



CITU

Portal Feasibility Study

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1. INTRODUCTION

It is the intention of CITU, on behalf of the Government, to develop Government Portals as potential, single, integrated means of access to Government information and services. This will allow information from different sources within Government to be brought together at one point, allowing the creation of new “joined-up” services with a standardised presentation.

PA Consulting was appointed by CITU to assess the feasibility of implementing the Portals concept with the specific objectives of:

- Determining the feasibility of the fundamental concept
- Identifying and evaluating the practical issues associated with the implementation
- Determining the likely costs of meeting the White Paper objectives through the use of Portals, including the cost of accommodating the estimated traffic flows
- Identifying and assessing the commercial issues associated with public and/or private sector service provision
- Assessing the feasibility of, and identifying the issues surrounding, the development of a prototype Government Portal.

In undertaking this review PA has interviewed representatives of:

- CITU
- CCTA
- Customs and Excise
- DETR
- DSS
- DTI
- Home Office
- Inland Revenue
- Local Government Association
- Cable and Wireless Communications, the suppliers of the Government Secure Internet (GSI) service.

This report presents our conclusions.

In assessing feasibility our approach has been to first assess the requirements to implement the first fully operational prototype version of the Government Portals. This is targeted to be operational by 2002 and is intended to carry a range of services defined in the White Paper. Within this report this implementation is referred to as the 2002 Portal.

We have then considered the feasibility of an initial implementation, which is intended to demonstrate the feasibility of the Portal approach. This will be implemented in two stages.

Stage 1 will see the implementation of a simple, demonstration site for internal Government use and for assessment by two or three focus groups which will provide an early view of how the service might look and operate. This is expected to be operational within a few months and is described within the report as the Stage 1 Demonstrator.

In a longer timescale a fuller implementation will act as a more comprehensive evaluation of standards, architecture, traffic levels, user reaction, image and branding requirements for the 2002 Portal. This pilot will carry one service, notification of change of address to three Departments and is intended for use by a significantly larger user base. Hereafter it is described in this report as the Stage 2 Pilot.

In the following sections of this Report we discuss:

- How the Portal concept will simplify access to Government (Section 2)
- Some of the complications in implementing the concept (Section 3)
- The benefits of the proposed architectural approach and how this will address these complications (Section 4)
- The high-level architectural structure that will provide the flexibility to connect a wide range of customer access channels to the various Departmental systems used to deliver services (Section 5)
- The technical architecture which will underpin it to provide an open, secure, scalable and resilient implementation (Section 6)
- The unpredictable nature of the traffic volumes and how the initial architecture could be scaled accordingly (Section 7)
- How the brand image and channel mix should be focused to meet customers' needs and Government objectives (Section 8)
- The procurement opportunities arising from the potentially substantial benefits (Section 9)
- The concepts and architecture of the Stage 1 Demonstrator (Section 10)
- Ways in which the Stage 2 Pilot can test many of the principles for the 2002 implementation (Section 11)
- Some of the key issues which remain to be addressed (Section 12)
- How the 2002 Portal should be implemented with indicative costs (Section 13)
- The plan to build the Stage 1 Demonstrator (Section 14)
- The implementation and costs of the Stage 2 Pilot (Section 15)
- Our recommendations and the next steps (Section 16)

2. SIMPLIFYING ACCESS TO GOVERNMENT THROUGH THE PORTAL CONCEPT

2.1 THE PORTAL CONCEPT WILL SUPPORT JOINED-UP GOVERNMENT

The Government has affirmed, through its “Modernising Government” White Paper and “Government Direct” Green Paper, its commitment to electronic service delivery as the means to deliver better services that are:

- More accessible
- More resistant to fraud
- More convenient
- Easier to use to access information and services
- Quicker in response
- Less costly to the taxpayer, promoting efficiency between Government Departments.

A key element of the proposed approach is the Portal concept which will integrate services across Government Departments to deliver seamless or joined-up government as a one-stop service for citizens and businesses.

The implementation of the Portal concept is expected to contribute directly to the achievement of the objectives by providing:

- Access from a wider range of locations, including the home and workplace, using a range of different access methods
- Leadership within Government in the development of electronic delivery methods which are resistant to fraud
- 24 hour, 7 day per week service
- “Seamless one-stop shopping” for a range of Government services from multiple Government Departments
- Fast, electronic interchange of information
- Increased efficiency through electronic delivery and authorisation.

In all cases the Government Portals will be one of a number of methods of electronically accessing appropriate Central Government, Departmental and ultimately Local Government services or information which will also include:

- Direct access into the Department or Agency which owns the service, principally from customers who want the specific service offered
- Access through links from other parts of the Department, or other Departments, which offer associated services – for example vehicle registration and road fund licence
- Access from other similar Portals which could, for example, be focused on another or the same “life event”, for example marriage or moving house.



3. SIGNIFICANT COMPLICATIONS IN INTRODUCING THE PORTAL CONCEPT

A number of factors will combine to complicate the implementation of the Portal concept in Government:

- Citizens and businesses will use a wide variety of channels to communicate with the Portals
- The scale of usage is undefined and may vary significantly
- The Departmental systems with which the Portals will communicate are complex
- The levels of authentication remain to be resolved.

3.1 A WIDE RANGE OF CHANNELS WILL BE USED

The Portals must support Government policies for social inclusion and therefore a wide range of channels will be needed which will collectively appeal to all sectors of the user community.

From the channel media perspective, potential Portal delivery channels can be categorised as:

- Direct electronic channels, for example internet access through a customer's PC, interactive television or kiosk
- Voice telephony channels where the customer contacts a call centre agent by telephone who is able to communicate with the Portal using a direct electronic channel
- Face-to-face channels where the customer interacts directly with an agent who is able to communicate with the Portal using a direct electronic channel, for example with a Post Office counter clerk or Bank teller.

At the highest level, access channels will be focused towards the private citizen and SoHo (Small Office, Home Office) or SME (Small Medium Enterprise) segments of the business market. It is expected that the larger segments of the business market will prefer to continue to use other e-business implementations including value added networks, having made a significant investment in the development of their corporate systems to operate with this technology. This should not, however, preclude larger businesses from using the access channels available through the Portals if they prefer.

In the long term the development of diverse delivery channels to fully meet socially inclusion requirements will depend on the specific market segments to be addressed by each service and, in some cases, the rate of roll-out and take-up of the technology concerned. Focused market research will be needed to investigate this area more fully.

In the short term, if separate delivery channels are provided within each of the above three categories, this will confirm that the broad development principles are on the right track to provide the scalability required in future as the number of access channels develops.

We briefly discuss two key channels in the following paragraphs.

3.1.1 The development of internet access as a direct electronic channel

There is a detectable expectation on the part of users that communication with Government should also include PC access through the internet. Indeed with 10 million UK internet users and growth of 3 million since Christmas 1998, it seems likely that the internet will quickly form a second key channel. CITU funded research into the potential customer take-up of on-line government services in October 1998 identified that the PC was the most popular access interface followed by the tone-dial phone.

Internet access will develop to other communications devices

The internet will soon be accessed by a variety of communications devices, ranging from mobile telephones to interactive TV. Penetration of mobile telephones is now significant and is forecast to continue to rise during the next few years.

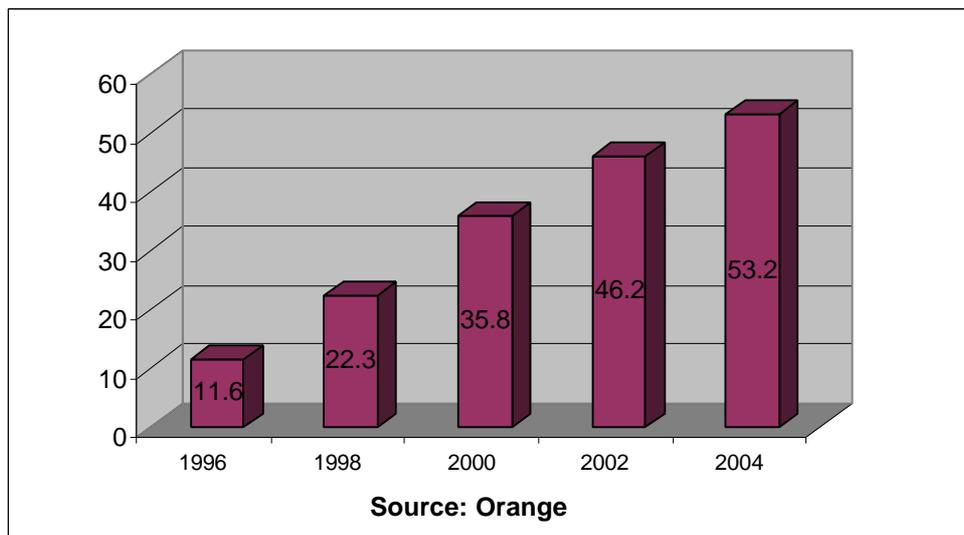


Figure 3.1.1 Current and Projected Penetration of Mobile Phones as % of Population

Mobile telephone operators and network equipment suppliers have developed interfaces to the internet and other value added services which will allow customers with appropriate telephones to access these services. The availability of the new 3rd generation UMTS networks, which are shortly to be licensed by the Government, will increase the functionality which can be provided in this area.

Interactive television is also likely to be key in extending the delivery of electronic services beyond the community of PC users. Interactive TV service providers are delivering internet access as one of a range of services. In a longer timescale as the market matures it may be appropriate for the Government to develop customised packages with one or more of the service providers.

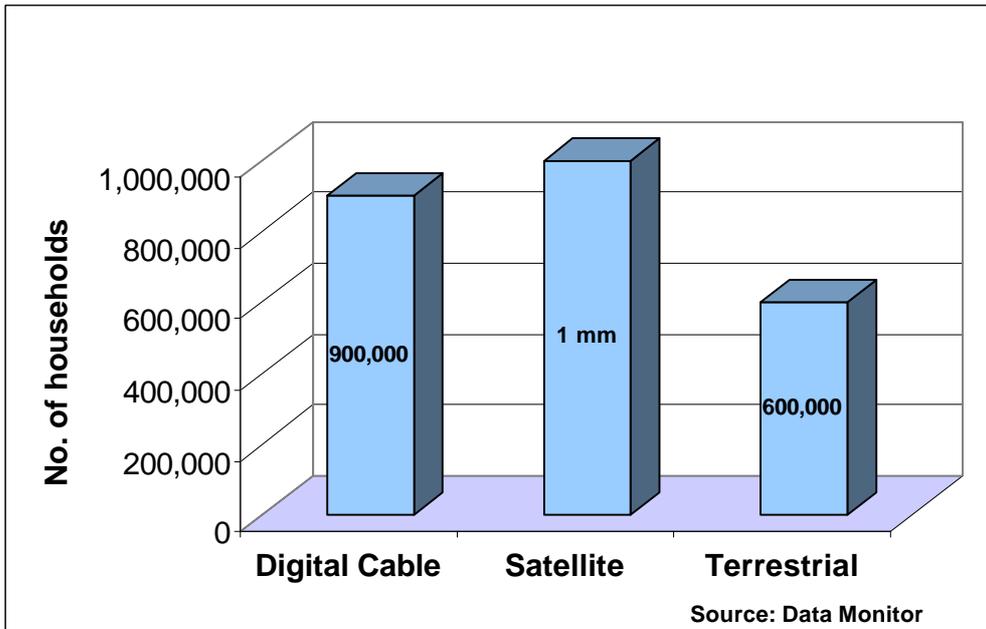


Figure 3.1.2 Projected Penetration of Digital Television by 2002

3.1.2 Voice telephony channels

Call centre based services will undoubtedly be a key component, not only as a channel in their own right but also to provide help line services for other channels, given the rapid rise in the use of this approach to support customer service of all types across many industries.

3.2 THE TECHNOLOGY USED FOR THE PORTAL MUST SUPPORT MULTIPLE ACCESS CHANNELS

As an integral part of the requirement to simplify access to Government, it seems probable therefore that customers will want to communicate with the Portals through a wide range of different access channels, some of which may be provided under Government licensing arrangements. Most of these access channels are currently undefined or continuing to evolve. A common access technology must be provided within the Portals which will provide the flexibility to add channels freely as and when required without impedance from technological constraints. Therefore the Portal technology must provide a low cost, easy to implement interface that supports multiple channels.

It seems to PA therefore that internet technology provides the solution here. The key question is whether internet technology is scalable to be able to handle the levels of transactions anticipated.

3.3 THE SCALE OF USAGE IS NOT YET FULLY UNDERSTOOD

The Portals will not only take traffic directed at services that are centrally accessed, but will also have to provide routes to services hosted on Departmental portals and to existing Departmental or Agency websites. This means that the Portals will see a significant number of visitor connections, even though they will service only some of the requests directly. A number of factors make the scale of usage difficult to define:

- The limited information available currently on the electronic take-up of individual Government services and the wide variations in that take-up



- Difficult to predict growth rates for the market
- The difficulty in understanding the relative proportions of traffic which will be taken by Government Portals, Life-event portals and Departmental portals.

We can begin to understand the range of likely transaction rates by considering Departmental transaction rates as they occur today. For example the DTI deals with over 9 million transactions per year, mainly from UK companies. Annual returns and other company returns constitute some 40% of the volume and requests for company information makes up another quarter of the total. Half of the information requests are already dealt with electronically. In Customs and Excise nearly 29 million transactions are processed each year. Half of these are VAT collections, 2 million of which are already dealt with electronically, mostly through disk and magnetic tape. Another 30% of the annual traffic consists of Customs import entries of which 98% is electronic.

Contrasting with these levels are the transaction rates for other large sites. For example each month, the BBC Online website fulfils 77 million requests for pages from more than 1.5 million individual hosts. Although the Government's web presence as a whole may be in the same order of magnitude as BBC Online after the 2002 services have had a year to ramp up, it seems unlikely that the Portals will reach those levels of traffic in the short term. Moreover the online audience will have increased significantly by then and other channels, for example call centres, will have rolled-out web access further.

The relative proportion of the Government on-line traffic which Government Portals and Departmental portals can be expected to carry is also an unknown. Recent evidence from the US (Source: Media Metrix) suggests that the traffic through major portal sites may be in decline as users find their way directly to the more focused vertical market sites behind the portal. Another survey of on-line shopping by BizRate suggests that the number of on-line shopping referrals from major portals is low in proportion to the number generated to sites from other off-line sources. So, as long as the entry of data can be made robust without the need for multiple, follow-on transactions it seems reasonable to conclude that the initial Portal traffic is not a demand that will be difficult to cope with. The key issue is to ensure that the design is scaleable.

3.4 THE LEVEL OF AUTHENTICATION NEEDS TO BE RESOLVED

Currently a wide range of authentication levels are in use for Government services ranging from the level of identity check which is required for the issue of a passport to a much lower level of authentication needed for a change of address. Comparative authentication levels for electronic services have not yet been defined.

The Government Electronic Commerce Bill, which is scheduled to receive Royal Assent by April 2000 will legalise "digital signatures" which can be held on Smartcards. It is anticipated that digital signatures will provide an appropriate level of authentication for most, if not all, electronic services proposed in the short term, augmented by additional proof of identity where appropriate.

It is not anticipated that the Government will be an issuer of Smartcards holding digital signatures. This responsibility will be licensed to other issuers, for example banks and interactive TV service providers. Further study is required to develop the process further for identification of authorised Smartcard issuers.

Other authentication methods which are equivalent to those currently in use by internet or telephone banking service providers are also likely to be used for some services. These could include PIN identification or disclosure of specific, personally submitted passwords



or information. These levels of security may be particularly appropriate for call centre access and access through other intermediaries.

3.5 THE DEPARTMENTAL SYSTEMS ARE COMPLEX

The Portals will offer a gateway to a range of services provided through the systems of the Government Department that owns the service. These systems are of varying ages and technologies. Some are legacy systems up to 20 years old that are only able to accept and action requests in a batch mode. Others are more modern and will be able to action requests in real-time.

In many Departments multiple processors are used to deliver the end service. In the Inland Revenue for example, 18 mainframes are used for Self-Assessment and 12 mainframes for PAYE. The Portals must deliver service with a consistent “look and feel” to users, both operationally and visually. Therefore the implementation of the interfaces to the Back Office Departmental systems will be challenging.

For example in the past, data mismatch issues between front end and Back Office systems have caused significant problems where a standard front approach has not matched the Back Office database format. In this case searches have either yielded no matches or a significant list of “matches”. In either scenario the pollution is costly to rectify – 5 million incorrect records were generated in one case.

4. AN ARCHITECTURE TO INSULATE ACCESS CHANNELS FROM COMPLEXITY

The Portal architecture must be:

- Able to cope with a variety of channels
- Structured to accommodate different Back Office requirements
- Based on proven, widely available and used technology
- Scalable to accommodate growing and changing usage requirements with cheap incremental increases in size
- Equipped to handle digital authorisation.

A three-tier architecture can be used to insulate the access channels from the complexity of the Government Back Office with web technology providing the portal, or gateway between the channels and the individual service requested. The key concept of the three tier architecture is the use of middleware technology to provide a brokerage capability, a concept that sits well with the idea of a portal. The middleware will link components to allow them to interact without the need to have knowledge of the other component's location, hardware platform, or implementation technology. The architecture has the characteristics described above and if managed correctly will provide:

- Access to "all" Government Back End services from 'all' delivery channels
- The ability to integrate new delivery channels using the functions developed previously
- The means to add new services through the existing delivery channels without major changes to the existing service set of the Back Office legacy systems
- Scalability beyond the capabilities of traditional two tier architectures.

The deployment of a three-tier architecture will also bring the following benefits:

- A reduction in the cost, time and complexity to implement distributed client-server applications by eliminating custom integration code at the network and operating system level
- The means to allow applications, services and components, implemented in different systems and across different platforms, to transparently invoke, control, and interact with each other
- Location-independent application naming, capability registration, activation, and dispatching of requests or data achieved through an access method which is common across all platforms
- Isolation of clients and servers from changes in network topology and protocols
- Encapsulation of existing legacy applications and data without modifying source code, to allow the integration of existing applications into new client-server architectures
- Evolution towards an object-orientated, software development approach that allows existing software to be widely retained and simplifies the integration of new software where this is required.

5. THE THREE-TIER ARCHITECTURE PROVIDES ACCESS FLEXIBILITY

Although there are a number of options for the architecture structure, PA recommends a three-tier Portal architecture consisting of:

- Client Elements
- Middle Tier
- Government End.

Our proposed conceptual architecture is shown in Figure 5.1.

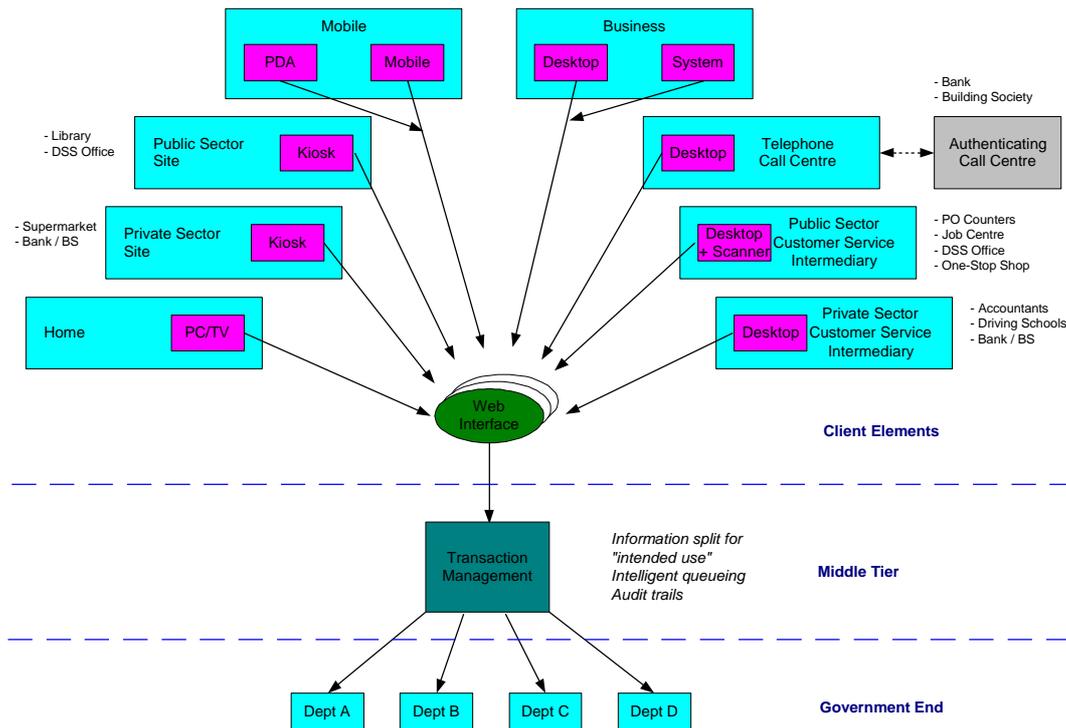


Figure 5.1 Three-Tier Portal Architecture

The **Client Elements** provide the connectivity for customers to the common information and services. In the short term it is proposed that these elements will use common web interface technologies but as access media develop in the longer term it will be possible to incorporate technology which is specific to any one individual delivery channel within the Client Elements without affecting the service software. Hence the architecture provides the ability to add new access channels without technological constraint or implications on the service delivery architecture.

The **Middle Tier** contains the Transaction Management System which houses the Middleware and provides the common infrastructure to support the transportation of messages to obtain the appropriate level of authentication and access the services or information. Common information-based services are also housed within the Transaction Management System including, for example, common search facilities to provide information across the range of services contained within the Portal service set. Other components could include, for example, a feed mechanism identifying the next appropriate service or other appropriate delivery channels for the customer based on sample usage.



5. *The three-tier architecture provides access flexibility...*

Data Protection auditing will also be provided in the Middle Tier to ensure that information relating to specific services is only sent to the appropriate Department to safeguard the rights of the individual. Experience from the IFORMS project suggests that many data protection issues can be resolved if this data is not stored in the Portal.

The **Government End** provides the connectivity from the Departmental systems, including legacy systems, to the Transaction Management System through appropriate interface systems. This layer will “ring fence” existing systems. Its isolation layer will allow ongoing development of the Departmental systems without a knock-on development requirement on the Portal architecture.

6. THE TECHNICAL IMPLEMENTATION MUST BE “OPEN” TO ACCOMMODATE SYSTEM AND CHANNEL REQUIREMENTS

The technical implementation of the three-tier architecture must provide the glue to link existing Departmental services and systems to a wide range of different access channel technologies. This means that open standards need to be proscribed and that the interface standards needed to ensure good interworking must be defined.

An **open** architecture will maximise the flexibility and opportunities for infrastructure provider competition. Every major interface in the architecture will need to have an interface specification defined for it. This will allow architectural components, services and supplier systems to be replaced easily and a ‘plug and play’ approach to be taken to architecture components, services and supplier systems. Examples of the required level of specification include the adoption of internet protocols such as HTTP for the display interface protocol and TAPI for call handling between call centres.

The architecture must also be:

- Secure
- Scalable
- Resilient.

Secure since it will act as a conduit for a high volume of sensitive personal information. The integrity and confidentiality of this information must be protected with the Portal treated as a Confidential site because of the aggregated data which it holds. A security policy framework will be required which is a superset of the GSI Security Policy, because the Portal will be an active system rather than a data transfer network.

Portals will support a wide range of popular services through several channels, while communicating with a number of government departments. To achieve this the network architecture must be **scalable**.

Resilience will be required with resistance to single point failures and denial of service attacks. Portals must exhibit characteristics such as multiple paths, graceful degradation and self-healing. Network paths to service providers should be provided using multiple, diverse routes.

The technical implementation of our proposed three-tier architecture to achieve these objectives is shown in Figure 6.1.

Client Elements

The WWW (Web) server will provide a Web front end to the Portal users, including customers connecting directly, call centre agents and other intermediaries staff. The application server will support portal services, with the responsibility for managing communication with the middle tier. The application server may also support other third party services.

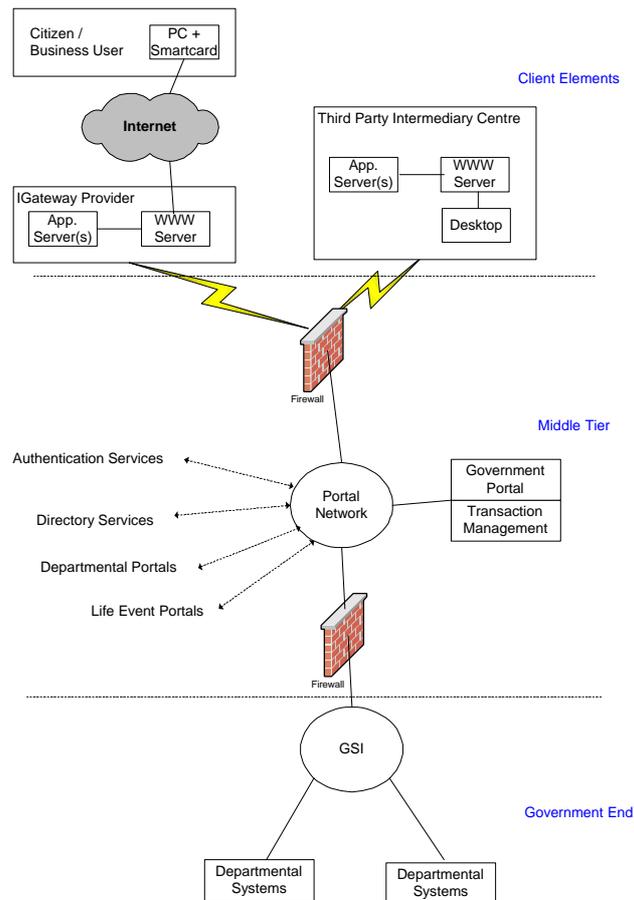


Figure 6.1 Technical Implementation of the Three-Tier Architecture

Middle Tier

The middle tier of the architecture is responsible for supporting the client elements, integrating the services provided by the Departments, and managing transactions.

The Central Portal Service will service requests or pass them to the other Portal elements, such as the Life Event portal service and authentication portal service. For example the central service might receive a request, which originated from the Internet, for authentication containing a user digital certificate and an IGateway provider Certificate. It would pass the request to the appropriate authentication services. The request would then be passed to the appropriate portal service for action and a response returned to the originator. If a call centre is providing authentication the request would be received with the call centre’s certificate and an indication that authentication was successful. The authentication service would then check the certificate and determine that user authentication had been provided by the call centre, since the call centre is trusted to provide authentication.

Government End

The Government End provides communication between the portal elements and the Government Departments. The architecture will largely depend on the nature of the Government systems with which it must work, and whether real time interaction is possible. The key will be the establishment of an interface specification, which can then be used across multiple Departments.



6.1 CONFORMANCE TO STANDARDS WILL ACHIEVE AN OPEN ARCHITECTURE

We recommend that the technical elements should conform to the following standards to achieve an open architecture.

Client Elements

Element	Recommendation
Web server protocol	HTTP(Hyper Text Transport Protocol) protocol allowing the download of Java applets ¹ providing flexibility for future enhancements.
Application server candidates	CORBA ORB supporting services written in Java, or DCOM and Microsoft Transaction Server.

Middle Tier

Element	Recommendation
Application server architecture candidates	CORBA ORB supporting services written in Java or DCOM and Microsoft Transaction Server

Government End

Element	Recommendation
Suggested protocol for communication with Government departments	SMTP
Suggested messaging standard	S/MIME since this is supported by a range of commercially available products

6.2 AUTHENTICATION AND CONFIDENTIALITY MUST BE SUPPORTED

Client Elements

Confidentiality will be provided using encryption between the desktop and the Web server. Secure Socket Layer (SSL) or HTTPS (HTTP Secure) is recommended. Encryption beyond the Web server will also be required. A combination of bulk encryption and secure private networks may be used. Investigation will be required to determine if 40 bit encryption will provide sufficient protection based on the volume of sensitive information and the threat. If stronger protection is required 128 bit encryption should be used. Export approval, where appropriate should be sought using a case similar to that for the IFORMS project. The connection between the Web server and Application server will be protected through the use of a controlled environment.



¹ Any Java applications, or active components, used would need to be certified by the appropriate agency of HMG to allow use within the GSI domain as well as outside.

Middle Tier

Public Key Infrastructure (PKI) should be provided using certificates and certificate authority solutions from companies such as VeriSign, Thawte or a retail Bank.

A firewall will limit network access between the Client Element systems and Middle Tier systems.

Government End

Communication with Government Departments will use structured messages or structured files to support batch communications. These will be digitally signed by the Portal to protect the integrity of the information, authenticate the source, and prevent repudiation. The acknowledgements will be transmitted using the same protocol to ensure that delivery was confirmed and that the message could not be repudiated. The GSI or xGSI standards will be used to provide secure communication to Government Departments including the necessary firewall protection.

7. THE PROPOSED ARCHITECTURE CAN MEET UNPREDICTABLE VOLUMES

Although the anticipated volumes through the Portals can be calculated empirically, allowing the architecture to be dimensioned, the nature of web traffic and the limited data available make accurate forecasting impossible. In reality initial load estimates can only be made from using broad estimates of the likely usage, adding appropriate amounts to cover peak loads and adding contingency margins. Longer term, a more accurate picture of demand can be derived from historical usage trends but changes in usage and demand can be dramatic. For example Amazon.com experienced growth in customer accounts from 940,000 in September 1997 to nearly 4.5 MM in September 1998, an increase of over 377%.

From a systems viewpoint, the way forward is to ensure that the architecture on which these systems are built is capable of controlled capacity expansion in order to meet growing demand.

The Portal architecture proposed is sufficiently flexible, scalable and robust to meet these unpredictable traffic volumes and the dramatic changes in traffic that may occur. The proposed architecture can be readily scaled by:

- Increasing server capacity, adding servers in cluster formation
- Splitting services between servers as demand for specific services grows
- Developing interconnect capacity to the public networks through the addition of 2 Mbit/s links as the volume of traffic increases
- Increasing capacity to the systems on the Government side through the implementation of larger connections to the GSI, splitting traffic between multiple Departmental processors where appropriate.

In view of the current uncertainty concerning the services which will use the 2002 implementation and the transaction levels which will be generated, the most appropriate method of dimensioning the infrastructure requirement is to make appropriate comparisons with implemented systems. For example the online support side of the Microsoft website generates 2.3 million page views per day for 129,000 visitors. The 100,000 pages of information are transmitted by six servers. An unusual aspect of Microsoft's main site is that a large amount of software is generated – 1.2 Terabytes were generated on the day that Internet Explorer was released. To serve this need the Microsoft.com sites are built on a network of over 50 servers dedicated to different tasks such as web content, file download, search and databases.

In contrast another large website which fulfils over 75 million requests for pages per month from more than 1.5 million individual hosts handles this traffic through 3 clusters of servers which are geographically and “logically” distributed across the Internet. Each cluster consists of two webservers, a streaming media server, database server, disk arrays and a management server. In total the website is able to call upon over 150 Mbit/s of connected bandwidth.

The Government Departments and Agencies collectively handle on average 49 million transactions per month with an expectation that this will rise to 52 million transactions per month by 2002. It is expected that the capability will exist to handle two thirds of these transactions (35 million) electronically by 2002. It is reasonable to anticipate 50% - 75% of transactions take place through the web. This means that the Government's web presence taken as a whole could reasonably be expected to be of the same order of magnitude as the large website after the 2002 services have become fully established

since each transaction will generate several page requests. However enquiries will be taking many different routes and the Government Portals will only take a proportion of that traffic – possibly one third. The requirement could therefore be served by two resilient clusters of two web servers, each cluster also containing a database server, a streaming media server, if required, and dedicated search engine. It is anticipated that bandwidth of 50 Mbit/s would cover 2002 Portal requirements.

These demand estimations should be viewed as indicative only based on current uptake. They should be regularly reviewed against changes in demand forecasts which occur between now and implementation so that appropriate uplifts can be applied.

Further assessment should also be carried out following the Stage 2 Pilot. Once real-life data is available from this implementation we recommend that firmer system sizing should be defined by:

- Mapping services to specific servers, including search engines, static page delivery and video databases
- Considering requirements for the individual applications which will run on each server
- Assessing the bandwidth available and potential constraints at busy periods
- Calculating the amount of data which the client and server will send and receive during transactions.

8. IMAGE AND CHANNEL MIX MUST MEET CUSTOMERS' NEEDS AND GOVERNMENT OBJECTIVES

The channel mix and service “look and feel” must not only meet customers’ needs but also support Government brand objectives.

Customer feedback from some of the previous e-commerce initiatives has been mixed. For example the initial implementation of the “Open for Business” pilot in Norfolk achieved very low user take-up rates and did not include the marketing required to overcome a natural intransigence to electronic delivery from some of the public.

In general the specific lessons from existing electronic government initiatives should be addressed:

- *Privacy*: any advertising, sponsorship or third party data manipulation must be strictly controlled to ensure that the customer’s wishes are met and that data protection principles are not contravened
- *Quality*: the introduction of new technologies must be seen to provide greater ease of use and better transaction capability, for example digital interactive TV would provide higher quality screen definition and interactivity based on familiar remote control units
- *Dialogue*: more access channel or access points will provide greater choice for the customer and allowance must be made for more interaction and feedback through e-mail, the telephone or interactive TV
- *Simplicity*: given the complexity of managing a multi-channel environment supported by several technology platforms, there is a constant need for testing through research to ensure that the ‘customer experience’ remains straightforward and to carry out re-design work if it is not.

8.1 BRANDING MUST SUPPORT GOVERNMENT OBJECTIVES

One of the major areas for development will be the linking of valuable commercial (private sector-led) services to electronic government activity. This will require the establishment of selection criteria to decide which companies are chosen and which services are offered in conjunction with the relevant Government Departments. The intention would be to offer appropriate services and products that are focused on a customer’s preferences, as disclosed by his or her interaction with government. This does raise a number of issues that will need to be addressed concerning privacy, the need for sophisticated customer data management and the basis for commercial partnerships.

Similar issues will arise when considering whether or not it is appropriate to have advertising or sponsorship, either on the web site or on other material. There may be certain companies whose brand values closely align with that of electronic government, but they would have to be chosen and tested carefully. This whole area is a highly complex one and would require further research.

It will be important at this stage for the Government to retain control of the Branding and Image which is presented by the Portals. Transfer of responsibility to a third party or intermediary is unlikely to be an acceptable option.

8.2 CHANNELS AND SEGMENTATION MUST PROMOTE EASE OF USE

The implementation should focus on the customer groups which could be persuaded to use PC or call centre access technologies. This is likely to include the ABC1 segment of the market and younger C2DEs who can see the benefits of working in this way but will need help in making this happen.

In addition to PC and call centre access, penetration of interactive digital TV may be sufficiently high among these segments of the market to also use it as an access channel. To many it may appear to be the most 'user-friendly' channel, with familiar reference points to analogue TV. Research suggests that younger C2DEs are likely to exhibit relatively high take-up, based on the benchmarks for analogue satellite and cable TV penetration.

Kiosks within local government centres and retail environments may also be viable within the 2002 timeframe, particularly where retailers have made the initial investment in kiosks and the addition of Government services can be shown to provide an added attraction. A simple, touch screen approach would encourage greater take-up among the target segments.

8.3 MARKETING MUST BE BACKED UP WITH CUSTOMER SUPPORT

Marketing communication programmes can be targeted at specific customer segments in specific regions but information should be combined with direct support, either through a physical presence or call centres. Case study material will persuade potential new customers that this is a tried and tested mode of operation.

Local marketing initiatives should be used in parts of the country where there are significant clusters of the target segments. These initiatives should include direct marketing supplemented by regional TV, radio and poster advertising as appropriate.

9. PROCUREMENT OPPORTUNITIES DEPEND ON AN UNDERSTANDING OF THE BENEFITS

9.1 BENEFITS FOR PRIVATE SECTOR PARTNERS COULD BE SIGNIFICANT

The Government Portal concept offers the attraction of significant revenue to private sector partners which could come from a number of sources:

- Transaction income from handling the transaction with the customer, either through the Portals directly or within the Client End by providing Call Centre services, gateways or kiosks
- Use of transaction volumes to stimulate interest in other services, for example the generation of significant numbers of last-minute applications for tax self-assessment forms to stimulate demand for accountancy services
- Advertising to customers using the Portals
- Inclusion of Government services within electronic shopping malls to stimulate demand by providing a more comprehensive service than that provided by competitors, for example inclusion of road tax and log book services in a car purchase area of the mall.

Currently PFI/PPP partnerships are attracting significant amounts of interest from the private sector, particularly for initiatives that are market-facing rather than internal to Government. We anticipate that the private sector will be excited by the potential offered by a contract in the electronic commerce area allowing the Government to proceed with PFI/PPP options to share the potential risks and rewards.

It will be essential to develop a robust business case for the PFI/PPP procurement early in the process. This business case must fully test the feasibility of a fully transaction-based PFI and the relative risk/reward profiles of PPP against a more standard procurement. This is critical to ensure that the weaknesses and disappointments inherent in some of the development based PFI schemes are avoided so that a realistic commercial and procurement strategy can be built.

9.2 THE SCOPE MUST BE TIGHTLY DEFINED

The scope of the 2002 implementation will need to be tightly defined in order to deliver within the required timescales.

The minimum electronic service set which the Government intends to deliver by 2002 is defined within the Government's White Paper "Modernising Government". Services available to the citizen will include:

- Booking driving and theory tests
- Seeking work and being matched to jobs
- Submission of self-assessment tax returns
- Information and advice about benefits
- On-line health information and advice
- Use of the National Grid for Learning

- Applications for training loans and student support.

Electronic services for businesses will include:

- VAT registrations and VAT returns
- File returns at Companies House
- Applications for Regional Support Grants
- Receipt of payments from government for the supply of goods and services.

At this stage the intention should be to implement all of the above services on the 2002 Portal. It should be recognised, however, that this service set may be modified by the ability of individual Departments and Agencies to develop services in electronic format within the required timescale. Currently all of those interviewed remain committed to White Paper objectives.

In defining the access channels for the 2002 Portal the minimum requirement, expressed to potential suppliers in the procurement documentation, should be to provide access through:

- The internet, which in the 2002 timescale is expected to include access through mobile phones and interactive television
- Call centres
- At least one intermediary with the ability to provide access to a wider spectrum of customers, for example a retail bank or the Post Office.

The expectation, however, is that a much wider range of access channels will be available in this timescale. Potential suppliers, in bidding, should therefore be encouraged to contribute other additional access methods as a fully-costed part of their response.

9.3 BROAD CONSORTIA WILL BE KEY TO SUCCESS

Respondents to this type of procurement have traditionally been from the IT equipment or telecommunications service industries but the range of expertise needed to successfully implement the Portal will be considerably more extensive. Therefore the breadth and quality of the consortia which are formed by the potential suppliers will be key to the success of the project. It will be essential for CITU to “warm the market” with potential suppliers before the procurement process commences to allow consortia negotiations to take place and ensure that the best possible quality of responses is received.

The costs of a PPP/PFI procurement are significant, although the payback usually makes this investment worthwhile. It is important to ensure that the benefits and payback profile are understood by all concerned and the impact on existing Departmental PFI contracts assessed. The development of a business case and public service comparator during late 1999 will therefore be key to the project’s success.

An important element in this area, if the rewards are transaction related, will be the risk to benefits if the transaction volumes change or the initial predictions prove incorrect. A clear payments strategy which defines the risks in this area will be required as a part of the development of the business case.

Assuming that the 2002 Portals are implemented by third parties, the supervisory role to be filled by whoever assumes the customer lead role in Government will be to:



- Define the service requirements in conjunction with the Departments and Agencies which contribute the services
- Build process maps for the interworking required between all involved parties
- Specify the service level requirements, authorisation, security levels and interfacing standards to other systems
- Define the high-level Government charging and pricing policy
- Develop the channel, branding and advertising strategy
- Award, manage and monitor the contracts.

10. THE STAGE 1 DEMONSTRATOR WILL SHOW HOW THE PORTAL MIGHT OPERATE

The Stage 1 Demonstrator is intended to provide a simple, cheaply implemented version of how the Portal might operate providing a first tentative insight into the view which the user will see. It will not be suitable for any significant large-scale tests of the image and branding of the full Portal or as a test of the three-tier architecture. Usage will be restricted, for demonstration purposes only, to:

- A small, controlled, internal user base
- Two or three small external focus groups to provide feedback on the demonstrator “look and feel”.

The demonstration will show how users can notify change of address to two Departments without duplicating address information. Information will be sent to dedicated mailboxes in the target Departments for processing and fulfilment. Additional links will provide connectivity to other appropriate publicly available information such as, for example, National Grid for Learning information.

The proposed architecture is shown in Figure 10.1. The Reflector will provide an extra security layer to prevent the risk of the Government End mailbox addresses becoming visible to internet users. “Crypto-wrapping should be used to protect the data between the web server and reflector. As additional protection the form entry should run under SSL.

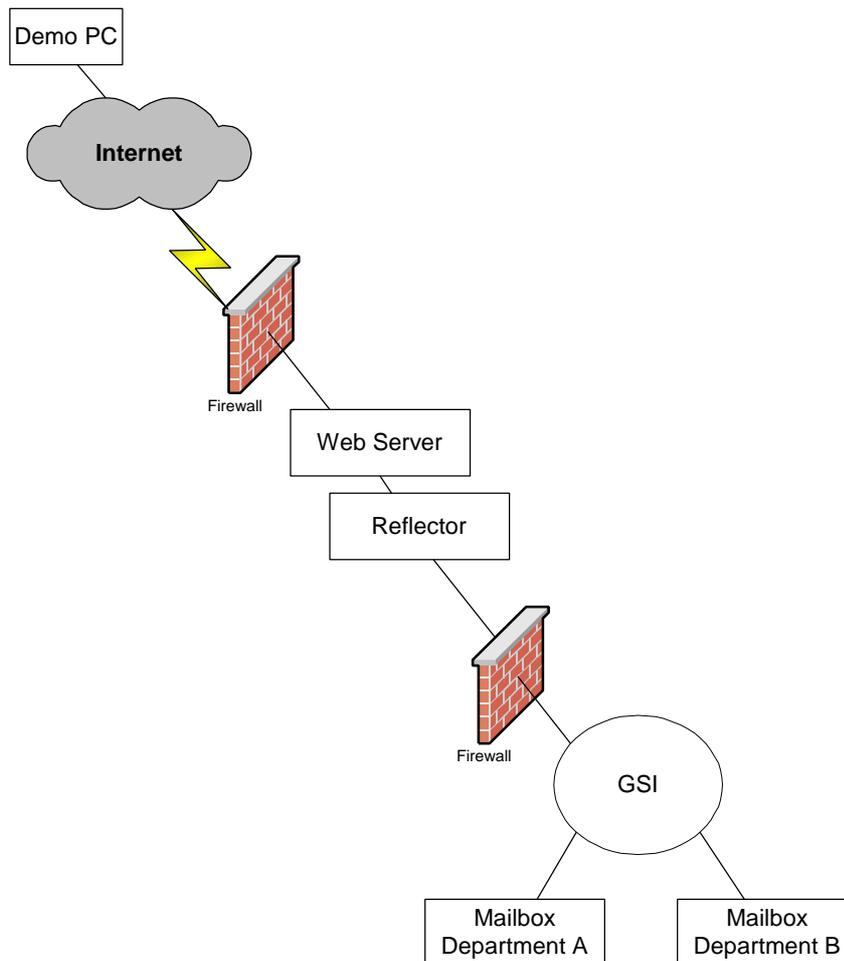


Figure 10.1 Stage 1 Demonstrator Technical Architecture

11. THE STAGE 2 PILOT SHOULD TEST THE PRINCIPLES OF THE FULL IMPLEMENTATION

The Stage 2 Pilot must test the principles embedded within the full implementation. It is proposed to achieved this by:

- Building a smaller version of the proposed three-tier architecture linking to the systems of three Departments
- Implementing the base level access channel infrastructure of:
 - Internet access
 - Call centre access
 - Access through an intermediary.
- Carrying out brand assessment with service and channel evaluation through focused market research and focus groups
- Adhering to the proposed technical standards and architecture
- Monitoring the service volumes.

Each of these aspects is discussed below.

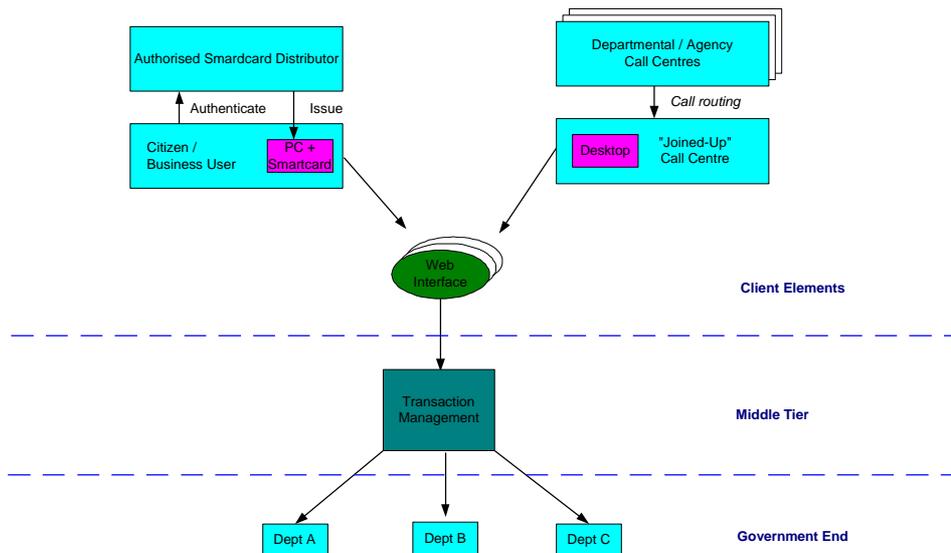


Figure 11.1 Stage 2 Pilot Architecture

11.1 THE PROTOTYPE SHOULD TEST THE THREE-TIER ARCHITECTURE

A smaller version of the three-tier architecture should be implemented for the Stage 2 Pilot. Timescales for implementation will need to be tight so that the lessons learnt in Pilot development and implementation can be carried forward to the 2002 implementation. The Pilot should therefore, as a general principle, be commissioned through connection to the readily available systems and channels rather than through bespoke development.

Access will need to be limited to the following three methods:

- Directly through the internet

- Through a call centre
- Through a pilot Smartcard implementation.

In view of the limited time available the call centre access should be through an established facility, for example the existing Inland Revenue Self-Assessment enquiry centre.

The Smartcard pilot will similarly need to be pursued through an established pilot, for example a pilot already initiated by one of the Retail Banks.

11.2 THE TECHNICAL ARCHITECTURE CAN BE PROVEN

The technical architecture implemented for the Pilot should be a cut-down version of the final implementation. As such it will be a realistic test of the principles embodied in that architecture:

- **Open**, the concepts embodied in the target architecture can be verified by adopting the same technical standards
- **Secure**, similar levels of security should be adopted for both the Pilot and 2002 system. The electronic signature authorisation process can be fully trialled during the pilot in anticipation of the planned legislation when this is in place. Options for authentication should be limited to methods that exist already, for example a Smartcard trial
- **Scalable**, the more limited scope of the Stage 2 Pilot compared with the 2002 system means a lower degree of scalability is required. However since the design will conform to the same architectural approach, scaling will be available if needed
- **Resilient**, a lower level of resilience is appropriate for the Stage 2 Pilot and limited periods of down time may be acceptable. The pilot should, however, support 24 hour, 7 day per week operation and prove many of the principles within the 2002 design including multi-hosting, resistance to single points of failure and denial of service attacks through multiple paths, graceful degradation and self-healing. Network connections should also be effected through multiple, diverse routes.

The Departments participating in the pilot will be connected to the GSI and should have an existing transaction handling infrastructure already in place. Systems that handle electronic transactions from external parties, for example IFORMS, may be appropriate.

Interface standards should conform to the requirements of the 2002 system and be based as far as possible on the interfaces of existing systems to minimise the development required for integration.

11.3 IN-SERVICE VOLUMES CAN BE MONITORED

The Stage 2 Pilot will be limited to a single service implemented over three Departments and the demand generated will therefore be significantly lower than for the 2002 implementation. Moreover the level of demand will be controllable through the level of advertising and stimulation of the market which takes place.

A considerably smaller infrastructure will be needed to handle the anticipated traffic. We anticipate that demand could be handled initially through a single cluster of one

webserver, one database server, a disk array and one management server with 8 Mbit/s of connected bandwidth.

A key benefit of the pilot implementation will be the opportunity to measure and calibrate service traffic. Regular monitoring should be established of the following attributes:

- Load on the server system (CPU, memory and disk usage)
- Load on the server applications (web server, databases)
- Bandwidth usage
- Usage patterns (average and peak usage)
- Correlation of usage with events and advertising
- Server log file analysis.

This will provide a clearer analysis of potential usage on the full 2002 implementation.

11.4 MARKET INTEREST SHOULD BE ASSESSED

The Pilot will provide the opportunity to extensively evaluate interest in and take-up of Portal services.

Channels and Segmentation

Given the differential propensity among customers to interact with electronic government, depending on a whole range of factors, including age, social grade, attitude towards technology, general public or small/medium business role, it is important that the Stage 2 pilot focuses on those segments of the population that:

- Are keen to use the technology
- Have access to that particular channel and are experienced in its use.

In general, this should include ABC1 social groups and younger, under 45, age groups. Specifically, in the small business segment, this could include financial advisors and professional service firms. Initial research by CITU indicates that such groups would be favourably disposed to electronic government initiatives. This view is confirmed by the indications that such companies have regular interaction with Government, particularly the Inland Revenue, and wish to reduce the process cost and time of transactions as well as provide access outside normal business hours. For individual citizens it will also be necessary to target specific regions of the UK where members of the ABC1 groups are concentrated.

There should be a focus on a small group of keen sub-segments in order to:

- Encourage initial take-up and subsequent penetration of the service
- Avoid over-demand in the early stages resulting in poor service levels and negative first experiences.

There may also be a need for heavy support in the first stage of the pilot, either from third party intermediaries or trained Government staff, so that public perception is positive and good PR opportunities can be gained. This will be critical in the early stages when the system may contain initial bugs.

Marketing communications

Marketing communication programmes should be targeted at specific sections of the community for both small businesses and the general public. The concept should be 'test marketed' in specific regions before general rollout:

- Direct marketing and poster or radio advertising should be targeted regionally, ensuring cost-efficiency and better response rates
- PR activity should be generated, possibly in conjunction with local government authorities
- Web sites should be used to highlight information concerning where the pilots are taking place, initial take-up and penetration, including contact details for more information including, for example, call centre details, Government contact points

Communication will need to stress that there are tangible benefits from the electronic approach, rather than simply moving the queue from counter to kiosk. The comparative ease of interacting with Government in this way should also be emphasised. A low-key approach, rather than a grand initiative, will need to be adopted, emphasising the local nature of the Pilot.

Branding

The branding of electronic government generates a number of principles that will need to be followed for the pilot:

- A logo appropriate for electronic government should be designed for use in all communications and materials
- Branding should extend to *communications* – the need for seamless, clear and consistent messages across all materials – whether physical, for example direct marketing, posters or radio advertising, or virtual, for example web based – and all contact points between Government and its customers is imperative, promoting a distinctive 'look and feel' associated with electronic government
- Branding should extend to *service* – for example, government web site addresses should be co-ordinated for ease of search and the Portal must be easy to navigate - and responses to any interaction should be managed carefully. Leading-edge technology may create expectations that service is also leading-edge!
- Branding should extend to *partnerships* – any commercial partnerships undertaken by government with the private sector will, initially at least, have to align with the values of the 'government brand', integrity, public service *et al*, especially where the partnership relates to access points, for example supermarkets, or affinity deals, for example financial services offered based on a customer disclosing details of her personal circumstances

Customer Feedback

The principles outlined for the 2002 implementation are also relevant for the Stage 2 Pilot:

- *Privacy*: any public domain interaction outside the home or office should be undertaken in an environment where privacy is respected, for example in a separate room, if necessary, and disclosure to non-governmental parties is strictly controlled

- *Quality*: mystery shopper visits should be used to evaluate performance; exit surveys could be used to refine the service
- *Dialogue*: the need to maintain constant communication with users of the service through regular market research 'drip feed' rather than 'big bang'
- *Simplicity*: complex technological interfaces will not encourage take-up, whatever the benefits; technology need to be 'invisible'; and complex technology needs to be broken into simpler uses, for example, Smartcards used specifically for identity confirmation

11.5 PILOT DEVELOPMENT SHOULD BE UNDER GOVERNMENT CONTROL

For the full benefit to be gained from the Stage 2 Pilot, the Government must retain full control over all aspects of its implementation. This is important because:

- A supplier-controlled implementation will often focus on the attributes which interest the supplier the most from a market positioning perspective, this might limit access, for example, to the most recent version of software so that potential customers with older versions cannot participate. Alternatively connection to some Departmental systems might be precluded if the supplier specialises in development for specific types of system
- An implementation controlled by an access channel provider is similarly likely to focus on specific commercially-attractive access options to the exclusion of other socially-inclusive channels which are of most interest to the Government in the pilot phase
- In both cases the branding and image of the Portal is likely to become diluted and confused with the supplier or service provider's own images.

Conversely, the Government objectives from the pilot must be to achieve the fullest evaluation of:

- The market potential for the range of available channel options and the success of the branding
- The steps needed to achieve wide customer acceptance during the launch process
- The scalability and flexibility of an open architecture which will be procured under competitive tender
- The potential of common technical standards which do not rely on proprietary implementation.

These objectives can only be achieved by implementing the pilot with direct funding rather than through collaboration with potential future suppliers of the architecture or access channels.

The procurement options are limited to achieve implementation within the available six-month window. In our view the only option to achieve these timescales will be to award conventional procurement contracts under the existing S-Cat and G-Cat framework arrangements which are in place with consultancy and equipment suppliers.

12. KEY ISSUES FOR FUTURE RESOLUTION

As well as proving the concept, the Pilot must also begin to provide answers to the following issues that have been identified during the course of the feasibility study:

12.1 SERVICE BOUNDARY DEFINITIONS

Traditional boundaries for the delivery of services have been well defined. Departments are responsible for the service, processes and stationery. The role of intermediaries, for example Post Office Counters, is clear. Electronic commerce will cause these boundaries to be redefined. The new structure is more complex with Portal and service providers positioned between the Department and the customer or traditional intermediary. In many cases the boundaries for service management and service responsibility will be separated. Where services cross and blur the traditional boundaries and existing agreements, new definitions for management and responsibility will have to be drawn up so that:

- End to end service provision is managed,
- Responsibility for each part of the service delivery is allocated
- Service level agreements exist at each boundary,
- Standards to achieve a common “look and feel” are available
- Departments understand their boundaries of responsibility and customers understand who they are dealing with
- Responsibilities for the resolution of service problems are clear.

12.2 CENTRALISED OR FEDERATED STRUCTURE

In the short term the Government “Portal in the Sky” concept may be difficult to achieve because some Departments are already offering a range of electronic, joined-up services across Departments and the initial Government Portal implementation can only offer a smaller range of services. Some of these issues could be addressed by branding Departmental sites as Government Portals with a similar “look and feel”. Alternatively the Government Portals could be established within existing Departmental sites. The downside of either approach is the difficulty in imposing open standards within an established site and the dilution of the Government branding.

12.3 RUNNING AHEAD OF THE FIELD

In pursuing a policy of implementing services which are at an advanced stage of development first, care must be taken to ensure that decisions are not taken which will preclude those Departments joining later. The Portal architecture must remain as flexible as possible to preserve the benefits for all.

Some Departments will take considerably longer than others to implement electronic services. Determining factors will include the complexity of the service, the number of interfaces required to other departments and the level of problems in upgrading the existing systems and infrastructure. More importantly, some of the new services, or simply the new ways of delivering them, may involve significant realignment of business processes, bringing changes in culture and working practices.

Conversely, it is also important to maintain close links with those Departments that have an advanced e-government programme in order to ensure that all services are compatible with the Portal model and that services build upon each other rather than duplicating functionality.

To minimise the effects of these problems, the Portal architecture must remain open and flexible, so that services can be integrated as they become available.

12.4 THE CHANNEL MIX MUST BE SOCIALLY INCLUSIVE

In providing electronic service delivery the objective must be to provide access channels which will appeal to the widest cross-section of the public and business. The risk, however is that those channels which are easiest to implement will not provide that breadth.

The access channels which are currently on offer will exclude some users because of technophobia or lack of access because of low income. It is important, therefore, to offer these customers alternative channels using more familiar interfaces.

Similarly business uses many different access methods to communicate electronically with Government. In persuading business that moving to modern, internet based systems is beneficial, it is inevitable that some businesses will find it difficult to relinquish their traditional systems in which significant investment may have been made.

12.5 SERVICE ACKNOWLEDGEMENT AND CLOSURE

The interaction between the different systems involved in service delivery is complex and must be specified.

Some transactions through the Portals will involve a complex set of interactions between databases and systems in several Departments. Some systems will be able to react to the transaction in real-time whilst others will operate in batch mode. The responsibilities of each system in sending notifications along the chain must be established. The user will need to know in real time that the service request was received, whether it was complete and correct, and possibly when the request will be actioned. It may subsequently be necessary or desirable to notify the user that the request has been fulfilled, but this should be carried out only once, rather than separately by each system involved.

12.6 BACK-OFFICE COMPLEXITIES OF A JOINED-UP PRESENTATION

Resolution of the service acknowledgement and closure issue will not ensure that all services are presented with a common "look and feel".

If a Department has full GSI accreditation and connectivity, the Portals will be able to deliver service requests and messages to their electronic 'front doors', but what happens from that point can be significantly more complex. Some Departments have a large number of interconnected systems, often covering a range of data formats and standards. Taking a simple message from the Department's gateway and presenting it to each system in a language that it understands can require significant processing.

In order to bring discipline and structure standards should be developed for the data format between systems. This approach removes the need to develop an individual format for every pair of connected systems and allows new systems to be developed to a common standard.

12.7 SCALING THE INFRASTRUCTURE

Only a small amount of research has been carried out to date to identify what the consumers of Government electronic services actual want or need. Although there is much evidence to suggest that electronic, and in particular Internet, channels are gaining popularity at exponential rates, call centres are also experiencing a boom. Uncertainty in the mix of channels also leads to uncertainty in identifying the usage that the Portal infrastructure will need to support. Scant information on projected transaction volumes for existing and future services leads to further large uncertainty.

The infrastructure must be built with scalability and responsiveness in mind to mitigate the risks from inaccurate traffic forecasts. It must allow for additional resources to be brought on-line quickly and for the capacity of each of its fundamental components to be upgraded as the need arises.

12.8 FUNDING – DELIVERING THE BENEFITS

Departmental portals, life portals and Government Portals will all overlap in the services that they offer. Multiple access channels from the same Portal may deliver the same service set. Business cases with their associated benefits analysis will need to be tightly defined to prevent overestimation or double counting of the benefits. The PPP/PFI contract will also need to take full account of the impact on other contracts.

12.9 UNFORESEEN CHANGES THROUGH LEGISLATIVE UNCERTAINTY

Although legislation is coming to the House that will place electronic authorisation mechanisms on the same statutory footing as their traditional equivalents, the final detail of the legislation is not yet known. Amendments tabled during its passage through Parliament may affect development. EU e-commerce requirements are also awaited. The development of UK and EU legislation must be carefully tracked to reduce the chance that Portal development moves in a direction that does not comply with proposed legislation.

12.10 TIMESCALES MAY PRECLUDE FULL COMPETITIVE TENDERING

Short timescales to deliver the Stage 1 Demonstrator and Stage 2 Pilot may preclude full competitive tendering. A pilot implementation by one or more interested vendors is one option but will make it more difficult for the Government toundertake the full evaluation of standards, formats and market needed without the constraints of proprietary architectures or branding. Implementation may therefore need to be contracted through existing framework agreements or other existing partnerships.

12.11 AUTHENTICATION LEVELS

The work of the Inter-Departmental Working Group, which is defining a hierarchy of authentication standards will be essential to the future of the Portals approach. As paper processes are replaced by electronic and more processes are automated, care will be needed to ensure on a case-by-case basis that levels of authentication are not reduced. In fact, the systems now exist to ensure, if fully implemented, that a higher level of authentication is achieved, to both prevent fraudulent use and improve personal awareness of services and entitlements. Implementation cannot, however be achieved without careful adherence to privacy and data protection requirements.

A fuller list of issues is included in Appendix A.



13. THE 2002 PORTAL COULD BE LAUNCHED IN OCTOBER 2001

13.1 PPP/PFI IMPLEMENTATION WILL HAVE FOUR PHASES

The 2002 Portal will be undertaken as a Public Finance Initiative (PFI) or Public Private Partnership (PPP) with a private sector partner entering into a commercial arrangement with the Government to deliver a defined set of services. We anticipate that the work will take place in four phases:

- **Definition of Requirements**
- **Evaluation**
- **Negotiation and Contract Award**
- **Implementation**

13.1.1 Requirements Definition

The initial phase will incorporate the activities from Project Initiation to the issuing of the Requirement Specification to potential suppliers. Initial project definition work will focus on the definition of the services, scope of work packages, responsibilities, and the proposed commercial arrangements. Once the OJEC advertisement has been placed, informal discussions should take place with the potential suppliers to “warm the market” so that appropriate consortia are in place to respond to the Specification of Requirements.

Other significant activities in the phase include:

- Finalisation, documentation and agreement of scope and responsibilities
- Preparation of a business case and Public Sector Comparator
- Definition of performance requirements
- Development of commercial framework including contract strategy, payment model and development of market interest
- Development of the Procurement documentation including the Specification of Requirements.

13.1.2 Evaluation

After the procurement specification has been issued and potential suppliers' responses have been received the detailed evaluation can commence. Suppliers will be encouraged to be innovative in their offers, particularly in defining access channels. Evaluation will therefore necessarily be a complex process as the potential benefits and risks associated with each offered solution are assessed. Activities during this Phase will include:

- Evaluation and clarification of responses
- Consortia assessment
- Cost-Benefit and Scenario modelling
- Technical and operational evaluation
- Short-listing and selection.

13.1.3 Negotiation

Once the selected approach has been determined negotiations on contractual relationships, licensing of service providers and final detailed definition of contractual details will commence. Main activities will include:

- Service finalisation
- Scenario modelling
- Value analysis
- Contractual and licensing negotiations
- Contract documentation and schedules
- Business case refinement
- Performance specifications.

13.1.4 Implementation

We anticipate that the Departments will commence implementation of the Government End services once Project Definition is completed so that only interface development and testing remains to be completed when the Supplier's implementation phase begins.

The major workstreams within the Implementation phase will be:

- System Development including build, development and integration of the Portal systems
- Service Integration in which the interfaces to the individual services are built and tested
- Access Channel Development including any development work needed to commission the proposed access channels, for example expansion of call centres
- Service Provision, to specify, order and implement bandwidth requirements
- Brand and Image development for the marketing, publicity and focus groups associated with the new services
- Business Process definition and implementation
- Training, for customer service representatives and first line support personnel.
- Deployment including bringing into service, trialling and launching the services to the general public.

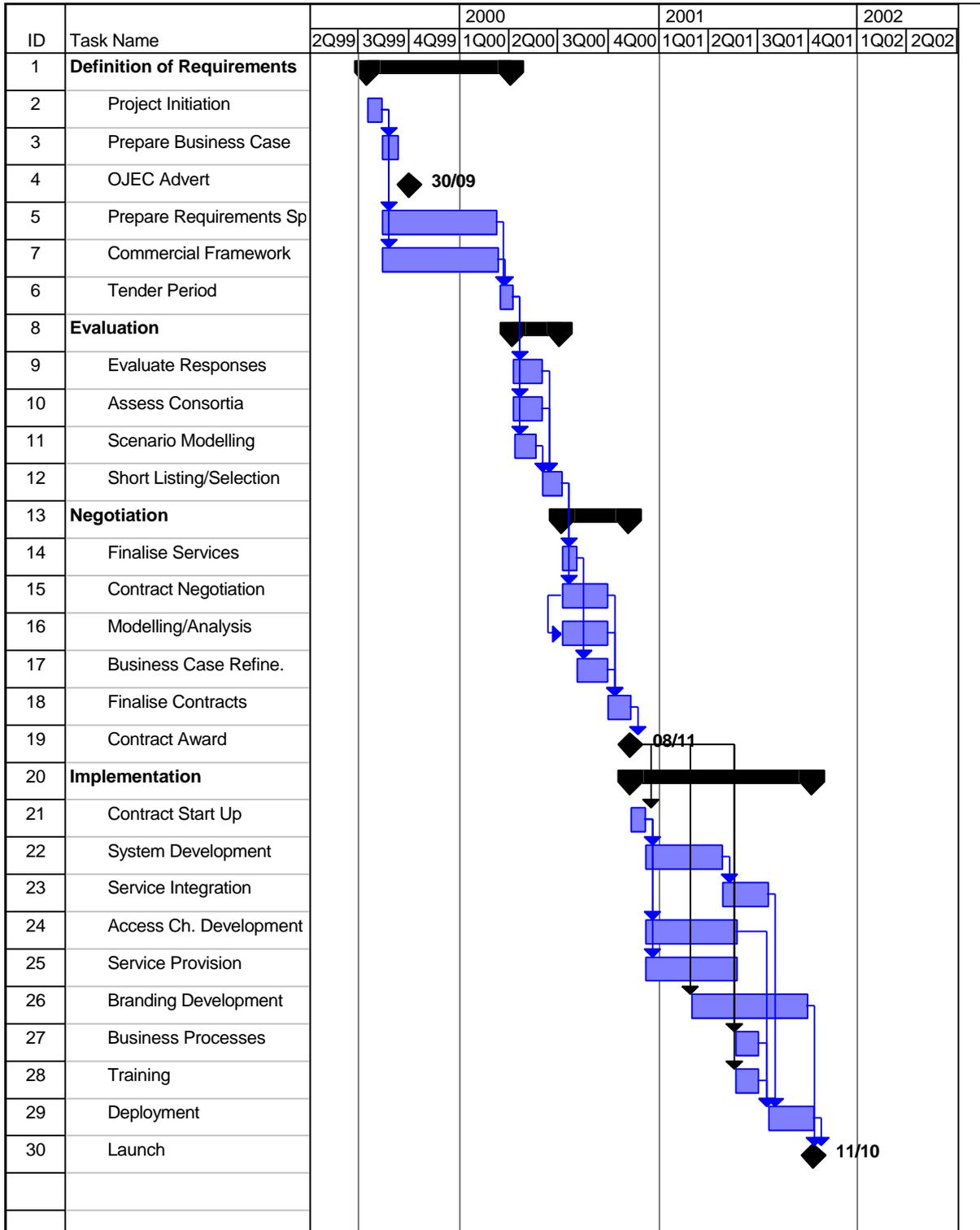


Figure 13.1 Project Plan for 2002 Implementation

13.2 ESTIMATED COSTS FOR THE 2002 PORTAL



Cost estimates at this stage can only be broadly indicative and will need to be reviewed in the light of take-up of the Stage 2 Pilot service and other electronic services throughout Government.

We have compiled broad cost estimates from the limited information which is currently available and from the costs of other large web-based services.

Costs not published.

The award of a PFI or PPP contract could result in third party benefits leading to a reduction of costs.

The cost of any system whether IT or business is determined by a wide range of factors. Factors that will have a major impact on the cost of the Portal and the Back Office systems are:

- **Eliminating errors close to the customer**, the closer to the customer an error or ambiguity is detected the lower the cost of resolution. Early resolution of errors eliminates the costs associated with re-contacting the customer, exception handling in the systems and associated processes. In the IFORMS project error rates approached 0% compared with 30-40% previously
- **Channel transaction costs**, different channels have different transaction costs ranging from high end costs for face-to-face channels to low end costs for internet channels, the adoption channels with lower transaction costs will reduce overall costs within the constraints of social inclusion.
- **Transaction volumes**, the higher the volume of transactions handled by the Portal the greater the costs of the systems required to support the transactions. However these costs may be offset by reduced costs in other channels, for example reduced transaction costs to intermediaries
- **Transaction complexity**, the more complex a transaction the more costly the system required to support it. To minimise costs simple transactions similar to those used on the IFORMS project, should be adopted. If a more complex structure is required it should be modelled on transactions which are already in use in the public domain, for example on the Internet.
- **Leveraging technology**, in order to minimise costs the Portal must take advantage of existing technology rather than drive the development of new technology. To achieve this it must adopt Commercial Off-The-Shelf (COTS) solutions that have become de-facto standards. These could be packages or development environments.
- **Back Office interface complexity and diversity**, HMG consists of a number of Departments supported by an even larger number of IT systems. Connecting the Portal to some or all of these is a significant systems integration project. The cost of this integration can be reduced by adopting a lowest common denominator for interface standards, for example structured email standards in recognition that real time dialogue may not be necessary, and minimising the number of interface types.
- **Diversity of Authentication Methods**, since it is not the intention for the Government to issuing authentication tokens such as SMART cards the Portal will have to authenticate citizens using a variety of mechanisms for example trusted third party, question and answer, SMART card, SWIPE card. Minimising the number of authentication methods will reduce costs. This is particularly important, as the Portal will have to communicate in real-time with authentication system where it is validating authentication credentials.

- **Business Process Complexity**, the simpler the processes which define how the Portal interacts with the Citizen, third parties and Government Departments the lower the cost.
- **Eliminate Manual Processes**, automated processes are cheaper than manual processes for high transaction volumes. Eliminating manual stages and paper will reduce costs.
- **Apply the 80/20 rule**, there will not be a simple trade-off between results and effort applied. In order to take advantage of this the implementation should focus on simple high volume transactions, rather than complex low-volume transactions. For example when handling change of address transactions consideration should be given to only including citizens with one address and directing those with more than one address elsewhere.

13.3 ASSESSMENT OF PRINCIPAL RISKS FOR THE 2002 PORTAL

No	Risk	Rating	Action/Contingency
1	Departmental legacy systems can't be developed to meet Portal needs	H	Use standard interfaces to systems which have been developed for electronic services
2	Usage may fluctuate widely from predicted levels	H	Employ scalable architecture Monitor usage levels during pilot. Control and monitor take-up after launch through marketing and channel strategy
3	Authorisation level required for each specific service may not be fully defined	M	Support fast resolution through inter-Departmental working group to define
4	Smartcard operators may not want to co-operate	M	Put the onus on suppliers to obtain support
5	Portal branding or advertising may not match government objectives	M	Establish selection criteria
6	Half-hearted launch may lead to poor user perceptions	H	Provide human support to customers during the launch period through call centres and help at kiosks etc. Launch at a controlled speed
7	Departments may be unable to deliver the full range of services planned for 2002	H	Scale down the 2002 service set to those services which are available electronically when Portal system development starts.
8	Expertise of existing PPP/PFI suppliers is too narrow for Portal delivery	H	Warm up the market to encourage formation of appropriate consortia
9	Benefits are double counted with other Government e-commerce projects	M	Clearly define perceived benefits, discuss with other Departments and state the implications for other affected Projects.
10	Confusion because the traditional service demarcation boundaries don't apply	H	Draw up new boundaries, processes and SLAs where appropriate.



No	Risk	Rating	Action/Contingency
11	Government branding becomes diluted because other Portals offer a wider service set	H	Establish a branding policy
12	Late joiners are precluded because the standards have been defined by those participating at the beginning	M	Keep architectures and processes open
13	Channels which are straightforward to implement don't include all	M	Keep the architecture open so that other channels can easily be added. Include other groups within market surveys.
14	Service acknowledgement processes are difficult to implement	H	Specify in detail the interaction between different systems and the procedures for notifying users of successful completion of the transaction.
15	Departmental systems don't provide a common look and feel in data formats	M	Develop common data format standards.
16	Legislative changes affect authorisation	M	Track legislation.
17	Greater service accessibility may lead to increased resource requirements to process	M	Make Departments aware of projected and actual take-up rates.
18	Dependency on GSI - may not be capable of realising the volumes, service levels etc	M	Adopt xGSI standards to allow competitive tendering if this becomes an issue.
19	No detailed market research, therefore customer needs are unclear	M	Undertake more detailed research.

14. THE STAGE 1 DEMONSTRATOR CAN BE BUILT BEFORE THE END OF 1999

14.1 THE STAGE 1 DEMONSTRATOR CAN BE BUILT WITHIN FOUR MONTHS

The Stage 1 Demonstrator can be built within a short timescale, subject to the agreement of the participating Departments to establish the necessary processes and mail facilities. The proposed timeplan is shown below.

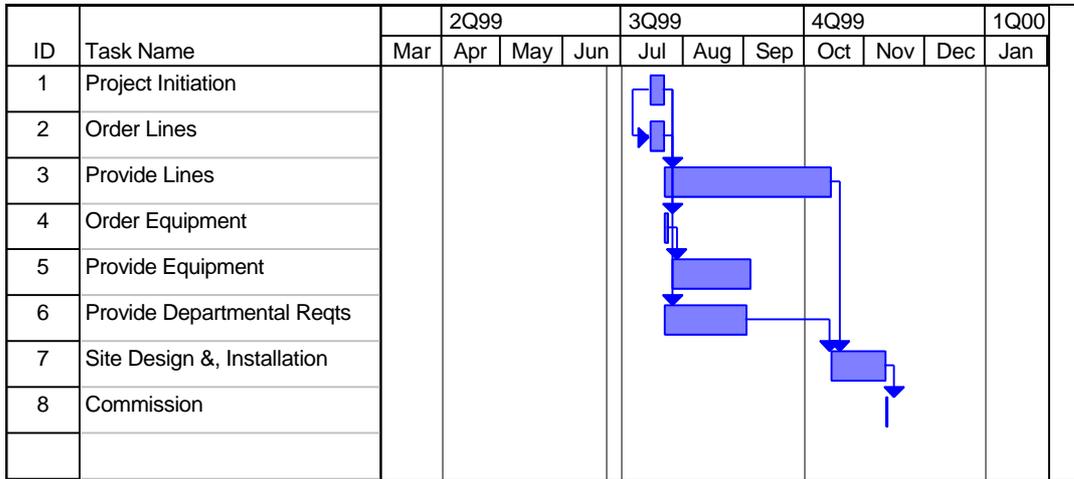


Figure 14.1 Project Plan for Stage 1 Demonstrator

14.2 ESTIMATED COSTS FOR THE STAGE 1 DEMONSTRATOR

Costs not published.

14.3 RISK ASSESSMENT FOR THE STAGE 1 DEMONSTRATOR

No	Risk	Rating	Action/Contingency
1	Departmental services are not available in time for the pilot	H	Define scope of requirements and implementation timescales at the earliest opportunity
2	Internet address becomes known externally through press etc causing congestion, or misunderstanding of Demonstrator status.	H	Ensure that knowledge of the address is restricted. Use an address which can be readily changed if needed.
3	Incorrect data is entered because of the "demonstration" status and limited authorisation	H	Use the information provided as sample data only without changing held records.
4	User expectations dented by quality of Demonstrator	H	Need to raise awareness that this is a cheap demonstration which does not reflect the quality of the Stage 2 Pilot or 2002 implementation. Include "Demonstrator only" on each web page.

15. **TIMESCALES ARE SHORT FOR THE STAGE 2 PILOT**

15.1 **SIX MAJOR WORKSTREAMS WILL BE REQUIRED**

The Stage 2 programme must deliver a pilot electronic implementation within short timescales to prove many of the concepts embodied within the 2002 implementation. Successful delivery of the solution will require careful management of many inter-dependent tasks across several Government Departments.

We propose six major work streams to achieve the Stage 2 objectives:

- **System Development**, developing and integrating the system components
- **External**, combining the service elements of the programme which are outside the system build
- **Marketing**, developing the activities associated with launching the new service and managing demand
- **Business Process**, defining and implementing the processes which will support the Pilot
- **Training**, delivering the training required by customer service representatives and first line support personnel.
- **Deployment**, installing, testing and commissioning the system in the 'production' environments

15.1.1 **System Development Programme**

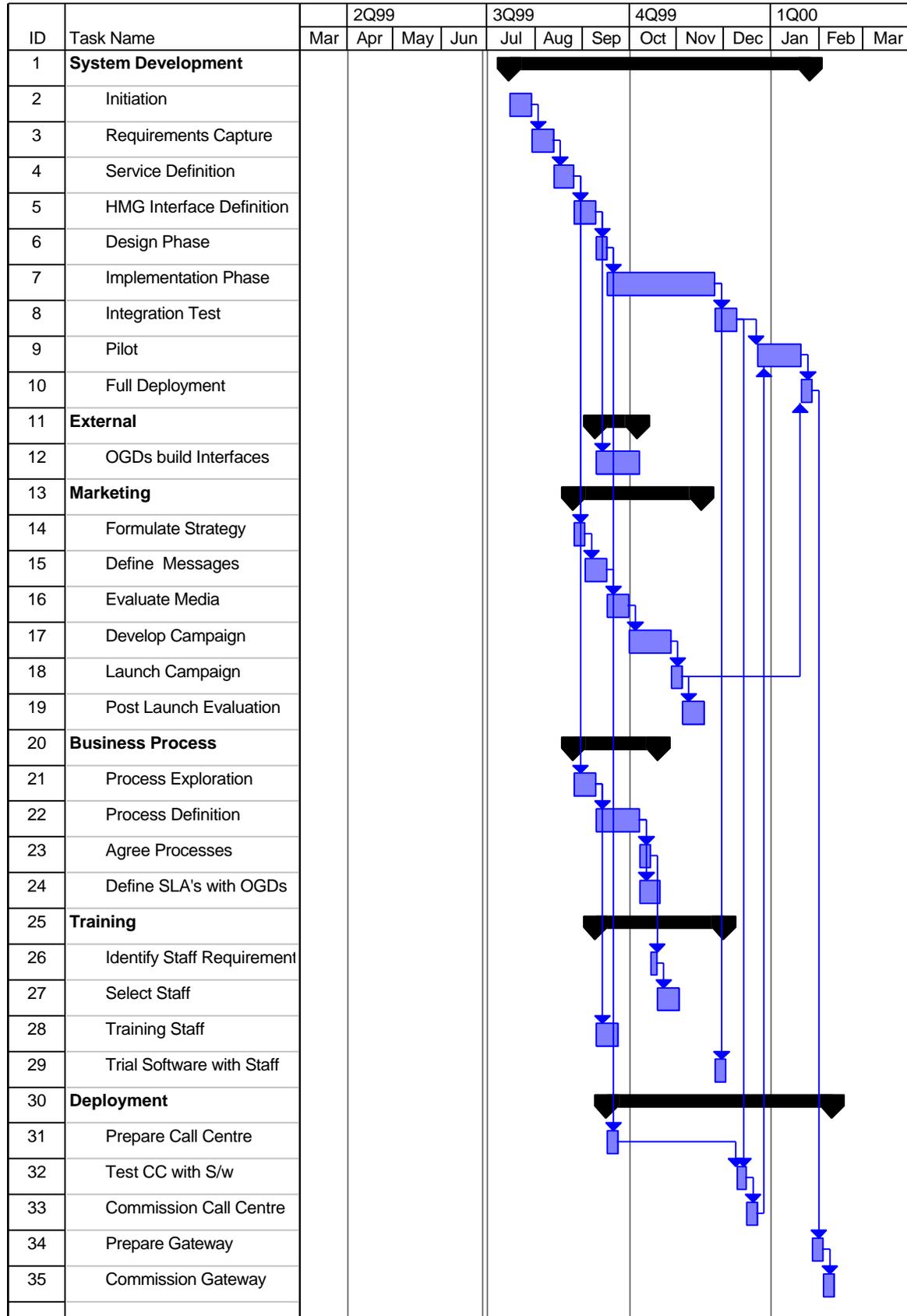
Project activities will commence with the development of a project initiation document (PID) which will define the structure of the project, the objectives and services to be delivered.

A more detailed set of requirements will describe in detail the:

- Portal functionality
- Portal – Departmental Interface specifications
- Non-functional requirements such as availability, performance, and capacity.

The specifications for interfaces between the Portal and the Departments involved in the Pilot will have to be agreed with the Departments concerned. However it is recommended that a working party to discuss data interchange standards be established, given that the 2002 Portal will connect to a wider range of Departments.

Integration testing will be required to demonstrate that communications between the Portal and external systems work smoothly. A Pilot will be required to ensure that all the elements of the build programme work together.



15.1.3 External Activities

Since the Portal will provide the brokerage between the public and Government Departments, it will, by definition, have a large number of external dependencies which must be delivered on time for the overall programme to be successful:

- GSI must deliver the required network capacity and be able to increase the available bandwidth to order
- Interface standards and cross-boundary practices must be agreed between Government Departments and CITU
- Departments must deliver the system development required to handle Portal transactions to agreed timescales
- Call centre infrastructure must be available to host the client elements of the Portal required to support customer service representatives
- SLAs defining the service levels must be agreed.

15.1.4 Marketing

The marketing element of the overall programme will be key to the successful delivery, stimulating demand and managing demand. The image projected by the pilot and its delivery will be key to ensuring that both the 1999 and 2002 programmes are seen positively by the public. The marketing programme will consist of the following stages:

- **Formulate Strategy** - this will include e-govt branding (logo, identity, values), channel mix, customer segments, partnerships, use of customer data, communications.
- **Define Messages** – agreement of the communications and media approach deciding appropriate message for each media. Issues resulting from government and commercial partners working together will also need to be resolved
- **Evaluate Media** – the channels to deliver the campaign messages must be evaluated. Market segments will also be tested
- **Develop Campaign** - feasibility evaluation, focus groups/interviews (CATI, CAPI etc), service level requirements
- **Launch Campaign** - when, how, PR, event management (low-key), rollout issues
- **Post-launch evaluation** – once the pilot has been launched the market effort will continue. It will be necessary to manage the demand for the pilot, either by stimulating additional demand or delaying further publicity programmes.

15.1.5 Business Process programme

The Pilot is not only about the systems, it is also about the business processes. In fact the business processes are often the most challenging part of an e-commerce programme.

The business processes will need to be developed across Departments and therefore particular attention must be applied to:

- Exception handling and problem resolution, for example invalid addresses



- Cross-Departmental responsibilities
- SLAs.

15.1.6 Training Programme

Training will be an important aspect in ensuring that those who provide the liaison between the Portal and the public help to build an appropriate perception of the services with users. Training courses covering a range of topics will need to be developed and delivered to the following groups:

- Call centre based customer service representatives
- Call centre 1st line technical support staff
- External Help desk staff.

15.1.7 Deployment

The deployment programme will ensure that all aspects of the programme are integrated to provide an all-encompassing solution. These activities will include final integration tests and trials with “friendly” customers before the launch and wider evaluation with the general public.

15.2 ESTIMATED COSTS FOR THE STAGE 2 PILOT

We have compiled broad cost estimates, which can only be broadly indicative, from the limited information that is currently available.

Costs not published.

We anticipate that the Stage 2 Portal will be in service for a maximum of two years at which point it will be superseded by the 2002 implementation. The majority of the concepts will be proved within a much shorter timescale of 6-12 months but we anticipate that the Government will want to retain the service to monitor changes in demand.

We have assumed that costs associated with the development of Back Office services and interfaces within Departmental systems will be borne by Departmental budgets. It has not been possible to assess these costs within the scope and timescales of this review. These costs could be kept to a minimum by providing simple interfaces comparable to those used for IFORMS with the manual transfer of information from the interface to the Departmental systems. These costs have not therefore been included.

We have also assumed that suitable secure accommodation is available to house the Portal.

It is assumed that costs incurred in developing and operating access channels will generally be paid by the access channel provider.

15.3 RISK ASSESSMENT FOR THE STAGE 2 PILOT

No	Risk	Rating	Action/Contingency
1	Departmental services are not available in time for the pilot	H	Identify a “long list” of potential services, define delivery timescale during Project Initiation and only select services which are already available in electronic format.
2	Call centre not available in time for the pilot	H	Identify a “long list” of potential call centres, define delivery timescale during Project Initiation and use a private sector call centre if a public sector option is not available
3	Pilot traffic runs out of control	M	Employ scalable architecture Monitor usage levels Control and monitor take-up after launch through marketing and channel strategy
4	Smartcard operators may not want to co-operate	M	None
5	Portal branding or advertising may not match government objectives	M	Control through direct procurement strategy

No	Risk	Rating	Action/Contingency
6	Half-hearted launch may lead to poor user perceptions	H	Provide human support to customers during the launch period through call centres. Launch at a controlled speed
10	Confusion because the traditional service demarcation boundaries don't apply	H	Draw up new boundaries, processes and SLAs where appropriate.
14	Service acknowledgement processes are difficult to implement	H	Specify in detail the interaction between different systems and the procedures for notifying users of successful completion of the transaction.
15	Departmental systems don't provide a common look and feel in data formats	M	Develop common data format standards.
17	Greater service accessibility may lead to increased resource requirements to process	M	Make Departments aware of projected and actual take-up rates.
18	Dependency on GSI - may not be capable of realising the volumes, service levels etc	M	Adopt xGSI standards to allow competitive tendering if this becomes an issue.

16. RECOMMENDATIONS AND ACTION PLAN

16.1 PRINCIPAL RECOMMENDATIONS

PA's principal recommendations from this feasibility study are summarised below.

16.1.1 Architecture

All access channels should use internet access technology as the delivery mechanism. E-commerce users have an expectation that internet access will be available. Use of this technology as the standard will simplify development.

A three-tier architecture consisting of Middleware, Client Elements and a Government End should be implemented to provide the necessary flexibility and scalability to connect to the full range of access channels and Departmental systems of varying ages.

The Stage 2 Pilot should be used to test fully the principles embodied in the 2002 architecture.

A simple architecture should be used for the Stage 1 Demonstrator but careful attention will need to be paid to security. A "Reflector" is proposed within the Portal to prevent the risk of Government End mailbox addresses becoming visible to internet users.

16.1.2 Technical

The architecture should be developed using open standards including HTTP, CORBA ORB, SMTP and S/MIME.

Encryption should be implemented using SSL or HTTPS with 40 bit or 80 bit encryption as appropriate.

PKI should be provided using certificates and certificate authority solutions.

GSI or xGSI should be used for Portal to Departmental communication, including firewall protection. A security policy framework should be developed as a Superset of GSI Security Policy including the implementation of encryption.

Transaction volumes are difficult to assess and will need to be regularly reviewed. For initial planning purposes an appropriate architecture for the 2002 Portal would be two resilient clusters of two web servers, each cluster also containing a database server, a streaming media server, if required, and dedicated search engine. It is anticipated that bandwidth of 50 Mbit/s would cover 2002 Portal requirements.

On the same basis an appropriate architecture for Stage 2 would be a single cluster of one webserver, one database server, a disk array and one management server with 8 Mbit/s of connected bandwidth.

The in-service data available after the Pilot is launched should be used to revisit the initial dimensioning for the 2002 Portal.

The Stage 2 Pilot should test the technical principles of the 2002 implementation by employing the same standards, adopting similar levels of security and authorisation, employing the same approach to resilience and scalability. Existing interface standards should be used as far as possible to minimise development timescales.

The Stage 1 Demonstrator should use “crypto-wrapping” security protection within the Portal with form entry running under SSL.

16.1.3 Brand and Imaging

Current market research is limited. In-depth market research should be commissioned to identify the most appropriate channels for each service to serve the target audience.

Initially segmentation studies should be focused on PC and call centre users. Appropriate target groups for interactive tv and kiosks should also be identified.

During launch marketing should be combined with a human presence for users wherever possible to ensure that the adverse problems with previous pilot implementations are not repeated. A focus on key sub-segments will provide the opportunity to both encourage and control the speed of take-up.

Emphasis should be placed on the points highlighted during previous Government pilot implementations, namely the need to:

- Maintain customer privacy
- Measure and refine quality
- Maintain regular dialogue with customers
- Implement simple technology solutions.

Selection criteria should be developed for branding and advertising to safeguard Government impartiality objectives and other standards.

Logo and branding should be established prior to the Stage 2 Pilot to allow the branding to be extended through services, communication and access channel partnerships.

Portal “look and feel” issues should initially be evaluated through two or three focus groups using the Stage 1 Demonstrator. More detailed evaluation to a wider range of users will take place during the Stage 2 Pilot.

16.1.4 Commercial Issues

There are significant potential commercial benefits from a PFI/PPP deal and the Government should proceed with the 2002 procurement on that basis. The requirements should specify the minimum channel requirement of internet, call centre and Smartcard intermediary access. The Invitation to Tender should however invite suppliers to submit fully costed proposals for other innovative channels in the expectation that a much wider range of channels will be offered.

In the Stage 2 Pilot there is a need for the lead Government interest to retain tight control over the implementation. In view of this and the limited time available, a conventional, directly let procurement contract is the most appropriate option.

The Stage 2 Pilot should test the proposed minimum set of access channels. This objective can be achieved by using an existing call centre and services already available electronically for the Stage 2 implementation. An existing Smartcard pilot, for example one currently being undertaken by a retail bank, should be used for the intermediary channel.

16.2 ACTION PLAN

As the next steps the Government should:

- Proceed with the Stage 1 Demonstrator to stimulate interest in the Portal implementation and to initiate discussions on Portal “look and feel “ through focus groups
- Commence Project Initiation for both the Stage 2 and 2002 projects producing the necessary Project Definition documents. Scoping work for the services and access channels in the Stage 2 implementation is particularly time-critical and should proceed without delay
- Identify and allocate the appropriate project teams and project steering group members
- Commence work on the Business case and Public Sector Comparator for the 2002 implementation.

Other longer term activities are defined in the Implementation Plan.

APPENDIX A: LIST OF PRINCIPAL ISSUES IDENTIFIED DURING THE STUDY

Costs to Departments

Although the focus is on providing better services to the citizen and business, the Departments involved may be subjected to increased costs in delivering it. They may see cost savings through streamlined work practices but the costs of providing additional support to address additional transaction volumes, additional customer service staff and contributions to central infrastructure costs may prove to be a burden. Infrastructure costs may include contributions to GSI based on traffic profiles. On the other hand, dealing with some Departments is so disjointed and complex that having a department-specific 'portal' would be very valuable to the Department concerned.

Eligibility of Service Providers

Guidelines will need to be drawn up for the selection of partners and licensees who provide Portal services for or on behalf of the Government. These include bandwidth suppliers, access channel providers, customer facing intermediaries and outsourcing contractors.

Developing Trust

Trust can only be established with users if they understand whether they are dealing with Government or an individual Department. They must also feel that their dealings are secure. This includes assurance that provided information will be used in accordance with guidelines and only with the supplier's explicit agreement.

Do adequate powers exist to prevent another site "passing off" as a Government Online site in order to extract personal details from unsuspecting users.

Marketing Issues

The word 'portal' has tended to conjure images of web-based portals such as "Yahoo!". It is important to ensure that the public understands that Portal access is not limited to those people with a computer and Internet access.

Both marketing and trust issues are brought to the fore when considering the impact on public perceptions of having third-party suppliers delivering Government content. For example, confusion may arise if superstore kiosks, painted in the store's colours and badged with the store logo, are used to access Government online services.

Guidelines will be required to ensure that Government branding or content is not diluted or contaminated.

Revenue

There will be ongoing maintenance, upgrade and operational costs associated with running fully fledged Portal services. Mechanisms to generate revenue, leveraging the "market of one" potential of the information held on users, may need to be explored, including targeted or blanket advertising.

Expectation Management

Users expect a prompt reaction to information they key into a web site. When the confirmation of input is received almost immediately on their screens, an expectation is built that the fulfilment of the service will be equally prompt. The timescales for performing any behind the scenes processing and the final user confirmation of completion (if applicable) need to be explicit. Also, the scope of the service must be explicit, especially where the service is not Department specific, for example a student will change his or her address with the DfEE online, perhaps also alerting The Student Loans Company, but not the LEA or education establishment.

Agency Involvement

Local government and executive agencies have not always been brought into centrally-managed Government projects from the outset. In the case of the Portal, these bodies will be hampered, at least in the initial stages, by their lack of connectivity to common Government infrastructure, for example GSI.

Departmental Change

In adding new, electronic, channels of communication between Departments, the bigger picture of the processes and data flows must also be considered. This is essential to ensure that the basic business of the Department is not compromised.

Standards

Open, commonly adopted standards should be employed throughout the infrastructure. Minimum standards must also be specified for security, desktop PCs and other equipment used by intermediaries to access the Portal services. Some of these standards will also be applicable to other users.

Personalisation

It is more and more common to find websites that personalise content based on stated preferences, typically provided during a registration process, or based on past usage of the site. The implementation effort and additional infrastructure requirements can be significant. The requirements and rationale for any personalisation would have to be considered in detail.

Service Location

Although it is simple to provide 'pointers' from one website to another, each service must be carefully defined and bound to a specific management function that takes responsibility for it. For example, multiple points of notification exist for trading entities. They may register at Companies House or Inland Revenue, for the self-employed, or Customs and Excise, for VAT. A service for new traders to register may be held centrally with the relevant Departments informed within the same transaction. Alternatively, information could be provided to help the trader find the appropriate service on the Department's own 'site'. Furthermore, if a trader registers with IR, and subsequently needs to register for VAT, does the trader have to complete all the details again, or should the trader expect to simply give consent for data sharing and provide additional details as required?

Authentication

It may not be appropriate for each person or user to have an individual electronic ID. This is because both citizens and businesses are legally entitled to have multiple IDs.

Existing and Planned Services

The Portal is not being built in a 'green field site'. Some existing projects may be implementing Government Portal equivalent functionality. These services need to be identified and implementation timescales reviewed to ensure that they comply with any newly defined Portal standards, to promote interoperability for instance and that the duplication of services is prevented.

Knock-on Resource Requirements

Once 24x7 Portal services become available, there will be a need to provide telephone helpdesk support services to users. The resource implications of extended operational hours for call centres, system management cover and other similar issues will need to be addressed.

Intermediated Services

Some of the services proposed for citizen access on the 2002 Portal are, in fact, often undertaken by third parties on behalf of the citizen, for example driving tests are often made under block bookings by driving schools. The implementation of services must reflect the actual users of the service rather than those who benefit directly from their use.

Audit Trails

For some services there is currently still a need to record a written signature, meaning that paper records must be kept. Planned legislation at UK and EU level is expected to remove this requirement in some cases. IFORMS and other projects have already established the use of electronic record keeping and audit trails, although IFORMS did also create a need to generate paper records.

Knock-on effects on Business

Businesses may not be *able* to move to new access channels as soon as they become available because:

- The cost of new infrastructure may be expensive
- It may not be possible to re-engineer their systems to use a new communications infrastructure
- They may not be able to extract themselves from capital, maintenance or operational agreements relating to their existing infrastructures
- They have, perhaps, 20 years of EDI/VAN/X400 experience and no expertise in the new system technology

This means that existing access mechanisms must remain in place until businesses are in a position to migrate.

GSI Dependencies

For the near future at least, the Portal infrastructure will be heavily dependent on GSI as the backbone to connect to Departments. The Portal will rely on the GSI service provider to provide adequate bandwidth, reliability and availability. Currently, GSI only allows SMTP traffic in the inbound direction.

Departmental Implementation

Poor data quality in Departmental databases may result in a requirement for complex data cleansing before systems can be integrated into the Portal structure.

Standardised Methods of Payment

The methods of payment which Departments are prepared to accept vary from Department to Department. Some Departments, for example, are prepared to accept credit card payments whereas others are not. A common approach is needed to achieve a consistent look and feel throughout the Portal.