is the evidence underpinning the range of inputs, not the power of the computing model. Where results are sensitive to a particular input variable and there is great uncertainty about what its value might be, then more effort and expenditure is often required to improve the estimates.

Risk analysis gives a much more complete understanding of potential outcomes. The outputs show what could happen, one's judgement of how likely it is to happen, and enables authors to make judgements on which risks to take and which ones to avoid. While no software package can predict the future, risk analysis software can facilitate improved decision-making based on the available information.

The results of sensitivity analysis and risk analysis should accompany the central estimates for any business case. Measures such as the breakeven point can aid assessment of the significance of risk. e.g. two projects with the same NPV might have different break-even points.

¹⁹ For a detailed guidance around Risk and Sensitivity within business cases refer to Annex 4 of the greenbook - <http://greenbook.treasury.gov.uk/annex04.htm>

Appendix 1: Proposition Summary Template

A clear statement of the e-service proposition on a single page can greatly enhance the clarity of the vision.

The summary ensures key elements of the proposition and potential programme are considered and captured early – to avoid wasted effort on projects that do not have a compelling overall proposition.

It provides a means of clear, quick and effective communication of the overall proposition to facilitate early buy-in of sponsors and stakeholders.

Proposition Summary Template

<p>1) Service description and rationale</p> <p>Brief description of the services to be offered, and why an e-channel is appropriate / desirable</p>	<p>4) Positioning relative to existing services</p> <p>Will the service on the e-channel be identical to the non-e equivalent? Or will it differ on some dimensions, e.g.:</p> <ul style="list-style-type: none"> • Price reduction / premium? • Deadline extension / reduction? • Faster turnaround? • Increased functionality / information • Compulsion for some / all users 	<p>7) Programme delivery</p> <p>How will the programme be financed / delivered?</p> <ul style="list-style-type: none"> • CMF? PFI? CSR? • New ITT? Extension to existing contract?
<p>2) Target customer and needs</p> <p>Who are the principle user of the service? Which segment (if not all) of this user base is the online service principally intended for?</p>	<p>5) Sources of benefit</p> <p>What are the main sources of benefit of the new channel / service?</p> <ul style="list-style-type: none"> • To the delivery department / organisation? • To other government departments / other public service organisations? • To users? • To 3rd parties? 	<p>8) Partners / Stakeholders</p> <p>What other parties are (potentially) involved?</p> <ul style="list-style-type: none"> • Other government departments / Other public service delivery bodies? • Commercial organisations? • Other
<p>3.1) Proposition - New process model</p> <p>What is the suggested new approach to delivering the service or streamlining / transforming the process behind it? Existing website? Integrated with other services? One stop shops? Commercial intermediaries? Etc.</p>	<p>6) Market size</p> <p>What is the size of the potential user base for the new channel / service?</p> <ul style="list-style-type: none"> • Unique users • Transaction volumes • Internet penetration & likely take-up within target segments 	<p>9) Risks</p> <p>What are the principal risks of the new channel / service? How likely are these? How can they be mitigated?</p>
<p>3.2) Proposition – Services offered</p> <p>What services / functionality will be offered via the new channel?</p>		<p>10) Next steps</p> <p>What are the next steps to take the opportunity forward?</p>

Appendix 2: Assumptions Tracker

Any business case / financial model will depend on many assumptions and a range of disparate data inputs, which it is important to document and track. This:

- Facilitates review and assessment
- Allows thorough audit
- Enables understanding of effect of external / environmental changes

The robustness / reliability of key assumptions can be assessed when key business case drivers are understood. It provides clear ownership/source of assumptions/data for greater transparency. Evidence for assumptions is captured, and can be enhanced as the business case is developed

Assumptions Tracking Template

Variable	Assumption	Last review date	Owner / Source	Key indicators to watch	Comment
What variable / unknown is being considered	What value / range / status is assumed ?	Last review date + initials	Owner / source of assumption	What key indicators might have a significant effect on the assumption & cause it to be revised?	Additional comments: Rationale / Breakdown of calculations Source(s) of additional data sets Reviewers Etc.
EXAMPLE					
Service take-up rate	S-curve adoption to saturation after 7 years	1/04/03 HA	Humphrey Appleby	Take-up of online government services	S-curve pattern seen in take-up of other online services S-curve profile from ONS data Reviewed with OeE
Service Saturation level	25% of user base	1/04/03 JH	James Hacker	Internet penetration & usage of online services of target segment	Based on take-up of commercial online information-based services by target customer segment
Population	UK population mid-2001 = 58.84m	1/04/03 JH	Office of National Statistics		

Appendix 3: Potential Customer Benefits

		Business Customer	Citizen
Monetary		<ul style="list-style-type: none"> • Price reduction of charged-for service / avoidance of future price increases • Reduced cost of transmitting information – phone, post etc. • Reduced travel costs • Reduced associated costs (e.g. professional advice, software tools, equipment etc) 	<ul style="list-style-type: none"> • Price reduction of charged-for service / avoidance of future price increases • Reduced cost of transmitting information – phone, post etc. • Reduced travel costs
Non-monetary	Time based	<ul style="list-style-type: none"> • Reduced user time (hours savings) • Reduced need for multiple submission of data for different services / events • Reduced travel time 	<ul style="list-style-type: none"> • Reduced user time (hours saving) • Reduced need for multiple submission of data for different services / events • Reduced travel time
	Value based	<ul style="list-style-type: none"> • Quicker response <ul style="list-style-type: none"> ➢ Reduced application processing time (elapsed time saving) ➢ Improved response time to events • Improved information <ul style="list-style-type: none"> ➢ More reliable / up-to-date ➢ Faster / easier access ➢ Transparency (e.g. status of 'live' applications) ➢ Can be live / real time • Improved reliability <ul style="list-style-type: none"> ➢ Reduced error rates ➢ Greater confidence / certainty of transaction ➢ Service consistency ➢ Overall reliability • Choice & convenience <ul style="list-style-type: none"> ➢ Range of access channels – increased choice & ease of access ➢ Greater user convenience • Premium service <ul style="list-style-type: none"> ➢ Extra tools / functionality for users ➢ Improved customer service ➢ Personalised service ➢ Service integration 	<ul style="list-style-type: none"> • Quicker response <ul style="list-style-type: none"> ➢ Reduced application processing time (elapsed time saving) ➢ Improved response time to events • Improved information <ul style="list-style-type: none"> ➢ More reliable / up-to-date ➢ Faster / easier access ➢ Transparency (e.g. status of 'live' applications) ➢ Can be live / real time • Improved reliability <ul style="list-style-type: none"> ➢ Reduced error rates ➢ Greater confidence / certainty of transaction ➢ Service consistency ➢ Overall reliability • Choice & convenience <ul style="list-style-type: none"> ➢ Range of access channels – increased choice & ease of access ➢ Greater user convenience • Premium service <ul style="list-style-type: none"> ➢ Extra tools / functionality for users ➢ Improved customer service ➢ Personalised service ➢ Service integration

Appendix 4: Generic Customer Interactions

		Pre-transaction			Transaction			Fulfilment		Pre-repeat	
		Information self-serve	Information request	Register / Authenticate	Transact / Pay	Status request	Correct error	Appeal / Complaint	Confirm current information	Change information	
Traditional Channels	Example	<ul style="list-style-type: none"> Picking up a leaflet (e.g. in Post Office) 	<ul style="list-style-type: none"> F2F / OTC Phone call Letter / request form via post 	<ul style="list-style-type: none"> F2F / OTC with ID Home visit Postage of ID documents / copies 	<ul style="list-style-type: none"> F2F / OTC – cash, cards, cheque Phone – cards Post- cards, cheque 	<ul style="list-style-type: none"> F2F/OTC Phone call Letter / form via post 	<ul style="list-style-type: none"> F2F/OTC Phone call Letter / form via post 	<ul style="list-style-type: none"> F2F/OTC Phone call Letter / form via post 	<ul style="list-style-type: none"> F2F/OTC Phone call Letter / form via post 	<ul style="list-style-type: none"> F2F / OTC Phone call Home visit Letter / form via post 	
	Direct costs	<ul style="list-style-type: none"> Travel costs 	<ul style="list-style-type: none"> Travel costs Phone call Postage Information fee 	<ul style="list-style-type: none"> Travel costs Postage ID document copying Registration fee 	<ul style="list-style-type: none"> Travel costs Phone call Postage 	<ul style="list-style-type: none"> Travel costs Phone call Postage Information fee 	<ul style="list-style-type: none"> Travel costs Phone call Postage 	<ul style="list-style-type: none"> Travel costs Phone call Postage 	<ul style="list-style-type: none"> Travel costs Phone call Postage Information fee 	<ul style="list-style-type: none"> Travel costs Phone call Postage ID document copying 	
	Time factors	<ul style="list-style-type: none"> Travel time Reading time 	<ul style="list-style-type: none"> Travel time Letter writing / form completion Phone time Waiting time Reading time 	<ul style="list-style-type: none"> Travel time Waiting time Evidence / document collation Form completion 	<ul style="list-style-type: none"> Travel time Waiting time Form completion / payment collation Payment completion / cashing 	<ul style="list-style-type: none"> Travel time Waiting time Letter writing / form completion 	<ul style="list-style-type: none"> Travel time Waiting time Letter writing / form completion 	<ul style="list-style-type: none"> Travel time Waiting time Letter writing / form completion 	<ul style="list-style-type: none"> Travel time Waiting time Letter writing / form completion 	<ul style="list-style-type: none"> Travel time Waiting time Letter writing / form completion 	<ul style="list-style-type: none"> Travel time Waiting time Letter writing / form completion Evidence / document collation
E-channels	Example	<ul style="list-style-type: none"> Website Automated phone system 	<ul style="list-style-type: none"> E-mail Website request form Automated phone system 	<ul style="list-style-type: none"> Secure online authentication Digital signature Phone password system 	<ul style="list-style-type: none"> Secure website – cards Automated phone system – cards Direct money transfer 	<ul style="list-style-type: none"> E-mail Secure website request form Automated phone system 	<ul style="list-style-type: none"> E-mail Secure website request form Automated phone system 	<ul style="list-style-type: none"> E-mail Secure website request form Automated phone system 	<ul style="list-style-type: none"> E-mail Secure website request form Automated phone system 	<ul style="list-style-type: none"> E-mail Secure website request form Automated phone system 	
	Direct costs	<ul style="list-style-type: none"> Web access Phone call 	<ul style="list-style-type: none"> Web access Phone call Information fee 	<ul style="list-style-type: none"> Web access Phone call Registration fee Digital signature setup 	<ul style="list-style-type: none"> Web access Phone call Direct transfer fees 	<ul style="list-style-type: none"> Web access Phone call Information fee 	<ul style="list-style-type: none"> Web access Phone call 	<ul style="list-style-type: none"> Web access Phone call 	<ul style="list-style-type: none"> Web access Phone call Information fee 	<ul style="list-style-type: none"> Web access Phone call Information fee 	
	Time factors	<ul style="list-style-type: none"> Web search Phone time Reading time 	<ul style="list-style-type: none"> Web search E-mail / form completion Phone time Reading time 	<ul style="list-style-type: none"> Web system usage time Digital signature setup/usage Phone time 	<ul style="list-style-type: none"> Web system usage time Phone time Payment completion / cashing 	<ul style="list-style-type: none"> Web system usage time E-mail / form completion Phone time 	<ul style="list-style-type: none"> Web system usage time E-mail / form completion Phone time 	<ul style="list-style-type: none"> Web system usage time E-mail / form completion Phone time 	<ul style="list-style-type: none"> Web system usage time E-mail / form completion Phone time 	<ul style="list-style-type: none"> Web system usage time E-mail / form completion Phone time 	<ul style="list-style-type: none"> Web system usage time E-mail / form completion Phone time

Appendix 5: Generic Cost Elements for IT Projects²⁰

1. Market Planning and Development
 - 1.1. Business Planning and Options Analysis
 - 1.2. Market Research
 - 1.3. Due Diligence / Plan Audit
2. System Planning and Development
 - 2.1. Hardware
 - 2.2. Software Licence Fees
 - 2.3. Development Support
 - 2.3.1. Programme Management
 - 2.3.2. System Engineering Architecture Design
 - 2.3.3. Change Management and Risk Assessment
 - 2.3.4. Requirement Definition and Data Architecture
 - 2.3.5. Test and Evaluation
 - 2.4. Design Studies
 - 2.4.1. Customer Interface / Usability
 - 2.4.2. Transformation / Business Process Redesign
 - 2.4.3. System Security
 - 2.4.4. User Accessibility
 - 2.4.5. Data Architecture
 - 2.4.6. Network Architecture
 - 2.5. Other development phase costs
 - 2.5.1. Facilities – offices, office equipment, etc
 - 2.5.2. Travel
3. System Acquisition and Implementation
 - 3.1. Procurement
 - 3.1.1. Hardware
 - 3.1.2. Software
 - 3.1.3. Customised Software
 - 3.2. Personnel
 - 3.2.1. Additional Programme Management
 - 3.2.2. Internal Communications
 - 3.2.3. Process Redesign
 - 3.2.4. System Integration
 - 3.2.5. System Engineering
 - 3.2.6. Test and Evaluation
 - 3.2.7. Data Cleaning and Conversion
 - 3.3. IT Training
4. System Operations and Maintenance
 - 4.1. Hardware
 - 4.1.1. Maintenance
 - 4.1.2. Upgrades and Replacement
 - 4.2. Software
 - 4.2.1. Maintenance
 - 4.2.2. Upgrades

²⁰ Adapted from Value Measuring Methodology How-To-Guide, US Federal CIO Council, Best Practices Committee

- 4.2.3. Licence Fees
- 4.3. Telecoms Network Charges
- 4.4. Operations and Management Support
 - 4.4.1. Programme Management
 - 4.4.2. Operations
 - 4.4.3. Security
 - 4.4.4. IT Helpdesk
- 4.5. On-going Training
- 4.6. Other Operations and Maintenance
- 5. Financing Costs
- 6. Market and Process Implementation
 - 6.1. Personnel
 - 6.1.1. Internal Communications
 - 6.1.2. Training
 - 6.1.3. Redeployment
 - 6.1.4. Customer Helpdesk
 - 6.1.5. Call Centres
 - 6.2. Marketing and Communications
 - 6.3. Customer Inducements / Rebates

Appendix 6: Checklist of Potential Benefits to Government and Society

	Benefits to Society / Nation	Benefits to Government / Public Service
Direct Cash benefits		<ul style="list-style-type: none"> • Greater tax collection / revenue • Reduced fraud • Reduced travel costs / field force expenditure • Reduced publication & distribution costs • Lower fines to UK government from EU / other international body • Additional revenue from greater take-up / usage of commercial services / data offered (e.g. use of electoral roll data) • Additional revenue from newly available services / newly charged for services • Reduced need for benefits – e.g. through faster job searches

	Benefits to Society / Nation	Benefits to Government / Public Service
Monetisable benefits / efficiency savings	<ul style="list-style-type: none"> • More effective use of existing infrastructure • Greater educational participation / retention / achievement • Encourage socially / environmentally desirable behaviour (e.g. shift from road to public transport) • Reduced regulatory burden / paperwork → Economic development • Stimulation of specific industry / sector 	<ul style="list-style-type: none"> • Time savings: <ul style="list-style-type: none"> ○ Reduced processing through common standards for data / processes etc. ○ Time saving of public servants (teachers, police etc.) ○ Reduced error rates / re-work / complaint numbers ○ Reduced need for multiple collections of data from single customers ○ Enable more flexible working hours • Information benefits <ul style="list-style-type: none"> ○ More accurate / up to date / cleaner data / reliable information ○ Capacity for greater information sharing across OGDs • Risk benefits <ul style="list-style-type: none"> ○ Improved risk management ○ Improved security / fewer security breaches • Future cost avoidance <ul style="list-style-type: none"> ○ Lower costs for future projects through shared infrastructure / valuable knowledge ○ Reduced demand for service (through better information provision) – e.g. Health ○ Reduced need for future government capacity expansion ○ Encourage increased take-up of other e-services • Resource efficiency <ul style="list-style-type: none"> ○ Reduced redundancy through integrated systems ○ More effective use of existing (e and non-e) infrastructure / reduced capacity wastage

	Benefits to Society / Nation	Benefits to Government / Public Service
Non-monetisable benefits	<ul style="list-style-type: none"> • Improved Health • Greater take-up of entitlements • Enhanced democracy - increased user involvement / participation / contribution • Greater Fairness & equality • Leadership in digital economy • Increased citizen well-being 	<ul style="list-style-type: none"> • Improved Service Delivery <ul style="list-style-type: none"> ○ Greater take-up of entitlements ○ Improved user Satisfaction ○ Improved Communication ○ Improved Reputation / increase user trust & confidence ○ Enhanced Customer Service ○ Improved service consistency and equality ○ Integrated view of customer • Enhancements to policy process <ul style="list-style-type: none"> ○ Enhanced policy alignment & outcomes ○ Better information to facilitate policy making • Enhancements to democracy <ul style="list-style-type: none"> ○ Increased user involvement / participation / contribution • Allows more / greater / new data to be collected • Improved health and safety standards (e.g. farms) • Improved Security

Appendix 7: Examples of e-Business Efficiency Savings

There are many examples in both the private and public sectors of efficiency savings generated by investment in IT. For example, the PIU's e-Government report²¹ highlighted research which found that the cost of a typical banking transaction was \$1.07 over the counter, \$0.27 through an ATM and \$0.01 over the internet; and the cost of a typical travel reservation through a travel agent was \$10 compared with \$2 over the internet. In a similar vein, Egg figures suggest that phone bank transaction costs are 40% of branch costs and Internet costs are 1%.

Of course, banking transactions, such as cash withdrawals or transfers, are not directly comparable with the more complex interactions between citizens and Government, so savings per transaction will not always be as high as in that sector. But work carried out by KPMG in Northern Ireland estimated the costs of delivering many public services over the Internet would be in the order of 20% of manual costs. For example, car tax renewal £0.39 compared with £1.95 and housing benefit applications £2.50 versus £12.48.

Efficiency savings were also reported in five out of eight case studies of e-enablement in the public sector reported by the NAO²² (details below). The Office of Government Commerce, for example, expects that savings of £13m could be made for the taxpayer through the use of e-tendering.

The Singapore government has estimated that the introduction of electronic filing of tax returns via the Internet and the telephone saves it some £20m each year. Inland Revenue has recognised that the greater accuracy of e-services requires less administrative checking and fewer queries, saving time for the public and the Inland Revenue. Whilst it is difficult to predict precisely the savings achievable the Inland Revenue estimates that when take up reaches 50% across all activities, this might enable savings of some 1,300 posts. They have estimated that: The Internet service for Self Assessment will save the department £3 per customer. Encouraging large organisations to send staff Pay As You Earn details by electronic data interchange improves accuracy by up to 50% and, therefore, reduces the number of queries to be followed up. A take up of around 40% would save £30m by 2003-04.²³

Efficiency savings reported by transaction cost case studies

A study on transaction costs commissioned by PSX(E) also provides evidence of efficiency savings achievable in the public sector.

The study by DWP reported the highest level of savings: these were potentially as much as 44.6% of the total cost of administering the transaction (savings of £7.4m per

²¹ Performance and Innovation Unit: *e.gov: Electronic Government Services for the 21st Century* (September 2000)

²² NAO draft report: *Better public services through e-government* (2002). The Land Registry, Office of Government Commerce, The Planning Inspectorate, Hertfordshire County Council and the Royal Automobile Club reported efficiency savings.

²³ NAO: *e-Revenue* HC 492 Session 2001-2002, 14th February 2002.

annum). These savings were expected to come about mainly through major restructuring and “e-enablement” of back-office processes and were therefore relatively independent of take-up. It is important to note however that the cost of restructuring did not feature in the calculation of potential efficiency savings.

The Rural Payments Agency also expected to make relatively large savings: approximately 24% of its total cost (£35.7m p.a.). These were due to come about through the introduction of new systems, office closures, redundancies and relocation of staff.

Inland Revenue reported more modest savings of 3.2% on the total cost of administering self-assessment returns (£13.5m p.a.), although these calculations included the costs of providing the electronic channel and included only the savings attributable to reduction in the number of staff directly involved in SA processing (i.e. did not include other savings e.g. from reduction of staff indirectly involved in support functions: finance, HR etc.). Savings were in this case highly dependent on take-up and did not materialise until take-up reached 25%.

DVLA were the most pessimistic about the potential for savings through electronic service delivery, reporting savings of £4m (7%) over a 10-year time span. This was due to the cost of investing in new equipment and software required to integrate the processing of paper and electronic transactions.

Efficiency savings reported by the NAO

Land Registry: E-enablement / Land Registry Direct

Reduction of cost per unit of work (in real terms) from £27.48 in 1995-6 to £22.52 in 2000-01. (Case studies, p.4);

Fees reduced by 40% since 1993;

Further reductions in fees for those who use Land Registry Direct.

[Total expenditure £0.27m, total income £0.28m in 2000/01 – HM Land Registry, Agency Business Plan 2000/01].

OGC: E-tendering

OGC calculate that e-tendering could produce savings in the region of £13m for the taxpayer over a four-year period. (Case studies, p.24)

OGC expects burdens and costs to suppliers to reduce by £37m.

The Planning Inspectorate (PI): information and automated casework

Savings from implementation of the Planning Portal Programme are estimated to be some £150,000 in 2001/02 rising to £7.5m in 2002/03. [In 2000/01 total expenditure was £36.7m and total income £4.2m]

Hertfordshire County Council: services online

Library services have found that typically transaction costs have reduced from £4 to deal with a face-to-face query to 10p if the query is resolved over the Internet.

Royal Automobile Club: reorganised operations

5% improvement in operational productivity

Oracle: cost savings demanded

Delivered £0.7bn of efficiency savings from various sources e.g. consolidating IT (reduction of 100 e-mail servers to 2). Some of these are discussed in the case study.

BT: web access policy

Emphasises tracking savings achieved and having realistic view of take-up (but no details given).

International

For tax filing, the US Government has decided not to duplicate private sector investments or services but instead to work with the tax preparation software producers in complimentary ways. The benefits identified²⁴ include:

- Growth in take-up of electronic filing ranging from 15%-65% year on year
- Reduced risk to government arising as the private sector takes full responsibility for privacy, security, accuracy, technical support and customer relations
- Reduced cost for government for software and service provision
- Reduced cost for government arising from 99% reduction in filing error rates
- Greater consumer confidence in the benefits of electronic tax tools, resulting from the accuracy guarantees of private sector providers and from the avoidance of the perception of conflict of interest of tax-collector as tax-advisor
- Increased take-up of targeted work-incentive payments for lower and middle income tax filers together with higher visibility of and access to these programmes
- Superior customer experiences from private sector “e-tax” innovations and customer service (leading to higher take-up)

The report ‘High Payoff in Electronic Government²⁵’ by the Intergovernmental Advisory Board of the Federation of Government Information Processing Councils in the USA gives many further examples of benefits obtained through e-government projects.

²⁴ Making It Work: Optimising Electronic Tax Filing In The United Kingdom, CCiA, 25 June 2002

²⁵ http://www.gsa.gov/cm_attachments/GSA_PUBLICATIONS/High-Payoff-finalreport_R2D7J7_0Z5RDZ-i34K-pR.doc