Box 42. **Germany: SAGA – Standards and architecture for e-government applications**

The German government has begun to consolidate government wide standards and guidance into one document, SAGA. SAGA has guided the implementation of e-government in Germany. Its aim is to develop standards for the smooth flow of digital information between citizens, business and the federal administration and to make as many electronic services as possible available using uniform procedures. Data models must be defined in order to develop integrated and interdisciplinary e-government applications.

In its current version, SAGA can be accessed and downloaded in English at the portal of the Federal Government's Coordination and Advisory Board for IT in the Administration (KBSt) *www.kbst.bund.de/sage*. The document includes an explanation of what is necessary to respect its aims in terms of standards and architecture. SAGA describes its aims and the basic agreements, responsibilities and applications of SAGA, the architectural building blocks of SAGA, *i.e.* the components needed for a functioning e-government architecture, and the standards for the basic components defined in BundOnline 2005 (*e.g.* content management system, platform for payment transactions).

SAGA is not a final document. It is constantly revised to include the latest developments and amendments. To develop the SAGA document in a targeted way, the federal government's service portal now includes a technology forum at *http://foren.kbst.bund.de*. It offers German-speaking experts and anyone interested a discussion area covering the various topics of SAGA, such as appropriate interface connections or interdisciplinary data models.

Source: OECD E-Government Working Group.

Use of co-ordinated **budget funding** for e-government initiatives, including specific approval arrangements, can avoid duplication and help governments set priorities across overall e-government activities. However, this may also add an extra layer of regulation and absorb much senior management time and capacity. The rules by which such arrangements operate need to be clear to all parties if they are to operate effectively.

A programme of key projects can be managed to test innovative approaches, provide broader demonstration effects, provide seed funding for initiatives that remove a bottleneck, or provide a model of common processes that can be adopted by a number of agencies. Such a programme can have important longer-term benefits by encouraging agency investment that would otherwise not occur and speeding up overall progress.

Box 43. **Australia: Business authentication framework (BAF)**

Jointly managed by the Australian Taxation Office (ATO) and the Department of Employment and Workplace Relations (DEWR), in consultation with the National Office of Information Economy (NOIE), the BAF project aims at developing functionality that will allow Commonwealth government agencies to authenticate the online identity of businesses that use the agencies' e-commerce applications. The BAF provides utilities to assist agencies with the development of e-commerce applications using public key infrastructure (a Certificate Signing Interface – CSI) and will assist with the validation of incoming business certificates by providing a centralised validation service (Certificate Validation System – CVS).

The BAF collaboration grew out of a number of business-centred e-commerce initiatives undertaken by the ATO and DEWR which require digital signature certificates as core enablers for secure and trusted messages sent via the Internet. While each agency is nominally responsible for developing one project element (*i.e.* the CSI element by the ATO and the CVS by the DEWR), which suggests a straightforward division of labour, the success of the project nonetheless depends on the mutual dependency of the two elements and requires close collaboration for the BAF project as a whole.

The BAF Joint Taskforce was established to manage the development and implementation of both elements of the framework, and is represented by ATO, DEWR and NOIE. It has two main groups.

- A senior executives group meets periodically to manage high-level issues, including the impact and influence of the BAF on other initiatives. The group includes representatives from other agencies that might use the BAF, such as the Australian Customs Service.
- A project management group, whose more direct role is to steer the BAF project to the completion of specific milestones.

There is also an associated users group, with members from interested government agencies and businesses. Owing to successful collaboration between the two agencies through the joint taskforce, and the structure of the taskforce itself, the BAF is now approaching operational readiness. The CSI recently entered a testing phase, and the CVS is due to begin testing soon.

Source: OECD E-Government Working Group.

For the above measures to operate effectively, they require:

- **Central resources and support from the e-government co-ordinating agency or a lead agency.** For example, structured information sharing arrangements require at least some support to operate effectively and to

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Box 44. **World leaders in e-procurement**

The Interchange of Data between Administrations (IDA) Transborder eProcurement Study identified the world leaders in e-procurement to be: Australia, Canada, Finland, Germany, Norway, the United Kingdom and the United States. These countries have clear and nationally defined e-procurement strategies, and a wide range of mature projects in place.

The report especially mentioned Finland as "the most advanced system", as it covers almost all of the procurement cycle. However, the OECD Report on E-Government in Finland found that the Finnish central e-procurement system only handles about 3-4% of Finland's total government purchases.

Source: IDA 2002 and the OECD Report on E-Government on Finland.

remain valuable. Specific arrangements need to be reviewed over time to remain relevant and to take advantage of new approaches.

- Commitment by participating agencies. At the simplest, this will involve a commitment of staff time, for example, to release qualified staff to review activities and to participate in policy development committees.
- **A government framework that acknowledges the value of co-ordination.** Government-endorsed e-government policies generally provide the overall context, but the message needs to be reinforced, at both the political and senior public management level, that such co-ordination is valuable and indeed essential for many aspects of e-government activity. A particular target group is agency leaders, who, understandably, are driven by urgent agency-specific agendas, and need to see the value of devoting resources to co-ordination and shared information, with short-term costs and less apparent longer-term benefits. Engaging this group is extremely important.
- **In a number of areas, such as security, privacy and authentication, minimum standards must apply to all agencies.** These are generally embodied in legislation or regulations. The greater the degree of compulsion, the greater the responsibility on e-government co-ordinating agencies to make correct judgements and to involve user agencies in the decision. Consultation with user agencies to develop and implement requirements will be crucial.

These efforts can provide a framework for the efficient rollout of e-government initiatives. Requirements to share information on anticipated projects will help avoid duplication of spending and facilitate better use of corporate knowledge.

Given the inherently decentralised nature of e-government implementation, such an approach implies a model that is more co-operative and horizontal than a top-down framework controlled by a central co-ordinating agency. In such a context, the latter's role is broadly to facilitate sharing among agencies; ensuring that the overall regulatory framework is efficient; and managing whole-of-government key projects, frameworks and functions (see below).

Collaboration and seamless services

The dominant structural forms in all OECD governments are "stovepipe" or "silo" organisational units. Such units have relatively clear, mutually exclusive areas of responsibility and control and political accountability. However, the capacity to offer integrated, seamless government services so that users can interact with government as a single organisation, represents one of the major advantages of Internet and broad ICT use in government.

The development of a customer focus requires collaboration. One-stop shops, advice bureaux, whole-of-government telephone call centres and services such as information kiosks have attempted to bring together information and services from different government agencies.

The Internet has brought a quantum leap in efforts to provide this customer focus, and member countries are actively developing initiatives to draw together information and services for specific customer groups. These seamless online services aim to transcend the agency-based structure of the supply of information and services and present users with a coherent, integrated package of government information and services. Such services can provide higher levels of value to customers than separate services.

As services become more complex, efficiency considerations require greater co-operation between agencies, in areas such as authentication, shared processing and the exchange of data. The need for collaboration between agencies thus has both "front-office" (service to the customer) and "back-office" (efficiency in government) dimensions. From the customer's point of view, government should appear as one organisation; from government agencies' point of view, the customer should appear as a single customer.

Experience with implementing e-government seamless services has highlighted the impact they can have on agencies' ways of working, structures and culture. The challenge of implementing and operating seamless services has also highlighted the need for change in the internal governance frameworks of public administrations. The following section looks at these impacts to draw out potential lessons; these services can be seen as representing a leading indicator of likely future trends and pressures in e-government more generally.

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One challenge to effective e-government collaboration is the need for greater accountability. In line with the acceptance of ICT, new public management models have promoted the empowering of managers by freeing up control over inputs and making managers accountable for specified outputs. The consequence is that managers need to have the power of decision over ICT use in their organisation if they are to be effective. Top-down control of ICT, for example by controlling inputs, may reinforce the flight from responsibility for ICT use and related unit outputs by managers who are adverse to ICT.

Seamless online services: progress to date

At the level of information provision, online government portals are well established as a means of gathering together material from different parts of government. Significant co-operation among agencies has been required to enable these portals, but e-government central co-ordinators have also played a key role.

But the development of portals to provide customer-focused information, while challenging, has generally not required addressing differences in agencies' ways of working or technical interoperability issues beyond a certain level. In practice, portals have also been established in some isolation from other service delivery channels (although in a number of countries call-centre and front-counter staff use the co-ordinated online information as a core resource).

The situation changes, however, when integrated transactional services are desired, and these are an important goal in most member countries' e-government strategies. By their nature, such arrangements will require a greater level of collaboration to operate effectively. While many countries are active in this area, the current number of integrated transaction services involving services from more than one agency is small.

Increased collaboration is also needed in order to increase efficiency through shared projects. Shared infrastructure, for example for authentication of key customer groups, can facilitate individual agency initiatives that would otherwise lack a business case. It can also free agencies to focus on their specific content issues. Shared infrastructure is developed centrally, or by a lead agency, to facilitate seamless online services and improve the business case for specific agency initiatives. The use of such infrastructure by agencies can be mandatory or available to be adopted if the infrastructure meets agency needs. For some initiatives, such as whole-of-government portals or secure networks, their value lies in their inclusive nature.

Various middleware solutions are emerging as the dominant approach to technical integration in a number of member countries, allowing information

Box 45. **Japan: Shared infrastructure – Kasumigaseki WAN**

The Kasumigaseki WAN, which connects all national government head offices, has been in operation since 1997, as a secure intranet for national government. In 2002, it was connected to the Local Government Integrated Administrative Network to link central and local governments. In a first stage, it connects the central government and some 60 local governments (prefectures, major cities), and it is expected to cover all local government by 2003. This joining up is expected not only to improve the level of government services to citizens but also to promote streamlined and efficient administration in central and local governments.

Source: OECD E-Government Working Group.

to flow between the integrated customer interface and the various agency back-office environments. Implementing this approach varies, with different degrees of centralisation involved. The United Kingdom Gateway project aims to provide a common authentication and message hub for use generally across governments, as does Ireland's Reach Agency (see box, below). In Australia, middleware development has advanced primarily in the area of business services and taxation, while arrangements in that sector in Finland use private firms as data collectors and distributors.

Box 46. **Mexico: Shared infrastructure and seamless online services – middleware approaches**

During 2002, the Government of Mexico launched two experimental projects to build online services under a shared technological platform. Market-based web-services standards were adopted and a total of 20 services from 16 agencies were successfully developed and deployed on top of two alternative platforms for gateway services. The major objective of the project was to demonstrate the interoperability between technological platforms and the ease with which common services could be built using a shared infrastructure.

Source: OECD E-Government Working Group.

On the basis of experience to date, it is evident that the use of agreed standards and approaches and overall levels of co-operation between agencies is more important when agencies share users of their services. Close co-operation is a prerequisite for seamless transaction services, with pooling

Box 47. **Ireland: Public Services Broker – an approach to seamless services**

In 2000, Ireland adopted the Public Service Broker model to deliver online public services. The Reach Agency (set up in 1999) was mandated to deliver it. Ireland is committed to having all key public services capable of electronic delivery available online, through a single contact point, by 2005. Delivery of public services progress through the framework of the Public Services Broker, which will provide "all day, every day" public services. The Broker's key features are:

- Integration: Providing integrated access to services of central and local government through a single contact point.
- Multiple access channels: Making services available through multiple access channels, including online self-service, and intermediate services through both telephone contact centres and one-stop shops.
- Data security: Providing protected data vaults for secure storage of the personal or business information necessary to facilitate access to public services, while making available to public service agencies only the information that is strictly necessary for the delivery of specific individual services.

Source: Irish country submission.

of market research on shared customers, common approaches to presentation, data sharing within government and the authentication required. Customer-focused co-operation can thus be seen as a key organisational principle for e-government; the greater the sharing of citizen or business users, the greater should be the level of co-operation among the relevant organisations.

The resulting landscape may have **clusters of agencies with common customers**, with strong levels of co-operation and common activity within clusters within a broad framework of co-operation across government. However, clusters may bring together programs, products and services without joined-up-services. The integration of working teams from different agencies regarding accountability, financing, organisation, etc. remains a challenge.

Implications of seamless online services

Arrangements for reconciling back-office systems with an integrated customer interface may give the impression that collaboration can be achieved primarily at the technical level, and that other operations can be left

Box 48. **Sweden: Wilma – information system for processing migration cases**

Wilma, the Web-based Information System Linking Migration Authorities, is a new IT support tool shared by Swedish authorities involved in processing migration cases. These authorities are the Migration Board, diplomatic missions (embassies and consulates general), the police border units and the Aliens Appeals Board. The purpose of Wilma is to process information concerning individuals, cases, documents and decisions. IT support allows it to embrace the entire chain, from application for a visa or residence permit at the diplomatic mission to a decision in the case and any appeal. IT support will also promote more efficient monitoring of entries and exits.

The development of Wilma is part of the broad changes aimed at rationalising the multi-authority process affecting the work of diplomatic missions. The improvement involves a basic strategy for applying a holistic approach to developing process-oriented methods. In addition to IT support, the new measures include the development of various forms of collaboration, skills development, strengthening of resources in the form of migration officers posted overseas, a central help desk, improved information, improved follow-up, etc.

Source: Statskontoret.

undisturbed. In practice this is unlikely to be the case. In effect, collaborating for seamless e-government services will lead to a deeper engagement between the agencies involved:

- Implementation of **integration models** for online services will require a high level of co-operation for architectures, service delivery policies and standards, implementation methods and schedules, and the co-ordinated acquisition of ICT services and equipment by individual agencies. This will have implications for budgets, business plans, skills and resource management generally. Joint teams may be established to implement new arrangements and may be retained to carry out or co-ordinate maintenance and upgrading.
- Seamless online service **content** will require deeper collaboration on issues such as service quality, presentation of material, decision making on individual cases, dealing with problems, complaints and appeals. This will have an impact on ways of working, decentralised authority and other dimensions of organisational change. Overall **service delivery policies** involving all delivery channels will need to be agreed and co-ordinated by agencies dealing with the specific customer group. There is little point or value in providing a seamless government online service while leaving other channels uncoordinated. In practice, such an approach would be difficult to sustain.

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- Seamless service delivery will reinforce pressures for **co-ordinated policies** covering the particular customer group. This implies a further layer of collaboration between agencies, building on what may already exist.

Seamless online government service initiatives challenge traditional **accountability** arrangements. Ministers and senior executives are generally responsible for administration of specific legislative or executive instruments. Accountability rules and practices have been developed to clarify responsibility in situations where the service is outsourced, with public administrations and ministers accepting responsibility for the action of non-government providers. The situation may be more complex when the situation involves an agency outside a minister's area of responsibility that provides a service for which the minister is responsible or where cross-agency teams operate. Arrangements need to be made to assign responsibility in these cases. As already occurs in a range of policy areas, responsibilities will invariably be shared. This is not necessarily a problem, so long as there is clarity about the sharing.

Similar comments relate to the issue of **parliamentary or audit scrutiny**. There is a need to preserve the integrity of established overview arrangements while allowing more complex cross-agency activity in the name of more effective and efficient service. Achieving such a balance is difficult, and will require collaboration between service agency and audit and parliamentary officials and representatives to reach an agreed position on information and other requirements.

However, while communication and other change management strategies can be used to align ways of working and culture with the requirements of the overall system, if teamwork and integration are not apparent at senior management levels, performance will not be maximised. There is a danger that the overall objective of the seamless service can become no one's responsibility, and that each agency will aim to maximise its own outputs irrespective of the overall results, and that a cultural divide will persist and detract from the overall performance of teams.

The role of managers and e-government co-ordinators

The **management** of seamless online service initiatives raises its own challenges for agency managers, who are faced with issues of managerial autonomy and collaboration in the context of practical implementation. Member countries' experience suggests that managers and central e-government co-ordinators can facilitate the development of seamless online services with common customers by:

- Developing a **shared vision** for services for the customer group. Political leaders, staff, unions and agency management should endorse the need to collaborate and accept the value of a customer rather than an agency

outlook must occur. This includes the development of plans that could usefully cover projected services, implementation paths, agreed standards and procedures and co-ordinated change management strategies

- Increasing use of **formal co-operative mechanisms** such as quasi-contracts or other statements of co-operation spelling out joint responsibilities, objectives, agreed contribution of resources and other aspects of the linked but separate roles of each agency involved. This could involve the adoption of a shared responsibility approach, with a formal agreement covering resource issues and performance of the system. It could also be helpful to create other **incentives for collaboration**, such as a central facilitation fund to focus on design, innovation and incentive structures to facilitate progress.
- Facilitating the development of **customer-focused clusters** to help identify opportunities for closer technical, service delivery and policy integration. Sharing of infrastructure and development or use of a lead agency model will be important for collaboration and would be facilitated by co-ordinated acquisition of ICT within each cluster. Cross-agency teams can help implement and manage specific projects or act as a within-government application service provider to the relevant agencies.
- Taking action to address constraints arising from **internal governance frameworks** in the public administration and adopting team-based

Box 49. **Korea: Privacy and data sharing between agencies**

Through e-governmen services, many agencies share administrative information. Documents are issued in electronic format and circulated on the network. The Korean government takes a strong interest in the level of security protection afforded to private information. As a way to ensure security, the network for the shared use of information between administrative agencies is closed and only links government agencies, thus blocking intrusion and hacking.

Strong regulatory measures also exist in the form of various laws (laws on protection of public agency private information) that prohibit access for inappropriate purposes such as disclosure of private information by internal government employees, unauthorised use of personal information and use by unauthorised personnel.

The use of administrative information from another agency is subject to approval by the agency providing the information through a separate approval procedure, after which user registration is required. The perusal of information is possible only after logging in with an administrative electronic signature issued by each administrative electronic signature registration agency.

Source: OECD E-Government Working Group.

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approaches involving staff from more than one agency. This will require human resource management frameworks, legal frameworks and privacy and data protection.

In practice, collaborative models will involve elements of all of the above approaches, and the approaches will change as co-operation becomes more ingrained.

Skills

OECD countries recognise that ICT-related skills are important not just for ICT production and service industries, but for the economy as a whole. ICT skills have become a new general skill, like literacy or numeracy, and governments have implemented a range of policies to promote the acquisition of basic and advanced ICT skills across the economy. E-government initiatives **increase the importance of the ICT–related skills** required by public administration workforces.

The skills required for e-government are **not simply technical**, as general managers need broad skills to engage in e-government decision making. Necessary skills include basic technical understanding (IT literacy) but also an understanding of information management and the information society. Managers must be able to lead (and not be led by) the organisation's IT department and outside partners, and they must be able to integrate the organisation's ICT strategy with the broader goals of the organisation.

Furthermore, traditional management skills need to be updated and strengthened to deal with the impacts of e-government. Additional competencies are needed in areas such as organisational change, co-operation and collaboration across departments, public-private partnerships, accountability frameworks and performance management.

Four specific **sets of skills** can be identified as essential to successful e-government strategies: information technology (IT) skills, information management (IM) skills, information society (IS) skills, and updated management skills. While the borders of these skill sets are blurred, they provide a useful framework for analysis.

Governments should take steps to identify and ensure the skills needed for effective e-government. This section identifies the types of skills needed for effective e-government, with an emphasis on the skills needed by managers. It also discusses approaches to skill development and training and gives examples of the development and evaluation of e-government skills in various OECD countries.

Who needs e-government skills?

In the early phases of online services, when the Internet was relatively unfamiliar, many projects were driven by IT specialists. General managers lacked interest and/or the required skills. A major challenge is to overcome the view, still held by many employees and managers, that e-government skills are technical matters best left to specialists.

Table 2 gives a broad overview of the types of skills needed by managers and specialists. While general employees and IT specialists need updates and training in new skill areas, managers require the greatest number of new skills.

Table 2. **Summary of skills needed for e-government**

Skills	Needed by
Information technology	
Basic IT literacy Specialist IT skills	All employees, managers and IT specialists
Information managment	
Internal information management External information management Privacy protection Feedback mechanisms	Managers and IM specialists
Information Society	
Understand capabilities of ICT Ability to evaluate trends Foresee ICT's impact on organisational culture Ability to set ICT strategy	Managers
Management/Business	
Organisational change Risk management Accountability frameworks Financing arrangements Co-operation and collaboration Publict-private partnerships	Managers

Source: OECD.

Skills for all employees. As ICT is increasingly integrated into public administrations, a basic knowledge of technology and the Internet is becoming essential for all employees. Basic IT skills include a working knowledge of applications and how they can improve work quality and efficiency. For employees who do not have these skills, training should be available.

Skills for managers. The adoption of e-government solutions has been hampered by business unit managers' lack of knowledge about how technology can be used as a tool to accomplish or improve government processes. Managers need to be able to work with their organisation's

information technology and information management experts to **match government processes with appropriate technical solutions**.

Like all employees, managers need basic IT skills to use ICT effectively. But managers also need to be able to understand the possibilities of ICT, to set or manage the information strategy for the organisation and to deal with the impact of e-government on the organisation. They need to understand how new technology works, how it can be incorporated into existing government functions, and how e-government applications can build new government services and products or open new channels of communication. A solid understanding of the options and their strengths and weaknesses will give managers confidence to negotiate and to specify characteristics for **developing projects that will work**.

Box 50. **Italy: Skills for managers**

After having provided training schemes and resources for e-literacy training for employees, the Department of Public Administration in co-operation with the Department for Innovation Technologies, has recently promoted two new training programmes for managers.

The first one aims at providing top managers (state government) with training to develop information management and information society skills. The programme is run by the National School for Public Administration.

The second one aims at providing top and middle managers of regional and local administrations with training to develop management skills, necessary to meet new organisational needs relating to e-government in the wider context of modernisation plans. This training scheme is part of a broader programme to foster innovation and modernisation in public administrations.

Source: OECD E-Government Working Group.

Given the requirements of e-government, understanding the uses of technology has become a necessary management competency similar to budgeting, strategic planning and personnel management. In addition to basic IT skills, managers also need information management skills, information society skills and updated management skills (see below).

Types of e-government skills

Information technology skills. IT skills are the **technical skills necessary to implement e-government**. They include basic IT literacy (for all employees), and technical skills to design and implement the technical elements (hardware, communication and software) of an e-government initiative (for IT specialists).

Box 51. **Specialist information technology skills**

Strategy and planning

- Develop the organisation's ICT architecture.
- Audit existing technological instruments and their adequacy to the strategy of the organisation.
- Explore software solutions in order to achieve interoperability of data and information.

System development

- Establish the communications network for data, voice, text, image, etc.
- Design the database structure and plan its maintenance.
- Design (or acquire and adapt) software adequate to meet service needs.
- Define requirements for the acquisition of hardware, software, operational and maintenance services.
- Test online services such as Websites, digital TV, electronic kiosks and digital signatures.
- Design instruments for integrating processes and exchanging data.
- Facilitate communication among IT managers, employees and customers.
- Design the system of response to technical problems.

System implementation and maintenance

- Install, integrate and maintain new hardware and software.
- Administer the organisation's network and maintain database structures.
- Implement the system's security measures.
- Implement the organisation's e-payment policy.
- Implement Websites and other output media.
- Evaluate the system continuously through selected performance indicators.

Service and user support

- Receive problems reported by the users and provide technical fixes.
- Design tools for ongoing user training for IT literacy.

Source: Parrado-Díez (2002).
Original source: "Skills Framework for the Information Age": *www.e-skills.com/cgi-bin/cms.pl/120*; UK Cabinet Office (2000), "E-business Skills Assessment Toolkit": *www.e-envoy.gov.uk/publications/guidelines/skills/skills.htm* and document in: *www.e-envoy.gov.uk/publications/rtfs/skills-toolkit-partl.rtf*. Pages visited on 20 July 2002.

While employees and managers increasingly need basic IT skills, most managers and employees do not need specialist skills. Specialist IT skills are for technical staff working in fields such as information technology supplies and services, telecommunications, IT consultancy, multimedia and Internet-based products and services.

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Information management skills. IM skills cover the **deployment of knowledge resources** within an administration and the sharing of knowledge with partners and others outside the organisation. These skills play an important role in co-ordination and collaboration within the organisation, in creating an organisation that is transparent to the public, and in improving services to citizens and businesses.

Box 52. Information management (IM) skills for managers and specialists

Strategy and planning (for managers)

- Understand the organisation's needs in order to design the information system.
- Design the strategy for information management within the organisation and externally.
- Design training programmes for employees and end users.

System development (for IM specialists)

- Identify relevant sources of information for the organisation.
- Design the system of retrieving and keeping information electronically for future use.
- Help to establish the content to be provided for output media and target groups.
- Design the technical system to update and maintain information in different output media.
- Achieve the goals of interoperability of data and information.

System implementation and maintenance (IM specialists)

- Administer and maintain the archive system composed of traditional and electronic means.
- Maintain and update information (knowledge content) from external and internal sources.
- Implement content management system for various output media and target groups.
- Filter and codify information.
- Continuously evaluate the system through selected performance indicators.

Service and user support (for IM specialists)

- Respond to problems with information reported by users.
- Develop and maintain training programmes for employees and end users.

Source: Parrado-Díez (2002).

Box 53. **Information society skills for managers**

Relationship management

- Determine the level of citizen involvement in decision making; set the level of responsiveness.
- Establish long-lasting relationships with ICT suppliers and specialists.
- Define the level of ICT integration with suppliers and other stakeholders.
- Consult staff regarding their needs for e-government services.
- Ensure that staff have adequate support and training.
- Identify common sources of co-operation with partners to achieve seamless government.
- Help to establish governance principles of transparency, responsiveness, responsibility and equity among different partners.

ICT awareness to support organisational strategy

- Understand technology developments related to the organisation's e-government strategy.
- Scan technological tools that can support the organisational strategy.
- Understand the organisation's ICT architecture and the possibilities for innovation and expansion.
- Monitor and understand the activities of suppliers.
- Understand standards for security, privacy and authentication, so that they can be met.
- Understand the principles of risk management.

Implementation management

- Establish the relationships and responsibilities between the supply side (technology) and the demand side (online services).
- Ensure that the end users receive online services in an appropriate manner by meeting quality standards.
- Combine traditional channels and electronic channels of e-government service delivery.

Evaluation management

- Apply project management evaluation to the development of the information system, to the introduction of ICT-related services and to business process re-engineering.
- Identify and apply a library of indicators (with other stakeholders if necessary) in order to evaluate the impact of a strategy of online services adequately.

Source: Parrado-Díez (2002).

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IM managers and specialists collectively share responsibility for meeting government's information management needs. IM professionals in government include librarians, archivists, specialists in access to information and privacy, communications managers and record managers; traditional IM skills now need to be updated for ICT use. Additionally, managers need IM skills to set the organisation's strategy for information sharing, privacy protection, transparency and customer feedback mechanisms.

Information society skills. IS skills relate to the ability to use ICT resources to **implement an e-government strategy coherent with the organisation's overall strategy**. They involve understanding the possibilities and the limits of new technology as well as the organisation's overall service strategy, so that the manager can engage in e-government decision making.

IS skills are essential for e-government managers, and comprise areas such as relationship management, ICT awareness to support organisational strategy, e-government implementation management and evaluation management.

Updated management skills. E-government clearly has a major impact on the structure and organisation of public administrations. This impact is so significant that managers must update their traditional managerial skills to meet new organisational needs. Managers need the skills to manage organisational change, improve customer responsiveness, develop accountability frameworks, create incentives for co-operation and collaboration, and manage relationships with the private sector.

E-government skill assessment

The availability of e-government skills in the workforce (and especially among managers) will greatly affect an organisation's ability to adopt an e-government strategy. Finding personnel with the skills needed for an e-government strategy is a problem. Specific skill needs vary by agency and position, and assessment procedures must be simple enough to be practical.

As various examples demonstrate, OECD countries are taking steps to identify and provide the skills and competencies needed for public administrations to efficiently implement e-government initiatives and to maximise their benefits.

Skills development and training

The scale, complexity and rate of change associated with e-government require structured initiatives to ensure that skills remain relevant. The public sector has a range of options for e-government skills development, including hiring of skilled professionals, in-house training and partnering with outside organisations for skills development.

Box 54. **United Kingdom: E-Envoy – an information skills map**

The Office of the E-Envoy in the United Kingdom has outlined a skills map as part of the UK Online Strategy to prepare UK government agencies for e-government adoption. The E-Envoy has defined seven areas for skill development: leadership, project management, acquisition, information professionalism, IT professionalism, IT-based service design and end-user skills.

The E-Envoy has produced a skills assessment toolkit to determine the e-readiness of each agency. The toolkit has been used for departments' self-assessment to gain an understanding of the skills required for planning, implementing and delivering e-government services. The assessment identifies the skills available internally through in-house technology and information professionals and identifies skill gaps that may need to be addressed by expanding staff or outsourcing.

Source: Settles (2002).
Original Source: Office of the E-Envoy (2000), "E-Government: A Strategic Framework for Public Services in the Information Age". Pages visited on 29 June 2002: *www.e-envoy.gov.uk/*

Box 55. **United States: The State of Washington's applications template**

The State of Washington uses the Applications Template and Outfitting Model (ATOM) to bring together policies, infrastructure components and technology and integrate them into a task list. The model also identifies the skill gaps that may need to be filled through training, recruitment or outsourcing. The model defines the following steps:

Step 1: Project definition.

Step 2: Requirements analysis.

Step 3: Detailed design.

Step 4: Project review.

Step 5: Deployment.

Step 6: Systems maintenance.

Source: Settles (2002).
Original Source: Washington State Department of Information Services (2001), "Applications Template and Outfitting Model": Pages visited on 18 August 2002: *www.wa.gov/dis/atom*

Government recruitment of IT and IM specialists should be considered in the context of overall demand, as peaks and troughs in ICT activity affect the availability of skilled staff. Governments generally lag behind the market in

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remuneration, and thus find recruitment of specialist skills a problem. More flexible arrangements, such as supplementary payments for specific skills, short-term appointments and the use of contractors and private outsourcing organisations are all used to access specialist skills. However, it is important to maintain a core level of expertise within the organisation.

Governments can make better use of the existing workforce (through retention and training), provide more information on skill needs and opportunities (including new pathways to IT jobs) and develop adequate training programmes for various categories of workers (including unemployed and older workers).

Current skills development. OECD countries are taking a variety of approaches to developing and retraining skills. While specific skill sets vary, most countries recognise that technical IT skills are not enough.

Many countries have created Chief Information Officer (CIO) positions both within government organisations and for the whole of government in order to improve organisation practices for the management of information technology and to improve co-ordination and co-operation within government. For example, the United States provides specific training opportunities for CIO positions (see box below).

Box 56. **United States: Chief Information Officer (CIO) University**

The Chief Information Officer (CIO) University in the United States is an example of a government-sponsored training programme. Learning objectives are organised into 12 broad topics, each of which contains a number of necessary competencies. The 12 topics of the CIO University cover:

1. Policy and organisational.
2. Leadership/managerial.
3. Process/change management.
4. Information resources strategy and planning.
5. Performance assessment.
6. Project/programme management.
7. Capital planning and investment assessment.
8. Acquisition.
9. E-government/electronic business/electronic commerce.
10. IT security/information assurance.
11. Technical.
12. Desktop technology tools.

Source: Settles (2002).
Original source: CIO Learning Objectives (2001), Page visited 11 July 2002: *www.gsa.gov/attachments/GSA_PUBLICATIONS/extpub/lo-matrix-2001.doc*

Meeting the public's new and changing expectations requires a more agile workforce capable of adapting government processes rapidly in response to changing needs and circumstances. In Canada, the creation of an office for change management demonstrates government's recognition that the success of service transformation depends critically on ensuring that public servants have the knowledge, skills and competencies to deliver public services in an integrated, client-centred, multi-channel environment. However, sustainable change readiness requires leadership and commitment at all levels of the public service.

Box 57. **Canada: Change management skills**

The Organisational Readiness Office's (ORO) approach to building an agile workforce has two main themes: a need for new knowledge and skills to support citizen-centred services; and a need to operate more "horizontally" in partnerships that cut across programmes, departments and even jurisdictions. Workplace cultures are changing, and cultural change of the nature and magnitude expected will not come from the traditional human resources (HR) function alone. The acceptance of individual responsibility for career planning and a focus on adaptability and flexibility also constitute a significant cultural change from the traditional "top-down" approach to skills training and staff development.

The ORO business strategy focuses on identifying alignment between community and organisational interests on HR issues, particularly those related to service transformation. The three key elements of the strategy are awareness and engagement, human-resource capacity building and sharing of management and work practices.

Building on the experience of various initiatives, the IT community is exploring the development of a community-based approach to managing human resources. In the proposed framework, assessment against 15 accepted competency profiles would form the basis of recruitment, staffing, performance management and learning and development plans. The HR framework will include tools, development approaches and procedures that could increase the adaptability and agility of the workforce and increase readiness for change across government. The more profound implication of the framework is that it recognises that there is a place in modern management for input and insights from communities, especially in government workplaces where structural changes to accommodate organisational needs for horizontal integration and collaboration may not be an option.

Source: Canada Country Paper (2002c).

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Long-term skills development. Maintaining skill levels is an ongoing process, not a one-time fix. Long-term skills development techniques include providing information to students about possible careers, developing stronger IT skills in secondary schools, assisting in teacher training, making IT careers more attractive (in particular to under-represented groups such as women), ensuring better integration of educational programmes with "real world" problems and helping workers maintain up-to-date skills.

As current IT workers retire, the need for skilled workers is increasing in certain OECD countries. In most countries this is a long-term issue that will require significant change on the part of administrations. Creating systems that unify and simplify citizens' access to information and government services requires new designs, new perspectives and new skills. In an organisation as large and complex as most administrations, such change is necessarily tied to the organisation's history. There must be a concurrent emphasis on retaining a talented workforce with knowledge of the organisation's traditional missions

Box 58. **United States: Building the e-government workforce**

Creating a blended workforce and turning innovative designs into reality present significant challenges, the first of which is recruitment. Overall US government employment has been static or in decline over the last decade. Although there has been some growth in the employment of IT professionals, a significant amount of this growth has come from within existing employee ranks. Recruitment has, in the case of most agencies, been at a maintenance level with turnover in the 2-3% range. There has been little pressure to improve a slow and outdated recruitment and selection system that makes little use of technology.

This stable workforce has become progressively older, with 40% of IT professionals in their 40s and another 29% over age 50. About 50% of the federal IT workforce will be eligible for retirement in the next few years. In an independent study commissioned by the Federal CIO Council, the National Academy for Public Administration stated the challenge as follows:

"It is probably safe to assume that over 50% of the current federal IT professionals, or around 30 000 workers, will retire within the next ten years. Over the same course of time, the federal government is projected to need over 16 000 additional IT workers. This translates to a net need of over 45 000 IT professionals in the next ten years."

Building the e-government workforce in this environment requires change. Change is under way and starts with a human capital plan and a process for developing government IT workers and project managers as well as the skills of the contract workforce that performs much of the government's IT requirements.

Source: United States Country Paper (2002b).

Box 59. **Japan: Timeline of e-government training**

Japan's experience shows that e-government training must be adapted over time to respond to changing requirements.

1960: Implementation of training courses on information systems for national officials. Two courses given for managers and for management analysts.

1968: Decision that "training of key personnel will be implemented uniformly". Automated data processing (ADP) management course created in 1969.

1994: Decision to promote government-wide use of information technology, including steps to enhance human infrastructure and promote IT use. This included securing staff in the information system sector and training core personnel who lead IT services.

1996: Curricula radically revised and courses organised into basic training, specialist technical training and procurement and management training.

1998: Steps to improve the information literacy of employees. New course created for network specialists and Internet-related technology added to the curriculum.

1999: To improve information literacy and increase use of ICTs, courses created for personnel education support training, security specialist training and information analysis and utilisation.

2000: To accompany the updating of local area networks (LANs), the number of courses and terminals increased.

2001: Training courses revised, volume of training courses increased and quality improved in all ministries and agencies (including IT literacy education).

2003: Date scheduled for the introduction of online training.

Source: Japan Country Paper (2002b).

and a strong understanding of how existing systems and strategies can be retooled to support e-government innovations.

Outsourcing to obtain e-government skills

Once skills gaps have been identified, organisations need to decide whether such skills should be provided in house or obtained from external providers. Some basic skills will need to remain in house, for example project management, data security, IT strategy and procurement skills.

Care must be taken in determining which skills to buy in from outside suppliers, taking into consideration risk management, privacy, confidentiality and the security of data, and relationships between business skills and ICT-related skills. This is particularly important for skills which are strategic for an organisation. The following checklist can be used to help determine the need for outsourcing (Parrado-Diez, 2002):

Pre-outsourcing question on skills

- What is the skill level of the organisation for deciding the pre-outsourcing conditions?

IT function and the e-government service

- Is the organisation's IT function clearly defined or definable?
- How critical is the IT service level for the organisation's performance and strategy?
- What are the strengths and weaknesses for internal provision of IT?
- What are the mid- and long-term perspectives for the internal and external provision of IT?

Cost of e-government services and market competition

- Are there hidden costs in outsourcing services?
- What is the total cost of operating e-government services?
- What is the cost of maintaining in house capacity?
- What is the level of competition in the market?

Skills level to manage contracts

- What are the organisation's experience and skill level for managing complex contractual relations?

E-government skill – the role of e-government co-ordinators

While e-government skills needs and arrangements vary considerably among OECD countries, e-government co-ordinators should consider the following points:

- E-government skills are a crucial element of the required mix of skills for managers. It would be of value to **increase awareness of this requirement** at the policy level, backed up by incorporation in management training programmes, criteria for recruitment and assessment of performance.
- Assisting agencies to identify their e-government skills needs through promotion and support for a **standardised assessment approach** would facilitate the task of senior management.
- While requirements can be addressed individually, **agencies have shared training needs**. In conjunction with public-sector training organisations,

e-government co-ordinating units can identify broader skills needs and work with training providers to develop appropriate training packages for different levels of experience and managerial responsibilities.

Public-private partnerships

Engagement with private-sector suppliers has been an integral feature of government use of ICT. Public-private relationships have broadened from the acquisition of products and services such as mainframe computers which governments themselves could not provide, to services such as the operation of computing facilities and direct provision to end users of government services.

Governments' desire to take advantage of the Internet and related technologies has highlighted the role of these relationships. The demand for more sophisticated transactional services adds a level of complexity, with consideration of relatively new technologies such as public key infrastructure. Government organisations faced with these pressures often turn to private providers not just for technical solutions but for the capacity to develop, implement and deliver whole new services.

In addition to providing ICT services *per se*, partnerships are increasingly used as the virtual front counter of government, delivering services to citizens and businesses. This integration of government services with non-government activity can leverage existing infrastructure and existing patterns of citizen and business interaction. While the concept is not new, the integration of online services with related private-sector offerings has highlighted it: integration can add value for both parties. Integration with non-government activity complements seamless government services; from a customer perspective, integration with relevant private-firm or civil-society services may be more relevant than linking government services.

E-government increases the need to engage private partners, for the following reasons:

- As ICT use becomes more widespread, there is a danger that public administrations become too deeply drawn into ICT production issues. Partnerships can free public administrations to allow a **focus on core policy and business issues.**
- Partnerships can be used to access **specialised skills**, for example for software development. Such skills may be difficult or uneconomical to maintain in public administrations or which simply can only be obtained from a private service provider.
- Partnerships can help reduce **risk** by a formal assessment of solutions available in the market and taking a partner that accepts some of the risk

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Box 60. **Denmark: Innovative partnership arrangements**

There is limited experience with digital projects in public-private partnerships in Denmark. Therefore, both the public and private sectors have been interested in discussing together what is important for forming a successful partnership. Public-private partnerships are often used for complex projects in which knowledge from both the public and private sectors needs to be combined. While the goal must be clear from the start, the solution is most likely to be developed in partnership. This is a challenge and requires both the private and the public organisation to be ready to engage in a close partnership.

The dialogue has led to a joint document, which emphasises three themes:

1. The importance of managerial involvement in setting the project goal, clarifying existing work processes, deciding the space for restructuring and ensuring an overall efficient set-up.

2. The need to improve the efficiency of the public sector. It is important to establish a business case in order to get return on the investment. Furthermore, it is essential to agree on common goals and get the incentives right to achieve them, internally as well as for the partner.

3. To have the necessary flexibility to develop the solution, it is important when calling for tender and writing the contract not always to indicate a specific solution for the project but to concentrate on essential goals and requirements. The use of options can give the flexibility necessary to change that results from an ongoing dialogue.

Source: OECD E-Government Working Group.

associated with the project in return for payment (see section on managing risk and cost).

- Partnerships can help reduce or avoid the need to obtain sufficient **up front funding** to establish a service, by enabling costs to be covered through a series of recurrent payments albeit at a greater cost to government.
- In some cases, partnerships can help **integrate** the delivery of government services into private infrastructure or delivery arrangements to benefit customers and to capture efficiencies.
- Partnerships allow governments to benefit form **economies of scale** for services or processes that are seldom used in any one organisation.
- Partnerships can enable governments to benefit from **innovation** and to capture efficiencies that they otherwise might not be able to.
- Greater experience putting services online within the private sector and civil society can help governments improve their own services.

Governments use partnerships to **learn** from the private sector and civil society, and they can use partnerships to **piggyback** current services already in place.

- Additionally partnerships enable the **private sector to acquire knowledge** of the structure and functioning of the public sector, and thereby improve specific government-oriented solutions.

Types of partnerships

In the broadest sense, the term "public-private partnership" could be used to cover all arrangements where governments contractually engage with a non-government entity to provide goods or services. More narrowly, partnerships involve arrangements whereby work, risk and rewards are shared. In practice, all private supplier relationships are likely to involve elements of partnership, and it is therefore useful to see partnerships as part of a continuum. The partnership management issues they raise need to be addressed as part of the implementation of any e-government project or strategy.

While partnerships differ in complexity and scale, they share many common features:

- They are covered by some form of **contractual arrangement**, specifying outputs, costs, expectations, dispute resolution mechanisms and the like, with the complexity and detail depending on the specific transaction concerned. Whatever the level of flexibility and close working relationships that may be desired, the partnership ultimately needs to operate in a contractual framework.
- Partnerships operate within **established arrangements**, including those of procurement, accountability and reporting. The transparency of such arrangements, particularly involving the privatisation of activities previously undertaken in house has been a major public governance issue for a number of years.
- While governments can use private firms or non-government organisations to supply or deliver goods and services, **responsibility** for the service or programme ultimately rests with government.

Challenges

The more comprehensive and innovative the partnership arrangements, the greater the likely challenge to existing frameworks. The challenges for developing sound partnerships are as follows:

- **Accountability, scrutiny and audit** requirements need to balance providing enough flexibility for innovative arrangements and preserving required

levels of oversight of public expenditure. This is a difficult area, although arrangements to achieve this balance are evolving in countries with experience in partnerships both within and outside the ICT area. The use of public-private partnerships should not be at the expense of public scrutiny or compromise accepted privacy or service quality standards. The business case for partnerships should not depend on a lowering of standards.

- The **specification of outputs,** including value for money, can be difficult in arrangements designed to operate over a long period and which allow for future resetting of priorities. If specifications are too tight, it may be necessary to renegotiate – if they are too broad, requirements may be unclear. Arrangements to deal with failure also need to be clear.
- Traditional procurement arrangements aim to transfer risk while retaining control. It needs to be accepted that, in a partnership, both parties should **share the risks** and the benefits. The issue here is management of risk, with the respective risks assigned to the parties best placed to manage them.
- Retaining the public administration's **capacity to manage the relationship** with the private partner is of crucial concern. Managerial awareness and commitment is essential to ensure that the required skills are developed and maintained (see section on skills).
- While structured review and clauses can facilitate review and formal approaches to the market, there is a danger that an existing partnership may be seen as the only approach, thereby effectively **excluding other service providers**.

Ultimately, the overall relationship between the partners is important. The two sides must accept the sharing of risk and rewards, and specify outputs in a way that allows for flexibility. They must accept joint responsibility for project outputs, while acknowledging the differences in accountability and responsibility between government and outside partners. Agencies must balance the need for stability and stable relationships with the need to reassess the value of current partnerships.

Public-private partnerships – the role of e-government co-ordinators

It may be difficult to determine which types of services should be done using public-private partnerships, which should use more conventional supplier relationships and which are best retained within public administrations. For this reason it is important to make available to agencies a **structured approach for assessment**, which allows them to make an appropriate decision. Use of private suppliers can have its costs, in terms of opportunities foregone and transaction costs for establishing and maintaining them.

E-government co-ordinating agencies may wish to develop, in conjunction with procurement authorities and key agencies, an **e-government public-**

private partnerships framework. This would assist in particular the small agencies that often lack sufficient expertise to assess proposals made by potential suppliers of services. Such a framework would also help clarify what is allowed under existing procurement frameworks, and help identify areas where change would be beneficial. It is also important for broader policy frameworks (regarding for example the use of local ICT suppliers) to be flexible enough to enable decisions to be made on the merits of each case.

An examination in each country by e-government co-ordinators and other relevant agencies, including national audit bodies, of audit and accountability arrangements covering private supplier relationships would help clarify requirements and give further guidance to agencies.

Managing risk and cost[4]

Most governments experience problems when implementing large IT projects. Budgets are exceeded, deadlines are overrun and often the quality of the new system is far below the standard agreed when the project was undertaken. Moreover, governments are not alone in failing. Evidence suggests that private sector companies have similar problems. The Standish Group, for example, estimates that only 28% of all IT projects in 2000 in the US, in both government and industry, were successful with regard to budget, functionality and timeliness. 23% were cancelled and the remainder succeeded only partially, failing on at least one of the three counts.

Large public IT projects can pose great political risks. Ministers and governments are held accountable for the failures and the accompanying waste of taxpayer money. These significant economic losses comprise not only outright waste in exceeded budgets and abandoned projects, but also – and equally importantly – lost opportunities for enhanced effectiveness and efficiency. The inability of governments to manage large public IT projects threatens to undermine efforts to implement e-government.

Public management systems

Public sector organisations operate in settings very different from the private sector, and these differences are important for understanding why governments fail and what challenges project managers face. Change is inherent in implementing public policies. Laws are changed, priorities shift, and implementation accordingly has to adjust. However, changing specifications for IT systems that are under construction is likely to make the systems more complicated, blur agreements with providers and bloat budgets. Small policy changes can require major changes in IT structures. Similarly, the time allowed for legislation to come into effect is often much too short for proper IT systems to be built and launched. Unrealistic deadlines set by the highest political authorities need to be addressed.

If failure is to be avoided, implementation must be taken into account when policies are formulated. Furthermore, special standards of accountability and transparency apply to the public sector. This means that failure is often widely publicised and that top-level civil servants and politicians are held accountable for very technical projects over which they may have little influence.

In many countries, rapid policy change, higher standards of accountability and short deadlines are unavoidable governance facts. Nevertheless, it might be possible to raise awareness of the interdependency of policy and implementation issues when it comes to e-government. At the very least, risks inherent in the governance settings should be identified and better managed.

Budgeting for risk

Public sector budgeting systems can encourage the funding of large and highly visible IT projects. Small projects cannot justify new funds and do not command attention during budget negotiations. Furthermore, large, expensive and spectacular projects are often favoured because these projects are more easily communicated as evidence of political action and response to a problem. This is unfortunate, since the risk of failure is proportional to the size of the project. Very large projects, *i.e.* expensive, long-term and complex initiatives, often fail.

A radical approach, increasingly adopted in the private sector, is to avoid large projects altogether, opting for small projects instead. One expert has called this change a shift from "whales to dolphins". Adopting dolphins does not mean breaking big projects into small modules. Rather, it involves a shift to a different way of working and thinking, with total project timeframes of no more than six months, technical simplicity, modest ambitions for business change, and teamwork driven by business goals.

Although large IT projects should be avoided wherever possible, government is often very big business. Millions of citizens are served, regulated or taxed, and thousands of employees use the systems. Therefore, it is improbable that all IT projects in the public sector can be made smaller. Where big projects are

Box 61. **New Zealand: Funding for risk**

In New Zealand, risk-based funding rules for complex projects have been developed. Using quantitative risk analysis, each risk is assessed along with its impact and probability. Thus, the fiscal impact of a project's risks can be made explicit to decision-makers.

Source: OECD Policy Brief "The Hidden Threat to E-Government" (2001).

unavoidable, they should be divided up into self-contained modules that can be adjusted to changes in circumstances, technology and requirements.

Managing new technologies

New technologies are tempting because they often promise better solutions and fascinating possibilities for business change. More often, they promise solutions that enable an organisation to implement IT without changing its business processes. It is therefore not surprising that public sector organisations keep trying to develop systems based on new technologies. Experience shows, however, that systems built on emerging and unknown technologies are very susceptible to failure. In some instances the potential benefits might warrant taking such huge risks; most often this is not the case.

Risk of failure can be reduced by using well-proven approaches or even better, standard software, although this will often imply that business processes have to be adapted to the possibilities offered by the IT system. The application of common commercial practice, rather than custom software, has proven time and again to be the most successful solution. Where the use of unproven technologies is unavoidable, a testing programme for the new technology in question carried out prior to the contract with the supplier could help identify, assess and manage the risks.

Responsibility

There is no such thing as an IT project in isolation. Rather, every IT system should be seen as a tool and means to other ends – notably a change in business processes. IT projects are thus business projects and must be led by top management and not by IT experts.

Clear lines of responsibility and accountability are needed for good project management. It must be clear at the outset *who* will be held

Box 62. **United States: Risk and responsibility**

One of the most important reasons for resolving the Y2K problem in the United States was the attention from top-level management. Because the Federal Government designated it as the foremost management objective in 1999, management policies, practices and processes were all refocused and managers were held accountable for coping with Y2K. Dealing with the risk of failure became the mission, even though it was a technological problem.

Source: OECD Policy Brief "The Hidden Threat to E-Government" (2001).

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accountable for delivery, *how* performance will be measured and sanctioned and *when* assessment will take place. Thus, in the public sector the role of IT must be reflected in the way organisations are managed. An isolated IT office is sufficient for internal technical applications but not for critical business applications that change the face of the agency and that affect critical legal and business issues.

Involving employees

The potential impact of IT initiatives on employees and their jobs must be recognised. A comprehensive strategy for managing change should be part of project planning. This should include targeted communications, effective and appropriately timed education and training, and user support plans to prepare employees and other stakeholders for change.

Employees who use technology should thus be involved as early as possible in project management and communication. Close consultation with client groups and representatives helps build ownership and commitment. Extensive user participation in systems development and testing is essential.

Risk identification

Risk identification and management are paramount features of successful IT project management. Some countries have well-developed guidelines and practices in this field; others still have something to learn. Independent consultants from outside the administration can help identify risks. The use of such independent reviews at key stages of a project can provide a valuable snapshot of the health of the initiative. However, expert advice only makes sense if project management deals promptly and thoroughly with the issues raised. It is interesting to note, however, that many failures can be explained by poor compliance with otherwise very good guidelines and existing good practice. Knowledge management and management control systems adapted to the national culture must also be put in place.

The general lesson is not that governments should not take any risks; rather, governments must identify risk, determine which risks they are willing to take, and manage the relevant risk within appropriate governance structures. Governments must balance risk management with innovation and value creation. When governments have complex e-government plans, they must ensure that these plans are feasible (see also section on vision statement/plan), and not try to do too much at once. This idea has much in common with the conventional e-commerce wisdom: "Think big, start small, scale fast."

Monitoring and evaluation

It is necessary to monitor and evaluate e-government to understand demand, assess the benefits to users of alternative proposals and evaluate the effectiveness of proposals in meeting their objectives. Evaluation is needed to argue the case for new projects and expenditure, to justify continuing with initiatives, to allocate additional IT funds, to assess progress towards programme goals and to understand impacts. Additionally, monitoring and evaluation can assist with programme consolidation and selection of standards. OECD countries recognise the importance of this issue, and e-government policies and strategies reflect this recognition.

A number of promising initiatives exist in this area, although OECD countries acknowledge the need for improvement. Current efforts may be suitable for evaluating online services but do not take into account the back-office changes that accompany e-government.

The section on online services discusses a four-tier model for evaluation of online services, this section discusses back-office monitoring and evaluation. It gives an overview of current practices and discusses specific tools that have been identified over the course of the project as being of particular importance (assessment of costs, benefits, demand and service quality).

Background and context

Current tools for programme and project evaluation provided by the private sector are a good starting point to evaluate e-government initiatives but should also take into account the public dimension of e-government in order to be effectively applied. Evaluation tools in this context demonstrate the limits to capturing the qualitative and/or fiancial value generated by large ICTs projects. (Van Gils, 2002):

- E-business evaluation tools like the **DMR Results Chain, the E-business Balanced Scorecard** and **Cranfield's Process Model** have been successful in evaluating e-business, but to be suitable for e-government, they would need to incorporate social dimensions and the expected benefits of governance goals.
- The **EFQM Excellence Model** was introduced in 1992 for self-assessment of quality in organisations. Building on this model, the **Common Assessment Framework (CAF)** was designed for self-assessment in the public sector. While both frameworks are useful for government assessment, neither takes into account the difficulty of measuring the benefits of ICTs.

Obstacles to evaluation

Monitoring and evaluation of government programmes is generally difficult, given the frequent lack of clarity of objectives owing to the different and often competing views held by different stakeholders. In addition,

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overlapping initiatives and policies and continuous fine-tuning of initiatives complicate monitoring and evaluation efforts. The fact that e-government is relatively new and that there are few advanced services means fewer models and actual outcome experiences that can be used for benchmarking.

These problems are magnified when attempting to monitor and evaluate e-government programmes. ICT projects are hard to evaluate because of the pervasive nature of ICTs, the integration of ICT goals with policy goals and the organisational changes that necessarily accompany e-government initiatives. Effective evaluation requires good metrics, regular monitoring and reporting, disciplined and professional use of robust evaluation frameworks and the use of long-term evaluation practices. These qualities depend on a government's overall evaluation culture. Table 3 summarises some of the barriers to e-government evaluation and gives various examples.

Table 3. **Obstacles to evaluating e-government**

Obstacle	Example
Lack of clarity of objectives – stated goals may not have associated measures of progress; there may be multiple objectives	Hard to measure "quality of life"
Hard to define success	If people are spending more time online, is that good or bad?
Easy to be too ambitious	Several countries have set targets of "al services online" by specific dates. But not all services are appropriate to put online
Information paradox	The benefits of ICT investment may not be visible for some time (see OECD Growth Study)
Question of who are the clients; multiple clients	Should one evaluate benefits for the users, the employees, the government at large, partners, etc.?
Hard to measure shared benefits	Shared infrastructure, multiple projects benefiting from shared portal, etc.
Private sector tools may not work for governments	Governments place importance on social values that are not incorporated into private sector tools and objectives
Available indicators may not be the good ones	Current indicators (such as number of employees with Internet connections) are helpful, but have limits
Government definitions and methodologies vary from one country to the next	Collecting data is easier at the local level, but at that level administrations are highly decentralised
Incentives to misstate evaluation results	If an organisation succeeds in saving money, telling others may result in their losing that money
Challenge of sharing results	Hard to get organisations to report unsatisfactory results
What you measure may become focus of organisation	Il you measure number of services online, but not service quality, priority will be on putting services online but not on service quality

Source: OECD.

To overcome these barriers and monitor and evaluate e-government successfully, a number of issues must be addressed:

- **A framework for assessment must be prepared prior to initiation**, as well as a framework for evaluating efficiencies once the project is completed. The process to be improved or replaced by the proposed arrangements must be clearly defined. The project's full costs, including the costs of managing the associated organisational changes, also need to be identified. Furthermore, "success" needs to be clearly defined and if possible linked to the broader goals of the organisation and the national strategy. Both implementers and evaluators must agree on the definition of success.
- The knowledge that the evaluation may be used to determine the survival of the project or future funding creates a danger that the organisation's sole focus will be to meet specific targets. This is particularly a problem when the indicators for e-government evaluation may not be representative of the programme's goals. To the extent possible**, e-government indicators should be designed to reflect programme goals.**
- For an evaluation to be useful, **results need to be available to decision makers at the right time**. When information on longer-term outcomes is not available in the requisite timeframe, alternative indicators should be used. Evaluation procedures should be realistic and focused on specific issues of value. All e-government evaluation will inevitably be a compromise between rigorous evaluation on the one hand and practical realities on the other.
- The **evaluation process should be unbiased and independent**, so that it can be used as a basis for revising e-government initiatives. It should also be non-threatening to participants. It should be general enough to apply to more than one agency, initiative or programme.
- E-government evaluations should be **based on a mixture of qualitative and quantitative indicators**. Qualitative indicators are useful because they may be better suited to some e-government benefits (such as improved quality of life) than quantitative indicators. However, qualitative indicators may be difficult to use when comparing projects and levels of success. Quantitative indicators are useful because they are more readily comparable and can be used to demonstrate concrete benefits. However, quantitative indicators are not always suited to e-government goals, and there is the danger of overvaluing their importance. As evaluation efforts become more advanced, there may be a greater reliance on qualitative measures.
- The evaluation process should take into account both **direct and indirect costs and benefits**. While indicators should be based on stated targets, they should also be flexible enough to take into account unexpected outcomes or be adapted for a later point in time.

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- Finally, **e-government should be repeatedly evaluated** over time. The process should include pre-analysis, implementation analysis and post analysis.

Benchmarking

Evaluating national policy. Evaluating e-government programmes at the national level involves assembling data from a wide range of inputs, using consistent definitions and methodologies. Benchmarking sectors or national efforts with other sectors and programmes requires common approaches and definitions.

It is much more difficult to measure e-government at the national level than to evaluate specific projects. Evaluation **requires a large degree of compatibility between data from different agencies**, but their data are rarely comparable.

Current efforts to evaluate national policy have largely focused on the evaluation of online services. These studies tend to focus on: online service breadth (*e.g.* the number of services provided); online service span (*e.g.* the customer target group to which online services are delivered); online service depth (*e.g.* the complexity of the online services provided); and to a lesser extent online service quality (*e.g.* the extent to which online services achieve their stated objectives). However, these measures are only for online services, and are not well suited to evaluating e-government at the back-office level (except for advanced services, which generally require back-office changes). Specific measures that can be used for a broader e-government evaluation include:

- Pre-requisites for online services (*e.g.* Internet penetration, necessary skills, etc.).
- Level of shared infrastructure (*e.g.* are different agencies sharing the same infrastructure resources, or is each obliged to build its own?).
- Channel delivery strategy and/or existence of a one-stop shop (*e.g.* one point of access for all government services, whether national, regional or local and whether all agencies are working through it).
- Level of regulatory framework and enforcement at national level (*e.g.* privacy and security standards, authentication).
- Prevalence of national standards.
- Extent of co-operation and co-ordination among organisations.
- Level of public-private partnerships.
- Existence of financing mechanisms supporting e-government.

Box 63. **Italy: E-government observatory**

The Department of Public Administration has established as a pilot project an observatory to examine the impact of ICT on public administration. At both central and local level, the project aims at measuring quality improvements in the provision of a public service (mainly to citizens and businesses, but also to other branches of local and central government) as well as efficiency gains within public administrations. The observatory aims at providing policy makers as well as managers with a tool allowing more thorough decision concerning both e-government policy and projects.

Source: Corsi and Gullo (2002).

International benchmarking. Measuring progress against other countries (international benchmarking) is a common way of determining the success of national policy. International benchmarking can be a powerful tool for capturing the attention of ministers and generating political commitment to achieving certain national goals. However, international benchmarking studies to date lack accuracy and are judgmental, so they can conceal as much as they reveal. Finding common measures across countries is a very difficult task, especially as countries take different approaches to the provision of online services. Finding effective and comparable measures is also more difficult when dealing with complex variables such as quality *versus* the more simple quantity of services online. For this reason, existing statistical surveys tend to focus on the aspects of e-government that are easier to measure, such as percentage of services online or use of e-government services, but do not take into account the more complex and back-office changes that are fundamental to e-government. A summary of existing statistical surveys is given in Annex 2.

Current benchmarking studies are limited for the following reasons:

- They tend to focus on the supply side and do not generally include the demand for and use of e-government.
- They tend to be output rather than outcome oriented.
- They focus on government-to-citizen and government-to-business interactions, but do not measure government-to-government or government-to-employee interactions.
- The process is not transparent to governments and does not include a clear methodological statement.
- The process is not internationally agreed (each survey employs its own definitions and measuring tools, and other countries are not consulted).

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Box 64. **Post-implementation reviews for e-government projects**

Post-implementation guidelines provide evaluation requirements to be included by agencies in post implementation reviews (PIR). Once a project has reached its end, a PIR should be conducted, generally 3-12 months later. The focus of the PIR is to provide an assessment of the implemented project, including an evaluation of the development process and indicate the extent to which the organisation's investment decision-making processes are sustaining or improving the success rate of IM/IT projects.

Three essential areas have to be evaluated as part of a complete PIR:

- Citizens/end users: Surveys should be conducted to determine users' satisfaction with the end product. Many of the intangible benefits identified at the outset will relate to how citizens and end users feel about the final projects.
- Mission/programme impact: A close look should be taken to determine whether the system implemented has achieved its intended effect and whether this effect still fits mission goals. There should be a focused look at how well the project supports the organisation's various processes. An assessment should also be made of other project-specific aspects, such as an estimate of the cost savings achieved, compliance with the information technology architecture, along with evaluations of the information product (accuracy, timeliness, adequacy and appropriateness of information) and identification of additional maintenance or security issues.
- Technical capability: Finally, an evaluation should be made of the technical aspects of the project, both current and future. This evaluation may focus on such factors as the competency of the workforce to use the new system, employee satisfaction or retention, the extent to which advanced technology was used and the methodological expertise of the development team.

Source: Van Gils (2002).
Original Source: IM/IT Investment Evaluation Guide, based on *www.cio-dpi.gc.ca/emf-cag/investeval/ieg-gei00_e.asp*

- A country's overall performance is measured on the basis of only a small number of elements.
- No account is taken of countries' priorities, approaches or e-government objectives.

Standard OECD statistics. Using standard statistics to make international comparisons of e-government is not easy. Not only is it difficult to delineate the concept of e-government (it may range from publishing basic government

Box 65. **The Netherlands: The need for evaluation tools**

A recent Dutch study proposes developing a common system of concepts for measurement of e-government and international benchmarking. At present, there is scarcely any quantitative material available, at either the international or national level. The few internationally comparable publications often include no more than a few readiness indicators. While there are valuable national studies, they do not lend themselves to international comparison or benchmarking.

To measure e-government, OECD countries need to develop a measurement tool which covers all relevant aspects and indicators of e-government. Each country would measure and analyse its situation with regard to e-government using the same set of research tools, preferably during the same time period. Some adaptation would be possible, *e.g.* large countries might use a larger sample than smaller ones. In their report to the OECD, countries would be able to contextualise results in the light of specific national characteristics, such as the structure and extent of the government.

As a result, the benchmarking of e-government would be based on primary data and internationally comparable. However, it is also important to take countries' specific context into account when evaluating its implementation of e-government. A benchmarking exercise should offer space for considering qualitative aspects along with the quantitative data, thus providing a more nuanced view of each country's position.

Source: Holland (2002).

information on the Internet to letting citizens engage in dialogue with elected officials), but governments have different structures for service delivery and e-government co-ordination.

The statistics produced by OECD countries often refer to evaluation of national policies on the information society, but even here the statistics may vary from country to country. The OECD's *Measuring the Information Economy* (2002b) provides some internationally comparable statistics on aspects of e-government.

Very few countries implement dedicated surveys of e-government, *i.e.* surveys in which government agencies are asked how they use ICTs as tool for improved service and communication. Countries that do use such surveys include Australia, Canada, Denmark and Norway.

The OECD Working Party on Indicators for the Information Society (WPIIS) is currently developing guidelines and model surveys covering aspects of e-government. The model questionnaire on measuring ICT use and e-commerce currently includes one e-government question for enterprises, which asks about

business use of the Internet to communicate with public authorities. For households and individuals, the model questionnaire includes questions about obtaining information from government Websites, downloading or submitting forms and other dealings with government.

WPIIS is aiming eventually to create separate modules on e-government in the enterprise and household/individual model questionnaires by further developing the current questions, and adding one new one. By taking on this task, WPIIS hopes to act as a forum for developing common indicators on e-government demand and use. However, no plans exist for developing guidelines and model questionnaires for ICT use in government; the very different structures of government would make it difficult or impossible to compile comparable statistics.

Evaluation of e-government activity

A focused examination on **elements of e-government activity** would be very valuable to most OECD countries. Cost-benefits assessments can assist agency decision makers in facing specific choices when implementing projects or help central e-government co-ordinators identify priorities for limited central funds.

Monitoring and evaluation of e-government is a broad area. The following discussion focuses on aspects judged priorities by the project working group, namely: costs and benefits, demand and service quality.

Cost/benefit analysis. Discussions of the utility of cost-benefit analyses for e-government initiatives are ongoing. Some argue that countries should not rely on cost-benefit analysis as the single basis for public budgeting and that other non-financial gains must be considered. Cost-benefit analysis is typically readily calculable for bricks and mortar projects like dams and roads, but is less obviously of value for government initiatives where the expected benefit may be public convenience or even improved public perceptions of public services (Reeder, 2002).

For example, there is considerable debate regarding the economic value of small time savings. If the public, on average, spends 30 minutes less time waiting in line for a driver's licence to be issued, are those small increments truly recoverable and put to other economically productive uses? Put differently, if 100 000 individuals each save 30 minutes once a year, has the economy realised the equivalent of 25 work years in savings?

Cost and benefits need separate measures before they can be combined into cost/benefit analysis. A few areas for consideration include:

- Available tools to measure the costs of an e-government project and justify launching an initiative.

Box 66. **Australia: National evaluation of e-government, February 2003**

In early 2002, the Australian National Office for the Information Economy (NOIE) commissioned a study into the demand for and benefits of e-government. The aim of the study was twofold: *i)* the development and application of a methodology to assess the success of the Commonwealth's government online programme through an analysis of past and future demand, benefits and return of investment; and *ii)* the development of a methodology for measuring the success of future online initiatives allowing comparison. Preliminary findings of the study were released in November 2002.

The findings – Demand

From 1997/98 to 2001/2002, the Prime Minister's commitment and agency client service strategies appear to have provided the major stimulus for agencies to offer services online to citizens and businesses.

The study found that there is ongoing demand for online services and that users believe significant benefits are available. It found that future demand for online government services might increase by approximately 30% in the period 2002 to 2004.

Citizens and businesses indicated that in the next twelve months they would use the Internet to access Commonwealth Government information related to education, health, taxation, employment, weather, community support, and to a lesser extent family assistance information.

Benefits to users

The vast majority of users of government online services see significant benefits from being able to access services online. 86% of government online users felt that the overall benefit of government online was either significant (36%) or moderate (50%). However, only 45% were able to quantify actual cost savings associated with interacting with Government online compared to traditional channels.

As a result of interacting with government online:

- over 80% of all users indicated a moderate to significant improvement in the ease of finding information;
- approximately 75% indicated some or significant improvement in service quality;
- 75% saw either some (24%) or significant improvement (51%) in their ability to make decisions;
- over 80% of businesses and nearly 90% of government employees saw either some or significant improvements in the quality of their decision-making; and
- access to public records was considered more open by 68% of all users.

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Box 66. **Australia: National evaluation of e-government, February 2003 (***cont.)*

Benefits to government

The study estimated potential financial benefits over the period 2000 to 2004 to government agencies through a reduction in costs:

- 67% expected to reduce costs significantly due to improved business processes;
- 64% expected to reduce costs significantly by directly reducing costs of servicing – *i.e.* direct cost reductions, such as advertising, printed material, staff costs and client management costs; and
- 17% expected to reduce costs significantly by using multi agency delivery channels.

Future beneficial features

The study found that citizens and businesses considered that there would be further benefits from features, such as:

- a seamless online government presence that provides more information, structured so that it is easy to find and does not require an understanding of how the government works; and
- further integration and clustering of services across agencies at all levels of government.

The final results from the study are available on the NOIE website.

Source: www.noie.gov.au

- Comparing costs of an e-service and the traditional equivalent.
- Investment and uptake costs.
- Operational costs, including maintenance and training.
- Long-term costs, including the cost of updating systems and depreciation.
- Expected cost savings in the longer term.
- Opportunity costs of launching an e-government initiative.

The benefits flowing from ICT investments can be difficult to identify, given the integration of ICTs into broader policy goals and organisational change. More specifically, assessing the benefits of e-government initiatives to governments and to service users is difficult because:

- Benefits may be unclear, overlapping and reliant on the performance of other initiatives.
- Goals may be expressed in terms of putting services online, or putting infrastructure in place. While these goals can be evaluated in their own

Box 67. **Australia: The Victoria Government Online intermediate benefits review, 2001**

The Victorian State government, a leader of e-government efforts in Australia, undertook an intermediate benefits review (IBR) of its government online programme. The goal was to provide an accurate summary of delivered and planned GOL benefits and funding in Victoria. An independent consultant conducted the IBR in three phases over a 20-week period commencing 13 November 2000. Some 460 online government projects encompassing 155 programmes, 56 agencies and a sample of 274 citizens, as well as in-depth analysis of 26 individual case studies, were surveyed. At the time of the IBR, 46% of programmes were described as complete and 54% were still in progress.

Phase 1 involved surveying project data from agencies of the Victorian Public Service over a four-week period. As it was assumed that benefit tracking was not a core competency of all Victorian government agencies, the consultant hosted pre-survey briefing sessions to prepare the respondents for calculating expected benefits and cost savings. Agencies were asked to specify expected and delivered benefits of social worth ranging from nil to significant and agency worth in financial terms across a range of bands. Finally, the agencies were asked to estimate the extent to which benefits had been realised and what risks might prevent the benefits from being realised. Agencies were asked to supply where possible or at least identify suitable metrics and baseline data for future time series analysis. When the survey ended, the consultant performed a quality-control analysis of the data before freezing the database.

Phase 2 involved surveying a sample of users of GOL services (Victorian citizens, businesses and departments) to confirm the benefits identified in phase 1 from a social perspective and identify unexpected benefits and gaps where benefits were not achieved.

Phase 3 concerned future funding recommendations.

The benefits framework was built on the basis of GOL objectives, benefits estimations developed by the consultant and validation of data by opinion surveys of the population.

Source: Van Gils (2002)
Original source: Victoria Government Online – Intermediate Benefits Review, 2001 – *www/egov.vic.gov.au/Victoria/StrategiesPoliciesandReports/Reports/intermediateBenefitsReview/ibr.htm*

terms, they do not take into account uptake or the actual benefits desired or achieved by end users.

- It may not be clear who actually benefits from e-government initiatives (government, users, employees, etc.), especially as some of the beneficiaries

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may be unintended. It is also unclear whose benefits should be counted when adding up benefits.

- Benefits from shared arrangements such as common infrastructure can be difficult to assess.
- Benefits include both direct outputs (such as the reduction in the time needed for compliance by small businesses using online services) and broader outcomes (such as the impact of the reduced time on business viability).
- Benefits will inevitably involve elements that are both quantifiable (*e.g.* cost and time savings) and non-quantifiable (*e.g.* improved service quality), raising the issue of valuation of non-financial benefits.
- Benefits will not be static, but will change over the life of the initiative as user expectations evolve.

In practice, the evaluation of benefits has focused on estimates of efficiencies in government and improved convenience for users. These estimates are often made at the project initiation stage, to justify commencing a project. Assessment of realised benefits resulting from initiatives also needs to be emphasised to identify lessons learned from project implementation and operation.

Assessing demand. A major focus of e-government activity has been increasing the supply of online services with relevant targets. Given their relative novelty, many services were developed without reference to potential demand. However, as services become more complex and include transactional services, **assessment of demand becomes critical** to ensure that the benefits of initiatives both to governments and to end users match the costs involved.

As for other forms of service delivery, measuring demand for potential online services is complex. Issues to be addressed include identifying the potential pool of users, assessment of accessibility, including general online access by the target group, ease of use and the requirements of groups with special needs, such as the disabled.

Experience has shown the difficulty of predicting usage patterns before the online services are implemented. Potential users cannot be expected to have identified specific requirements for online services, as these emerge only in the light of actual experience. As services become more complex, the need for pilot testing and prototyping becomes more important. As services are implemented, **structured feedback arrangements** enable adjustments to be made in the light of experience.

Box 68. **Finland: E-government-related surveys**

Since 1999, the Ministry of the Interior has made annual surveys of citizens' views on the delivery of electronic services by the public administration. The results have suggested that while citizens are familiar with services provided by their own municipality or local state authority, they have little awareness of other public-sector electronic services. These limited surveys indicate that Finns support the development of public e-service, but they do not reveal much about the level of citizen demand for e-government.

As a part of building the national citizen portal, the Ministry of Finance carried out a user survey of 100 citizens and civil servants in 2000. The results showed that citizens recognised the need for a portal that could provide: *i)* information about public-sector organisations and their services; *ii)* advanced electronic services for which transactions are possible; and *iii)* feedback mechanisms on specific questions.

For regional portals, the most commonly used services were public services. Even though the attitude towards these services was positive and they were frequently used, these services were also seen as the ones that needed the most development.

The Chamber of Commerce and the Association of small and medium-sized enterprises have also conducted several surveys on companies' interest in electronic services.

Source: OECD report on E-Government in Finland (2003).

Service quality. Measuring service quality is of particular importance for e-government, as most governments regard improvement of the quality of public services as an important objective of e-government programmes. Quality standards, which will vary for individual projects, need to be developed in the context of broader service charters and standards. The quality of e-government services is often assessed as citizen satisfaction, measured through interviews or online questionnaires. Frequent **surveys of citizen satisfaction** are of particular importance in e-government, as customer's expectations and habits are evolving rapidly in a changing service environment. Results from these surveys may be used to identify improvements that meet user needs by making services more accessible and effective. Results may also be used to update service quality standards.

Monitoring and evaluation – the role of e-government co-ordinators

Improving monitoring and evaluation is a major task for e-government co-ordinators. Improvements in this area will require a balance between the practical needs of agencies – producing information that will actually be

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Box 69. **United Kingdom: The People's Panel**

In 1998, the Cabinet Office's Modernising Public Services Group set up the "People's Panel" to be better able to provide the services that people want. Citizens' panels had already been used in local government for many years, but this initiative was a world first at the national level. The panel is composed of 5 000 members and is representative of the UK population in terms of age, gender, region and a wide range of other demographic indicators. An additional 830 members were recruited from ethnic minorities to ensure that the sample of minority groups is large enough to be used for quantitative research.

The government is using the People's Panel for many service delivery issues on a regular basis and has recommended that departments use it when starting and implementing e-government projects and programmes.

For instance, in April and May 2000, the Cabinet Office's Performance and Innovation Unit (PIU) created six focus groups from the People's Panel to get a better understanding of people's attitudes towards electronic delivery of public services. The findings have been used by PIU in compiling their report on e-government, "Electronic Government Services for the 21 Century".

Source: People Panel's homepage: *www.cabinet-office.gov.uk/servicefirst/index/pphome.htm*

Box 70. **Australia: Victoria Tourism Online**

Victoria Tourism Online has performed customer surveys to establish performance baselines, conducted focus groups with representative users and participated in industry forums to understand the likely need for tourism services online. This knowledge of customer demand is cited as a critical element of the project's success.

Source: Detailed Benefits Report, Multimedia Victoria Government Online, Intermediate Benefits Review, Phase 2, 27 June 2001.

used – and the difficulty of maintaining a quality evaluation and analysis process. While countries' priorities will differ, the need to better articulate the benefits of e-government activity means that the focus should be on the benefits of initiatives. Without clearly stated benefits, e-government implementers cannot expect political and public support. E-government co-ordinators should consider the following action:

- Establishing a network of practice across key agencies, focused on e-government evaluation issues.

Box 71. **United Kingdom: Customer segmentation and website testing**

The Office for National Statistics (ONS) has used a number of means to better understand customers' needs. Throughout 2001, customer-segmented focus groups examined its product portfolios, the type of data provided and how best to deliver it – on paper or electronically via the Website, for example. Customers were segmented by type and by how frequently they used the data. On the basis of this research, the ONS decided how to deliver data and services for each group.

The ONS launched a new Website in 2001 after conducting the focus groups and laboratory usability testing to understand how its users navigated to find the information they needed.

These findings were systematically used as part of a development programme. Users are being involved at key stages of development and will influence the look, feel and functionality of the site.

Source: National Audit Office (2002).

Box 72. **Canada: Service quality and Common Measurement Tool (CMT)**

The CMT was developed by the Canadian Centre for Management Development's Citizen-Centred Service Network to improve the measurement of client satisfaction. The CMT asks questions about service delivery at the operational level. It is conceived around five key elements: client expectations, perceptions of the service experience, satisfaction levels of importance, and priorities for improvements. There is a core set of questions for inter-jurisdictional comparisons of client satisfaction in a few key areas of service delivery, as well as a larger question bank from which organisations can choose based on their needs and particular situations.

Source: www.cio-dpi.gc.ca/si-as/tools-outils/tools-outilstb_e.asp

- With the use of this network, developing a framework for assessment of demand, benefits and user satisfaction for use by agencies to assess individual agency projects.
- Gaining agreement of central budget authorities to use this framework as a standard, acceptable method for assessing these impacts for the purpose of budget decision making.

4.4. What could go wrong?

Identifying the potential gains from e-government is one thing; actually realising them is another. Implementing ICT projects, especially large-scale projects that can have a major impact on service quality improvements or efficiencies, raises a number of problems, many of which relate particularly to operating within government. Some of these problems are listed below; following the approaches outlined in this report will assist in reducing these risks.

- As with projects outside government, **projects must be managed effectively**. The section on managing risk and cost, as well as the OECD publication "The Hidden Threat to E-Government", (OECD Policy Brief 2001) set out some key lessons.
- There can be intrinsic **problems with the technology** being deployed. The conventional answer here is to reduce risk by using standard, open market off-the-shelf products. In government environments, funding pressures and complexity in operating environments mean that continuing levels of customisation are required, increasing risk and costs.
- A related issue regards a potential **first mover disadvantage** in implementing elements of the necessary infrastructure, or making policy judgements on which way to progress. Measures such as authentication gateways and public key infrastructures may be seen as essential to advanced integrated transactional services, but they are relatively new and untried in broad e-government applications.
- The much stated "think big, start small, scale fast" doctrine can be difficult to implement because of **ongoing budget scrutiny**. Scaling fast, in particular, may be victim to deferral or cutback. Funding of infrastructure and its upgrading is always easier to defer than more pressing policy imperatives, and unfortunately it can take a crisis such as a failure in service delivery to bring forward the necessary funds, which are then spent in a charged, pressured environment. Governments are not very fast in making decisions on funding, with annual funding cycles the common approach.
- Similarly, the need for a broader vision and related funding to integrate online service delivery into a broader service channel framework can be sacrificed in order to **keep immediate costs down**, or due to the difficulty in challenging existing work practices.
- Implementation can be **too complex**. At one level, the web of government regulations around ICT procurement, industry support, contract requirements, compliance with (often valid) security and other standards can increase costs and drag out implementation timetables. Unfortunately,

implementing seamless government services involving a number of agencies unavoidably adds to the complexity of implementation; it is understandable that ICT implementers within agencies can feel more comfortable working alone.

- Project timetables and required deliverables are often subject to **detailed political scrutiny**. Clearly ministerial setting of outcomes and timelines is legitimate. The idea that ICT use is a technical issue and somehow not appropriate for what is seen as political interference is unrealistic and not compatible with the focus now placed on e-government activities. However problems arise when timetables become unrealistic and expectations grow.
- Breaching individual **privacy** has the potential to derail the best e-government plans. Ensuring e-government initiatives are in step with society's expectations in this area is crucial as a means of building trust that privacy will be protected.
- Assuming the perils of implementation have been safely addressed, **take up** can be a major issue. Lower than anticipated levels of use of an online service will lead to criticism that expenditure has been wasted, that expected efficiency gains have not been realised. Higher level of use can lead to rapid declines in service quality as service providers become overburdened. For example more users may lead to an inability to respond to online queries within acceptable timeframes.

Notes

1. This model for electronic service delivery was developed by the Australian National Audit Office and the Australian Office for Government Online. It is available in the Audit Report No. 18, 1999-2000: *Electronic Service Delivery, including Internet Use, by Commonwealth Government Agencies*. See: *www.anao.gov.au*
2. An example is the eEurope report, *Web-based Survey on Electronic Public Services* (2002), which makes a distinction between interaction, two-way interaction and transaction. Stage 4 in this model is then equivalent to stage 3 in the model used above; data sharing is not included in the eEurope model. The Office of the e-Envoy, on the other hand, redefines the model used above so that stage 3 is two-way interaction while stage 4 is still defined as data sharing (Office of e-Envoy. 2000, *Benchmarking Electronic Service Delivery*. 2000)
3. Recent work has reviewed the experience of OECD countries with online engagement, drawing upon the definitions, terms and guiding principles proposed in the *Citizens as Partners* (2001e) report. Undertaken in 2002, this review was conducted as part of the OECD E-Government Project under the auspices of the OECD Expert Group on Government Relations with Citizens and Civil Society, whose members provided significant guidance in defining its scope and submitting country case studies.
4. Section taken from PUMA Policy Brief No. 8, "The Hidden Threat to E-Government: Avoiding large government IT failures" (March 2001)

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Chapter 5

Conclusions and Future Challenges

Implementing e-government has certainly created challenges for member countries, in spite of a long tradition of ICT use in government. While the level of practical experience to draw on when implementing Internet-based applications is now extensive, a range of future challenges will put pressure on public administrations and on e-government programmes to be more responsive, to deliver government priorities more effectively and to do so with fewer resources. This Chapter draws together the project's conclusions and identifies future challenges and priorities for action.

5.1. Conclusions

The impact of e-government at the broadest level is simply better government. E-government can act as an enabler to achieve better policy outcomes, higher quality services, greater engagement with citizens and improve back office procedures. Governments and public administrations will, and should, continue to be judged against these traditional, established criteria for success.

One of the biggest challenges to implementing e-government is the **need for a seamless approach** to serving citizens and businesses. A seamless approach implies a common vision, a common delivery strategy, and numerous back-office changes including organisational change, cooperation and collaboration. Problems with collaboration in public administrations reflect, in part, their compartmentalised structure and the absence of incentives for co-operation. A seamless approach can take many forms, but at a minimum necessitates the establishing of inter-linkages among government agencies in order to provide a common, simple interface for citizens and business.

As outlined in the report, implementation of e-government requires action and change at many levels if it is to succeed in maximising potential benefits. A government-wide vision is required, leadership and commitment is needed to translate this vision into reality, and existing barriers in the way public administration operates will need to be overcome. This report identified ten guiding principles as a framework for future action to advance e-government initiatives. These ten guiding principles fit into four broader areas:

- Vision and political will.
- Common frameworks.
- Co-operation.
- Customer focusfocus and responsibility.

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GUIDING PRINCIPLES FOR SUCCESSFUL E-GOVERNMENT

Vision/political will

1. **Leadership and Commitment:** Leadership and commitment, at both political and administrative levels, are crucial to managing change. Committed leaders are required to deal with disruptive change, to persevere when benefits take time to emerge, to respond when things go wrong, and to establish visions and plans for the future.
2. **Integration:** E-government is an enabler, not an end in itself. It needs to be integrated into broader policy and service delivery goals, broader public management reform processes and broader information society activity.

Common frameworks/co-operation

3. **Inter-agency collaboration:** E-government is most effective when agencies work together in customer-focussed groupings of agencies. Agency managers need to be able to operate within common frameworks to ensure interoperability, maximise implementation efficiency and avoid duplication. Shared infrastructure needs to be developed to provide a framework for individual agency initiatives. Incentives can help encourage collaboration.
4. **Financing:** ICT spending, where appropriate, should be treated as an investment, with consideration of projected streams of returns. E-government requires a level of certainty of future funding to provide sustainability to projects, avoid wasting resources and gain maximum benefit from given funding levels. A central funding programme could help foster innovation and allow for key demonstration projects.

Customer focus

5. **Access:** Governments should pursue policies to improve access to online services. Many advantages of online government information and services are not replicable offline, so that those who lack access will be excluded unless action is taken.
6. **Choice:** Customers should have choice in the method of interacting with government, and the adoption of online services should not reduce choice. A principle of "no wrong door" to access the administration should be adopted. Services should be driven by an understanding of customer needs.
7. **Citizen engagement:** E-government information and services should be of high quality and engage citizens in the policy process. Information quality policies and feedback mechanisms will help maximise the usefulness of information provision and strengthen citizen participation.
8. **Privacy:** E-government should not be delivered at the expense of established expectations of privacy protection, and should be approached with the goal of protecting individual privacy.

Responsibility

9. **Accountability:** E-government can open up government and policy processes and enhance accountability. Accountability arrangements should ensure that it is clear who is responsible for shared projects and initiatives. Similarly, the use of private sector partnerships must not reduce accountability.
10. **Monitoring and evaluation:** Identifying the demand, costs, benefits and impacts of e-government is crucial if momentum is to be sustained. E-government implementers cannot expect support if they cannot articulate potential benefits.

The means of enabling change through e-government is different in OECD countries, reflecting the current stage of e-government development, different political structures and environments, broader approaches to collaboration and access to funding. Precise impacts on public administrations and the way they adapt to incorporate e-government capacity will differ and will continue to evolve.

Taking these caveats into account, increasing e-government activity has broad implications:

- E-government ways of working will become the norm. The issues surrounding e-government (improved services, citizen engagement, organisational change, leadership, co-ordination, collaboration, skills, public-private partnerships, managing risk and monitoring and evaluation) will increasingly determine how public administrations as a whole will need to operate if they are to remain responsive to the pressures and demands on them.
- The need for cross-government architectures and other collaborative arrangements to reduce duplication and ensure efficient use of infrastructure will intensify. It is important to ensure that this does not result in over-centralisation and hinder managerial oversight and initiative.
- In terms of external governance relationships between citizens, businesses and public administrations, the boundaries between public administrations and society are likely to become more open, with a greater flow of information in both directions. Additionally, governments are likely to increase the provision of information to citizens and open up processes, and receive more input and information relating to policy processes and ways of working. The boundaries between public administrations and society are likely to become more blurred as a result of the greater use of private-sector firms and social intermediaries, driven in part by the imperatives of e-government.
- Within public administrations, the boundaries between agencies may similarly become less distinct, with greater information flows and overlapping processes and policies. This, in turn, would affect ways of working and involve a greater focus on customer and policy outcomes, the development of cross-agency teams and more sharing of data on customers and on policy issues.
- More structured knowledge management strategies could facilitate greater information flows within agencies. This would support a greater focus on customers, improve efficiency and develop a greater sense of organisational identity. The broader benefits of cross-agency collaboration will not emerge unless similar activity and change takes place within individual public administration units.

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5.2. Future challenges

To date, e-government has enjoyed a level of **political support** in OECD governments, which have seen e-government as a tool to modernise public administration, as a symbol of modernity, as a way of promoting the development of ICT industry and the move to an information society. The initial impressive visible results of e-government activity – the rapid appearance of numerous government Websites, a number of sophisticated transactional services, the development of portals – made support easy to find, especially since additional funding was often not necessary. The next stage of e-government involves the development of hidden infrastructure, joined-up back-office arrangements, higher levels of funding and possibly disruptive changes to public administrations. This next stage is likely to have less appeal. The benefits are also likely to emerge slowly and be less apparent to the outside observer. The collapse of the dot-com bubble has also made e-commerce and e-government less fashionable. The need for leadership and commitment to change will be more than ever indispensable.

The need for e-government initiatives will continue, and in all likelihood increase, in the light of the broader challenges faced by public administrations and governments. To date, governments have been able to introduce e-government services with little disruption to existing structures and ways of operating. However this phase of e-government is nearing its conclusion in many OECD countries, and governments must now focus on more drastic back-office changes, especially regarding **collaboration with a view to seamless service delivery**. In order to be effective, e-government must force co-ordinators to rethink organisational and internal relations within government. The logic of customer-focused, seamless government, and the need to work jointly to ensure interoperability and reduce duplication applies as much across jurisdictions as it does across agencies at the same level of government. This involves a number of issues, including:

- Since their introduction, ICTs have changed how governments operate. As e-government becomes more prevalent, and as its impact on processes becomes more profound as transactional services develop, there is a greater need for **organisational change** to facilitate and maximise its benefits.
- **Partnering with the private and non-profit sectors** will become increasingly important to maximise the benefits of e-government. Major challenges include the specification of outputs, the sharing of risk, accountability arrangements, and managing the relationship between public and private sector partners (including having the necessary skills).
- The growing complexity of the problems to be faced will challenge traditional delivery modes and related **accountability** structures. The impact of decisions taken at supranational level, greater collaboration across

jurisdictions and agencies, and the blurred border between private and public sectors in the delivery of government services will in all probability be more strongly felt. This will influence how citizens see government's ability to respond to their concerns and require assessment of accountability structures, including formal parliamentary arrangements, if government is to remain accountable and open. Accountability frameworks should also take into account provision of information and feedback from service users.

- Public administrations will need to continue to develop policies and technical solutions around the key areas of security, authentication and data storage, in order to preserve the **privacy** of individual citizens' data. If not handled correctly, this issue, more than any other, has the potential to undermine support for e-government. Solutions in this area can be contentious, and privacy issues are exacerbated when linked with seamless government initiatives; the linking and matching of separate data holdings in particular heightens concerns.
- The lack of **vertical e-government integration** across different levels of government (e.g. local, regional, national) is a key challenge to the successful implementation of e-government. Users want effective service, and care less about differences in approach and/or responsibility among levels of government. Uncoordinated local initiatives can lead to costly incompatibility or duplication.
- E-government should be a **continuous process of government improvement**, rather than simply putting services online in successive stages. Managing the transition to online service delivery will demand changes in all aspects of the public administration.
- The initial introduction of online services can be expensive when these services are introduced separately from existing traditional service channels. However, the development of online services as part of a service channel strategy, with the opportunity taken to reengineer overall service delivery processes, provides the means to capture overall efficiencies and savings
- OECD countries have difficulty **monitoring and evaluating** e-government (including cost, benefit, and level of demand), yet increased support for e-government projects will be dependent on these measures. Monitoring and evaluation should be used effectively for programme improvement and targeting, and needs to be better tied to e-government planning.

Citizens are interested not only in the provision of services online, but also in the opportunities ICT presents to **increase citizen engagement** in the policy process. Governments will need to create new and more direct links with civil society to improve the quality and responsiveness of decision-making. But citizens' enhanced ability to communicate directly with public administrations may put elected representatives in danger of being bypassed.

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In short, e-government will affect the relationship between parliament, the executive and citizens, challenging traditional concepts of political legitimacy, representation and ministerial accountability. These changes will make striking a balance between the representative and participatory models of democracy important.

5.3. Priorities for action

This report has argued that there is a need to take action to ensure that the benefits of e-government activity are maximised. Action is needed because the initial attraction of e-government has worn off in many countries just when e-government initiatives are starting to mature and to deliver major benefits. In order to deliver benefits, e-government will increasingly disrupt ways of working, require increased infrastructure investment and face increasing customer expectations. Additionally, the implementation of e-government initiatives needs to become as efficient and effective as possible, as reliance and expenditure on ICT increases.

The broad, cross-sector nature of e-government and the increasing number of service partners both within and outside of government demand public governance frameworks that take into consideration all e-government functions from a whole-of-government perspective. Such frameworks serve to diffuse the overall vision throughout government and to show all stakeholders (from heads of agencies to frontline service deliverers) their role in support of the overall process. They are necessary to ensure accountability for service quality when multiple agencies are providing seamless services. They allow internal input and feedback into the e-government policy development process, ensuring ownership of e-government vision and goals. And they help to correct policies along the way and to capture unintended benefits. The following checklist, based on the OECD Guiding Principles for Successful E-Government, presents a list of questions that e-government leaders should ask themselves as they introduce, develop and strengthen e-government initiatives.

In terms of **international co-operation**, considerable co-operation takes place through organisations such as the ICA[1] and the GOL-IN.[2] In addition to the present project, the OECD is active through the Working Party on the Information Economy (WPIE), the Working Party on Indicators for the Information Society (WPIIS) and the Working Party on Information Security and Privacy (WPISP). Further areas where sharing experience to address common issues could be valuable include:

- Co-operation on architecture frameworks for better use of ICT in government.
- Further co-operation on efforts to measure demand, costs and benefits for e-government initiatives.

CHECKLIST FOR SUCCESSFUL E-GOVERNMENT

Vision/political will

1. **Leadership and commitment:**
   - Do you have the necessary leadership and commitment at the political level in order to develop an e-government vision and guide change over the long term?
   - Is there leadership and commitment at the administrative level to implement change?
2. **Integration:**
   - Has there been a review of barriers to e-government implementation?
   - Is e-government integrated into broader policy and service delivery goals and processes?
   - Is e-government integrated into public management reform goals and processes?
   - Is e-government integrated into broader information society activity?

Common frameworks/co-operation

3. **Inter-agency collaboration:**
   - Are agencies working together in customer-focussed groupings of agencies?
   - Are agency managers operating within common frameworks to ensure interoperability, maximise implementation efficiency and avoid duplication?
   - Does shared infrastructure exist to provide a framework for individual agency initiatives?
   - Are there incentives to help encourage collaboration and seamless service delivery?
4. **Financing:**
   - Can ICT spending, where appropriate, be treated as an investment with consideration of projected streams of returns?
   - Is there a degree of certainty of future funding in order to provide sustainability to projects (and thus gain maximum benefit from given funding levels and avoid wasting resources)?
   - Are there programmes (such as a central funding programme) to help foster innovation and allow for key demonstration projects?

Customer focus

5. **Access:**
   - Is the government pursuing policies to improve access to online services?

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CHECKLIST FOR SUCCESSFUL E-GOVERNMENT *(cont.)*

6. **Choice:**
   - Do customers have choice in the method of interacting with government?
   - Is there a "no wrong door" principle for accessing the administration?
   - Are services driven by an understanding of customer needs?
7. **Citizen engagement:**
   - Does e-government engage citizens in the policy process?
   - Are there information quality policies and feedback mechanisms in place to help maximise the usefulness of information provision and strengthen citizen participation?
8. **Privacy:**
   - Are there mechanisms in place to protect individual privacy with regard to e-government?
   - Do broad standards for privacy protection allow for information sharing between agencies while preventing abuse?

Responsibility

9. **Accountability:**
   - Do accountability arrangements ensure that it is clear who is responsible for shared projects and initiatives?
   - Does the use of private sector partnerships maintain levels of accountability?
10. **Monitoring and evaluation:**
   - Is there a framework in place to identify the demand, costs, benefits and impact of e- government?
   - Are e-government implementers able to articulate and demonstrate the benefits of e- government in order to raise support for their projects?

- Harmonisation of policies for data sharing across countries (for example regarding security and privacy).

The OECD will remain active in the international e-government arena.

Notes

1. International Council for Information Technology in Government Administration *www.ica-it.org/*
2. Government Online International Network *www.governments-online.org*

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ANNEX I

Glossary

This glossary was compiled for the purpose of this study, and describes how the terms are used in this report.

ACTIVE PARTICIPATION – A relation based on partnership with government, in which citizens actively engage in the policy-making process. It acknowledges a role for citizens in proposing policy options and shaping the policy dialogue – although the responsibility for the final decision or policy formulation rests with the government.

AUTHENTICATION – A security measure for checking a user's identity before being allowed Internet or intranet access, typically by entering a user identity and/or password.

BACK OFFICE – The internal operations of an organisation that support core processes and are not accessible or visible to the general public.

EXTERNAL BARRIERS – External barriers to e-government are obstacles need to be resolved with the help of other actors (*e.g.* in central administrations) in order to be overcome. They often concern breakdowns, missing components or lack of flexibility in the government-wide frameworks that enable e-government. The result is often the inability to achieve a whole-of-government or seamless perspective in e-government implementation.

CHANNELS – A means of accessing services (*e.g.* Internet, telephone, visit to a government office). Different types of customers use different service access channels

CONSULTATION – A two-way relationship between the citizen and government, in which governments consult citizens and ask for their feedback and citizens provide feedback to government. Governments define the issues for consultation, set the questions and manage the process, while citizens are invited to contribute their views and opinions.

E-GOVERNMENT – The use of information and communication technologies (ICTs), and particularly the Internet, as a tool to achieve better government.

E-GOVERNMENT ACTIVITIES – Is broadly used to cover all activities relating to the use of ICTs by governments. It thus covers both an agency's activities with regard to citizens, businesses and other public agencies, as well as activities concerning internal administration processes, structures and behaviour.

FRONT OFFICE – Refers to government as its constituents see it, meaning the information and service providers, and the interaction between government and both citizens and business.

INFORMATION – A one-way relation in which government produces and delivers information for use by citizens. It covers both "passive" access to information upon demand from citizens and "active" measures by government to **disseminate** information to citizens.

INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) – Refers to both computer and communication technology. IT (information technology) is defined as any equipment or interconnected system (subsystem) of equipment that includes all forms of technology used to create, store, manipulate, manage, move, display, switch, interchange, transmit or receive information in its various forms. Information can be in the form of: business data; voice conversations; still images; motion pictures; multimedia presentations and other forms including those not yet conceived. The meaning of communication refers to a system of shared symbols and meanings that binds people together into a group, a community, or a culture. The word communication was added to IT so as to make a network of the usage of Information Technology.1

INFORMATION MANAGEMENT (IM) – Operations which develop and maintain the information reserves and information processes of an organisation.

INFORMATION NETWORK – A system of IT hardware and services which provides users with delivery and retrieval services in a given area (*e.g.* electronic mail, directories and video services);

INFORMATION NETWORK INFRASTRUCTURE – The whole system of transmission links, access procedures, legal and general frameworks, and the basic and supportive services of the information network;

INFORMATION SOCIETY (IS) – A society which makes extensive use of information networks and ICT, produces large quantities of information and communications products and services, and has a diversified content industry.

INFORMATION TECHNOLOGY (IT) – Means the hardware, software and methods used for the automatic processing and transfer of data.

1. Adapted from *http://afrinet.intnet.mu/competition2002/rcpl2/ict/frameless/definition.htm*

INTEROPERABILITY – The ability for organisations to share information and data (*e.g.* by using common standards).

MIDDLEWARE – Middleware is software that integrates services and distributed applications across the Internet or local area networks, and may provide a set of services such as authentication, messaging, transactions, etc. Middleware allows government organisations to share data between front office service delivery channels and back offices applications and processes, and is increasingly perceived as a technology for delivery of joined-up e-government services.

NO WRONG DOOR POLICY – Means keeping a variety of service access channels operational (government offices, telephone call centres, government websites) so that citizens can choose and use their preferred mode of access. See also "channel". (Note that in Canada, "no wrong door" policy refers to Internet channels only, and means that no matter which website or portal is accessed, users can link to all other government websites and portals.)

ONE-STOP SHOP – A government office where services by multiple public administration authorities are available on the same visit.

ONLINE GOVERNMENT SERVICES – Services provided by, but not necessarily supplied by, the public administration to citizens, businesses and organisations as well as to other public administration units through information networks.

PORTAL – This is a dedicated service that co-ordinates and presents information and services from different, independent suppliers into one interface, typically a website. The information is categorised in accordance with given criteria related to users' needs.

PUBLIC ACCESS TERMINAL – A PC with Internet access installed in a public space such as a library, available for free use by the public.

PUBLIC KEY INFRASTRUCTURE (PKI) – PKI is a method for authenticating a message sender or encrypting a message. It enables users of an insecure public network, such as the Internet, to securely and privately exchange data through the use of a public and a private cryptographic key pair that is obtained and shared through a trusted authority. It provides for a *digital certificate* that can identify an individual or an organisation and directory services that can store and, when necessary, revoke the certificates.

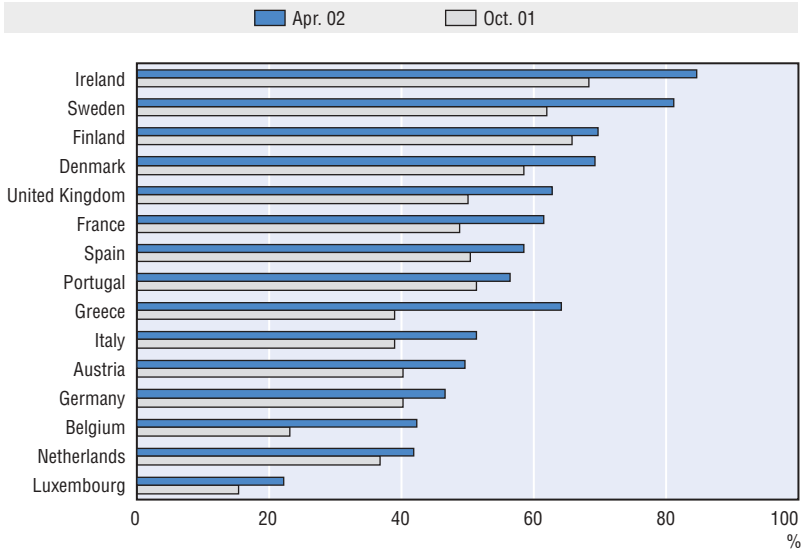
SEAMLESS SERVICES – This means presenting easy to use, function-driven services to the public. Seamless services provide citizens with what they need to know in a particular topic or client grouping, without having to know which government level or agency they must contact to get it. It provides all the information and services a user needs in one website.

ANNEX II

E-Government Statistics

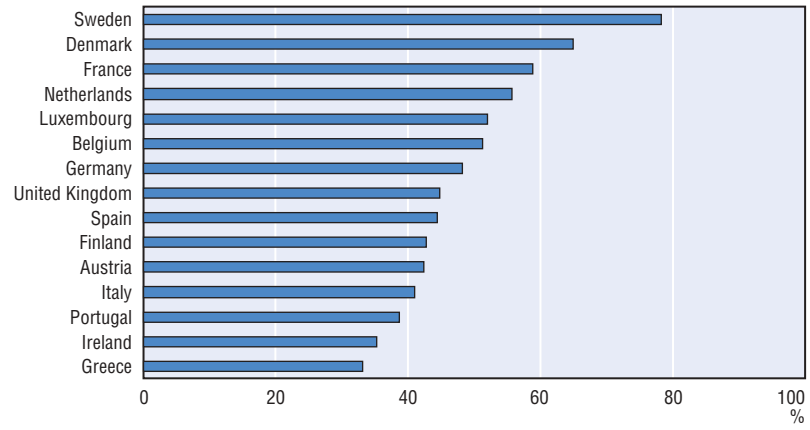
This annex provides e-government statistics from selected OECD countries.

Figure 3. **Online availability of public services (2001-2002)**



Source: eEurope.

Figure 4. **Per cent of users visiting sites (June 2002)**



Source: eEurope.

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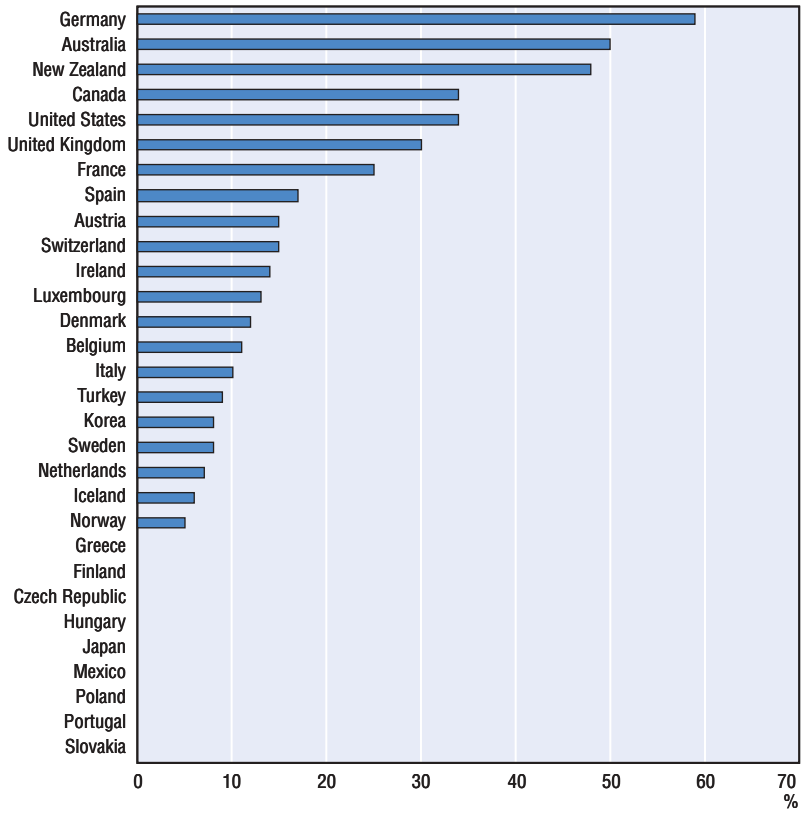
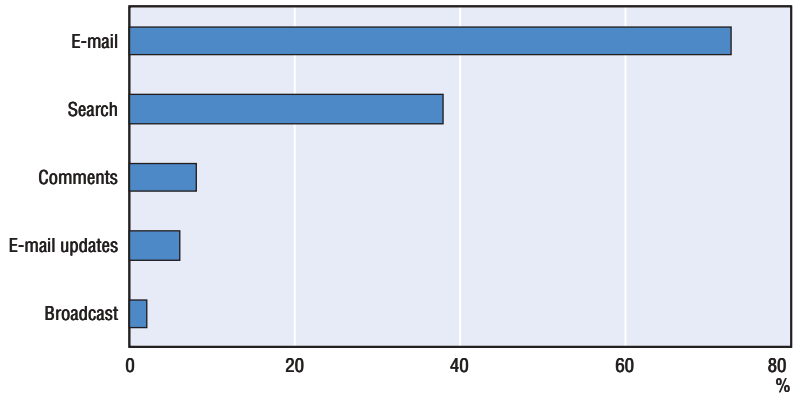
Figure 5. **Per cent of national sites offering online services**

Percentage of websites in each country that have each feature covered in the survey, such as online services, publications and databases



Source: World Market Research Centre Global E-Government Survey, September 2001.

Figure 6. **Per cent of government websites offering public outreach (survey of 196 nations)**



Source: World Market Research Centre Global E-Government Survey, September 2001.

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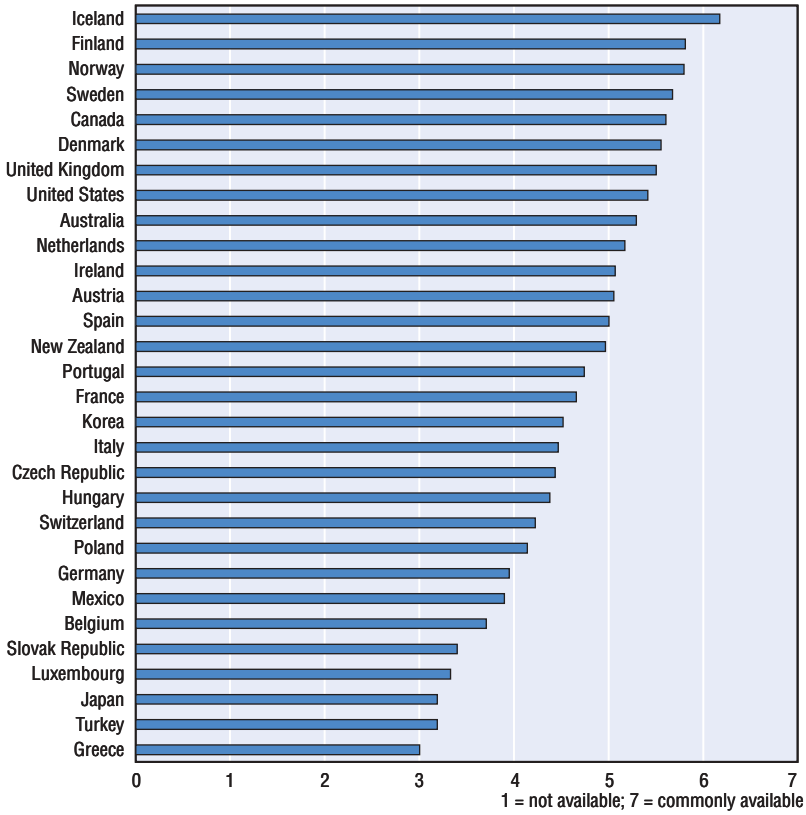
Figure 7. **Government services online**

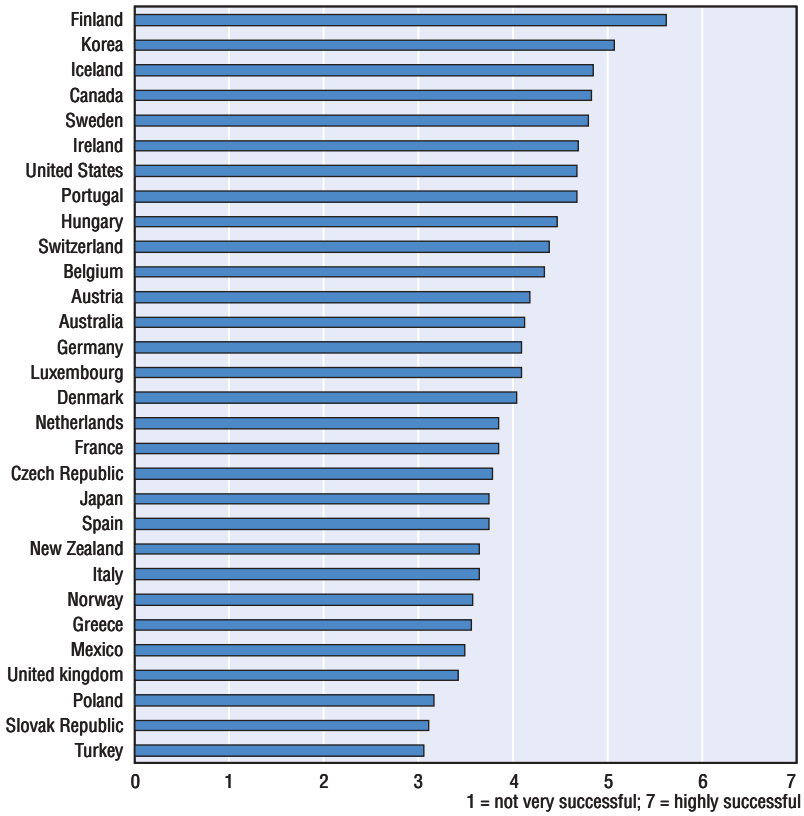
Are government services (downloadable permit applications, tax payments, government tenders) available on the Internet in your country: 1 = not available; 7 = commonly available



Source: World Economic Forum, "The Global Information Technology Report" (2002-2003).

Figure 8. **Government success in ICT promotion**

Government programs promoting the use of ICT are:
1 not very successful; 7 = highly successful



Source: World Economic Forum, "The Global Information Technology Report" (2002-2003).

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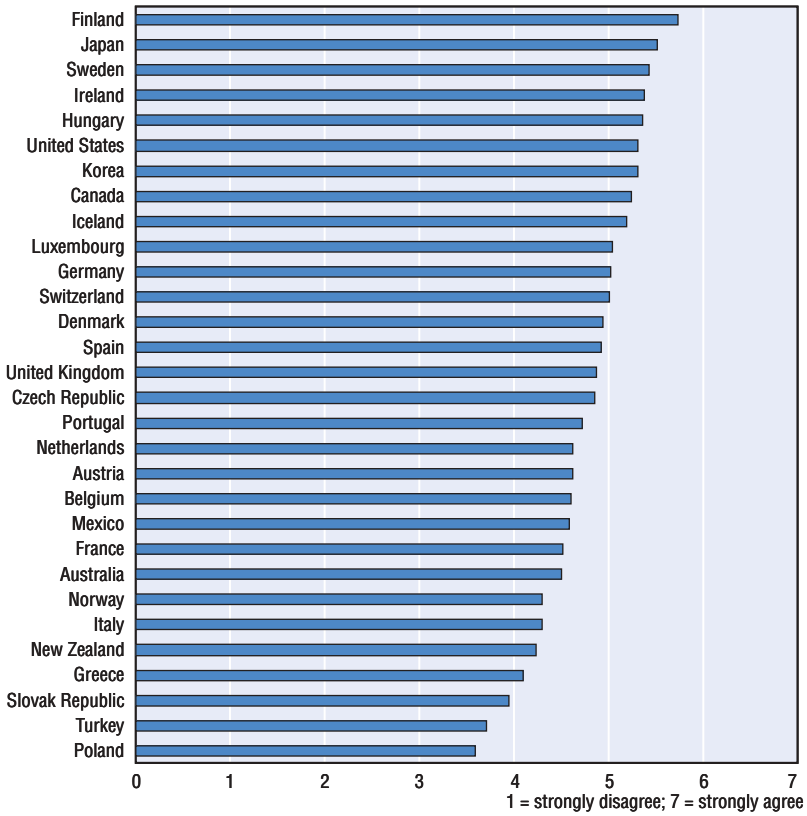
Figure 9. **Government prioritization of ICT**

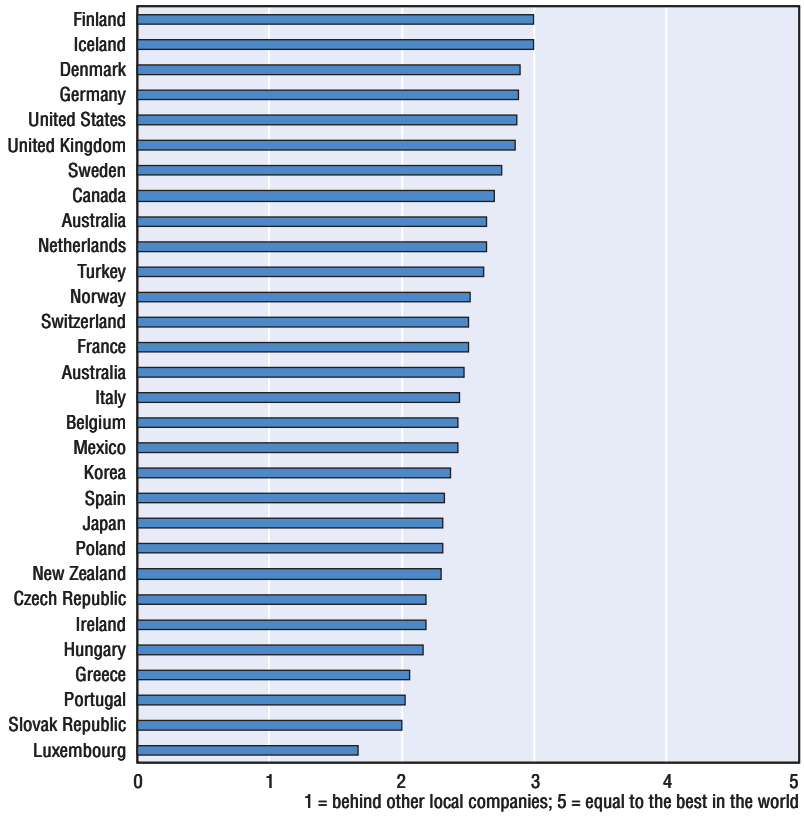
ICT are an overall priority for the government:
1 = strongly disagree; 7 = strongly agree



Source: World Economic Forum, "The Global Information Technology Report" (2002-2003).

Figure 10. **Use of Internet-based transactions with government (businesses)**

Please rate your company's position in Internet-based interactions with government *versus* international competitors in its largest business:
1 = behind other local companies; 5 = equal to the best in the world



Source: World Economic Forum, "The Global Information Technology Report" (2002-2003).

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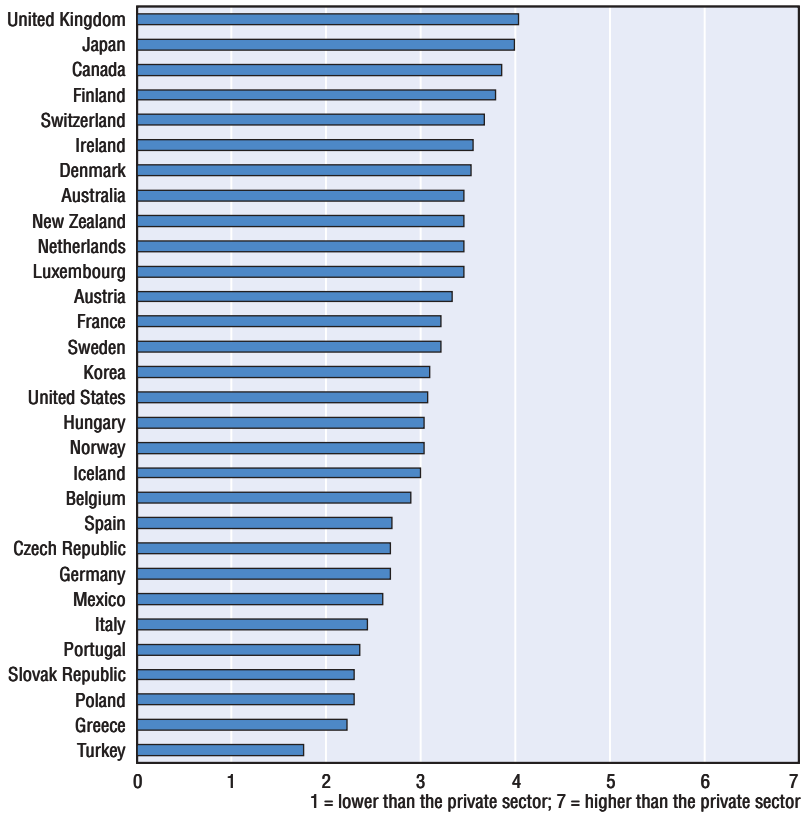
Figure 11. **Competence of public officials**

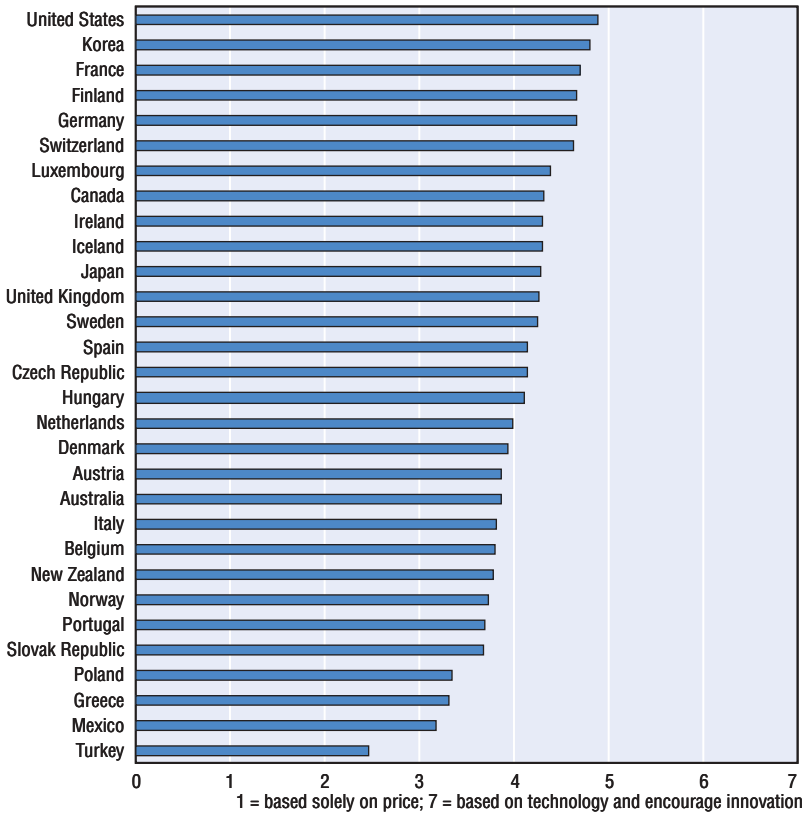
The competence level of personnel in the civil service is:
1 = lower than the private sector; 7 = higher than the private sector



Source: World Economic Forum, "The Global Information Technology Report" (2002-2003).

Figure 12. **Government procurement of advanced technology**

Government purchase decisions for the procurement of advanced technology are:
1 = based solely on price; 7 = based on technology and encourage innovation



Source: World Economic Forum, "The Global Information Technology Report" (2002-2003).

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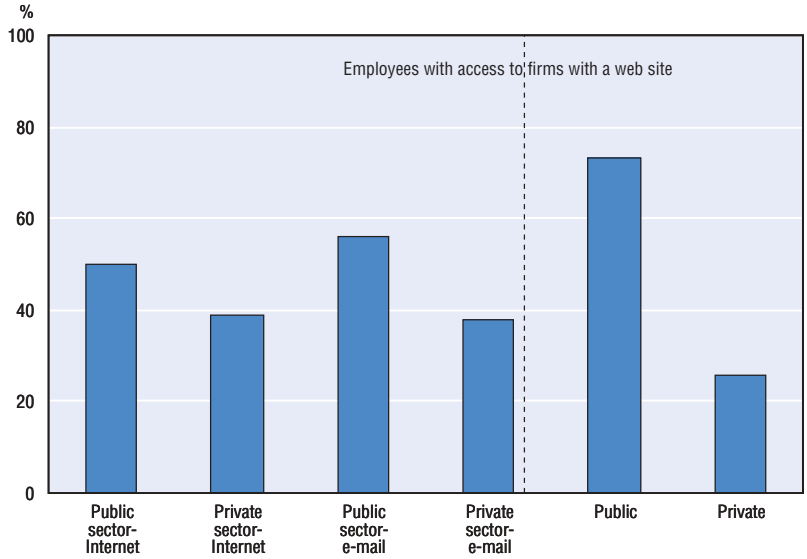
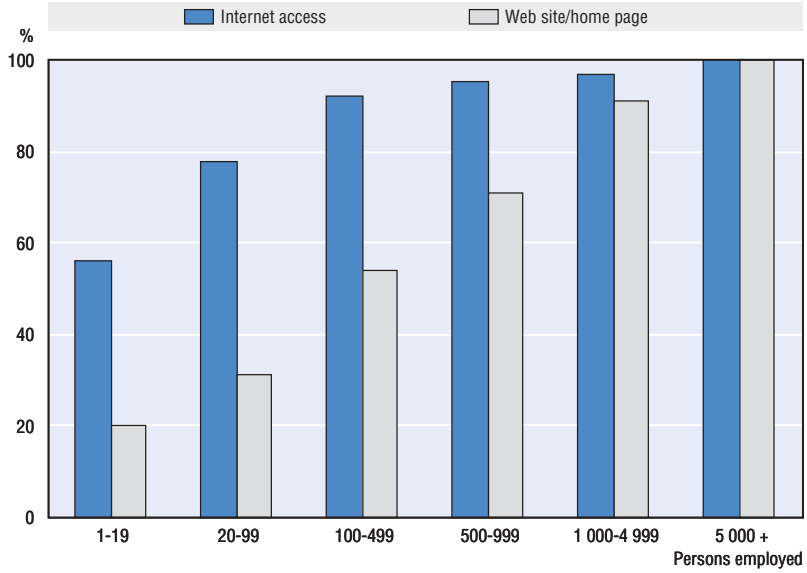
Figure 13. **Internet and e-mail access in Canada's public and private sectors, 2000**



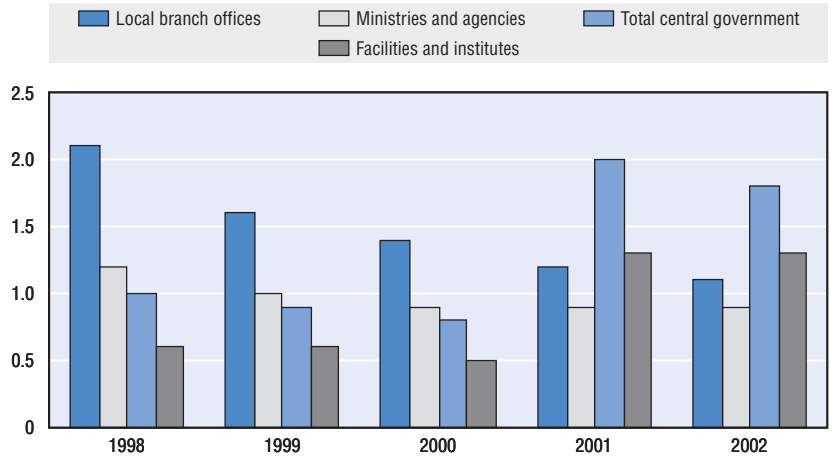
Source: Statistics Canada (2001), "Electronic Commerce and Technology Use", Connectedness Series, Ottawa, September.

Figure 14. **Government Internet access and websites in Australia, 1997/98**



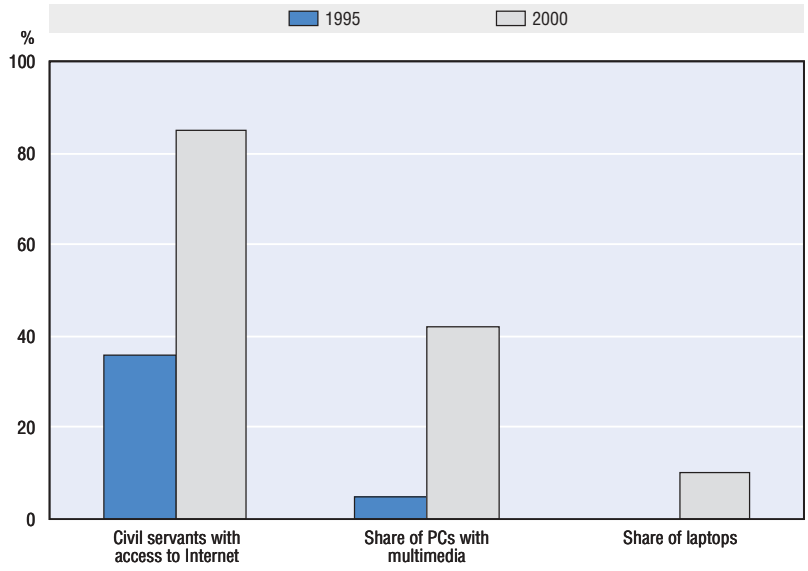
Source: Australian Bureau of Statistics (1999), "Government Use of Information Technology", 8119.0, Canberra.

Figure 15. **Employees per PC in Japan's central government, FY 1998-2002**



Note: The number of employees per PC in facilities and institutes rose in 2001 due to over 50 national organisations belonging to central government becoming "Incorporated Administrative Agency" not in the central government.
Source: Administrative Management Bureau, Basic Survey on the Progress of Government ICT Use, Tokyo.

Figure 16. **ICT use in the Finnish government, 1995 and 2000**



Source: Statistics Finland (2001), On the Road to the Finnish Information Society III, Helsinki.

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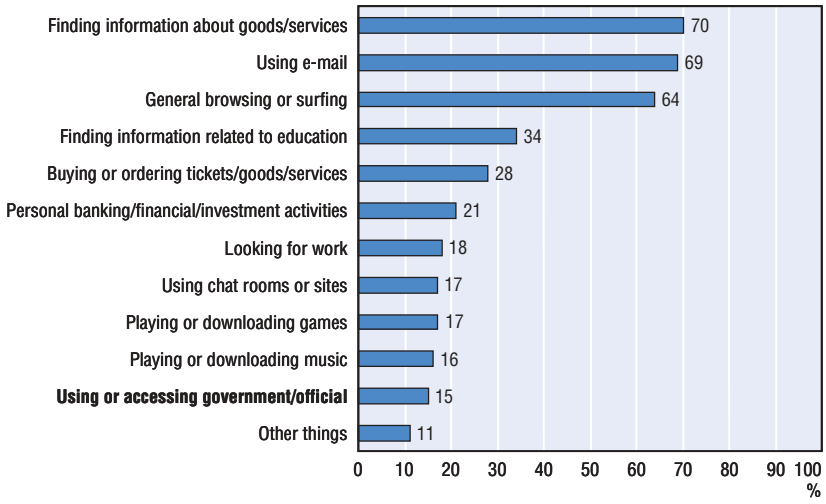
Figure 17. **Personal Internet usage by purpose in the UK, July 2000**



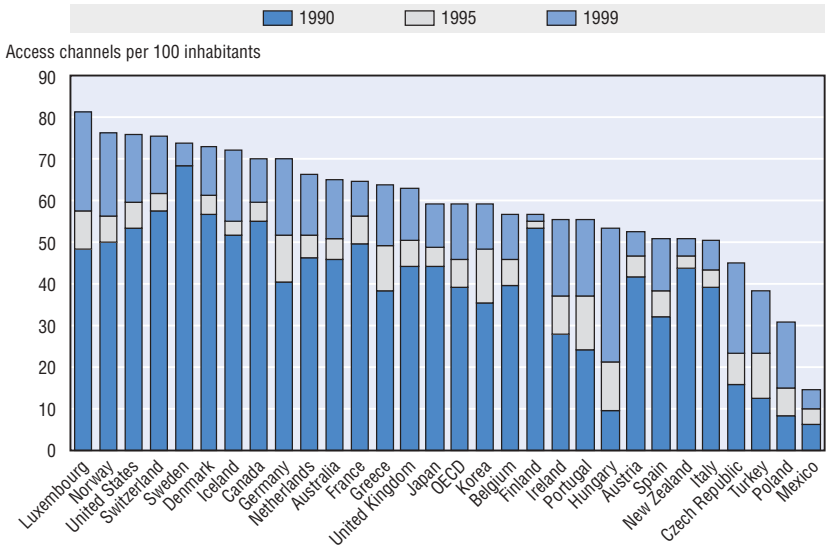
Note: Adult access to the Internet for personal use. Percentages do not add up to 100 as respondents may give more than one answer.
Source: UK National Statistics, 26 September 2000.

ANNEX III

ICT Diffusion and the Digital Divide

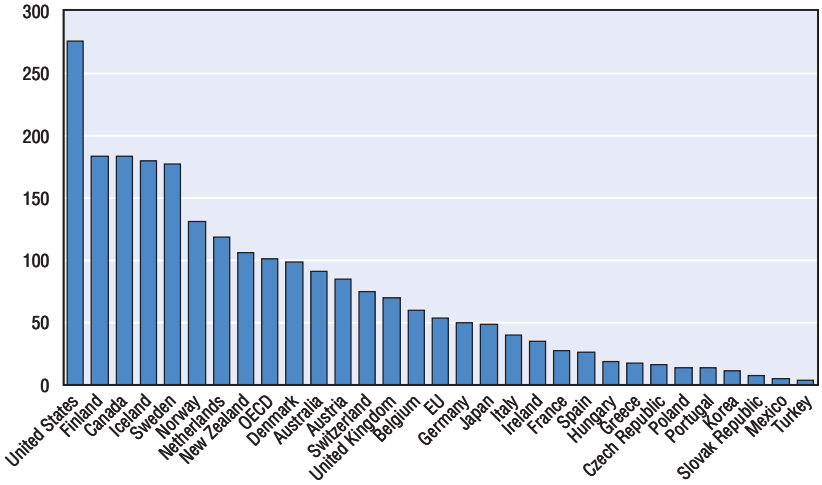
This statistical annex provides data on ICT diffusion in selected OECD countries.

Figure 18. **Fixed telecommunication access channels in OECD countries**
Per 100 inhabitants (1990, 1995 and 1999)



Source: *OECD Communications Outlook* (2001d).

Figure 19. **Internet hosts in OECD countries per 1 000 inhabitants, July 2001**
(gTLD adjusted)



Source: OECD, from Netsizer (*www.netsizer.com*).

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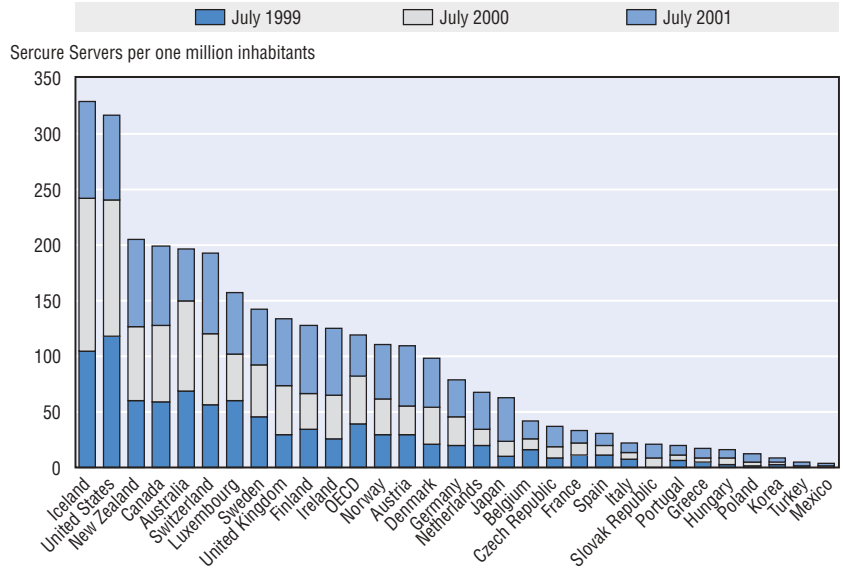
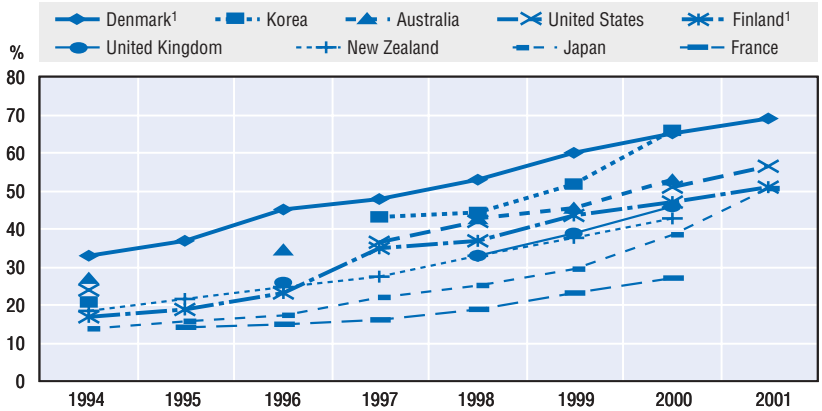
Figure 20. **Secure servers per million inhabitants, July 2001**



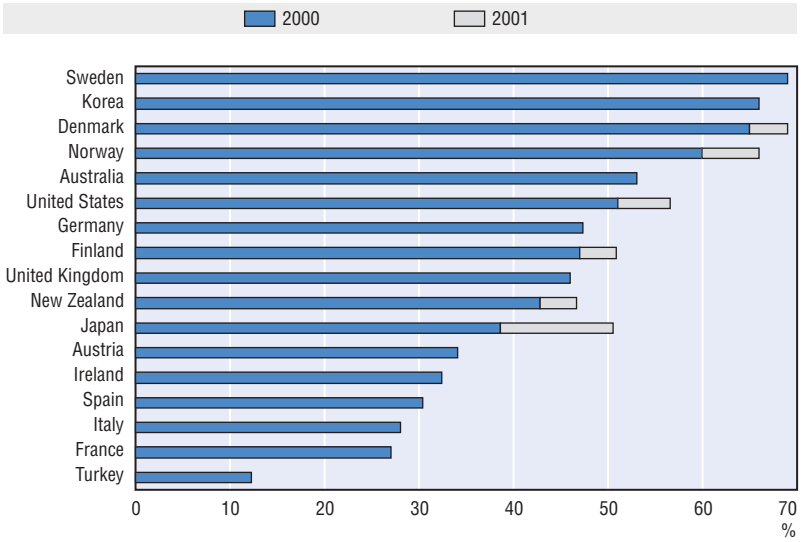
Source: OECD (*www.oecd.org/sti/telecom*) based on Netcraft (*www.netcraft.com*).

Figure 21. **Access to a home computer in selected OECD countries, 1994-2001**



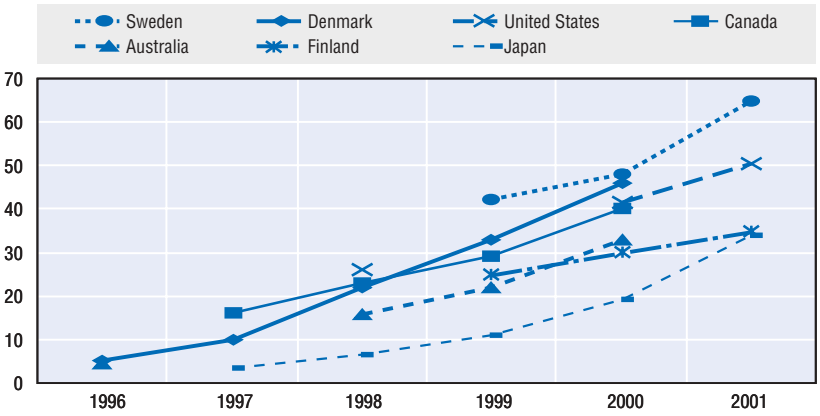
1. First quarter for 2001.
Source: OECD, ICT database, December 2001.

Figure 22. **Households with access to a home computer, 2000 and 2001**



Source: *OECD Science, Technology and Industry Scoreboard (2001)*, ICT database, March 2002.

Figure 23. **Household access to Internet in selected countries, 1996-2001**



Note: For Denmark, Internet access via a home computer; for other countries access via any device (computer, phone, TV, etc.).
Source: OECD, ICT database, September 2001.

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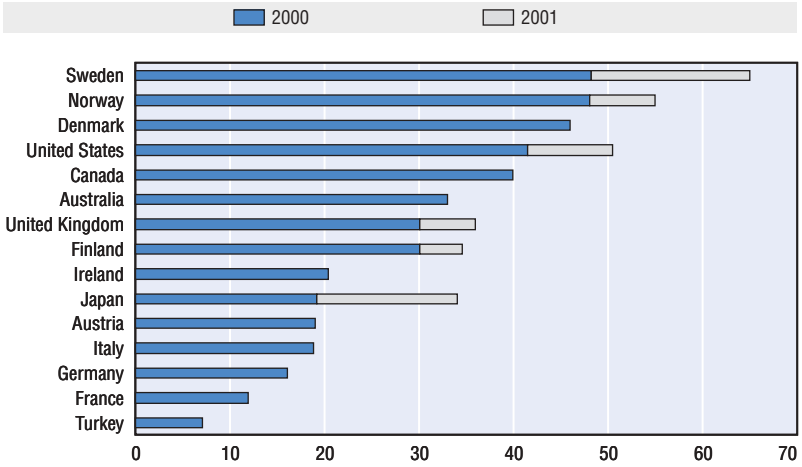
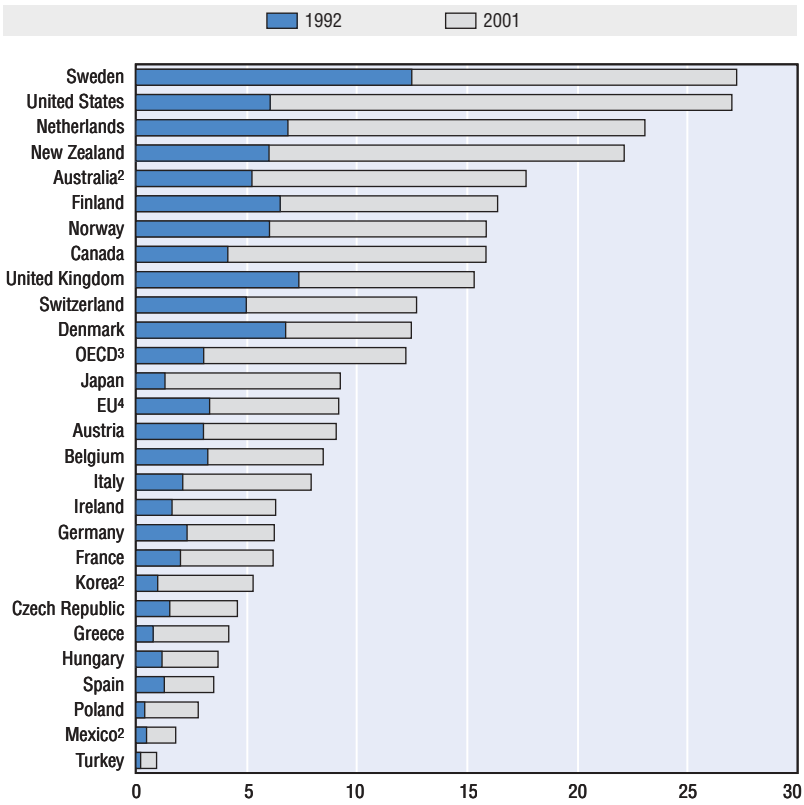
Figure 24. **Households with access to Internet, 2000 and 2001**



Note: For Denmark, Ireland and the United Kingdom, access to the Internet via a home computer; for the other countries access to the Internet through any device (*e.g.* computer, phone, TV, etc.)
Source: OECD Science, Technology and Industry Scoreboard (2001).

Figure 25. **Diffusion of information technology in the education system, 1992-2001**

Average number of PCs per 100 students



1. Average number of PCs per 100 full-time enrolled students. For 2001, 1999 student figures were used.
2. 1993.
3. Estimates for 1992. OECD excluding Portugal, the Slovak Republic and Luxembourg.
4. Estimates for 1992. EU excluding Portugal and Luxembourg.

Source: OECD, based on World Information Technology and Services Alliance (WITSA)/International Data Corporation (IDC), 2002.

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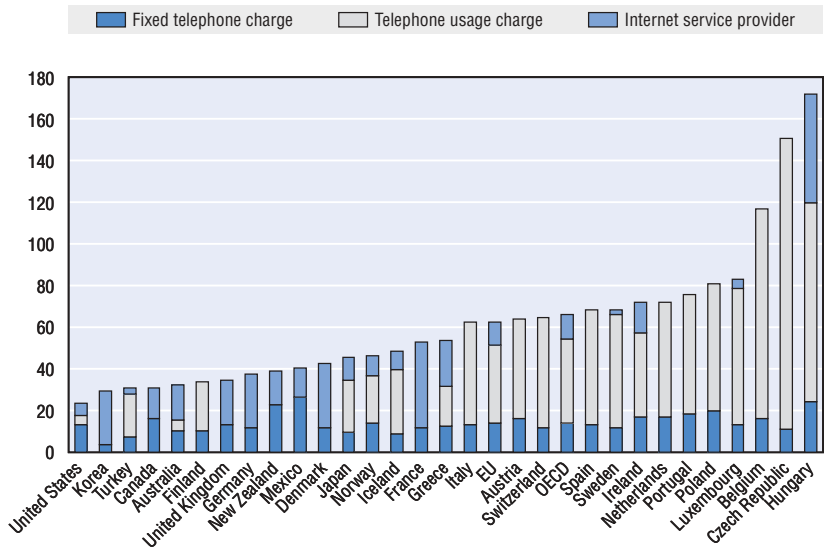
Figure 26. **OECD Internet access basket for 40 hours at peak times using discounted PSTN rates**

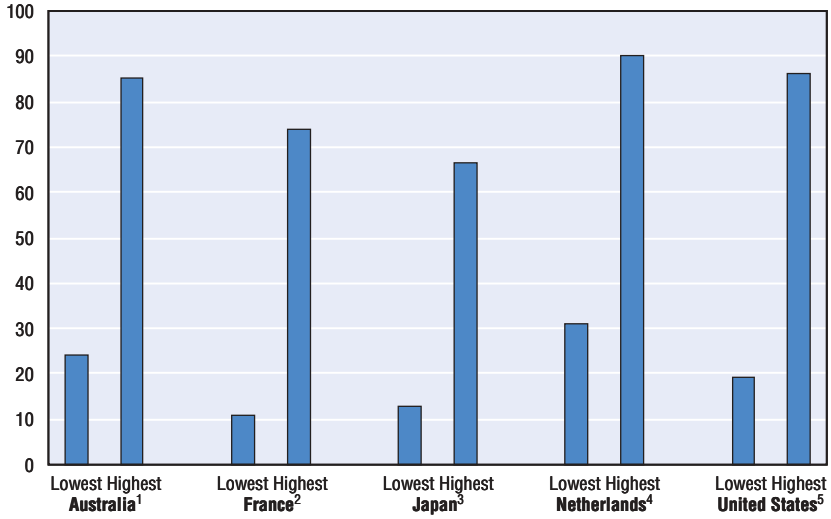
USD, PPP, including VAT (August 2001)



Note: Internet access costs differ substantially between OECD countries, primarily due to differences in variable telephone charges and the costs of Internet service providers. Previous OECD studies show that these differences are primarily due to the state of competition in different member countries.
Source: OECD.

Figure 27. **PC penetration by household income for selected OECD countries, 2000**

Percentages



Note: Because of differences in income brackets used, data is not comparable across countries.

1. Lowest income bracket: less than AUD 25 000; highest income bracket: more than AUD 100 000.
2. Lowest income bracket: less than FRF 80 000; highest income bracket: more than FRF 450 000.
3. Lowest income bracket: less than JPY 3 million; highest income bracket: more than JPY 12 million.
4. Lowest income bracket: second income decile (the second decile is used because lowest income decile includes students who have generally higher ICT penetration rates); highest income bracket: tenth income decile.
5. Lowest income bracket: less than USD 15 000; highest income bracket: more than USD 75 000. US data for 2001 shows an increase to 89.0% for the highest income bracket, and 23.8% for the lowest income bracket.

Source: OECD, based on data from Australian Bureau of Statistics, INSEE, Japanese Economic Planning Agency, Statistics Netherlands, and US Bureau of Census.

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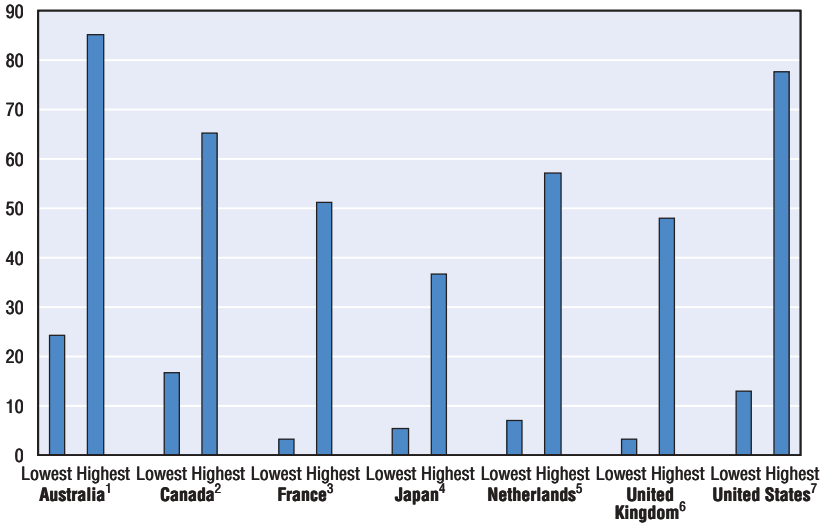
Figure 28. **Internet access by household income for selected OECD countries, 2000**

Percentages



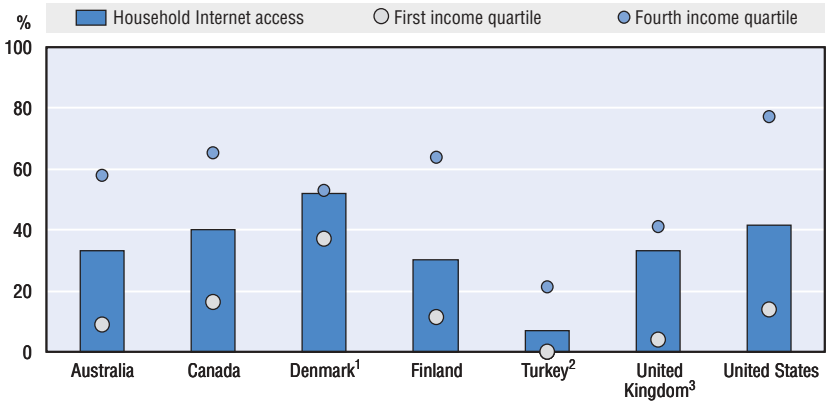
Note: Because of differences in income brackets used, data is not comparable across countries.

1. Lowest income bracket: less than AUD 25 000; highest income bracket: more than AUD 100 000.
2. Percentage of households having regular use of the computer from home. Lowest income bracket: first income quartile; highest income bracket: fourth income quartile.
3. Lowest income bracket: less than FRF 80 000; highest income bracket: more than FRF 450 000.
4. Lowest income bracket: less than JPY 3 million; highest income bracket: more than JPY 12 million.
5. 1999; lowest income bracket: second income decile (the second decile is used because lowest income decile includes students who have generally higher ICT penetration rates); highest income bracket: tenth income decile.
6. Smallest income bracket: second decile of income; Highest income bracket: Tenth income decile.
7. Lowest income bracket: less than USD 15 000; highest income bracket: more than USD 75 000. US data for 2001 shows an increase to 85.4% for the highest income bracket, and 17.7% for the lowest income bracket.

Source: OECD, based on national statistics.

Figure 29. **Internet home access among households by income level***

Percentages, 2000



* For Denmark and the United Kingdom, access to the Internet via a home computer; for the other countries access to the Internet through any device (*e.g.* computer, phone, TV, etc.).

1. First quarter 2001.
2. Households in urban areas only.
3. Last quarter 2000.

Source: OECD and national sources.

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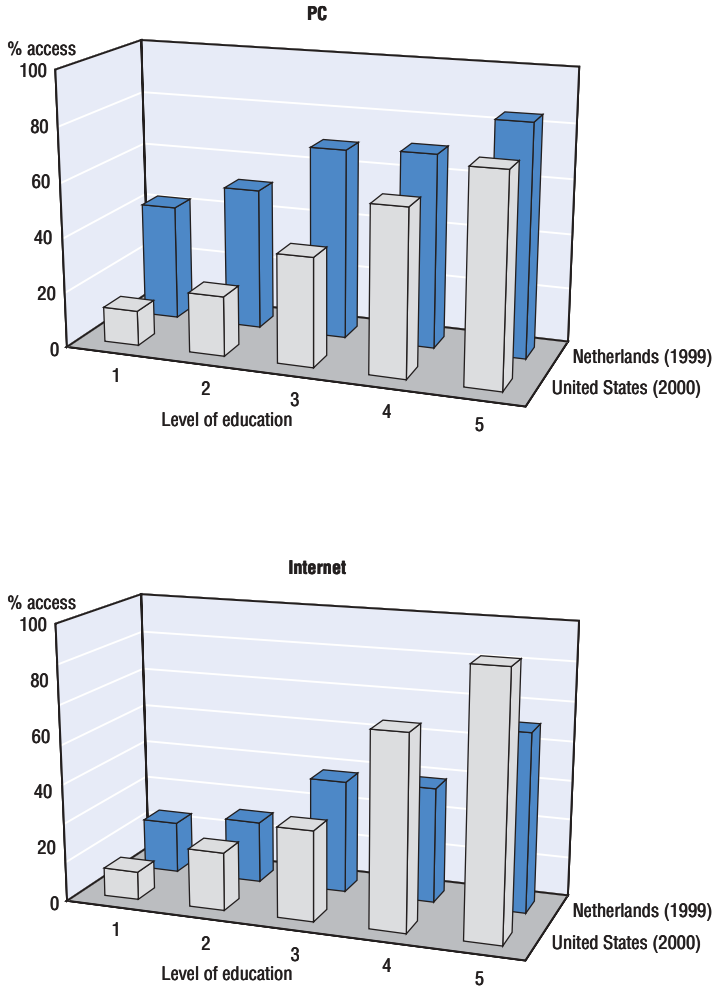
Figure 30. **PC and Internet access by educational level**
In the United States and the Netherlands (%)

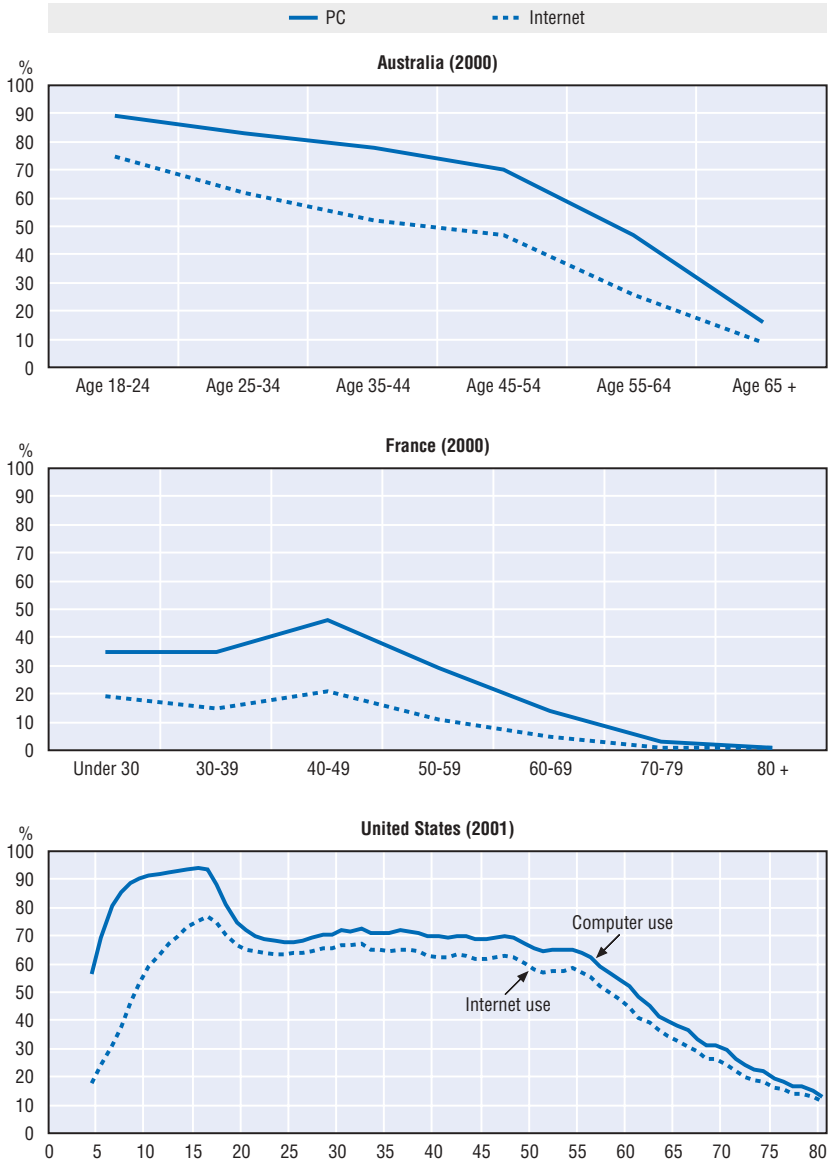


Note: Data apply to the educational attainment of the head of household in the US, the person interviewed in the Netherlands.
Educational levels 1 through 5 are defined as follows:
1. Elementary school in US; primary education in the Netherlands.
2. Some high school in the US; secondary education in the Netherlands.
3. High school diploma or GED in the US; lower general secondary education in the Netherlands.
4. Some college in the US; senior, higher general secondary education/intermediate vocational education/pre-university in the Netherlands.
5. BA or more in the US; higher vocational education/university in the Netherlands.

Source: OECD from national sources.

Figure 31. **PC and Internet penetration rate by age (%)**

Percentages



Note: Age of head of household in France. Age of individual in Australia and United States, and includes adults accessing the Internet from any site.
Source: OECD from national statistical sources.

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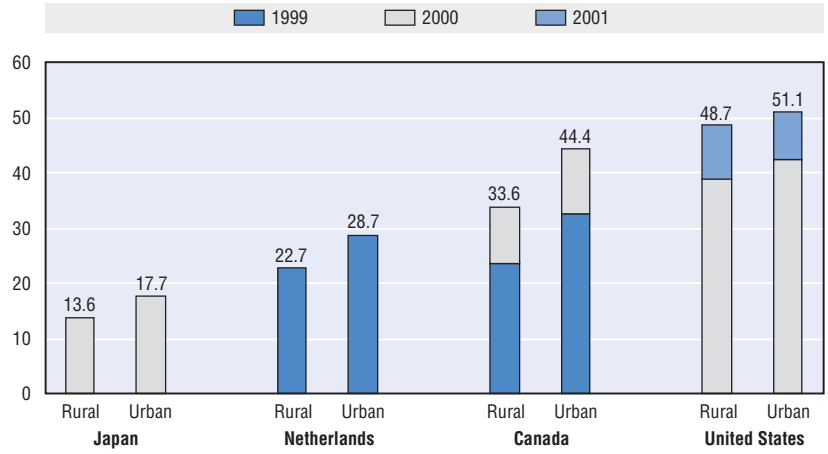
Table 4. **Internet and gender**
Percentages

	1998	1999	2000	2001
Australia				
Male	35	45	50	. .
Female	28	37	43	. .
Total	32	41	47	. .
Norway				
Male	43	53	64	72
Female	33	42	54	65
Total	42	51	63	67
Sweden				
Male	32	. .	67	. .
Female	26	. .	63	. .
Total	29	. .	65	. .
United States				
Male	34	. .	45	54
Female	31	. .	44	54
Total	33	. .	44	54

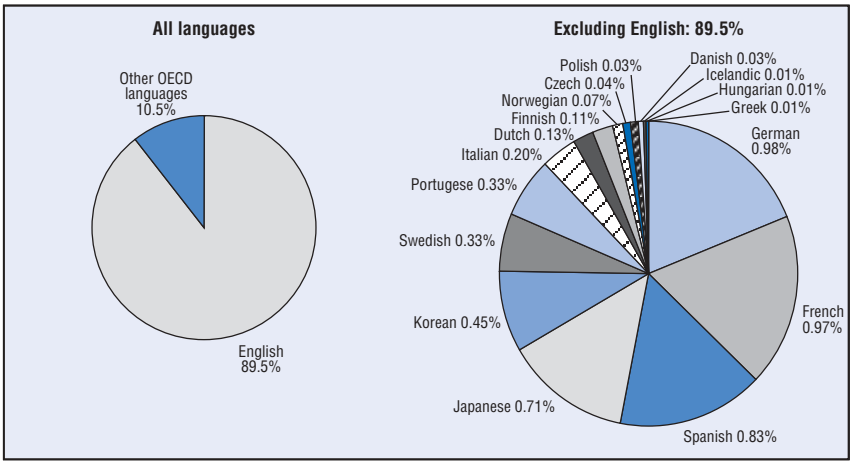
Note: Individual home access in Sweden and Norway, Internet use from any location in Australia and the United States.
Source: OECD from national statistical sources.

Figure 32. **Urban homes are more connected than rural ones**
Internet access among rural and urban households



Note: For the Netherlands, "rural" is defined as a low degree of urbanisation, and "urban" a high degree. For Japan, "rural" is defined as "villages and towns" and "urban" as "cities". For both countries, the highest categories were not taken into account. For Canada, urban refers to the top 15 metropolitan areas and rural refers to other households.
Source: OECD, based on national statistical sources.

Figure 33. **English is the main language of the Internet**
Links to secure servers by language (July 2000)



Source: OECD Understanding the Digital Divide (2001c).

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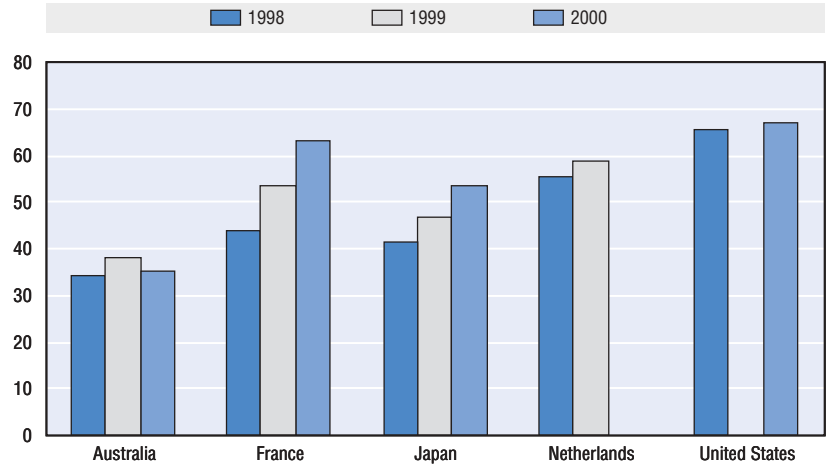
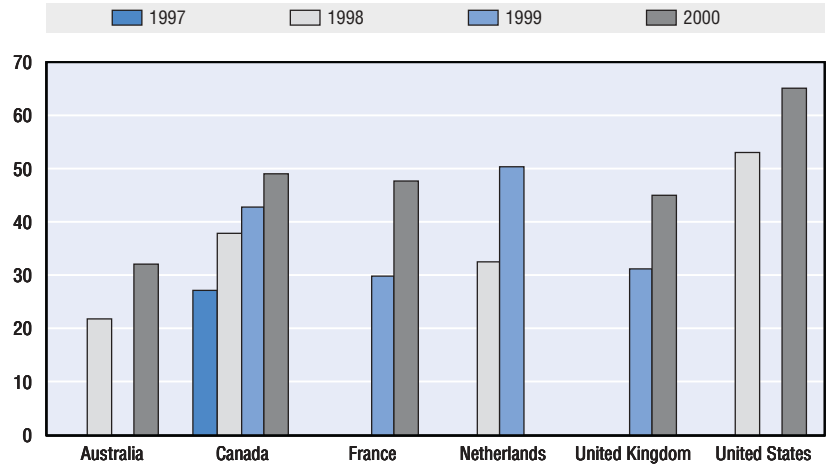
Figure 34. **PC access gap by income**
Difference between access rates of highest and lowest income groups



Note: Income groups defined as in Figure 14.
Source: OECD based on national sources.

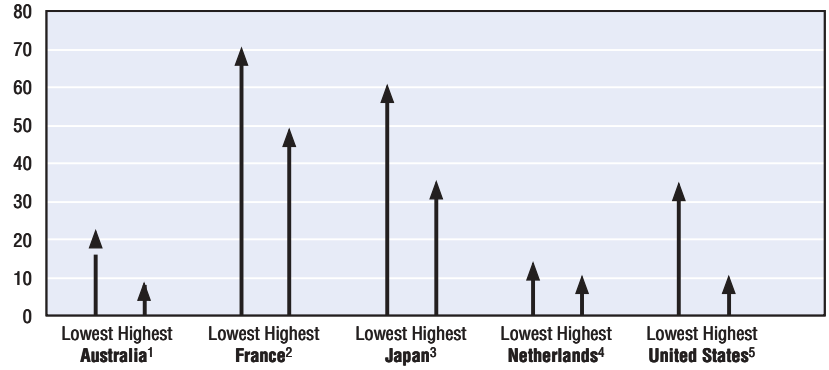
Figure 35. **Internet access gap by income**
Difference between access rates of highest and lowest income groups



Note: Income groups defined as in Figure 15. Details, including some 2001 data, table on Internet access, below.
Source: OECD based on national sources.

Figure 36. **% growth rate of PCs in households of lowest and highest income levels**

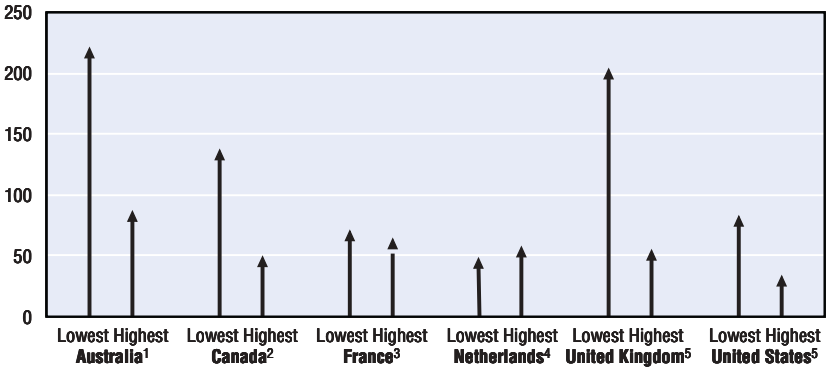
(1998-2000)



Note: Income brackets defined as in Figure 14. Netherlands growth is 1998-1999.
Source: OECD, based on national sources.

Figure 37. **% growth rate of Internet in households of lowest and highest income levels**

(1998-2000)



Note: Income brackets defined as in Figure 15. Netherlands growth is 1998-1999. The table on Internet growth rates, below, gives details of growth rates in 9 OECD countries.
Source: OECD, based on national sources.

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Table 5. **Households with access to a home computer in selected OECD countries 1986-2001**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Percentage of households																
Australia[1]									26.9		34.7		42.6	45.3	53.0	
Austria															34.0	
Belgium														45.4		
Canada[2]	10.3				16.2	18.5	20.0	23.0	25.0	28.8	31.6					
Canada[3]												36.4	40.6	50.0		
Denmark					15.0			27.0	33.0	37.0	45.0	48.0	53.0	60.0	65.0	69.0
Finland					8.0				17.0	19.0	23.0	35.0	37.0	43.4	47.0	50.9
France[4]		7.0		8.2			11.0			14.3	15.0	16.0	19.0	23.0	27.0	
Germany														44.9	47.3	
Ireland															32.4	
Italy[5]														29.5	28.1	
Japan[6]		11.7	9.7	11.6	10.6	11.5	12.2	11.9	13.9	15.6	17.3	22.1	25.2	29.5	38.6	50.5
Japan[7]												22.3	28.8	32.6	37.7	
Korea									20.7			43.2	44.5	51.8	66.0	
Mexico[8]														11.1		
New Zealand[9]	6.7	8.6	9.6	11.5	11.6	13.3	15.9	17.1	18.6	21.7	24.8	27.6	32.9	37.5	42.8	46.6
Norway															60.0	66.0
Spain[10]														27.2	30.4	
Sweden														65.0	69.0	
Turkey[11]															12.3	
United Kingdom[12]											26.0		33.0	39.0	46.0	
United States[13]				14.4	15.2				24.1			36.6	42.1		51.0	56.5
Percentage of individuals with a home PC																
Nether-lands[14]	10.0	11.0	14.0	18.0	21.0	25.0	29.0	31.0	34.0	39.0	43.0	47.0	55.0			
Nether-lands[15]												55.0	59.2	66.0	70.0	74.0
Norway									33.0	39.0	43.0	50.0	57.0	67.0	71.0	
Portugal														24.1	29.0	

1. February of each year, except for 2000, average of the year.
2. May of each year. Household Facilities and equipment Survey.
3. Survey of Household Spending.
4. June of each year.
5. For 1999, Multipurpose statistical survey on household: Everyday life aspects. For 2000, Multipurpose statistical survey on household: the citizens and their leisure – year 2000. ISTAT provisional data.
6. Fiscal year ending in March. Economic and Planning Agency.
7. Fiscal year ending in March. Ministry of Posts and Telecommunications, Communications usage trend survey.
8. Households in urban areas with more than 15 000 inhabitants only.
9. March of each year. 1999 and 2000 are projections.
10. Provisional data
11. Households in urban areas only.
12. Last quarter 2000.
13. November of each year, except August for 2000 and September 2001.
14. From CBS, Sociaal-economish panelonderzoek.
15. From CBS, POLS survey.

Source: OECD, ICCP, compiled from National Statistical Offices or national official sources.

Table 6. **Households with access to Internet[1] in selected OECD countries, 1996-2001**

	1996	1997	1998	1999	2000	2001
Percentage of households						
Australia	4.3		15.9	22.0	33.0	
Austria					19.0	
Belgium				14.0		
Canada[2]		16.0	23.0	29.0	40.0	
Denmark	5.0	10.0	22.0	33.0	46.0	
Finland				24.7	30.0	34.6
France[3]				7.0	12.0	
Germany				11.0	16.0	
Ireland					20.4	
Italy[4]				7.7	18.8	
Japan[5]		3.3	6.4	11.0	19.1	34.0
Mexico				3.0		
Norway					48.0	55.0
Sweden				42.3	48.2	65.0
Turkey[6]					7.0	
United Kingdom[7]				20.0	33.0	36.0
United States[8]			26.2		41.5	50.5
Percentage of individuals with access at home through a PC						
Netherlands[9]			16.0	26.5	45.0	57.0

1. For Denmark, Ireland, the Netherlands and the United Kingdom, access to the Internet via a home computer; for the other countries access to the Internet through any device (*e.g.* computer, phone, TV, etc.).
2. November of each year. Regular users.
3. June of each year.
4. Percentage of Households with home Internet access, not necessarily only from a PC. Provisional data for Italy.
5. Fiscal year ending in March.
6. Households in urban areas only.
7. Fourth quarter for 1999 and 2000, third quarter for 2001.
8. November 1998, August 2000, September 2001.
9. Fall of each year.

Source: OECD, compiled from National Statistical Offices or national official sources.

Table 7. **Proportion of households with Internet access by income bracket**

		1997	1998	1999	200	2001	2002
Australia	Lowest		5.0	6.0	10.0		
	Highest		44.0	52.0	69.0		
Canada	Lowest	5.5	7.1	10.9	16.5		
	Highest	32.5	44.9	53.5	65.4		
Denmark	Lowest				26.0		
	Highest				67.8		
Finland	Lowest		4.0	9.6	11.6	15.0	20.0
	Highest		36.8	50.2	64.0	69.2	69.4
France	Lowest			2.1	3.5		
	Highest			32.1	51.1		
Japan	Lowest			5.5	21.1		
	Highest			36.7	58.8		
Norway	Lowest					22.0	
	Highest					77.0	
United Kingdom	Lowest			1.0	5.0	8.0	
	Highest			32.0	62.0	78.0	
Proportion of Individuals with Internet access by income bracket							
Netherlands	Lowest		4.9	7.0			
	Highest		37.5	57.2			
United States	Lowest	9.2	13.7		18.9	25.0	
	Highest	44.5	58.9		70.1	78.9	

Note: Income brackets are defined as follows:
Australia: Lowest income bracket: less than AUD 25 000; highest income bracket: more than AUD 100 000.
Canada: Lowest income bracket: first income quartile; highest income bracket: fourth income quartile.
Denmark: Lowest income bracket: 100 000-199 999 Danish KR; highest income bracket: 400 000 Danish KR. or more.
Finland: Lowest income bracket: first income quartile; highest income bracket: fourth income quartile.
France: Lowest income bracket: less than FRF 80 000; highest income bracket: more than FRF 450 000.
Japan: Lowest income bracket: less than JPY 4 million; highest income bracket: more than JPY 20 million for 1999, more than JPY 10 million for 2000.
Norway: Lowest income bracket: less than NOK 259 000; highest income bracket: more than NOK 600 000.
United Kingdom: Lowest income bracket: second decile of income; Highest income bracket: Tenth income decile.
Netherlands: Lowest income bracket: second income decile; highest income bracket: tenth income decile.
United States: Lowest income bracket: less than USD 15 000; highest income bracket: more than USD 75 000.
Source: OECD ICT database (March 2002), and national sources.

Table 8. **Growth of household Internet access**

		1997-1998	1998-1999	1999-2000	2000-2001
Growth of Households with Internet access by income bracket					
Australia	Lowest		20%	67%	
	Highest		18%	33%	
Canada	Lowest	29%	54%	51%	
	Highest	38%	19%	22%	
Denmark	Lowest				
	Highest				
Finland	Lowest		140%	21%	29%
	Highest		36%	27%	8%
France	Lowest			67%	
	Highest			59%	
Japan	Lowest			284%	
	Highest			60%	
United Kingdom	Lowest			400%	60%
	Highest			94%	26%
Growth of Individuals with Internet access by income bracket					
Netherlands	Lowest		44%		
	Highest		53%		
United States	Lowest	49%			32%
	Highest	32%			13%

Note: Income brackets are defined as follows:
Australia: Lowest income bracket: less than AUD 25 000; highest income bracket: more than AUD 100 000.
Canada: Lowest income bracket: first income quartile; highest income bracket: fourth income quartile.
Denmark: Lowest income bracket: 100 000-199 999 Danish KR; highest income bracket: 400 000 Danish KR. or more.
Finland: Lowest income bracket: first income quartile; highest income bracket: fourth income quartile.
France: Lowest income bracket: less than FRF 80 000; highest income bracket: more than FRF 450 000.
Japan: Lowest income bracket: less than JPY 4 million; highest income bracket: more than JPY 20 million for 1999, more than JPY 10 million for 2000.
United Kingdom: Lowest income bracket: second decile of income; Highest income bracket: tenth income decile.
Netherlands: Lowest income bracket: second income decile; highest income bracket: tenth income decile.
United States: Lowest income bracket: less than USD 15 000; highest income bracket: more than USD 75 000.
Source: OECD ICT database (March 2002), and US Department of Commerce A Nation Online, 2002

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Table 9. **Internet home access among households by income quartile,* 2000**

(%)

	Household Internet access	First income quartile	Fourth income quartile
Australia	33.0	9.0	58.0
Canada	40.1	16.5	65.4
Denmark[1]	52.0	37.0	53.0
Finland	30.0	11.6	64.0
Turkey[2]	6.9	0.1	21.4
United Kingdom[3]	33.0	4.0	41.0
United States	41.5	14.0	77.0

* For Denmark, the Netherlands and the United Kingdom, access to the Internet via a home computer; for the other countries access to the Internet through any device (*e.g.* computer, phone, TV, etc.).

1. First quarter 2001.
2. Households in urban areas only.
3. Last quarter 2000.

Source: OECD, ICT database.

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