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Foreword

OECD governments are increasingly focusing on the question of how the use of ICT in the public sector can help them do their job better. Today, e-government is clearly more about government than about "e". This report is one in a series of country reviews undertaken by the OECD to analyse the successes and challenges of e-government in a national context, and to make proposals for action that can help countries improve their e-government efforts. By placing e-government in the context of national public management reform and good governance initiatives, these reviews help countries identify how e-government can best support overall government objectives and performance.

With backing from the Danish Government (Ministry of Finance), the OECD E-Government Project has conducted this country study of e-government to assess how Denmark's e-government strategies and solutions contribute, and could contribute in the future, to its objectives in the information age.

The report was completed in September 2005. It draws on a survey of Danish State and local government organisations, extensive review of information about public management and e-government in Denmark, and a series of interviews with Danish officials and other commentators. The report was drafted with the participation of peer reviewers from the governments of Austria, the Netherlands and Sweden. These e-government practitioners played an invaluable role by participating in interviews and contributing to drafting of the report.

The analytical framework for the report is based on the OECD synthesis reports "The E-Government Imperative" (2003) and "E-Government for Better Government" (2005). The review was carried out under the auspices of the OECD Network of Senior E-Government Officials, who considered its main findings as part of the work programme of the Public Governance and Territorial Development Directorate (GOV).

Under the leadership of Edwin Lau and Christian Vergez, the review was managed by Russell Craig who was heavily supported in preparation of the report by Marco Daglio, and assisted by Erika Nilsson. Special acknowledgements are due to the three peer reviewers: Peter Reichstädter (Austria), Gustaf Johnssén (Sweden), and Kees Keuzenkamp (the Netherlands). Thanks are also due to: Carsten Loesch and Kim Knudsen of the Danish government; Melissa Peerless and Jude Hanan who helped to review and edit the report; all the other members of the E-Government Project team; and Claude Jacqmin and Marie Murphy. Without the support of all these people, and the many people in Denmark who participated in the survey and met with the review team, this report would not exist.

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Summary Assessment and Proposals for Action

Background

At the request of the Danish Government, the OECD has conducted a peer review of e-government in the Danish public sector. The overarching objectives of the review have been to:

- Evaluate Denmark's e-government strategies and solutions, with a focus on how they contribute now, and could contribute in the future, to its good governance objectives in the information age.
- Further develop the OECD's e-government analysis framework, and obtain knowledge and information that will enable robust cross-country comparisons of e-government in OECD countries participating in the peer review processes.

The analytical framework for the review is based on the OECD publications *The e-government Imperative* (2003) and *e-Government for Better Government* (2005). E-Government is examined in the context of public governance, reform and modernisation. The analytical process has involved extensive review of published information about e-government and related government policies in Denmark, a survey of State and local government organisations to which 116 organisations responded, and two sets of in-depth interviews that involved nearly 80 people from a wide range of organisations, both within and outside of government.

Introduction

Denmark has been using ICT in government for several decades. Following a pattern common in OECD countries, during the 1970s and 1980s the focus was mainly using process automation to achieve efficiencies in public administration. Then, during the 1990s, there was a shift towards exploiting the potential of ICT to develop what, by the later part of the decade, was referred to as e-government. This new approach demonstrated a broadened understanding of the potential impact of ICT on improvement of government. Today, the Danish Government is pursuing a vigorous e-government programme spanning the whole of the public sector.

Denmark has made considerable progress with e-government. In the 2003 European Commission eEurope benchmarking exercise it ranked first in terms of full availability of public services online, and second in terms of the

sophistication of those services. In 2004, according to EU measures, Denmark's online public services for both citizens and businesses were, collectively, the most "sophisticated" (*i.e.* allowed the most interactivity) in Europe. Many other international assessments of countries' e-government achievements have consistently ranked Denmark as one of the leading e-government nations.

Despite this, Danish e-government faces a range of challenges including: 1) maintaining momentum during a time of major restructuring of responsibilities across levels of government; 2) increasing government organisations' awareness and understanding of the purpose and scope of the e-government programme; 3) developing more collaboration over e-government between agencies and across levels of government; and 4) striking the right balance between centralised co-ordination and decentralised implementation of e-government.

The overarching e-government challenge currently faced by Denmark is the question of how, during a period of major organisational change and fiscal constraint, it can maintain or even increase progress towards its e-government goals of developing a more efficient and user-focused public sector supporting a more competitive economy, and a vibrant Danish information society.

E-government structure and context

Denmark is home to 5.3 million people, the vast majority (85%) of whom live in urban areas. The standard of living in Denmark is high. The country ranked 17th among the 177 countries that made up the United Nations Development Programme Human Development Index (HDI) in 2004. Denmark is a relatively small, open economy with high per capita GDP. Almost three-quarters of the Danish workforce work in the service sector, with 31% being employed in the public sector.

There is a favourable environment for development of e-government in Denmark. E-government enjoys good, albeit indirect, political support. Past and present governments have placed strong policy emphasis on making the best possible public and private sector use of ICT in pursuit of both social and economic goals.

The Danish institutional environment supports the implementation of e-government. Positive factors include: 1) the fact that effective use of ICT has been a feature of government policy for several decades; 2) the existence of a political and administrative culture of compromise and consensus, supporting involvement of all levels of government in e-government; 3) the positioning of e-government as an enabler of other major government policies; and 4) the fact that local government (which is fully engaged in the national e-government programme) delivers many public services, allowing for close government-citizen relationships.

Between 2005 and 2007, sweeping reforms of the structure of the public sector ("the Structural Reform") will be the dominant factor in the environment for e-government. These reforms will impact on both State and local government, but will have the most effect at the local level, where fewer organisations will deliver an increased share of public functions and services – especially at the municipal level where 271 municipalities will be reduced (through mergers) to 98, and 14 counties will become 5 regions.

The Structural Reform goals of making government more coherent, user-focused and efficient are congruent with the goals of the Danish e-government strategy, and the long-term success of the Structural Reform will be influenced by application of e-government at all levels of government. Officials interviewed for this review regarded the Structural Reform process as being both a major opportunity for e-government to contribute to the Government's wider goals, and a potential challenge for e-government due to the risk of divided attention and resources. There was particular concern that the costs of change to local government ICT systems may have been underestimated in the planning of the Reform. The Government is relying on these costs being funded from savings that it expects will result from the Reform. Any failure to achieve these savings, or to ensure that they are not exceeded by the costs of change, could undermine the success of the Structural Reform and/or limit achievement of e-government objectives. There was also a feeling that, because e-government is not explicitly addressed as part of the Structural Reform, an opportunity to increase achievement of e-government goals within and across the different levels of government may have been lost, or diminished.

While it is vital that the Government does not underestimate the costs of changes to ICT systems that will result from the Structural Reform, evidence from a "mini-structural reform" on the island of Bornholm indicates that considerable real savings are achievable. Given this, what becomes most important is that Danish regions and municipalities are able to clearly identify net benefits from investing in an optimal level of e-government development. If they cannot, then some worthwhile e-government initiatives may be slowed or not proceed if they depend on a self-funding policy.

Top-level responsibility for e-government resides with the Danish Ministry of Finance, due in part to the explicit connection Denmark has made between e-government and its programme of public sector modernisation. This responsibility is exercised through a unique set of institutional arrangements overseen by the *Joint Board of e-Government*. The Board is chaired by the Permanent Secretary of the Ministry of Finance, with membership from State, regional and municipal government. The Board leads the national e-government programme, called *Project e-Government*, which is currently scheduled to run until the end of 2006. Delivery of the project is the joint responsibility of the Digital Task Force situated in the Ministry of Finance, and the IT-Policy Centre in the Ministry

of Science, Technology and Innovation (MVTU). Between them, these two organisations provide a balance of public management and ICT expertise to underpin the development and implementation of the e-government strategy.

In line with the decentralised nature of Danish government, and the strong autonomy of local government, the Joint Board does not have any formal powers to decide how, where or when government organisations (other than those of its members) will implement e-government. While this is consistent with Danish traditions of public management, many people interviewed for this review felt that more mandatory e-government requirements would help achieve even stronger results – especially in relation to adoption of the Danish "enterprise architecture" and related technical standards. Government-wide adoption of the enterprise architecture and standards for such things as ICT system and data interoperability is now widely acknowledged by OECD countries as being leading-edge e-government practice, supporting objectives such as increased efficiency, collaborative services delivery, and increased competitiveness of ICT industries. To achieve a full measure of these benefits, adoption of architectures and standards must be as widespread as possible. The question of how to respond to this situation is central to the ongoing progress of e-government in Denmark.

Proposals for action

1. The Government should note the concerns being expressed over possible underestimation of the costs of change to local government ICT systems that will be required as part of implementation of the Structural Reform. Without altering its policy of funding these costs through realisation of efficiency savings, the Government may wish to closely monitor these costs so that it is better positioned to identify and manage risks to achieving the goals of the Structural Reform and/or the e-government strategy. Beyond risk management benefits, such monitoring could develop useful information and knowledge about the costs of public sector ICT that would be of ongoing benefit – especially in assisting government organisations to identify the costs and benefits of investing in e-government.

2. The Government could respond to widespread calls, from both within and outside government, to make certain aspects of e-government mandatory by assessing: 1) where, when and how moving away from the current approach of voluntarism might improve the results being achieved through e-government; and 2) what risks might arise from such a shift, both for individual organisations and government as a whole. Any such assessment could focus, in particular, on issues and options for change in the area of implementation of the Danish enterprise architecture and related technical standards.

The case for e-government

Denmark is not pursuing e-government as an end in itself, but rather as an enabler of wider government objectives. Aside from the Structural Reform, there are three major elements to the e-government policy environment: 1) the push for modernisation of the public sector; 2) Danish government ICT policy; and 3) public sector efficiency goals. Together, these policies make up the case for e-government.

The OECD's interviews, review of relevant documentation, and survey of Danish government organisations show that this is clearly articulated in the design and implementation of the Danish e-government strategy. However, full understanding of the relationship between e-government and these other policies and programmes has not yet permeated the public sector. Where such understanding has been developed it is often biased towards ICT policy and efficiency goals.

Public sector modernisation

Since 2002, the Government has been implementing a public sector modernisation programme entitled *Citizens at the Wheel*, under the leadership of the Ministry of Finance. The vision of the programme is to create a government that is more focused on the needs of citizens than those of government agencies; especially through provision of public services that are coherent, accessible and responsive. It also aims to give citizens greater freedom of choice in dealing with the public sector, to strengthen their legal rights, and to use government funds as effectively as possible to achieve the highest possible public welfare within tight budgetary constraints.

The modernisation programme identifies e-government as one of the key enablers of these changes, treating it as both a discrete initiative and as part of other modernisation initiatives. The relationship between e-government and public sector modernisation has been well articulated. However, this relationship is not yet widely understood in government. Even where the relationship is understood, it is not being used as a strong driver of e-government within individual organisations. Overall, this creates some tension between the user-focused and efficiency-oriented objectives of the e-government strategy.

Government ICT policy

The MVTU, with technical assistance from its National IT and Telecom Agency, is responsible for the development and co-ordination of government ICT policies. The essence of these policies – as laid down in 1994 – is that effective use of information technology in support of development of the Danish information society is a key to economic development, improved

quality of life and better public and private goods and services. The public sector is expected to be a leading force in demonstrating and achieving this. Government ICT policy has evolved since 1994. Currently, it has three major goals: 1) creating growth in Danish business and industry; 2) preparing Danes for the future knowledge society, including by offering them a wider range of relevant and useful public services via the Internet; and 3) reforming the public sector.

Danish e-government and ICT policies are strongly linked, due both to the former having its origins in the latter, and the leadership role that the MVTU has undertaken. In 2001, following a review of the public sector's progress in developing e-government, the Ministry of Finance established both the Joint Board of e-Government and the Danish Digital Task Force to increase the focus being placed on overall e-government leadership, planning and co-ordination. Since this move the MVTU has concentrated on development of public sector ICT as a platform for e-government, with a special focus on the development of standards. While there were some tensions between the Ministry of Finance and the MVTU following these changes, most commentators indicate that these have now been more or less satisfactorily resolved. The keys to the success of current arrangements for governance of the national e-government programme seem to be: 1) clearly defining the e-government roles and responsibilities of the two lead ministries; and 2) building organisations' understanding of the relationship between e-government and government ICT policy.

Improving public sector efficiency

There is an economic case for e-government based on the Government's commitment to make the public sector more efficient, with a particular emphasis on restraining growth in public spending. Denmark has recognised that achieving these improvements requires, among other things, public investment in the improved government use of ICT. The importance of achieving economic gains from use of ICT in e-government was heavily reinforced in the latest e-government strategy. This challenge translates into a number of strategic goals, most obviously the commitment to 75% of all digitalisation projects "releasing resources" (*i.e.* generating savings) by 2006, with at least 25% doing so to "a great extent". This goal is notable among OECD countries for the explicit requirement it creates for e-government to deliver measurable economic benefits. However, beyond the involvement of Statistics Denmark in assessing achievement of this goal, it is not yet clear how these benefits will be reliably and verifiably measured.

As with ICT policy, the relationship between e-government and public sector efficiency is relatively well understood by Danish officials. Looking forward, what is very important is that: 1) government does not rely on weak *ex ante* logic or assumptions about the automatic existence of these benefits; 2) the efficiency

benefits that are realistically achievable are actually realised; and 3) robust measures are in place to judge the achievements of each organisation in this regard.

The root causes of the apparent imbalance in understanding of the case for e-government in Denmark are not clear. It may be that they represent institutional factors related to the ministries that are responsible for developing and articulating the policies and strategies associated with e-government. Alternatively, it may reflect an implicit policy hierarchy that has not been formally articulated. It may also simply be a matter of more and/or better communication being required. Whatever the cause, it is an aspect of e-government in Denmark where useful improvements could be achieved through increased clarity.

Proposal for action

3. An important feature of Danish e-government is the way that it is positioned as an enabler of wider Government policies. While Danish officials are generally well aware of the relationship between e-government and the Government's ICT and economic policies, they are less aware of its relationship to the public sector modernisation programme. This situation creates some risk of biasing e-government efforts and results away from the citizen-focused goals of public sector modernisation. The Government should examine this situation, looking for its causes and assessing the extent of any risk arising from it. Then, as appropriate, resources should be put into achieving a more balanced understanding of the business case for e-government.

External barriers to e-government

The overall context in which government organisations are required to implement e-government is very favourable. There is a sound platform of ICT infrastructure for development and delivery of e-government (including a functioning public key infrastructure), and high levels of ICT uptake and use of the Internet by both individuals and businesses. Also, modernisation of budget processes and regulatory reform have helped to provide a fairly flexible and updated legal environment in which to implement e-government.

Legal and regulatory barriers

The Danish legal environment is appropriately supportive of e-government, being set up to enable, not hinder, digital communications. This is the result

of both new legislation enabling e-government processes (*e.g.* the Act on Electronic Signatures) and efforts to simplify and modernise the legal environment, with a focus on ensuring that it is compatible with digital communications. However, despite government achievements in developing a favourable legislative and regulatory environment for e-government, some perceived challenges related to the complexity of laws and regulations, and their lack of flexibility, still exist. While part of the problem may relate to continuing deficiencies in the legal environment itself, it may also indicate limited awareness among government organisations of the changes that have already been made, which could be impeding them from making best use of the updated environment. In common with other OECD countries, this may also underline a general lack of knowledge, capability, drive and innovation in interpreting laws and regulations, which can lead organisations to incorrectly portray problems as being due to inadequate laws and regulations, rather than their own capabilities.

Privacy and security

Officials regard issues of privacy and security as being relatively less important challenges for the implementation of e-government in Denmark, reflecting both a strong environment for data protection and security, and the generally high level of trust and confidence that Danes have in this aspect of government operations; due, in part, to their long tradition of providing personal information to a range of public registers.

Budgetary barriers

A claimed lack of funding for e-government projects is the most important budgetary barrier to e-government revealed by this review. To the extent that this is a real barrier, it must be viewed in light of the implementation of the Structural Reform and the Government's decision to finance the change process through savings arising from increased economies of scale and gains in efficiency, rather than with new funds. However, the relative flexibility of e-government funding sources suggests that complaints about lack of funds to implement e-government do not arise from a tight budgetary environment itself, but may be linked to a lack of internal flexibility to re-evaluate spending priorities and reassign funds in the face of budgetary constraints. Although work to address this is underway, the development and use of common approaches for creating robust business cases for e-government (which would assist in making such decisions) is still immature in Denmark. A business case tool and supporting project management methodology have been developed for common use. However, there is still a need to communicate both its existence and the benefits of using it to government organisations, in support of its more widespread and consistent application.

Lack of long-term budgeting horizons is also considered by many officials to be an important barrier to e-government. Some long-term spending mechanisms are already in place (*e.g.* the ability to carry forward unused appropriations, and borrowing mechanisms), but it is not clear to what extent government organisations have effectively used them. This could simply indicate a general lack of knowledge of existing budget arrangements or, as expressed in interviews, the presence of risk-averse attitudes towards using these mechanisms.

A particular budgetary challenge frequently mentioned in interviews was the so-called "sow/harvest" problem. This challenge represents the fact that e-government initiatives involving more than one organisation often lead to disproportionate allocation of costs and benefits, thus creating differing and sometimes incompatible or perverse incentives for collaboration. The fact that this challenge was frequently mentioned can be interpreted as evidence of a significant barrier to e-government and/or as a sign of the relatively advanced stage of e-government development in Denmark. Whichever is the case, the challenge is acknowledged by the Ministry of Finance and identified in the e-government strategy which commits to, among other things, providing financing models that remove or limit the problem, and ongoing evaluation of the need for centralised loan pools, multi-year budget agreements, etc. The fact that this issue was frequently raised as a barrier to e-government indicates a need to examine whether these measures have been adequate in addressing it. It may also indicate that measures that have been taken to assist organisations in preparation of business cases for individual e-government projects need to be bolstered in the area of multi-agency initiatives.

Digital divide

Although it is not identified as a major barrier to e-government, the digital divide remains an important issue in Denmark. Despite Denmark's high ranking in terms of individuals' access to ICT, some differences persist in the basic determinants of access. Statistics indicate that, rather than failing to adopt ICT due to problems associated with its actual use, one of the main factors accounting for the Danish digital divide is that people lack understanding of its potential benefits. This may indicate a need for better communication of the benefits of connecting to the Internet, and demonstration of the capacity of ICT to enable delivery of public services that better respond to citizens' and businesses' expectations and needs.

Overall, while Denmark is very favourably positioned in relation to the digital divide, it is important that the issue is still considered to be necessary to address. Looking into the future, given the pressure the Government is placing on achievement of greater efficiency in the public sector, the ability to deliver as much information and as many services as possible online will be increasingly important – especially to the extent that it will allow any

reduction in the costs of delivering services through other channels. However, until all Danish citizens and businesses are able to easily access and use the Internet to deal with government (as far as this is feasible), equity concerns will impede the ability to close off old and inefficient channels, even if there are no other policy, legal or political constraints.

Proposals for action

4. The Government should continue to focus on legislative and regulatory simplification as an enabler of e-government. It should also focus on improving organisations' understanding of the new regulatory environment by better communicating these changes. The Government should consider whether there is a need to act in support of improving organisations' ability to interpret laws and regulations, and apply them in innovative ways. The Government may also wish to examine whether there is a need for more integration of the work of the Digital Task Force and the Regulatory Simplification Unit in the Ministry of Finance.

5. Adequate mechanisms for long-term budgeting seem to be in place in Denmark. However, it is not clear to what extent organisations are using them effectively. In order to reduce risk-averse behaviours and increase confidence in using such mechanisms, the Government could better explain how these mechanisms can be used, and the potential benefits of doing so.

6. The Government should consider the adequacy of existing arrangements for systematic monitoring of ICT expenditures, and the Digital Task Force could continue with efforts (especially in communication) to improve the use of business cases for e-government, in support of improved investment decisions and better incentives for participation in e-government (see also proposal for action 22).

7. As a means of combating the "sow/harvest" problem that is seen to lead to sub-optimal levels of multi-organisation e-government initiatives, the Government should thoroughly assess the existence and nature of this problem, and consider development of a commonly applicable model for financing e-government initiatives. Such a model should cover the financing of all aspects of initiatives, including: specification, tendering, contracting, system or application development, implementation and maintenance. It should also include mechanisms for proportional assessment and allocation of costs and benefits between participating organisations and/or levels of government.

8. The digital divide is not a primary challenge or barrier to e-government in Denmark. However, the Government could consider whether, in the longer-term, wider e-government policy options and improved e-government costs, benefits and achievements would result from replacing the current approach towards the closing the digital divide in Denmark with a more active one.

Planning and leadership

The e-government vision and strategy

Denmark has been successful in developing a common vision for e-government, and in translating it into a well-defined strategy that is known across government and provides an important driver for e-government implementation. Three key features of the strategy are: 1) its relationship to wider government policies; 2) the involvement of all tiers of government in the governance, development, and implementation of the strategy; and 3) support of the strategy by a partnership between two strong ministries with complementary roles and expertise.

The e-government strategy was introduced in 2002, revised in 2004, and will run to the end of 2006. In 2003 a review of the strategy identified a number of challenges and obstacles faced by e-government. Addressing these has involved a shift from "soft" to "strong" co-ordination as the overall approach to implementation of the strategy. This shift has led to: 1) more pressure being placed on organisations to align themselves with the strategy; 2) more robust evaluation of proposals for e-government projects; 3) State ministries being required to develop ICT strategies encompassing all their departments, agencies and other sub-bodies; and 4) contemplation of increased centralisation of some aspects of e-government. Overall, implementation of the strategy has moved away from exhortation and example towards being more action and results-oriented. Of note is the fact that a more active co-ordinating and centralising role being played by organisations at the centre of government represents something of a departure from traditions and current conventions of Danish public management, which rely upon decentralisation and consensus.

The vision of the Government's current e-government strategy is that "Digitalisation must contribute to the creation of an efficient and coherent public sector with a high quality of service, with citizens and businesses at the centre". To do this, the strategy defines five e-government goals to be achieved by the end of 2006, and sets out measures of their achievement. Of particular note is the goal of 75% of e-government initiatives releasing resources for other uses.

Government organisations are generally happy with the way the e-government strategy has been developed and the goals it establishes, and have responded well to it. The strategy contains well-defined goals that have been developed with the wide involvement of organisations from all levels of government. These have acted as an important guide for the e-government efforts of individual organisations. However, they can find it difficult to evaluate whether their achievements are satisfactory. The majority of the measures set out in the strategy rely upon survey data collected by Statistics Denmark. This reliance on organisations' self-reported progress against the goals of the strategy does not

appear adequate for forming a robust and independently validated view of whether they are being adequately achieved.

Alongside the problem of the reliability of measurement data there is a second problem relating to specification of the measures themselves. For example, Denmark's e-government strategy is notable for establishing an economic goal of releasing resources for use elsewhere in government. As already noted, it states that at least 75% of digitalisation projects should release resources and at least 25% should do so to a great extent. However, there is no clarity over what is meant by "release resources", and even less about what is meant by "a great extent". Coupled with the fact that organisations are left to report their own achievements against this goal, the lack of specificity of these measures creates the potential for lower performance than is expected by the Government, and/or disputes over the level of actual achievements.

Political and administrative leadership

At the whole-of-government level, Denmark is providing strong leadership for e-government, and officials express high levels of approval and satisfaction with the way e-government responsibilities are structured and co-ordinated. The Joint Board of e-Government's approach of bringing together top-level leaders from each level of government to take responsibility for a matter of cross-cutting interest has been an innovation in Danish government that appears to have paid off. The interface between political and administrative leadership is ensured by the relationship between the Board and ministers in the Government Finance Committee, who seem to be working well together in addressing e-government issues at the national political level.

At an administrative level, the Digital Task Force and IT-Policy Centre are seen as effective leaders, facilitators and co-ordinators of e-government. The Digital Task Force has been successful in acting as a catalyst to bring interested parties together to solve problems of co-ordination and collaboration across the levels of the public sector, and its use of staff temporarily seconded from other organisations has proven to be effective in spreading awareness and best practices. Its role and expertise have been well complemented by the IT-Policy Centre in the MVTU, which has played an important role in the development of enablers of e-government (*e.g.* the digital signature, enterprise architecture and technical standards) and connecting these to wider government ICT policies.

Proposals for action

9. The Danish e-government vision and strategy has played an important role in guiding the e-government efforts of individual government organisations, and providing a platform for the leadership and co-ordination of e-government. The strategy is scheduled to be achieved by the end of 2006, and any plans to continue with a national e-government strategy beyond this point have not been announced. The Government should consider whether a further iteration of the e-government strategy would be beneficial in terms of achieving both e-government and wider policy goals and, if warranted, what the focus of a renewed strategy would be.

10. The structure of e-government leadership and co-ordination, based on the pivotal roles of the Government Finance Committee, the Joint Board of e-Government, the Danish Digital Task Force, and the IT-Policy Centre, is well established and proven to be a key success factor for e-government in Denmark. The Government should take this into account in making decisions on what kind of central leadership, if any, is needed to support e-government beyond 2006.

11. The Danish e-government strategy is notable for the explicit measures it sets out for assessing achievement of its goals, particularly with regard to e-government delivering measurable financial benefits. However, it is not clear that current approaches to measurement of the achievement of these goals will be reliable or verifiable. To ensure this clarity, and avoid creating confusion and concern among organisations that are subject to these goals, more robust means of measurement should be developed.

12. The increasingly centralised and co-ordinated approach to development of e-government, coupled with a growing willingness to make participation in aspects of e-government mandatory, are departures from the main Danish approach to public management which relies upon decentralisation and consensus. The Government should make sure that that the implications and impacts of adopting this new approach are monitored and assessed in order to: 1) identify any wider relevance, applicability and benefits it may have for public management in Denmark; and 2) mitigate any risks to overall public sector performance that may arise from adopting this approach.

Organisational change

The Structural Reform currently dominates the question of organisational change in Danish government. While not an explicit driver or goal of the Structural Reform, e-government is clearly both an enabler of the reform process and a key feature of delivering some of its objectives, such as

reorganisation of the health sector and creation of "local service centres". The Reform is also heavily influenced by the ideas informing the Government's overall drive for public sector modernisation, of which e-government is a key component.

The capacity of e-government to enable cost savings will be an important element for the success of the Structural Reform, especially in light of the Government's decision to rely on operating efficiencies to pay for it, rather than funding it directly (other than through repayable loans). This highlights the importance of building widespread awareness of how the objectives of the Structural Reform and the e-government programme are related, and how each can support the other in achievement of their respective goals.

At the level of individual organisations, it is clear that e-government is having a range of positive impacts on organisational change, the most significant of which are currently being experienced in the areas of information sharing, changes to front- and back-office business processes, changes in skills and transparency. Information sharing, in particular, is an area that is key to not only building the capacity to implement e-government effectively, but also to the ICT-enabled delivery of better, more user-focused, services. The Digital Task Force has been quite active in supporting the establishment of so-called "service communities" which bring together several agencies to focus on e-government service delivery. It is therefore notable that there has been comparatively limited effort put into developing a fully ICT-enabled environment for the exchange of information and knowledge within the public sector. Such an environment could further support the establishment and work of such groups, and others seeking to exchange knowledge and collaborate across organisational boundaries. There is, for example, no government-wide approach to information or knowledge management, and no supporting frameworks such as a common public sector intranet (for use in support of both e-government and the wider business of government). There is, however, an excellent example of what can be achieved in this area in the form of the Danish *Infostructurebase* (OIO), which supports cross-agency knowledge sharing and collaboration around technical aspects of e-government.

In terms of organisational structure, e-government has yet to demonstrate any major impact in Denmark. Any such impact would be most likely to become evident or be required at the State government level which, compared to local government, is relatively unaffected by the Structural Reform. The existence of a so-called "bunker" (silo) style of organisation has been identified by the Digital Task Force as being a major impediment to e-government.

E-government in Denmark has been having a positive impact on organisational change with regard to changing business processes. Many organisations have

seen and are acting on the possibilities it presents for them to improve both front- and back-office processes, in order to both deliver better services and improve efficiency. There are many good examples of this type of change, both at the individual and multi-organisation levels.

In terms of its impact on organisational culture, values and skill requirements, e-government has so far only had a limited effect. It is reported to have had a positive impact on the overall transparency of government processes, but has yet to lead to the desired level of change in the way that people communicate, both with and within government. Despite the great success of the *eDay* initiative, the majority of communication is still occurring in non-digital ways. Within government this may be attributable to widespread resistance to

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13. The Government should consider whether there is a need to put in place measures to better communicate to government organisations: 1) the relationship between e-government and the Structural Reform; and 2) the role of e-government in supporting the Structural Reform through enabling strengthened governance arrangements, improved communication, enhanced collaboration across levels of government, delivery of more user-focused services and greater cost-effectiveness.

14. The Government should consider steps to strengthen the use of ICT as a tool to improve knowledge diffusion and increase collaboration across government. As a first step, the Government could consider building on established co-operation frameworks such as existing "new service communities" by expanding their mandate to include supporting the creation of ICT-enabled learning networks within their respective areas of responsibility. It could also consider whether there is a need for development of additional frameworks (*e.g.* a public sector knowledge management strategy) and/or infrastructures (*e.g.* a public sector intranet) in support of enhanced information and knowledge management, and increased collaboration on both e-government and the wider business of government, both within and between organisations.

15. In order to enable and encourage the supply of ICT skills which better match the requirements of government organisations, the Government could examine whether there is a need to improve demand and supply of ICT skills through: 1) improved communication of currently available public and private ICT learning resources; 2) establishing content that meets market requirements in existing ICT curricula of both private and public institutions; and 3) ensuring the ongoing development of ICT curricula in line with both organisations' and employees' needs.

change – a problem regarded by many people interviewed for this review as being the biggest barrier to e-government-enabled organisational change that they currently face.

While some of this resistance is no doubt the predictable reaction of organisations to changes of the type and magnitude that e-government allows, some may also be due to issues related to the impact that e-government is having on organisations' skill requirements. Aside from a self-acknowledged lack of ICT and e-government skills among the top level of Danish government officials, there appears to be a shortage of people with either the technical and/or business skills needed to effectively fill other e-government related roles in government organisations. Some of this may be due to a fragmented approach to development of ICT curricula and provision of training by the education sector (both public and private). To the extent that it affects the overall capacity of Danish government organisations to implement e-government, this lack of skills is a significant issue.

Common frameworks and collaboration

Collaboration on e-government is well advanced in Denmark. Interviews with officials revealed a strong commitment to the concept and practice of collaboration, and general satisfaction with the way the supporting policy and operational environment enables this type of behaviour. Because Denmark has put significant effort into developing leading examples of this aspect of e-government it is covered in considerable depth in both this summary and the main body of the report.

Supporting collaboration 1: Co-ordination of e-government policies and projects

Overall, Denmark's current arrangements for top-level co-ordination of e-government have made a significant contribution to its achievements, and there is strong support, both within and outside government, for continuation of these arrangements beyond 2006. Although no major problems have surfaced, there does seem to be room for further clarification of institutional responsibilities, and reduction of any duplication of roles among those organisations providing co-ordination.

Since revision of the e-government strategy in 2004, there has been a notable increase in efforts to develop all-of-government co-ordination frameworks and common ICT infrastructures, particularly the Danish enterprise architecture and its associated technical standards. While there is almost universal agreement and acceptance of the need to base the public sector's use of ICT on these mechanisms, there has not yet been a uniform move by organisations to align with and implement them. As noted above, a significant number of

commentators are suggesting that adoption of these frameworks should become mandatory. Some consideration of incentives organisations face in this regard may also be warranted.

Supporting collaboration 2: Common ICT infrastructures

Denmark has also been active in developing common ICT infrastructures that support e-government collaboration. Two particularly interesting examples of such systems outlined below are the Civil Registration System (CRS), and the Public Key Infrastructure (PKI).

The Civil Registration System

The Civil Registration System (CRS) is an example of how public registers have developed into a consolidated ICT infrastructure that provides Danes with a personal identification number used for dealing with government. The entire public sector uses these identification numbers and the CRS for many administrative purposes. It is also used for a variety of reasons by the private sector (under tightly proscribed arrangements).

The CRS is a core part of the e-government environment, providing Denmark with a significant advantage in developing more user-focused services. The long-standing existence of the CRS has had two other major benefits. First, it has readied public servants for the introduction of e-government by getting them used to relying on common stores of data that have been developed on the basis of a "collect once, use many times" principle. Second, it has enabled Danes to develop high levels of experience and trust in government's ability to collect, store and use their personal information without compromising their privacy, preparing them for wider introduction of data sharing in support of e-government.

Public Key Infrastructure (PKI)

To date, PKI implementations in OECD countries have been challenging due to their complexity, risk and high costs, which become especially acute when the size of the PKI user base is expanded beyond relatively small numbers. It is an area of e-government where some significant failures have been seen in recent years. This is not the case in Denmark, which has recently implemented a working PKI and is using digital signatures in delivering services to both individuals and businesses.

Digital signatures are now also being used by both citizens and businesses to access a growing range of e-government services, and uptake is constantly increasing. A goal of the current e-government strategy is that, by 2006, at least 1.1 million digital signatures will be issued to citizens and businesses. While it is not certain that this goal will be achieved, progress towards it is nonetheless impressive; by September 2005, 425 817 digital signatures had been issued.

PKI has become a widely understood and accepted part of the common e-government ICT infrastructure. Particularly as a result of the *eDay2* initiative led by the Digital Task Force in early 2005, there is now near universal adoption of digital signatures by government organisations. However, evidence suggests that it may be worthwhile to invest in providing them with further information, guidance, education or other forms of support in this area of e-government.

Two major strategic issues exist in relation to the PKI. First, there is the Government's decision to use a PKI developed by TeleDanmark A/S (TDC), rather than the system proposed by the consortium of Danish banks that was the other major party in the tender process. The banking consortium went on to develop its own PKI-based security and authentication system called Net-ID that is available to some 2.1 million customers, but is currently incompatible with the public sector PKI. Opting to build the PKI provided by TDC was clearly a difficult policy choice, and one that is still the subject of discussions between government and the banking sector regarding long-term strategic issues and consumer interests relating to alignment between public and private PKIs and digital signatures in Denmark. This could possibly be achieved through mutual recognition of public and privately issued signatures. Government is willing to recognise privately issued signatures as long as they comply (as appropriate) with the standards specified in Denmark's electronic signature legislation.

The second issue is that of uptake of digital signatures. Challenges experienced in implementing the PKI have contributed to slower uptake than desired – especially among businesses, for which more PKI-enabled government services are currently available than for citizens. Successful efforts to counter this through a telemarketing campaign aimed at businesses have been made, but more may yet be required. With regard to achieving greater uptake of digital signatures by citizens, two key challenges are: 1) the need to develop useful e-government services to drive use of the signatures; and 2) the fact that the architecture of the PKI does not allow for development of PKI-enabled services designed to be delivered on mobile platforms. While not yet a real problem, it is expected that this situation will become problematic as demand for mobile e-government increases over the medium- to long-term.

Supporting collaboration 3: Common frameworks

Danish enterprise architecture

This architecture provides the common conceptual framework for design of ICT solutions in the Danish public sector. Its fundamental purpose is to harmonise individual organisations' decisions about ICT so as to achieve interoperability of government information and systems – a precondition for creating the more efficient, coherent and user-centric public sector targeted by the Danish e-government vision. To implement the architecture, the Danish

government has developed an e-government interoperability framework that documents selected standards, technologies and protocols that give effect to the architecture.

Beyond simply developing these frameworks, Denmark has made sure that they are well communicated and easily accessible to those who need to use them. Denmark has put significant effort into this aspect of e-government, and overall these efforts are seen as an area where the collaborative e-government efforts of the public sector are well supported. However, issues raised by officials included concerns that: 1) many people working to implement the architecture find it abstract, and hard to understand and translate from theory into practice; and 2) while municipalities are solidly committed to the concept of enterprise architecture and common standards, their heavy reliance on one ICT vendor that provides them with many proprietary (*i.e.* non-standard) systems significantly slows their adoption of standards, and therefore the rate at which collaborative e-government goals can be achieved.

Counterbalancing these concerns, there was also frequent mention of a concern that organisations are not yet putting enough effort into achieving the desired goal behind developing these frameworks by applying them to the redesign of their services and business processes, and in developing common e-government IT systems and applications. The five main explanations advanced for this were:

- Development of the architecture and standards has so far mainly involved ICT specialists across government, with comparatively limited involvement of people responsible for broader management of service delivery, policy development or public management.
- Despite its work with new service communities, the Digital Task Force has not placed sufficient emphasis on facilitating organisations' adoption of the enterprise architecture and related frameworks.
- Organisations' use of these frameworks lags behind their actual development simply because of their relative newness, and the need to develop the awareness and skills required to apply them within and between organisations.
- Given their complexity, more guidance on how these frameworks relate to achievement of e-government objectives, and how they can be used to enable collaboration, would be useful.
- Adoption of the frameworks is voluntary.

Whatever the reason, these frameworks are obviously key platforms for supporting e-government collaboration in Denmark. However, they will only deliver benefits to the extent that they are actually applied by organisations. The consultative processes that have been used to develop the frameworks

have been a good innovation that could perhaps now be extended to include more engagement with people responsible for service delivery in agencies, alongside the more technically oriented people who have been the predominant participants to date.

Supporting collaboration 4: Local government common systems and frameworks

In addition to systems and frameworks for supporting collaboration across the entire public sector, there are also significant developments at the county and municipal levels. At the county level, the most significant work has occurred in developing common ICT infrastructures used in the health sector, where the Structural Reform is driving a major challenge of reducing 15 county health care systems to five regional ones.

Municipalities

Two features of Danish municipalities that have heavily influenced their development of e-government are: 1) the fact that they have traditionally operated independently of one another; and 2) in many cases their small size has limited their financial and human resource capacity to adopt and use ICT. As a consequence, at the municipal level there are few common ICT systems and frameworks that have been developed by municipalities themselves. However, a majority of the systems and services used by municipalities are provided by a company called KommuneData (KMD), a 100% publicly owned company created by municipalities and counties in 1972. This is a situation of considerable strategic importance to Danish e-government, due to the large role local government plays in government service delivery.

Although recent changes to the governance of KMD have helped clarify its standing in relation to supply of ICT to municipalities, by all accounts it remains so dominant a player that is has a virtual monopoly position in many product or service areas.

Many of the systems that KMD provides to municipalities can be described as "legacy" systems that many Danish commentators feel impose a fundamental limit on the ability of municipalities to fully embrace and deliver e-government. A wide range of often contradictory and polarised views were expressed, including:

- KMD uses its position of market dominance to lock municipalities into use of outdated, expensive, and non-interoperable (in terms of their alignment with the Danish enterprise architecture) information systems. It is also seen to be unresponsive to customer demands, due to the fact that it faces little or no competition in many areas.

- Municipalities' heavy reliance on KMD has led them to under-invest in developing the knowledge and skills necessary for effective and independent participation in e-government.
- The existence of KMD is a vital element of successful implementation of the Structural Reform, as it will both provide for continuity of municipal operations while mergers take place, and support changed administrative functions through various "Structural Reform Packages" that many municipalities will rely upon as the basis of their ICT environment during and beyond the reform process.
- Widespread reliance on KMD allows for more cost-effective development of municipal ICT systems and applications, especially due to economies of scale. It also allows for more consistent levels of front- and back-office service provision, which supports better user-outcomes.
- KMD distorts the structure of the municipal ICT market, which reduces competition, lowers quality, and inhibits innovation. This situation is said to be contrary to general Danish competition policy, and also to the Government's plans to make the ICT industry as competitive as possible.

The bias of comment was heavily towards the negative, although commentators consistently noted that the effect KMD has on municipal e-government is complex. On one hand, they cited the usual downside effects of monopoly while, on the other, acknowledging benefits such as the fact that KMD has provided the necessary ICT capacity to allow for relatively uniform implementation of many different municipal e-government systems, applications and services. There was widespread criticism of KMD's ability to deliver solutions that were compatible with the common e-government frameworks being developed in Denmark, although it is important to acknowledge that this type of problem can arise not only from issues of market structure, but also from the simple fact of technological evolution. There was also significant criticism of KMD focused on the obstacles it is seen to present to adoption of open-source software in government, which independent reports have said could save the Government several billion DKK per year.

KMD seems to be responding to these criticisms. It remains to be seen how these moves will impact the big question of how the present structure of the market for supply of ICT to municipalities is affecting development of e-government and/or the competitiveness of the ICT industry in Denmark. Irrespective of whether this situation is seen as being strictly a matter of either e-government or competition policy, or a combination of both, it is clearly a matter to which the Government should pay serious attention.

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Proposals for action

16. Collaboration between government organisations is a key to achieving Denmark's e-government goals. Much effort has been put into providing co-ordination, and common ICT infrastructures and frameworks in support of better collaboration. While resources are still committed to their ongoing development, it is now important that these frameworks be widely translated by individual organisations into e-government systems, services and processes. The Government should examine the adequacy and/or efficacy of incentives that exist for government organisations to adopt or align with these e-government frameworks, and alter them as required. In particular, in relation to the Danish enterprise architecture and associated technical standards, the Government should examine issues around translating these from concepts into actual implementations, and consider what actions can be taken to address them.

17. Denmark has made a significant commitment to the use of public key infrastructure (PKI) for both security and authentication purposes. In order to achieve maximum advantage from its development of a PKI at this stage in its development, the Danish Government should:

- Consider whether to provide government organisations with further information, guidance, education or other forms of support in their use of the PKI.
- Continue to market digital signatures to businesses, ensure there is an adequate approach available for assessing user demand and priority for PKI-enabled services and, where appropriate, push forward with development of such services.
- Focus on the challenges of making PKI-enabled applications available on mobile platforms.

18. The Government should, in partnership with Local Government Denmark, commission a major independent review of the impact that KMD is having on implementation of e-government and other government strategies and policies, and the wider effects current arrangements have on the competitiveness of the Danish ICT market.

User-focus

The Danish vision for e-government is clearly citizen- or user-focused, and service delivery at all levels of Danish government (whether on- or offline) is inherently user-focused. For a variety of reasons, while there is a pervasive commitment to delivery of user-focused services, many public servants do not regard using e-government to make improvements in this area as a top priority.

Research into user needs and priorities

Danes are among the highest users of the Internet in the world, with both individuals and (especially) businesses making significant use of the Internet for dealing with government. Despite this, individual government organisations are not putting a great deal of effort into ascertaining the demand for e-government services.

Through Statistics Denmark, there is a significant body of relevant statistical information about the Danish information society and economy, supplemented by research undertaken by some key ministries into factors affecting the demand for, and use of, ICT in the public sector. This research shows both a strong demand for more and better e-government, and ways that improvements in quality (including through making offerings more user-focused) can be achieved. This research is being used to improve the user-focus of Danish e-government, but it can also be used for other purposes. A number of major recommendations resulting from a recent study of qualitative aspects of e-government undertaken by the MVTU are currently under consideration. It is not clear that all government organisations are aware of this research and/or how it can help make their own e-government efforts more user-focused. There is no comparable research at the county or municipal levels, and Denmark has not formalised this type of research as an ongoing element of its e-government programme.

While Danish organisations clearly regard development of user-focused e-government as being important, this attitude appears to be driven more by the Danish Government than by individual citizens and businesses. Many organisations' efforts to assess demand for e-government are relatively unsophisticated, giving them limited ability to understand what users' actual needs and priorities are. No common frameworks or tools are available to assist them in this area. Despite this, organisations are aware of how a lack of user-focused services can constrain demand for e-government, and most have included improvement in this area as a goal in their e-government strategies or plans. However, many organisations need to take a more proactive approach to understanding and responding to user needs and demands.

Providing user-focused access to e-government

Denmark has neither explicitly directed nor provided guidance to organisations on how they should deliver e-government; for example through some form of "channel management" or "multi-channel service delivery" strategy. There is a large and growing number of Web sites (over 2 000) in service in the Danish public sector, none of which are subject to any formal or mandatory design guidelines. There is potential to present users with a bewildering and inconsistent array of options for accessing (e-)government, and also to fail to achieve the most efficient and effective use of the Internet as a delivery channel.

Portals are potentially a much more user-oriented way of delivering online information and services than individual Web sites. Danish government makes wide use of portals, and survey results indicate that this will increase. There is no overarching government policy or strategy regarding either the development of portals or the participation of various government organisations in them. In this absence, Denmark has developed a disparate and overlapping array of portals that feature different technical and information "architectures", and present their users with widely varying approaches to visual design and navigation.

The lack of an overarching approach to the development and operation of portals (and potentially also organisation-level Web sites) – either as a stand-alone initiative or as part of a wider "multi-channel service delivery" strategy – may be having a negative effect on both the degree of user-focus that can be achieved by each individual portal, and the overall coherence and user-focus of government services that is a goal of the Danish e-government strategy. It may also be having a negative effect on the efficiency of resource use in government.

E-government and offline service delivery

The plan to establish "local service centres" as part of Denmark's Structural Reform is a clear demonstration of the level of political commitment to user-focused government that exists in Denmark.

The proposal, which enjoys strong support within the public sector, will depend upon advanced e-government for its effective implementation – especially in the areas of information exchange and business process redesign between different services areas, and across levels of government. Several steps that will be taken to implement the new service centres will also benefit the ongoing implementation of e-government.

Once in operation, the service centres will function in a way similar to an Internet portal. Given the strong dependence of the service centres upon e-government, along with concerns about the potentially negative effect of the large number of existing Internet portals, it is interesting that the Government has not yet considered developing an overall approach to user-focused service delivery that explicitly links on- and offline modes of delivery.

Enabling participation in government

Participants in the OECD survey for this review indicated low levels of user-demand in areas of e-government involving consultation or participation. This does not mean that the Government has no goals in the broad area of "e-engagement" of its citizens or that government organisations have not taken steps in this direction. However, it is not a very prominent element of the Danish e-government programme, and may be an area that the Government wishes to pay more attention to in the future.

Proposals for action

19. The Danish Government is clearly committed to increasing the delivery of user-focused services, and to generally making government more citizen-centric. However, in the area of e-government it appears that more understanding of this goal is required, and that a more committed and proactive approach to its achievement could be taken, both at the whole-of-government and individual organisation levels. Measures that the Government should consider adopting include:

- Implementing an ongoing programme of research into user needs, priorities and experiences of e-government.
- Supporting improvement of individual organisations' ability to assess e-government needs and demands – possibly through developing common frameworks or tools to assist them.
- Requiring that all government organisations make basic information about themselves (function, contact details, etc.) available online, following agreed-upon data fields.

20. Denmark's commitment to delivery of user-focused government services covers both on- and offline channels. There is, however, no clear government-wide strategy focused explicitly on service delivery through online channels, and no strategy linking the use of on- and offline channels. The absence of such a strategy may be diminishing the results of both the e-government programme and other initiatives to make government more user-focused, and hindering improvements in both efficiency and effectiveness. To address this, the Government should consider:

- Building on the *Top of the Web* initiative by developing a common "design manual" for all government organisations to follow in developing Web sites and portals, possibly including a best practice approach to designing and delivering user-focused e-government services. As a first step, the Government could undertake a review of current public sector Web sites and portals to see how many exist and what functions they support, and to evaluate how well they are designed from their users' perspective.
- Development of a single portal for citizens, perhaps as part of a national strategy for government portals.
- Development of a government-wide multi-channel service delivery strategy, building on the potential improvements to user-focus that will be achieved by the Local Service Centre initiative.

21. E-government in Denmark has so far been heavily focused on issues of service delivery and improvement in public sector efficiency and effectiveness. There has been much less attention paid to the question of how, within a national culture characterised by consensus and a context of generally positive attitudes towards government, e-government can influence peoples' participation in government. As part of a possible wider examination of the future direction of its e-government programme, the Government could look closely at the opportunities, costs and benefits of taking more concrete steps in this area of e-government.

Monitoring and evaluation

Denmark has set clear e-government targets for all public sector organisations, and backed these up with measures for assessing achievement of the targets. Organisations, while having some concerns over how achievements will be measured, have found these targets helpful. However, the effect of monitoring and evaluation against the targets is yet to be seen. It is not clear how monitoring will relate to achievement of goals, and how the results of monitoring will be used to inform future e-government developments or to manage organisational performance. It is also not clear what consequences there are for non-participation, either in the overall achievement of the strategy, or in its various objectives and initiatives (*e.g.* uptake of interoperability standards).

E-government initiatives in Denmark are not generally proposed, monitored and evaluated on the basis of a sound and consistently applied approach to developing a business case detailing their expected financial, economic and social costs, benefits and risks. This problem, which is widely believed by government organisations to have a negative effect on the overall quality of e-government projects, has been addressed in the current e-government strategy. Some tools to assist organisations in improving their performance in this area have been developed by the Digital Task Force and the Ministry of Science, Technology and Innovation. However, their use is not mandatory, and they require further development and communication.

Overall, there is an apparent lack of demand and supply of rigorous monitoring and evaluation of e-government, either by the Parliament or the Government, which stands in contrast to the practices of many other OECD countries. Monitoring and evaluation of e-government is a largely discretionary activity given relatively low priority by many Danish government organisations. The monitoring and evaluation work being undertaken is biased towards individual organisations and the users of their services, and is undertaken internally rather than externally to a very significant degree. Results of monitoring and evaluation are not widely diffused outside most organisations, and there appears to be little external demand for this type of information. It should be noted, however, that the question of robust *ex post* evaluation of e-government is just starting to emerge as a major issue in leading OECD e-government nations. Any efforts Denmark might make to improve its performance in this area would be in advance of the majority of its peers.

There has been no explicit monitoring of e-government by the National Audit Office (NAO) so far. This means that the Parliament is not as strongly positioned to exercise its role in ensuring the accountability of the executive for achieving e-government goals as it could be, and the public has little

independent information available about the progress of e-government. If the NAO or any other body does conduct an audit of e-government, it is important that its approach be congruent with both the objectives and design of the e-government strategy, in order to ensure that the Parliament is not provided with spurious assessment of the Danish e-government programme.

Finally, there is a proposal to establish an independent municipal "evaluation institute" as part of the Structural Reform. There is strong consensus that this should contribute to improved performance of local government. However, it is not clear whether the institute will focus on e-government as part of its activities. It would seem sensible that, if e-government is to become an area of focus for the new institute, then the approach taken should reflect awareness of the whole-of-government context for local e-government efforts, and be designed to support collaboration across different levels of government.

Proposals for action

22. While the Danish e-government strategy sets clear e-government targets and backs these up with measures for assessing their achievement, there is still considerable room for improvement of both the *ex ante* and *ex post* monitoring and evaluation of e-government. To achieve this, the Government could:

- Strengthen the demand and supply of e-government monitoring and evaluation by requiring that more information be provided to ministers and the public.
- Increase the priority and resourcing of work to develop and communicate common tools for development and evaluation of e-government business cases.
- Consider measures designed to ensure the consistent application of e-government business case tools, including the possibility of explicitly linking business cases to funding for e-government initiatives, or some form of mandatory requirement that robust business cases be developed for all e-government initiatives.
- Consider inclusion of e-government in the work of the "independent evaluation institute" proposed as part of the Structural Reform.

23. It is important that the Parliament be strongly positioned in exercising its role of ensuring the accountability of the executive for the e-government programme. The Government should note the limited information being made available to the Parliament in support of this role, including the fact that the National Audit Office has not undertaken any explicit audit of e-government. It should also note that, if such an audit were to be undertaken, it would be important to ensure that the approach taken was congruent with the objectives, design and *ex ante* indicators established for the Danish e-government strategy.

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Chapter 1

E-government Context and Structure

There is a favourable environment for development of e-government in Denmark. Past and present governments have placed strong policy emphasis on making the best possible public and private sector use of ICT, in pursuit of both social and economic goals. As part of the Government's broader focus on the use of ICT in the economy and Danish society, e-government enjoys good, albeit indirect, political support. While e-government has not in itself been a "headline" policy of the Government, it has been clearly positioned as a key element of policies aimed at developing the Danish information society, modernising and increasing the efficiency of the public sector, and improving the performance of the economy. It has also been regarded as an enabler of the upcoming reforms of the administrative structure of the Danish public sector (the "Structural Reform") that are based on the recommendations of the Danish Commission on Administrative Structure.

The Kingdom of Denmark lies between the North Sea and the Baltic Sea on the European continent. The Danish mainland occupies the "Jutland" peninsula. The capital of the country, Copenhagen, is situated on the island of "Sjaelland" or Zealand, the largest of the 483 islands that make up "mainland" Denmark. Greenland and the Faroe Islands are also part of Denmark.

Denmark is home to 5.3 million people, the vast majority (85%) of whom live in urban areas. Culturally, the country is fairly homogeneous. The Danish language is spoken throughout the country. However, there is a small German minority near the border.

The standard of living in Denmark is high. The country ranks seventeenth among the 177 countries that made up the United Nations Development Programme Human Development Index (HDI) for 2004.

Denmark has a relatively small and open economy. Around 70% of foreign trade is with EU countries. The remainder covers a large number of trading partners, of which the United States and Norway are the most important.

Almost three-quarters of the Danish workforce is employed in the service sector: 31% in the public sector and 41% in private business (including the traditional shipping trade). Industry and construction employ about 24% of the population. The traditional sectors of agriculture and fisheries account for a mere 4% of the workforce.

Figure 1.1. **Map of Denmark**



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1.1. E-government context

Government policy and leadership

Denmark has employed ICT in government for several decades, and has a long history of instituting policies and programmes focused on effective use of this resource. The first notable move in this area was the establishment, in 1959, of a publicly owned IT services company called *Datacentralen*, which provided State government organisations with a wide range of data processing and information systems design and operations services until its sale to Computer Sciences Corporation Denmark in 1996. Public ownership of ICT providers is still a major feature of the local government context for Danish e-government, aspects of which are examined in depth in Chapter 6.

During the 1970s and 1980s, following a pattern common in OECD countries, Denmark focused mainly on achieving efficiencies through process automation. A good example of this type of development was the introduction, in 1970, of the Central Income Tax System, which enabled collection of income tax directly from employers, and became increasingly automated over the course of several years. The 1990s brought a shift towards exploiting the power of ICT to develop what was referred to as e-government by the later part of the decade. Today the Government is pursuing a vigorous e-government programme spanning the whole of the public sector.

There is a favourable environment for development of e-government in Denmark. Past and present governments have placed strong policy emphasis on making the best possible public and private sector use of ICT, in pursuit of both social and economic goals. As part of the Government's broader focus on the use of ICT in the economy and Danish society, e-government enjoys good, albeit indirect, political support. While e-government has not in itself been a "headline" policy of the Government, it has been clearly positioned as a key element of policies aimed at developing the Danish information society, modernising and increasing the efficiency of the public sector, and improving the performance of the economy. It has also been regarded as an enabler of the upcoming reforms of the administrative structure of the Danish public sector (the "Structural Reform") that are based on the recommendations of the Danish *Commission on Administrative Structure*.

While Denmark does not have a specific ministerial portfolio for e-government, it has placed overall responsibility for Danish ICT policy (covering citizens, businesses and the public sector) with the Ministry of Science, Technology and Innovation (MVTU). In 2001, following a review of the public sector's progress in developing e-government, the Ministry of Finance established both the *Joint Board of e-Government* and the *Danish Digital Task Force* to increase the focus being placed on overall e-government leadership,

planning and co-ordination. These bodies now work on e-government in close co-operation with the MVTU.

The Danish political system is characterised by a culture of compromise and consensus, and there are good opportunities for public participation in the political process at both the national and local levels of government. This tradition of compromise and consensus influences the culture and operation of the public sector.

Public sector structure and management

The Danish public sector is divided into State and local government. State government comprises both national and local functions and services. The structure of local government is based on a two-tier system of counties and municipalities, with each municipality "belonging" to one of the counties. However, the general rule is that municipalities are not subordinate to counties – both have their own spheres of responsibility.

The Danish public sector is notable for its decentralised structure and management. Counties and municipalities have a high degree of political and administrative autonomy from State government. Local government independence is established in the Danish constitution, and many administrative powers and functions are delegated to this level. As a consequence, local government plays a comparatively large role in the delivery of public goods and services. This allows for relatively close relationships between government, citizens and business – something that e-government benefits from and seeks to build on (the organisation and functions of the public sector are outlined in detail in Annex B).

Despite the high degree of local government autonomy, Denmark's national e-government programme successfully manages to encompass all levels of government. While remaining independent from State government, local government's strong involvement in, and commitment to, the national e-government programme is a positive indicator of how the consensus culture of the public sector has supported the Danish e-government programme to date.

Economy and society

The Danish economy is strong, with high per capita GDP and the most equal income distribution among OECD countries, partly because of Denmark's comprehensive welfare state. Given an ageing population, a key economic challenge is to maintain growth in living standards while preserving the social welfare system. One way that the Government aims to meet this challenge is by restraining growth in public expenditure through a variety of measures, including improved public sector use of ICT. As a result, increasing efficiency in government is a clear goal of the e-government strategy.

Socially, Danes exhibit the highest levels of satisfaction with the way their democracy works of all EU citizens. People have high levels of trust in government, which is notably transparent and free of corruption. The public sector appears to benefit from these attitudes which, combined with general satisfaction with public services, support Danes' overall willingness to interact with the State. This is shown, for example, by their willingness to provide personal information to central registers of personal information. These factors contribute to the positive environment for e-government implementation.

Key point 1.1

Denmark has a very favourable environment for the implementation of e-government. Positive factors include:

- ***Emphasis on effective use of ICT has been a feature of government policy for several decades.***
- ***There is strong political and administrative leadership and support of e-government.***
- ***A culture of compromise and consensus exists in the public sector, supporting involvement of all levels of government in e-government.***
- ***E-government is not a stand-alone policy. Instead, it is positioned as an enabler of other important policies.***
- ***Local government has an independent, but fully engaged and co-operative, involvement in the leadership and implementation of e-government.***
- ***Local government delivers many public services, supporting close government-citizen relationships.***
- ***There is a high level of public trust in government.***

1.2. The Structural Reform

Between 2005 and 2007 the Structural Reform, which will introduce sweeping changes to the structure and responsibilities of the public sector, will be the dominant factor in the environment for e-government. These reforms will impact both State and local government, but will have the most effect at the local level. The Structural Reform is based on the recommendations of the *Commission on Administrative Structure*, which convened in 2002. Some of the key objectives of the Reform are:

- Ensuring that the public sector is open and responsive, uncomplicated and efficient.

- Providing citizens with greater choice of services, and better value for money.
- Ensuring that the design and operation of the public sector is citizen-centric and allows for dialogue between citizens and politicians.
- Supporting the principle of decentralisation as a key factor in meeting local needs, and in building the broad democratic foundation of government.

The resulting *Agreement on a Structural Reform* (2004) defines a new public sector structure and set of roles:

- State government will continue to establish the general framework of government and deliver some public services.
- 271 municipalities will merge into 98 larger bodies providing the majority of government services, and become the primary point of access to the public sector for citizens and businesses.
- 14 counties will consolidate into 5 new regions with reduced responsibilities focused mainly on delivery of secondary health services (*i.e.* provision of hospitals), regional development and some major operational tasks. These regions will lose the counties' powers of taxation.

The Structural Reform goals of making government more coherent, user focused and efficient are congruent with the goals of the Danish e-government strategy, and the long-term success of the Reform will be influenced by application of e-government at all levels of government. Officials interviewed for this review regarded the Structural Reform positively, seeing it as both a major opportunity for e-government to contribute to the Government's wider goals, and a potential challenge for e-government due to the risk of divided attention and resources. There was, however, a particular concern that the costs of changes to local government ICT systems that will be driven by the Structural Reform may have been underestimated in the planning of the Reform.

The Government is planning to fund the costs of these ICT changes through savings enabled by the Reform (*e.g.* increased economies of scale). However, actual achievement of such savings implies a need for municipalities and counties to be able to identify a net benefit in making these changes. If they cannot, they will face weakened incentives to invest in e-government and reap any available benefits in the form of either better services or increased efficiency. Any failure to achieve these savings, or to ensure that they are not exceeded by the costs of change, could undermine the success of the Reform and/or limit or slow achievement of e-government objectives.

There is reasonable evidence demonstrating that the type of savings the Government expects are achievable. A study undertaken by KMD (KommuneData – the major publicly owned supplier of ICT services to municipalities) on the costs of a "mini structural reform" on the island of

Bornholm, where five municipalities were merged into one in 2003, showed one-time ICT costs of 34.6 million kroner (DKK) while ongoing ICT savings were evaluated to be around DKK 33.5 million per year. This analysis gives a good basis for the Government's confidence in the ability of local government to self-fund ICT costs arising as part of the Reform. However, the Government has also made provisions for helping local governments to move forward by setting aside, as part of local government funding for 2006, a sum of DKK 1 billion from which counties and municipalities will be able to borrow to cover up-front ICT investments.

In addition to concerns over financial aspects of the Structural Reform, officials also expressed apprehension that, because e-government is not explicitly addressed as part of the Structural Reform, an opportunity to increase achievement of e-government goals within and across the different levels of government may have been diminished, or lost.

Key point 1.2

Between 2005 and 2007, the Structural Reform of the Danish public sector will have a significant influence on development of e-government in two main ways:

- ***It will further increase the role of local government in service delivery, and is expected to make government more user-centric.***
- ***The process of change will demand significant commitment of senior leaders' attention, and considerable resources. This has the potential to deflect leadership and resources away from e-government.***

E-government is seen as an enabler of the Reform and of some of its outcomes – particularly efficiency savings. There are concerns that the costs of change to ICT systems have been underestimated.

1.3. Top-level organisation of e-government

Until 2001, all national ICT and e-government-related policy strategies were formulated by the Ministry of Science, Technology and Innovation (MVTU). However, consistent with Denmark's decentralised approach to public management, implementation of e-government was (and still is) a responsibility shared by virtually every Danish government organisation.

However, as noted above, in 2001 administrative responsibilities for e-government were augmented by inclusion of a major focus on e-government as part of the functions of the Ministry of Finance. Key reasons for this change,

which broadened the public sector's focus on e-government from being grounded purely in ICT-related issues and policies, were:

- Perception of a need for a greater overall drive towards e-government, within a wider context of public policy issues and goals.
- Recognition of government organisations' need for increased support and assistance in the form of government-wide co-ordination and solutions in some areas of e-government.
- A need for achievement of a better return on investment from e-government projects.

A key part of the context surrounding this shift was the *Digital Administration* project undertaken in 2001. This project arose from the process of forming agreements between the Government and local authorities concerning county and municipal budgets for 2001. Leaders agreed to set up a joint State and local government committee to look at the potential for "digital administration" (*i.e.* e-government) to enable delivery of better and cheaper public services, and to improve internal administrative procedures. The findings of the committee provided an important analytical bridge between the ICT and early e-government policies of the 1990s and the re-organised approach implemented from 2001 onwards.

Today, there are two organisations with principal responsibility for e-government across the public sector – the Danish Digital Task Force situated in the Ministry of Finance, and the IT-Policy Centre in the MVTU. Together, their work is focused around what is called *Project e-Government*. The shift is significant – the Ministry of Finance has a broad focus on matters of public administration policy and operations, and substantial economic and bargaining powers in relation to the rest of the public sector, both of which augment the strengths in public sector ICT policy and technical development that the MVTU brings to e-government.

Project e-Government

Scheduled to run from 2001 to 2006, *Project e-Government* is the national programme involving both State and local government in a co-ordinated push for e-government across the public sector. The project is under the leadership of the *Joint Board of e-Government*, which is a uniquely Danish arrangement for overall administrative steering of a national e-government programme. Chaired by the Permanent Secretary of the Ministry of Finance, the Board's membership consists of the permanent secretaries of five other State government ministries and the managing directors of Local Government Denmark and the Danish Regions. The relationship between the Board and

ministers is outlined in Chapter 4. The work of the Board is supported by both the Digital Task Force (which also serves as the secretariat to the Board) and the MVTU's IT-Policy Centre.

Established as part of the first e-government strategy published in January 2002, the prime functions of the Board are to:

- Create the right conditions for e-government.
- Develop an overview of e-government and transmit knowledge about it across government.
- Assure progress in e-government implementation.

While the Joint Board is responsible for leadership of e-government it does not have any formal powers to decide how, where or when government organisations will implement e-government (other than for Board members' own organisations). Instead, any power it does possess is directly derived from its ability to facilitate agreement among organisations to act in certain ways (*e.g.* in the adoption of standards, or participation in initiatives such as *eDay*, which is detailed in Chapter 4 and Case Study 2 of this report). In interviews, officials frequently suggested that progress with e-government would improve if more aspects of the e-government programme were made mandatory. For example, many people felt that mandatory adoption of the Danish enterprise architecture would be advantageous, because it will only fully achieve its desired effect once all organisations have aligned themselves with it. However, this did not translate into a call for the Board to be granted a mandate for decision-making in these areas. Rather, interviewees indicated that these sorts of decisions should be made by ministers.

As discussed in Chapter 4, any moves towards greater levels of centralised direction over how Danish government organisations should implement e-government should be considered in light of how this would fit with current Danish public management traditions and practices. If changes are made, it will be important to base them not only on a technical analysis of what is required to achieve e-government goals, but also assessment of how such changes may affect, or be affected by, the organisational culture of the Danish public sector, and of any implications this may have not just for e-government, but also for wider aspects of government performance in delivering public services.

The Digital Task Force

The Digital Task Force is responsible for improving co-ordination and co-operation on e-government across levels of government. It is an unusual organisation for Danish government, as it draws the majority of its staff from State and local government organisations using secondments of approximately one to two years duration.

Aside from supporting the Joint Board, the role of the Digital Task Force, as outlined in the current e-government strategy, is to:

- Promote the spread of e-government by providing information on the aims and content of the e-government strategy.
- Carry out cross-cutting follow-up and co-ordination on behalf of the Board.
- Contribute process skills to projects prioritised by the Board.
- Maintain ongoing monitoring of the need for cross-cutting initiatives, and propose these to the Board.
- Carry out projects in selected focus and business areas in co-operation with interested parties.

IT-Policy Centre

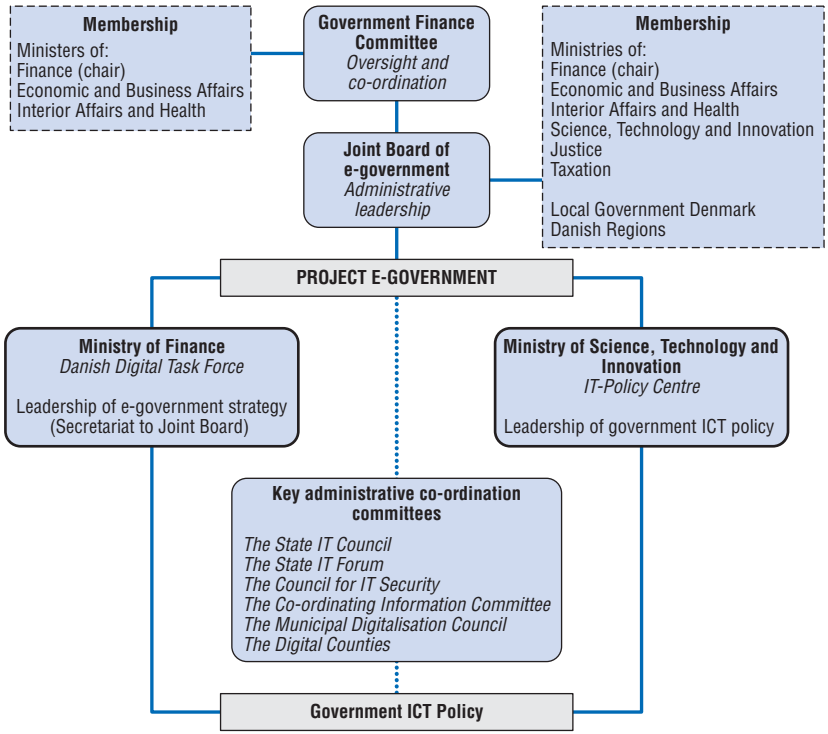
The central involvement of the MVTU's IT-Policy Centre in *Project e-Government* is intended to ensure that Danish e-government is based on a robust technical understanding of ICT and the role that it will play in government in the future. It also ensures continuity of current e-government efforts with previous work undertaken in the area of government ICT policy. As outlined on the Web site of *Project e-Government*, the vision for the IT-Policy Centre is "to be a nationally and internationally renowned and respected technical competence centre… making sure that the IT policy of the Government is developed and implemented based on a technically solid and modern basis".

Other bodies

The work of the Joint Board, Digital Task Force and IT-Policy Centre is augmented by a range of co-ordinating committees and councils in the area of government-wide ICT, and steering committees for individual e-government projects. The roles of the most significant of these groups are discussed in Chapter 6.

Danish e-government efforts are also enabled and supported by other organisations that have specific roles to play at each level of government, either as co-ordinating bodies for policy development (*e.g.* Local Government Denmark at the municipal level), or in implementation of specific elements of the e-government environment such as the public key infrastructure that has been put in place under the regulatory oversight of the MVTU's National IT and Telecom Agency. Additionally, a good range of e-government co-ordination frameworks have been put in place in Denmark (again discussed in Chapter 6 on collaboration).

Figure 1.2. **E-government structure and co-ordination**



Source: OECD E-Government Project.

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Chapter 2

The Case for E-government

Denmark is not pursing e-government as an end in itself. Instead, the national e-government programme is linked to other government policies, the three most significant of which are: 1) public sector modernisation; 2) government ICT policy; and 3) improving the efficiency of the public sector. The linkage between e-government and ICT policy is the longest standing and most widely understood. The link with public sector modernisation is more recent, and currently less well understood.

Denmark is not pursuing e-government as an end in itself. Rather, it is treated as an enabler of wider government objectives. In addition to its role in advancing the Structural Reform, there are three major elements to the e-government policy environment: 1) government ICT policy; 2) the push for public sector modernisation; and 3) public sector efficiency. Together, these provide the essence of the "case" for e-government. Detailed coverage of policies, strategies and plans related to e-government is provided in Annex D.

The OECD's interviews with Danish officials, review of relevant documentation, and survey of government organisations show that the case for e-government is relatively clearly articulated in the design and implementation of Denmark's e-government strategy. However, full understanding of the relationship between e-government and other government policies and programmes has not yet permeated the public sector.

2.1. E-government policy context

The e-government programme does not stand alone, instead being positioned as an enabler of economic and other policy goals. In particular, it is linked to:

- *Public sector modernisation*, which aims to create a more citizen-centric public sector providing better public services.
- *ICT policy*, which aims to stimulate growth in Danish business and the ICT industry, develop Danes' ability to participate in the "knowledge society" (particularly by offering a wider range of relevant and useful public services via the Internet), and reform the public sector.
- *Improving public sector efficiency*, which the Government has identified as a key factor in ensuring Denmark's ongoing competitiveness and ability to fund its welfare state.

Public sector modernisation

The Government has implemented a public sector modernisation programme called "Citizens at the Wheel". Launched in May 2002, under the leadership of the Ministry of Finance, the vision of the programme is to create a public sector that will:

- Be based on the free choice of citizens.
- Be open, simple and responsive.
- Provide value for money.

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The programme identifies e-government as one of the key enablers of achieving the Government's modernisation vision. The goal of the programme is to ensure that government is focused on the needs of citizens rather than those of government agencies, and that it provides public services that are coherent, accessible and responsive. It also aims to give citizens greater freedom of choice in dealing with the public sector, to strengthen their legal rights, and to use government funds as effectively as possible to achieve the highest possible public welfare within tight budgetary constraints. The project emphasises the need to redirect resources from internal processes of public administration into better service delivery to both citizens and businesses.

Within the programme, e-government is both a discrete initiative and part of other modernisation efforts. For example, e-government enables work on regulatory simplification and improvement. It is also part of an initiative aimed at achieving greater public value for money, which requires local government and all State government ministries to prepare strategies for improving the efficiency and quality of their services, partly through "more extensive and qualified use of information technology".

The relationship between e-government and public sector modernisation has been clearly articulated. However, as discussed below, this relationship is not sufficiently well understood within government. Interviews with officials showed that they are not consistently making a strong connection between the two initiatives. Even where the relationship is understood, it is generally not being used as a strong driver of e-government within individual organisations. This observation is backed up by the results of the OECD survey, which examined strategies, programmes and projects that are providing a drive for e-government within individual government organisations (as described in Figure 4.1 in Chapter 4). Given the centrality of e-government in achieving the Government's modernisation, this lack of understanding is of some concern. However, it could be relatively easily addressed through making stronger efforts to develop awareness in this area.

Government ICT policy

The MVTU, with technical assistance from its National IT and Telecom Agency, is responsible for the development and co-ordination of government ICT policies (with the exception of e-government itself, for which the Joint Board has had the lead responsibility since 2001).

Although the government has placed a high priority on ICT policy for many years, the recent history of ICT policy begins in 1994 with a report titled *Info-society 2000 – Report from the Committee on the Information Society by the Year 2000*. This document first put forward the idea that effective use of ICT to

support development of the Danish information society was a key to future economic development, improved quality of life and better public and private services.

Published by the Ministry of Research and Information Technology (the predecessor to the MVTU), the report stated that the public sector should be the leading force in the efficient and effective use of ICT in Denmark. In an effort to minimize the digital divide in Denmark, *Info-society 2000* recommended that Denmark's future use of ICT be based on values of openness and democracy, and on commitment to ensuring that all Danes share the benefits of ICT. The report identified a wide range of areas for action to achieve these objectives.

The subsequent *IT Political Action Plan* produced in 1995 was the first document to outline how the goals of *Info-society 2000* were to be achieved. This began a tradition of producing and implementing such IT action plans, the two most recent of which are *IT for All* (2002) and *Using IT Wisely* (2003).

By 2003, the emphasis of government ICT policy had explicitly shifted away from technology towards enabling effective and profitable utilisation of ICT by both the private and public sectors, and by the Danish public (especially through creation of high-value digital content), based on two main principles:

- Creation of a competitive market for the supply of ICT, with government being responsible for removing market failures.
- The public sector having a key role in promoting national ICT development by using its influence as a consumer, and by providing e-government to both individuals and businesses.

Based on these principles, government ICT policy currently has three major goals:

- Creating growth in Danish business and industry.
- Qualifying Danes for the future knowledge society (including by offering them a wider range of relevant and useful public services via the Internet).
- Reforming the public sector.

Public sector reform is supported and enabled by using ICT to: 1) increase public sector efficiency and productivity in providing coherent and user-focused public services; and 2) improve the internal organisation and operations of the public sector, and the way it interacts with both citizens and businesses. This strong linkage between Danish e-government and ICT policy is evidence of the fact that e-government has its origins in ICT policy, and also of the MVTU's continued close involvement in e-government since the creation of the Digital Task Force in 2001.

There has been more success in building organisations' understanding of the relationship between e-government and government ICT policy than with public sector modernisation. Many interviewees were able to chart the

development of e-government from its beginnings in the 1990s ICT policies, and most were very clear about the link between e-government and current ICT policies. In particular areas, such as development of the Danish "enterprise architecture" (see Chapter 6), the interfaces between the two policy areas appear almost seamless, with officials clearly understanding how one policy area contributes to the other. The survey data presented in Figure 4.4 in Chapter 4 shows that, after major initiatives of the e-government programme such as *eDay*, the Danish enterprise architecture is one of the most significant drivers of e-government, being identified as "important" by 30% of survey respondents. Given the highly technical nature of enterprise architecture, this is a significant result. It is also interesting to note that, ten years after its inception, the 1995 IT action plan is still regarded as a significant driver of e-government by nearly 10% of survey respondents.

Improving public sector efficiency

There is a strong economic case for e-government based on the Government's commitment to making the public sector more efficient. The approach to addressing this challenge – laid out in 2000 in a 10-year economic framework called *A Sustainable Future – Denmark 2010* ("the 2010 plan") – is to boost employment, restrain growth in public spending and reduce government debt. The public sector represents a large share of Danish GDP, providing over one-third of all jobs. Achieving improvements in the efficiency of the public sector will have an important impact on the future fiscal sustainability of the welfare state.

Denmark has recognised that, among other things, achieving these goals requires public investment in the improved use of ICT in government. The importance of using e-government to achieve efficiency gains was heavily reinforced in the latest e-government strategy released in 2004. As shown in Figure 3.1, the e-government strategy identifies economic pressures (expressed as "limited resources") as a major issue to be addressed by e-government. This challenge translates into a number of strategic goals, most obviously the commitment to ensuring that 75% of all digitalisation projects release resources for other uses by 2006. This goal is notable among OECD countries because it makes explicit the need for e-government to deliver financial benefits, and seeks to measure and capture these benefits.

Improved efficiency is also a strong driver of the Structural Reform. Again, there is an expectation that e-government will enable better use of public resources, through both improved economies of scale arising from the consolidation of counties and of municipalities, and improvements to the operating procedures of government organisations.

In the case of both the e-government strategy and the Structural Reform, it is important that the efficiency benefits that have been targeted are actually realised. Measurement is important; the setting of measurable goals and the process of measuring them provide incentives for government organisations to generate the desired efficiencies, and the results and background information needed to inform further efforts. However, measurement must be accompanied by a strong *ex ante* logic for organisations to invest time, money and human resources in e-government initiatives. It is not sufficient to assume that, as a general rule, investing in e-government will automatically lead to *ex post* gains in efficiency. Doing so could lead to both unrealistic expectations of what organisations can achieve and creation of negative incentives for them to pursue e-government, especially if there is a risk of being held accountable for achievement of unrealisable goals. In addition to highlighting the importance of basing e-government initiatives on strong business cases that identify realistically achievable benefits (something that is increasingly understood in Denmark), it is also important that the focus on the benefits of e-government encompasses both gains in public sector efficiency and effectiveness, and broader tangible and intangible benefits for Danish society and the economy. If not, many worthwhile e-government initiatives could fail to be implemented, and/or poorly conceived ones may unadvisedly proceed.

Key point 2.1

E-government in Denmark is not pursued as an end in itself. Instead, the national e-government programme is linked to other government policies, the three most significant of which are: 1) public sector modernisation; 2) government ICT policy; and 3) improving the efficiency of the public sector. The linkage between e-government and ICT policy is the longest standing and most widely understood. The link with public sector modernisation is more recent, and currently less well understood.

Improving public sector efficiency provides a strong policy driver for e-government, being an area where explicit objectives have been set and measures of achievement put in place. Going forward, it is important that these objectives are realistically achievable, and are based on capturing not only gains in efficiency but also other benefits that can arise from e-government.

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Chapter 3

External Barriers

Government organisations can face a range of external barriers to their ability to implement e-government. In Denmark, much effort has been put into modernising the legal environment for e-government. In this area, the main barriers now appear to relate to organisations' ability to interpret and apply the new e-enabled legislative and regulatory framework.

Budgetary barriers can also impede e-government. Danish organisations report difficulties in this area, but it appears that the budgetary environment is relatively flexible, and that more work in this area will help further reduce barriers.

The small Danish digital divide presents the least barrier to e-government, but also the greatest potential opportunity if government moves to close the remaining divide as far as possible.

The overall institutional context in which Danish government organisations are implementing e-government is very favourable, and Danes' behaviour regarding the use of ICT is positive. However, as the experience of other OECD countries demonstrates, a number of external barriers can impede the development of e-government and the take-up of online services. This chapter looks at four potential external barriers to e-government, three of which (legislative/regulatory issues, budgetary problems and the digital divide) were the subject of the OECD survey. The other potential barrier examined is the external technological environment that individual government organisations face in developing and implementing e-government. These barriers cannot generally be overcome by organisations working alone. Instead, whole-of-government efforts are necessary to ensure that external barriers to e-government are reduced as far as possible.

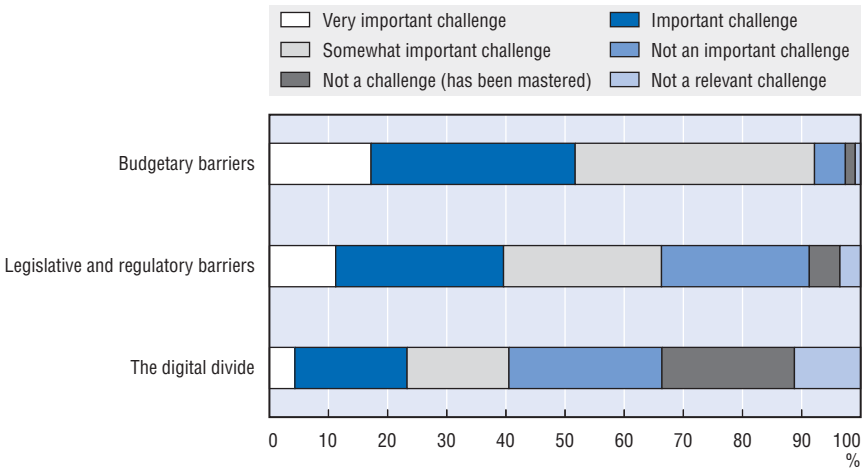
The results of the OECD survey show that, when asked to rate the importance of potential challenges to e-government implementation, survey respondents identified "external barriers" as the biggest challenge to e-government, slightly ahead of competition for resources (73%) and lack of planning within organisations (66%). When asked to rank the importance of external barriers, 92% of survey respondents said that budgetary barriers were a challenge, followed by legislative and regulatory barriers (66%) and then the digital divide (40.5%) (see Figure 3.1). These results are corroborated by Statistics Denmark's 2004 survey of public sector use of ICT, where budgetary difficulties were ranked as the biggest barrier to e-government (important for 83% of respondents) and legislative and regulatory issues were of lower importance ("major importance" for 10%, and "moderate importance" for 50%, of respondents).

3.1. Legislative and regulatory environment

The Danish legal system provides a framework for enabling digital communications both within and across government that is appropriately supportive of e-government. This is the result of new legislation enabling e-government processes (*i.e.* the Act on Electronic Signatures) and efforts to simplify and modernise existing Danish legislation, with a focus on ensuring that legislation is compatible with digital communication.

The initiative to enable e-government through legislative simplification was part of the overall Rule Simplification Programme, launched by the Ministry of Finance in 2002 as a key component of the Government's programme to

Figure 3.1. **External barriers to e-government in Denmark**



Source: OECD E-Government Survey: Denmark.

modernise the public sector and reduce the administrative and regulatory burden it imposes on citizens and businesses. The goal of this work was to promote digital communication by eliminating legal barriers to both e-government and e-commerce. The Government was committed to implementing any new laws or legislative amendments that might be required by early 2003.

The initiative required all Danish ministries to review their legislation and regulations to locate provisions that constrained digital communication between public authorities, citizens and businesses. Where these were identified, ministries looked at the reasons behind their existence and assessed whether or not they could, or should, be changed. Ministries then used this analysis to develop action plans for the modernisation of legislation. A secretariat consisting of the Ministry of Finance, the Ministry of Justice and the Ministry of Science, Technology and Innovation provided guidance as required, and followed up on the implementation of ministries' action plans. The secretariats to the State IT Council and the Joint Board of e-Government also had roles in co-ordinating the work.

In June 2004, the Danish Digital Task Force took over responsibility for finishing the project and producing a final report on the work that had been undertaken. The document, based on ministries' status reports on the implementation of their action plans, was seen as the final step in the legislative modernisation programme.

As reported by the Task Force, the outcome of the project was that 423 laws or regulations presenting unnecessary barriers to e-government have been amended, or will be in the near future. However, the process also identified

another 1 106 laws and regulations that were considered impossible to amend, either because they are tied to specific documents (such as passports, drivers licences, etc.) requiring non-digital procedures to fulfil proof functions, or because they are tied to EU rules or international conventions that prescribe non-digital procedures.

Despite the fact that many laws and regulations have not been updated, the modernisation process appears to have had the desired overall effect of removing legal impediments to e-government wherever possible. While the OECD survey did not directly investigate the impact of legislative and regulatory modernisation on e-government implementation, it does show that a relatively limited number of respondents regard conflicting or inconsistent regulations as important barriers to e-government.

Denmark has also enacted legislation enabling the use of digital signatures. The Danish Act on Electronic Signatures came into force on 1 October 2000. Administered by the Ministry of Science, Technology and Innovation, the Act implements EU Directive 1999/93 of 13 December 1999. Its purpose is to promote secure and efficient use of electronic communication, and to ensure that Danish electronic signature products and certification authorities meet a number of requirements – including security, procedures, personnel, economic resources, system audit and others – necessary for issuing "qualified" digital certificates.

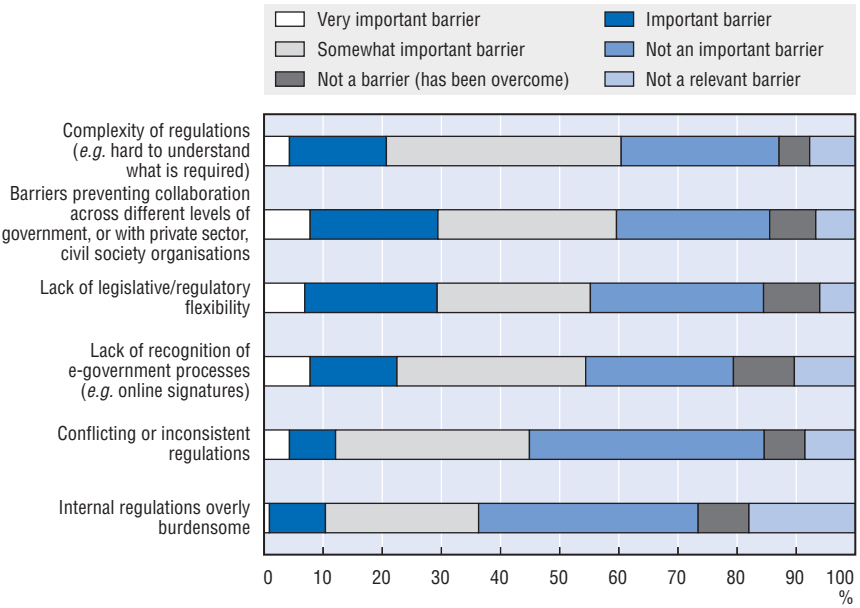
The *Committee on the Legal Consequences of Using Digital Signatures*, which was established in 1998 to consider the legal effects of digitally signed communications, did much of the work leading up to enactment of the Act on Electronic Signatures. The Committee investigated obstacles to electronic communications and signatures, including forms of communication, definitions of "writing" and use of personal signatures, which were created by requirements in existing legislation. It assessed the merits of different types of legislative action and drew up overall principles for the revision of various legal provisions.

The digital signature legislation succeeded in its desired enabling effect. Denmark is now equipped with a functioning public sector public key infrastructure (PKI), which is increasingly being used in the provision of e-government services for both citizens and businesses. The PKI was put in place following a tender process run by the Ministry of Science, Technology and Innovation in 2003 that selected TDC (TeleDanmark, Denmark's largest telecommunications supplier) as the PKI provider, under the regulatory oversight of the National IT and Telecom Agency (see Chapter 6 for more details).

The introduction of digital signatures, and the amendment or repeal of existing laws impeding digital communication, have brought great benefits by providing the necessary framework for the widespread adoption of digital communication with and within government. The enabling legal environment and the use of digital signatures are now key success factors of the Danish e-government programme (see Case Study 2 on the *eDay* initiative).

However, despite these achievements in building a favourable legislative and regulatory environment, the OECD survey indicates that officials still feel that they face legislative and regulatory barriers to e-government. The most significant challenge identified by survey respondents was that the complexity of regulations makes them difficult to understand (important for 60%). An equal number of respondents expressed concerns over the effect of legislation and regulations in creating barriers to collaboration across levels of government or with external private and/or civil society organisations. Concerns over a lack of legislative and regulatory flexibility (55%) and a lack of legal recognition of e-government processes such as digital signatures (54%) closely followed (see Figure 3.2).

Figure 3.2. **Legislative and regulatory barriers to e-government implementation**



Source: OECD E-Government Survey: Denmark.

Survey respondents' concern over the complexity of the legal environment for e-government may indicate that, while much legislation and many regulations have been effectively "e-enabled", there may still be considerable work required to make the revised legal framework more consistent and easy to interpret and apply. This result could also indicate inadequate awareness among government organisations of the changes that have been made, rendering them unable to make best use of the modernised legal environment. Further progress

could be made by better communicating the content and functionality of legislation to officials. It may also be beneficial to improve lawmakers' ability to draft "e-friendly" laws and regulations.

Experiences in other OECD countries indicate that concerns about legislative complexity creating a barrier to e-government can often come from individual organisations' lack of knowledge, competence and drive for innovation in interpreting laws and regulations. These deficiencies can lead them to incorrectly perceive legal barriers to e-government that actually result from their own misinterpretation or misapplication of the law. They can see problems as being the result of inadequate laws and regulations, which, in turn, can lead to an inappropriate belief that the burden of responsibility for change rests not with themselves but with lawmakers (*i.e.* drafters, ministers and parliaments). While both issues – the need for further legislative change and the need for better knowledge, interpretation and application of the law – are relevant, evidence from the OECD's interviews with officials supports the latter as being the more significant cause of any legal barriers to e-government in Denmark.

Perceived or actual legislative and regulatory complexity can also have a negative impact on e-government take-up, especially to the extent that it is responsible for any failure to use e-government to eliminate unnecessary administrative burdens on citizens and businesses. Currently, formal responsibilities for work on administrative simplification and e-government have been assigned, respectively, to the ministry of Finance's Division for Better Regulation and the Digital Task Force. Although there has been ongoing informal co-operation between these two groups, interviews showed that better results could be achieved by strengthening and formalising this collaboration, with potential for benefits both in the further development of e-government and the reduction or elimination of the administrative burdens. In particular, the design and results of the Division for Better Regulation's measurement of administrative burdens could be better integrated with the ongoing work of the Task Force in the areas of: 1) identifying and overcoming regulatory barriers to e-government; 2) defining indicators to measure e-government benefits; and 3) identifying relevant e-government challenges and opportunities to address jointly with other government organisations.

Reducing administrative burden is a subject of significant concern for the Government, which reported to the Parliament on this issue in early 2005. The report was based on the AMVAB (Activity-based Measurement of Companies' Administrative Burdens) model developed by the Netherlands, which will help Danish ministries to measure the impacts of administrative burdens. The Government's goal is to reduce administrative burdens by up to 25% by 2010. The Government recognises that legal barriers to e-government must be further reduced in order to achieve this goal. However, as noted above, questions remain about lawmakers' ability to draft e-friendly laws and regulations; some

laws passed in 2003/04 created new barriers to digitisation. To help address this problem, the Ministry of Finance is now developing a "digital toolbox" to help lawmakers prepare e-friendly legislation.

Legal and regulatory barriers are not just an impediment to e-government at the State government level. The OECD survey shows that almost 60% of respondents felt that an important barrier to e-government arises from regulatory and legislative barriers to collaboration between different levels of government, or with the private sector and civil society organisations.

These concerns may indicate inadequacy of the existing legislative framework in terms of supporting collaboration across government. However, according to interviews with officials, although legislative and regulatory obstacles to collaboration across levels of government still exist in certain areas, they do not generally present a major barrier for e-government in Denmark. Where they do exist, they are being tackled by relevant authorities in connection with implementation of the Structural Reform. For example, although they share the same physical offices to deliver their services, the Labour Market Board and municipalities have experienced regulatory barriers to accessing and sharing information and systems. These barriers are being addressed through the Government's proposal to enact a "Service Centre Act" (part of the regulatory package connected to implementation of the Structural Reform), which will enable establishment and operation of "local service centres" in municipalities. The Act will prescribe rules for the proposed service centres' authority to deliver services on behalf of other public authorities, including rules for exchange of personal data.

Regulatory barriers do not seem to represent a major obstacle to organisations in their collaborations with the private sector. Less than 30% of survey respondents identified this as an obstacle to establishing partnerships with the private sector.

Lack of legal recognition of e-government processes was identified as an important barrier by more than 50% of survey respondents. In light of the current legislative changes enabling electronic communication and the success of the *eDay* initiatives (see Chapter 4 and Case Study 2), concerns in this area may reflect the existence of a perceived rather than a real barrier. To the extent that it is perceptual, this could indicate a need for more communication about the results of the legislative modernisation process, especially in a quickly changing environment. However, while *eDay* and *eDay2* created internal capacity and removed obstacles impeding digital communication, they did not remove existing barriers linked to the application of ICT to specific government processes (*e.g.* taxation).

Key point 3.1

Denmark has undertaken significant work to ensure that the legislative and regulatory environment does not present unnecessary barriers to the development of e-government. While many laws and regulations either still remain to be updated or have been deemed impossible to change, the major elements of an "e-enabled" legal environment are now in place.

Despite this, Danish officials still report that they face e-government barriers in this area, citing problems related to complexity of regulations, legal impediments to collaboration and lack of legal recognition of e-government processes. Some of these problems arise from the fact that further work on removing legal impediments to e-government is required. However, it appears that other aspects of this problem relate to officials having inadequate awareness and understanding of the changes that have already occurred, lack of capacity to interpret revised laws and regulations in innovative ways, and failure of organisations to accept responsibility for changing their services and business processes in line with what is allowed by the altered legal environment.

Data protection

Danish legislation recognises two broad areas where laws and regulations are required to achieve security and privacy of public information: 1) technical security of information systems and data communications; and 2) protection of personal data. A third area – identification of providers and users of information (*i.e.* authentication) – is an area of ongoing legal challenge. Even digital signatures do not guarantee identity, as it is possible for persons other then the signature holder to use them. This is a pressing issue, which is not yet solved and will figure in ongoing work on digital signatures.

Data and system security is, to a large extent, a technical and organisational challenge; it requires information and communication systems that are technically secure from external attack and protected from internal misuse by appropriate laws, policies, management practices, business processes, organisational culture, staff skills and training. There is no specific law on IT security in Denmark. However, security provisions are contained in a number of laws (*i.e.* laws on telecommunications and data protection). State government responsibilities in this area are concentrated in the hands of few key actors, especially the Danish IT and Telecom Agency (ITST) and the Council for IT Security (see Box 3.1).

Technical standards for IT security have been defined but have not yet been uniformly implemented across government. Like many other countries, Denmark has derived these standards from the UK security standard (BS7799),

Box 3.1. **Main actors and responsibilities in the area of IT security**

The **Council for IT Security**, established in 1995 as a successor to the National IT Security Council, is composed of seven members appointed by the Minister of Science, Technology and Innovation. The Council acts as an advisory board, focusing on: 1) promoting an informed public debate on IT security; 2) increasing awareness of security risks; and 3) encouraging co-operation and knowledge sharing in connection with the development and implementation of security policies and procedures.

The **IT Security Division** within the National IT and Telecom Agency has a key role in providing national guidelines and instigating measures focused on strengthening IT security awareness and prevention, such as: 1) defining integrated IT and telecommunications security emergency planning; 2) launching information campaigns for both citizens and businesses; and 3) increasing research and training on IT security matters. It also has responsibility for specifying rules and standards for IT security in the government sector, and for implementation of electronic signatures. The IT Security Division acts as the secretariat for the Council for IT Security.

updated to reflect the relevant international standard (ISO17799). The Government has taken a relatively flexible and decentralised approach to IT security, making each organisation responsible for establishing and implementing the necessary security for its own digital communications. It has, however, provided strong guidance in terms of requiring organisations to implement common IT security standards by 2007. To help organisations meet this mandate, it has established a programme to assist organisations to implement these standards.

In Denmark, security arrangements for online communication of particularly sensitive information (*i.e.* health information) require that a concrete evaluation be undertaken to determine whether there is a need for more advanced security solutions, such as digital signatures. Other OECD countries have also adopted this approach. In Denmark, the Data Protection Inspectorate, situated in the Danish Data Protection Agency, is responsible for such evaluations which can be relevant, for example, in instances where a patient has a psychiatric or criminal record. In general, the high take-up of digital signatures in Denmark may reflect a tendency of organisations to adopt the highest level of protection available, regardless of a clear evaluation of the need for such protection.

In general, system and network security is considered to be a relatively unimportant challenge to e-government implementation in Denmark. Less than half (43%) of OECD survey respondents said implementation of information system and network security was a "very important" or "important" challenge. Survey results show that officials perceive the level of security of online processes to be adequate *vis-à-vis* traditional offline processes. This may indicate that the major legal, institutional, policy and technological aspects of security have been resolved. Coupled with Danish experience with online communication, and public confidence in using online services, this indicates a high potential for further development of online applications and services.

Denmark does not have legislation specifically addressing privacy, which is instead addressed in the *Act on Processing of Personal Data*. Enacted in 2000 (replacing the earlier *Public Authorities' Registers Act and Private Registers Act*) this law implements EU Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and the free movement of such data. The new law sets out rules on: 1) processing of data; 2) data subjects' rights; 3) legal requirements for the storage and processing of data; 4) notification requirements; and 5) arrangements for the operation of the Danish Data Protection Agency (DPA) and the courts in relation to the provisions of the Act.

The DPA is an independent body under the Ministry of Justice with responsibility for exercising surveillance over processing of data. In general, Danish law requires a subject's consent for data matching, and mandates that individuals be informed when government organisations collect data on them. However, the DPA can give permission for data matching if it is strictly for statistical purposes.

In terms of its surveillance activities, the DPA has the authority to undertake inspections and audits at all levels of government. It mainly operates in a reactive mode, dealing with specific cases on the basis of inquiries from public authorities or private individuals. It does, however, also take up cases on its own initiative. In addition to acting as a watchdog, the DPA conducts data protection seminars with municipalities and other organisations to diffuse knowledge about privacy protection. It is the authoritative voice on data protection issues, and supports the public sector PKI solution, which it regards as an improvement over less secure solutions. It also works with the Ministry of Science, Technology and Innovation to develop some technical security standards (*e.g.* for WiFi).

Concerns over protection of privacy are not a major challenge for the implementation of e-government in Denmark, reflecting both the strong environment of data protection and IT security, and the generally high level of trust and confidence that Danes have in this aspect of government operations – perhaps due in part to their long tradition of providing personal information to

a range of public registers. The OECD survey shows that only 21% of respondents consider privacy and security concerns as being either a "very important" or "important" potential challenge to e-government implementation.

3.2. Budgetary barriers to e-government

Budgetary environment

Like other Nordic countries, a defining characteristic of Denmark's budget system is that central budget definition and oversight rests with the Ministry of Finance, while individual ministries enjoy decentralised authority for budget execution. The Ministry of Finance also has responsibility for budget co-ordination, collecting budget proposals from ministries and combining them into the final government budget proposal.

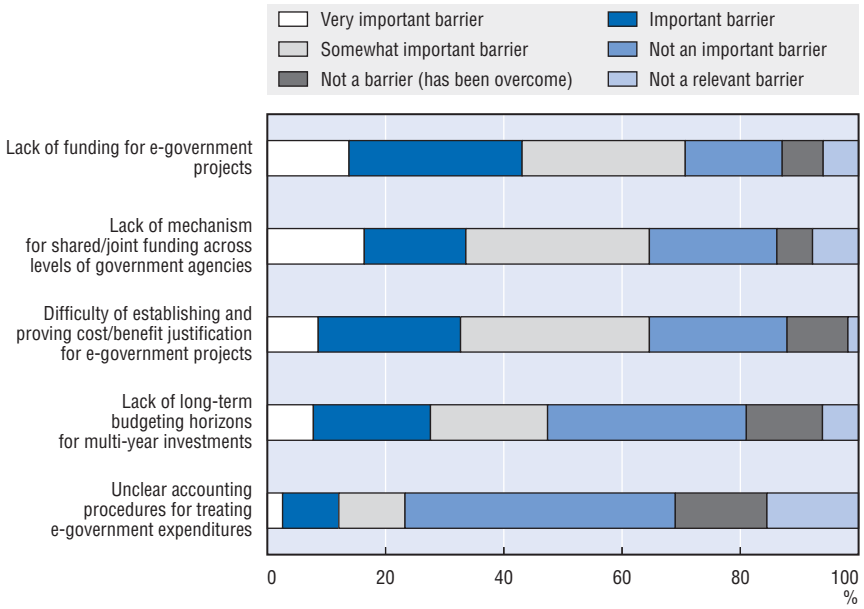
As a general rule, at the State government level ministers (and therefore ministries) are responsible for all expenditure decisions taken within their area of responsibility, including ICT spending. Every expenditure decision taken in State government is therefore a minister's responsibility. Each ministry is responsible for final allocation of funds within in its portfolio of responsibilities, within the limits for expenditures for each "spending ministry" as determined by the Ministry of Finance.

The Ministry of Finance exercises an important oversight function over ministries' expenditure programmes, and has the power to intervene if they do not respect the spending ceilings set for them. Despite these oversight powers, neither the Ministry of Finance nor individual ministries appear to be systematically monitoring ICT expenditures; as a result, there is no government-wide evaluation of ICT spending available for purposes such as e-government policy or strategy development, benchmarking or performance assessment.

Types of budgetary barriers

In regard to budgetary barriers to e-government, OECD survey respondents reported that the most significant challenge they face is a lack of funding for e-government projects (considered to be important by 71%), followed by a lack of shared/joint funding across levels of government, and the difficulty of establishing and justifying the costs and benefits of e-government projects (both 65%). In addition, a lack of long-term budgetary horizons for multi-year investments was also seen to be a significant challenge by nearly half (48%) of respondents. Budgetary issues are slightly more significant for organisations with "small" budgets (less than DKK 100 million) (see Figure 3.1). It must be noted that, in all cases, there is a lack of hard data to either corroborate or refute these claims. This is reflective of wider issues related to the capability Denmark has to evaluate its e-government programme and initiatives (discussed above and in Chapter 8).

Figure 3.3. **Budgetary barriers to e-government**



Source: OECD E-Government Survey: Denmark.

Budgetary barriers to e-government were also found to be significant in a survey undertaken by Statistics Denmark in 2004. When asked about the significance of barriers to collaborative use of data across government, 37% of all respondents said that the expense of adjusting systems to allow this was an "important" barrier (18% at State, 50% at county, and 44% at municipality level), while a further 31% said that it was "something" of a barrier. The larger nature of this challenge at the county level may reflect the particular difficulties being faced in achieving interoperable information management in the health sector (see Case Study 1), while the challenge being faced by municipalities may be related to the structure of the market for local government ICT (discussed in Chapter 6).

While complaints about lack of funding for e-government are common in OECD countries, in Denmark they can be better understood (particularly at the local government level) in light of the Structural Reform process and the approach the Government has taken to financing it. A significant reason for the merger of municipalities is to increase their size and, hence, their financial resources and ability to benefit from economies of scale. Many of the people interviewed for this review noted that small municipalities have found it quite difficult to develop e-government systems and services on their own, effectively increasing their dependence on KMD, their major supplier (see Chapter 6). Most

officials believe that increasing the size of municipalities will have a positive impact on reducing the e-government budgetary barriers they face.

The Government has determined that the implementation of the Structural Reform is not to be financed with new funds, but instead through achievement of economies of scale, process and system efficiencies, and savings from increased collaboration and joint financing of projects. Where absolutely necessary, it will lend money to assist organisations through the change process, using a fund it has created providing a total of DKK 1 billion for municipalities and DKK 500 million for counties to borrow from for one-off investments in ICT. Any such loans must be paid back within five years. Importantly, it has been recommended that any application to borrow from this fund must include a business case based on the approach that has been developed and promulgated by the Digital Task Force.

Borrowing money to fund e-government developments is also an option available to State government organisations. However, interviews revealed both a lack of awareness of the availability of this e-government funding and/or a reluctance to take it up because of concerns about meeting the costs of borrowing.

E-government in Denmark is also funded through retention of savings arising from e-government initiatives. An example is the Ministry of Economic and Business Affairs, which uses savings generated through application of e-government in the Danish Commerce and Companies Agency to fund other e-government initiatives. Overall, the relative flexibility of e-government funding sources available to State government organisations suggests that complaints about a lack of funds to implement e-government largely do not arise from a tight budgetary environment itself, but may be more linked to the lack of internal flexibility to re-evaluate spending priorities and reassign funds in the face of budgetary constraints.

There are two other indicators that budgetary barriers to e-government at the State government level may be largely internally generated. First, in 2001, as a response to the failure of some large IT projects during the 1990s, organisations were required to present any IT projects costing more than DKK 50 million (approximately € 7 million) to the Government Finance Committee for approval. Since then, only three projects of this size have been presented to the Committee; organisations have instead recast their projects to make them less expensive and, presumably, less difficult to finance.

Second, development of robust business cases for e-government initiatives has, to date, been limited in Denmark (see Chapter 8 for more information). Consequently, many organisations have not been able to easily prioritise their funding of e-government projects or make convincing cases for additional funding. This problem is recognised in the current e-government strategy, and

work is underway to help organisations to improve their business case methodologies. As noted above, a business case tool has been developed for use by government organisations, but it is not yet widely used.

Lack of mechanisms for shared/joint funding across levels of government was also identified as an important challenge to e-government. In order to meet the Government's goal that e-government will enable efficiency gains (*i.e.* by 2006 "at least 75% of digitalisation projects release resources and at least 25% do so to a great extent"), inter-agency collaboration will be necessary. There is an increasing expectation that, to achieve greater efficiencies without new funds for e-government, organisations will have to adopt more joint standards and solutions and strengthen their collaboration in implementing common applications and systems. However, few incentives are in place to ensure such collaboration.

During interviews, the so-called "sow/harvest" problem was frequently mentioned as a significant barrier to e-government. This refers to the fact that, when e-government initiatives involve more than one organisation they can face disproportionate costs and benefits, creating varying and sometimes perverse incentives for participation. Again, this challenge is acknowledged by the Ministry of Finance and identified in the e-government strategy, which includes a commitment to provide financing models which remove or limit the problem, and ongoing evaluation of the need for centralised loan pools, multi-year budget agreements, etc.

However, the frequency with which this problem was identified during interviews as being a challenge to e-government indicates a need to further examine the nature, extent and significance of the problem, and to determine whether these measures have adequately addressed it. It may also indicate a need to ensure that measures to assist organisations in preparing business cases for individual e-government projects address multi-agency initiatives (see Chapter 8).

Representatives of the Digital Task Force informed the OECD review team that the sow/harvest problem is leading to an inadequate level of IT system development across government. The lack of a commonly applicable model for financing the development and/or modernisation of multi-organisation IT systems has been identified as the main cause of the problem. The Task Force believes that, in order to be effective, any such model should cover the financing of all aspects of IT system development including: 1) specification; 2) tendering; 3) contracting; 4) system development; 5) implementation; and 6) maintenance. The model should also include mechanisms for proportional assessment and allocation of costs and benefits between State and local government. This appears to be a sensible and necessary approach to addressing the sow/harvest problem.

Survey respondents also perceived a lack of long-term budgeting horizons as a barrier to e-government. However, some mechanisms for long-term spending are in place in Denmark. Agencies can carry forward unused appropriations for operating expenditures without limit. They can also borrow up to 2% against future appropriations (up to a ceiling of DKK 10 million). In addition, agencies can carry forward appropriations for capital acquisitions to the next year. The Government is in the process of introducing accrual accounting (due to be completed by 2007), which will also allow agencies greater ability to take out loans for large ICT investments and repay them in the future. However, interviews with officials did not provide any indication of how effectively the long-term funding mechanisms available to agencies are being used. This could simply show a general lack of knowledge about existing budget rules. It may, however, indicate the presence of risk-averse attitudes towards using these mechanisms. This problem may be solved by linking investment decisions to robust business cases that properly evaluate the risk of e-government initiatives.

Special funds for e-government

Aside from a relatively small budget held by the Digital Task Force for investment in "collective interest" initiatives (*e.g.* so-called "service community" initiatives where groups of agencies collaborate to develop e-government projects in areas where they have overlapping roles and responsibilities), at the State government level there is no dedicated e-government funding. However, there has been some inconclusive discussion about creating central funds for e-government, with most concern focused on reducing the perceived risk associated with the repayment of loans. Central funds can be an effective tool for supporting e-government, provided they are linked to clear objectives and subject to the Government's prerogative and capacity to assess and renew expenditure priorities.

At other levels of government, until the recent establishment of the Structural Reform ICT loan fund there have been no dedicated funds for e-government initiatives. As discussed above, at the municipal level there has been a long-standing concern that the small size of municipalities has limited their ability to achieve greater efficiency or pursue performance improvement opportunities such as e-government. This concern has informed the design of the Structural Reform policy. Also, in the latest budgetary agreement between the State government and municipalities a DKK 30 million fund for municipal e-government initiatives was provided to Local Government Denmark.

Overall, while both the survey results and interviews clearly show that Danish government organisations do face budgetary challenges in the implementation of e-government, they do not form outright barriers. The clearest evidence of this fact is provided by the general progress Denmark is making with its e-government programme.

Key point 3.2

While organisations report facing budgetary barriers to e-government, there is no data available to verify whether and/or to what extent this is a real problem in Denmark. At the level of individual organisations there appears to be sufficient budgetary flexibility, and availability of instruments for longer-term budgeting and targeted budgetary assistance, to enable organisations to proceed with properly prioritised e-government initiatives. Lack of awareness, weak or missing incentives, and/or an absence of some supporting frameworks that would enable organisations to properly exploit these arrangements appear to be the main impediments to overcome in this area.

Two areas of particular challenge that are understood and being addressed as part of the e-government strategy are: 1) the need for better, more robust and consistent business cases for e-government initiatives; and 2) the so-called "sow/harvest" problem, which distorts incentives for organisations to participate in multi-agency e-government initiatives. Alongside work being led by the Ministry of Finance and the Digital Task Force to develop better business case and project financing models and tools, officials hope that the introduction of accrual accounting in 2007 will help alleviate these problems.

3.3. Technological environment

The technological environment outside government organisations (particularly the communications infrastructure) is strongly supportive of the development of e-government in Denmark. On the supply side, the telecommunications market is competitive, providing for a high level of access to relevant technologies such as broadband Internet connections and mobile services. On the demand side, Danish consumers (both individuals and businesses) show strong rates of adoption of PCs, broadband services and mobile phones.

In 2004, Denmark placed first in the annual IDC Information Society Index, and in 2005 it topped *The Economist* magazine's annual "e-Readiness Rankings". Both rankings are partially determined on the basis of countries' ICT environment (see Box 3.2).

ICT usage

Denmark is among the top 10 ICT-using nations in the world, with a first-class telecommunications infrastructure. In October 2004 broadband (ADSL) network coverage reached 95% of potential subscribers and by mid-2004 mobile phone penetration had reached 95.5%. According to figures

Box 3.2. **Measuring ICT readiness: Denmark's rankings in two international surveys**

In 2005, Denmark scored first in *The Economist*'s annual "e-Readiness Ranking", which is based on assessment of countries': 1) connectivity and technology infrastructure (25% weighting); 2) business environment (20%); 3) levels of consumer and business adoption of ICT (20%); 4) legal and policy environment (15%); 5) social and cultural environment (15%); and 6) support of e-services (5%). The connectivity and technology infrastructure measure is based on: 1) penetration of fixed-lines, broadband, mobile phones and the Internet; 2) quality of Internet connections; 3) levels of competition in the telecommunications industry; and 4) security of the infrastructure. Adoption measures look at the prevalence of e-business practices and the extent to which the Internet is used to overhaul and automate traditional business processes, and on State investment in ICT and other factors that inform these practices.

Further confirmation of the strength of the technological environment for e-government in Denmark is provided by the *International Data Corporation* (IDC) Information Society Index (ISI) for 2004. The ISI combines 15 variables in four infrastructure "pillars" to calculate and rank nations' ability to access and utilize information and information technology (53 nations were included in 2004). The four pillars are:

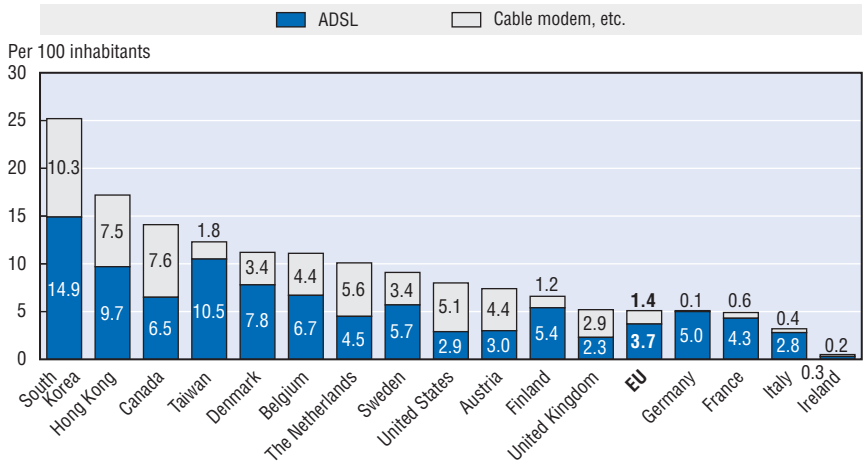
- *Computers:* the number of PCs in households, IT spending as a percentage of GDP, software spending as a percentage of total IT spending, and IT services spending weighted against GDP.
- *Internet:* the number of users, the number with Internet access at home, the number of mobile Internet users, and e-commerce spending.
- *Telecommunications:* broadband adoption, wireless services, and mobile handset shipments.
- *Social:* society's ability to utilize information technology as measured by levels of education, civil liberties, and government corruption.

Denmark received high scores in a number of variables across all four pillars and placed first ahead of Sweden, the United States, Switzerland, Canada, the Netherlands, Finland, Korea, Norway, and the United Kingdom.

Source: Economist Intelligence Unit "e-Readiness Ranking" (2005) and IDC Information Society Index (2005).

from the European Commission published in February 2004, Denmark has more broadband computer connections than any other EU country, with 11.2% of the population using a broadband subscription by the end of 2003.

Figure 3.4. **Penetration of fast access connections, October 2003**



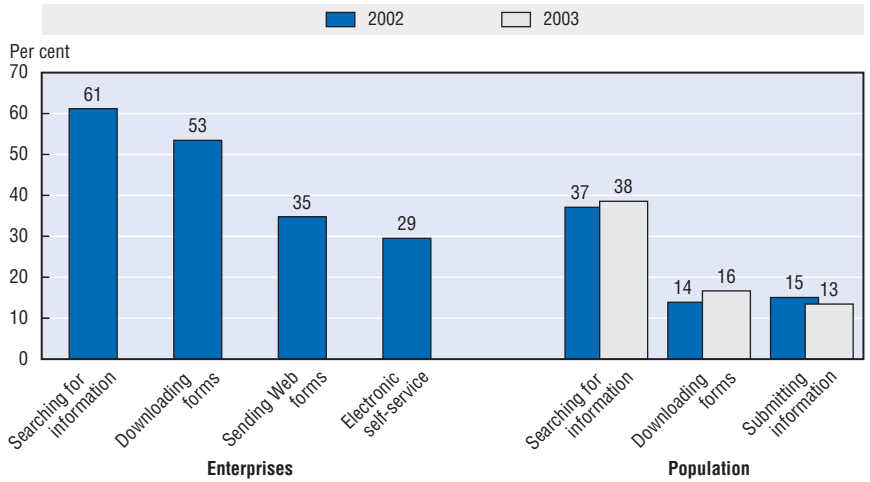
Source: Statistics Denmark (2004e), Key Figures on Information Society Denmark 2004.

Danes have rapidly adopted ICT, as indicated by high Internet and PC penetration rates. In 2004 80% of the Danish population had a PC at home and 75% had Internet access at home (of which 99% connected via a PC, 18% via a mobile phone and 4% via a handheld computer). There was no access via digital television. In terms of the type of Internet connection used, 33% connected via a dial-up modem, 48% via broadband (XDSL and other forms), 8% via ISDN, and 22% used other forms of connection including cable modems, broadband connections via building networks and wireless connections (see figures in the appendix to this chapter).

Use of ICT by Danish businesses is also high. In 2004, 98% used PCs, 97% had Internet access (with 68% using ADSL and 8% using wireless connections), 81% had their own Web sites, and 57% sent and 27% received orders via the Internet. Many businesses, and a large number of individuals, used the Internet to communicate with public authorities. In 2003, 43% of individuals and 84% of businesses with access to the Internet used it to find information, download forms and submit information to government organisations through government Web sites. Among both the public and businesses the highest use of e-government was for searching for information – the least sophisticated opportunity provided by e-government.

Additionally, 55% of individuals used the Internet for some form of e-commerce activity, and 84% of businesses used it for Internet banking or to conduct other financial transactions. These e-commerce figures have positive implications for Danes' future willingness to adopt advanced e-government

Figure 3.5. **Use of public digital services by the population and enterprises**



Source: Statistics Denmark, Key Figures on Information Society Denmark 2004.

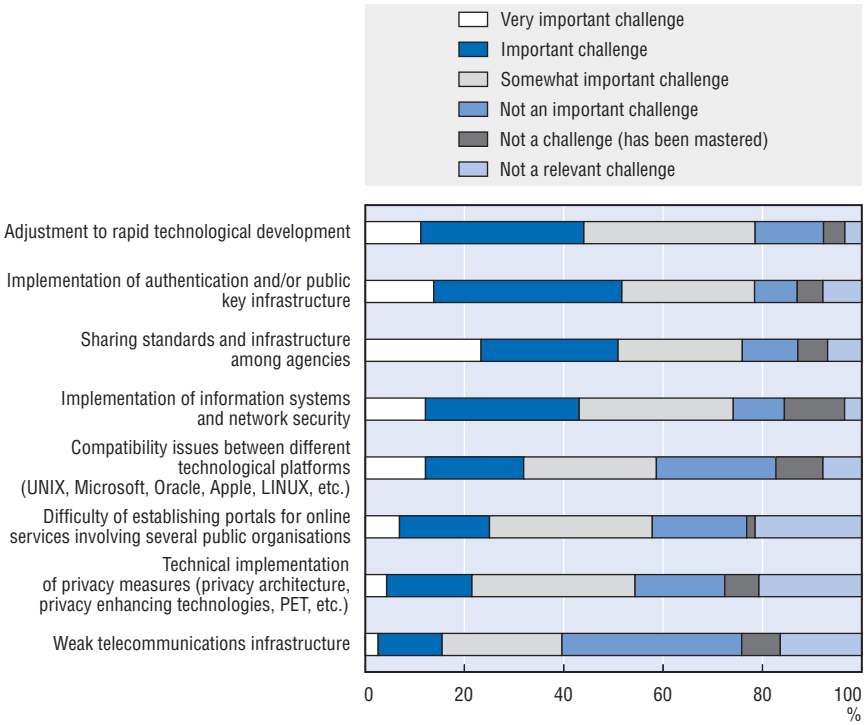
applications requiring high levels of trust based on strong protections for privacy and security.

Technological challenges

Despite the favourable technological environment for e-government, government organisations face a wide variety of technological challenges, some quite significant. The OECD survey indicates that the two greatest technological challenges are implementation of authentication and public key infrastructure (important for 78% of respondents) and adjustment to rapid technological change (79%). The high rating for authentication and PKI perhaps reflects the youth and complexity of these technologies, coupled with the fact that the survey was conducted at the same time organisations were readying themselves for *eDay2*, which involved implementation of PKI across government.

Of all the technological challenges examined in the OECD survey, sharing standards and infrastructure among agencies (a key element of successful e-government) was the single most important issue identified. This challenge was regarded as important by 76% of respondents, with 23% rating it as very important. This result emphasises the importance of the work Denmark is doing in developing an enterprise architecture and other arrangements for achieving interoperability of information systems and data (see Chapter 6). It may also reflect the significant managerial and cultural challenges that accompany technological issues in this area of e-government.

Figure 3.6. **Technological challenges to e-government implementation**



Source: OECD E-Government Survey: Denmark.

3.4. Digital divide

The "digital divide" was ranked lowest among barriers to e-government examined in the OECD survey. While it was perceived as a "very important" challenge by about 4% of respondents, nearly 60% regarded it as being unimportant. In line with the survey results, the digital divide was also the issue least mentioned in interviews. Nearly everyone who met with the OECD during this review either failed to mention the digital divide, or regarded it as presenting very little challenge to e-government.

Despite statistical data indicating that Denmark ranks high in terms of individual access to ICT, some differences persist in the basic determinants of access levels. Looking at access to the Internet in particular, some key differences can be observed:

- **Age:** older people have lower levels of access to the Internet. While Internet access remains relatively high under the age of 60 (with less than a 10% difference between ages 16-19 and ages 40-59), it declines considerably over the age of 60. People over the age of 60 have the lowest Internet access rate (54%).

- **Education:** the level of Internet access increases with the level of education. While 96% of university students have Internet access, only 72% of primary and lower secondary school students do. However, Denmark ranks well above the OECD average in terms of the number of pupils per computer used for learning purposes at school (in 2002 there were seven pupils per computer, and nine pupils per computer with Internet access).
- **Employment status:** students and workers have more access to the Internet than those who are outside the labour market. While 96% of students and 83% of workers have access to the Internet, only 52% of people outside the workforce have Internet access.
- **Type of household:** individuals living in larger households or families are more likely to have an Internet connection than people living in smaller households. In 2004, 94% of family households with children and 87% of single-parent households with children had Internet access at home. Comparatively, 78% of family households without children had Internet access at home, and 70% of single households without children had Internet access at home.

Statistics also show that Danes are more likely to have Internet access at home than at work (71% and 53%, respectively, in 2003). However, when asked about the most important barriers to home Internet access, 15% of Danish people indicated a lack of need for the Internet, 4% indicated that is too expensive, and 2% that it is difficult to use or that they access the Internet elsewhere. These results seem to indicate that one of the factors shaping Denmark's digital divide is a lack of understanding of the potential benefits of using ICT and the Internet, rather than problems associated with their actual use. This may indicate a need for better communication of the benefits of connecting to the Internet, and demonstration of the capacity of ICT to provide benefits and services that respond to peoples' expectations and needs.

Experience in many countries has shown that the digital divide is often linked to other social and economic divisions. One aspect of this problem is lack of access to basic ICT education, which can prevent individuals from grasping the benefits of using new technologies. Denmark has taken steps towards strengthening ICT education in schools. The number of people receiving formal ICT education grew 15% between 1999 and 2003.

Clearly, the existence of a digital divide in Denmark does not have a significant negative impact on the development of e-government. However, while Denmark is very favourably positioned in regard to the digital divide, it remains important to consider the issue as being necessary to address. In the future, given the emphasis the Government is placing on achieving greater efficiency and effectiveness in the public sector, the ability to deliver as much information and

as many services as possible online will be increasingly important. This is especially true to the extent that it enables cost savings from reduced use of other channels for government service delivery (wherever feasible).

To date, OECD governments have generally maintained a policy of retaining traditional service delivery channels alongside new ICT-enabled ones, mainly based on equity considerations. In the future, however, as governments strive to realise greater benefits from e-government, the question of how many and which delivery channels are viable to maintain may become an increasingly important policy issue, both in Denmark and elsewhere. Denmark has already shown that it is willing to abandon unnecessary offline means of dealing with government, as demonstrated by the mandatory move in early 2005 to only allowing businesses to present invoices to government organisations electronically. This was possible due to very high levels of business use of the Internet in Denmark, coupled with the provision of an effective alterative option (the "Read In" bureaux) for those businesses not yet online. The move to an entirely electronic system is expected to realise significant annual savings for both government and businesses (see Chapter 6). However, until all Danish citizens and business are able to easily access and use the Internet to deal with government (to the extent that this is physically, technically and practically possible), equity concerns will impede efforts to close off old and inefficient channels, and therefore fundamentally limit the financial benefits that e-government can deliver. Therefore, it would perhaps be sensible for the Government to consider the fiscal, social and economic costs and benefits of supplanting the current approach to the relatively small digital divide in Denmark with a more active approach aimed at closing the divide more rapidly than will occur under current policy settings.

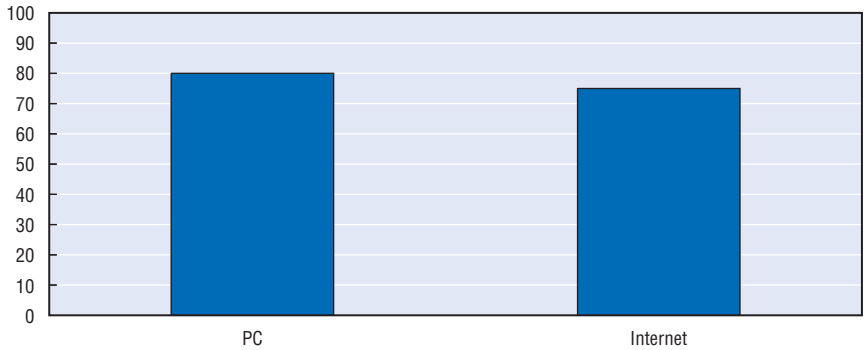
Key point 3.3

Denmark has very high levels of citizen and business access to, and use of, the Internet. The digital divide is much smaller than in nearly every other country. Perhaps as a consequence of this, the need to close the digital divide is not a very high-priority activity for government, and is not considered to be a barrier to e-government by most government organisations. It is important for Denmark to understand that the continuing existence of any avoidable level of digital divide places a fundamental limit on the ability to fully implement e-government in Denmark, and achieve the government goals it supports and/or enables as quickly and completely as would otherwise be possible.

APPENDIX 3.A1

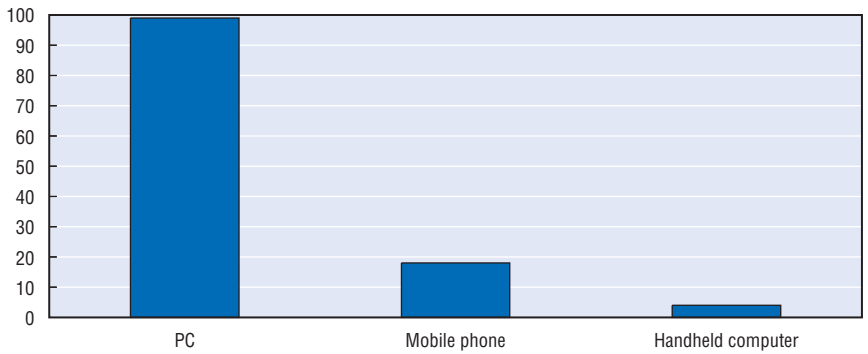
Information Society and the Digital Divide

Figure 3.A1.1. **PC and Internet penetration among the Danish population**



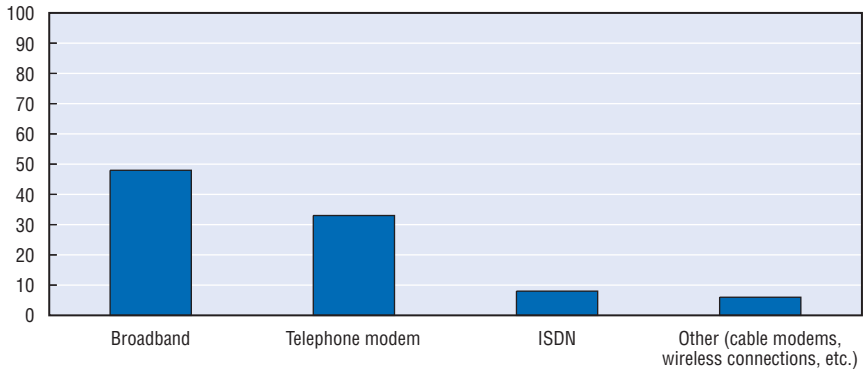
Source: OECD, based on Danish population use of the Internet, Statistics Denmark, 2004.

Figure 3.A1.2. **Ways of connecting to the Internet**



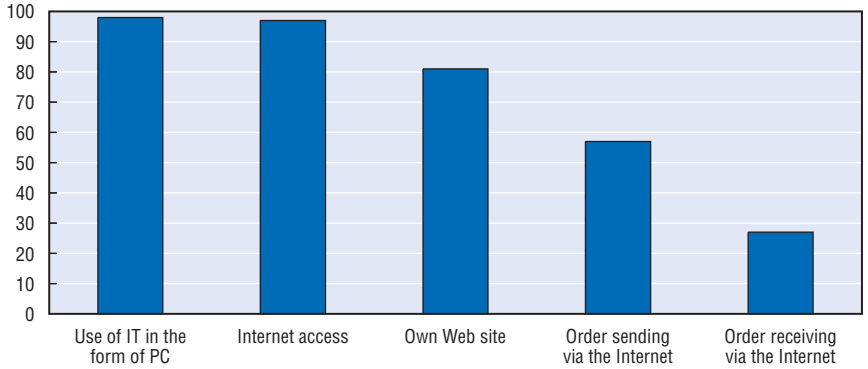
Source: OECD, based on Danish population use of the Internet, Statistics Denmark, 2004.

Figure 3.A1.3. **Types of Internet connections**



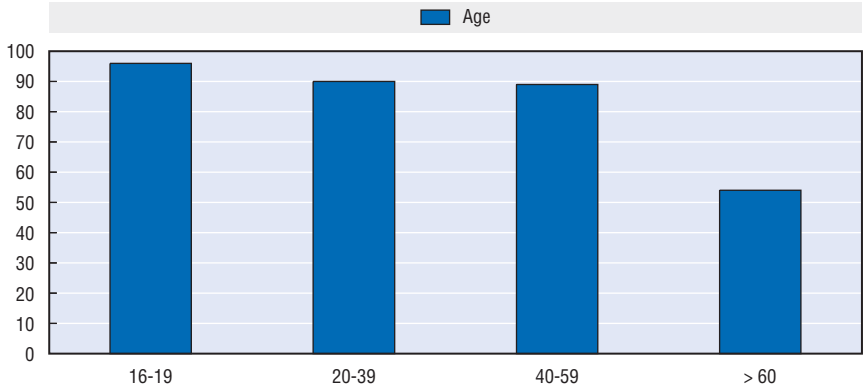
Source: OECD, based on Danish population use of the Internet, Statistics Denmark, 2004.

Figure 3.A1.4. **ICT usage among Danish businesses**



Source: Danish business use of the Internet, Statistics Denmark, 2004.

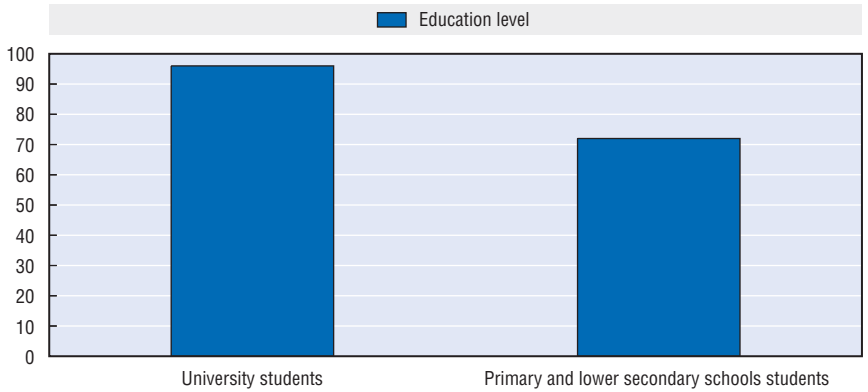
Figure 3.A1.5. **Internet use among different age groups**



Source: Danish population use of the Internet, Statistics Denmark, 2004.

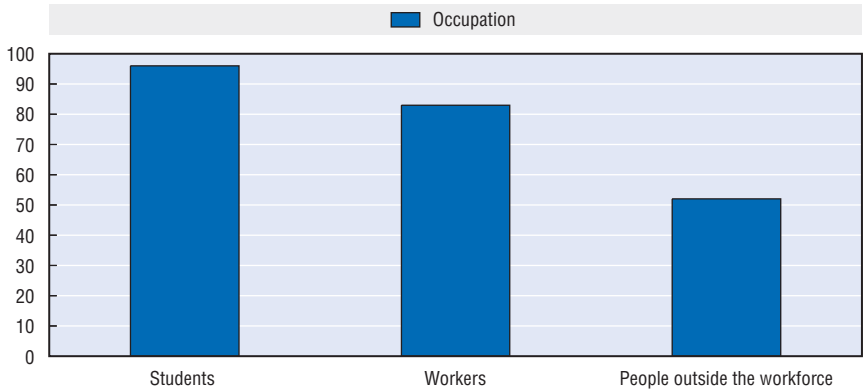
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Figure 3.A1.6. **Internet use among Danish students**



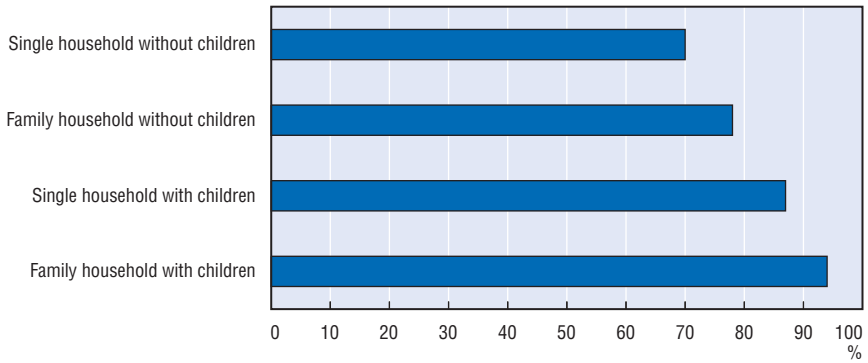
Source: Danish population use of the Internet, Statistics Denmark, 2004.

Figure 3.A1.7. **Internet access among different employment groups**



Source: Danish population use of the Internet, Statistics Denmark, 2004.

Figure 3.A1.8. **Internet access among different types of households**



Source: Danish population use of the Internet, Statistics Denmark, 2004.

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Chapter 4

Planning and Leadership

Denmark has been successful in both developing a vision for e-government that encompasses the whole of the public sector, and in translating it into a well-defined strategy which is known across government and provides an important driver for e-government implementation.

The strategy notes that Denmark is in a good position to develop e-government, having a well-developed "network society", high levels of Internet usage and a well-developed ICT infrastructure in place in the public sector. It warns, however, that the Danish public sector does not yet adequately meet the needs of citizens, and that more focused effort is required to make sure that the benefits of e-government are fully realised.

The strategy is supported by good leadership, and co-ordination mechanisms. Organisations generally approve of the strategy and arrangements for its implementation, and are responding well to it through their own e-government initiatives.

4.1. The e-government vision and strategy

Denmark has been successful in both developing a vision for e-government that encompasses the whole of the public sector, and in translating it into a well-defined strategy which is known across government and provides an important driver for e-government implementation. Although a strategy called *Get Going with e-Government* was initiated by the Ministry of Research and Information Technology in 1997, most people involved with e-government tend to focus on the strategies introduced under the leadership of the Joint Board of e-Government since 2001. However, it is worth noting that the concepts and goals embodied in the current e-government strategy are quite consistent with those introduced in the 1997 strategy. This reflects the strong overall consistency and evolutionary approach to e-government that Denmark has taken since the 1990s. The relative stability that this has created for government organisations charged with implementing e-government stands in contrast to the situation in some other OECD countries, and has undoubtedly been a positive factor in Denmark's strong progress with e-government.

The current strategy, introduced in 2002 and due to run to the end of 2006, is the guiding force behind *Project e-Government*. It was revised in 2004 following a review led by the Digital Task Force which identified a number of challenges and obstacles faced by e-government. These issues included: 1) a lack of familiarity with the e-government vision and strategy among government organisations; 2) a widespread "bunker" (silo) culture in government; 3) issues around allocation of e-government costs and benefits; 4) a lack of managerial commitment and skills; 5) unclear roles and responsibilities; and 6) too much emphasis on technical rather than organisational aspects of e-government.

In addressing these obstacles through the revised strategy, the Joint Board took a conscious decision to shift from "soft" to "strong" co-ordination as the overall approach to implementation of the e-government strategy. This shift has led to:

- More pressure being placed on organisations to align themselves with the strategy.
- More robust evaluation of proposals for e-government projects.
- Requirements that State ministries develop ICT strategies encompassing all their departments, agencies and other sub-bodies.
- Contemplation of increased centralisation of some aspects of government use of ICT.

Overall, the approach to implementing e-government moved away from exhortation and example towards a more action- and results-oriented strategy. Three key features of the current e-government strategy are: 1) its relationship to wider government policies; 2) the involvement of all tiers of government in the governance, development, and implementation of the strategy; and 3) the partnership between two strong ministries with complementary roles and expertise in support of the strategy.

The vision of the 2002 strategy (subtitled "Towards e-Government") was that government should "systematically use digital technologies to introduce new ways of thinking and transform organisations and work processes to improve the quality of service and efficiency".

Four guiding principles were set up as targets for achieving this vision:

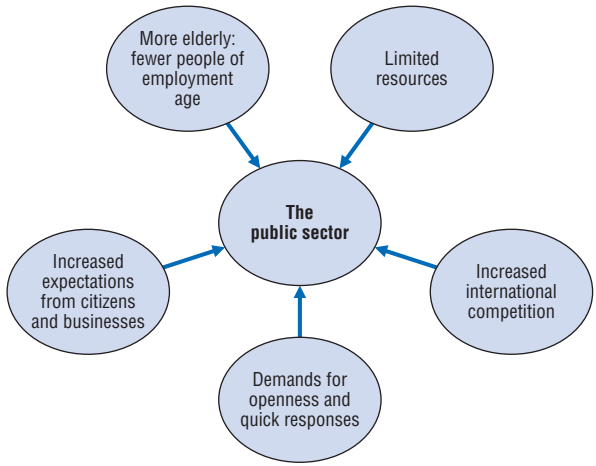
- E-government should actively contribute to the development of a network society.
- The public sector should work and communicate electronically.
- The services of the public sector should be delivered in a comprehensive, user-focused way.
- The functions and tasks of the public sector should be carried out where they can be handled in the best possible way.

Eight priorities were established to guide efforts to meet these targets: 1) flexible organisation; 2) agency co-operation in "service communities"; 3) "slimmer" administration through more efficient work processes; 4) comprehensive access points to the public sector; 5) full electronic service; 6) electronic infrastructure in all public organisations; 7) secure e-government; and 8) support and knowledge sharing. Importantly, however, the strategy did not specify the steps that should be taken to achieve the vision, or any measures that would be used to evaluate progress.

The current version of the strategy, introduced in 2004, is subtitled "Realising the Potential". It paints a picture of a public sector under various pressures to improve its performance. Several factors (changing demographics due to an ageing population, increasing citizen and business expectations of government, pressures on government budgets, and the need for Denmark to increase its national competitiveness) all contribute to a need to "renew and enhance management, organisation, task performance and working conditions across the public sector". E-government is positioned as a natural enabler of this goal.

The strategy notes that Denmark is in a good position to develop e-government, having a well-developed "network society", high levels of Internet usage and a well-developed ICT infrastructure in place in the public sector. It warns, however, that the Danish public sector does not yet adequately meet the

Figure 4.1. **Pressures on the Danish public sector that are driving e-government**



Source: Danish e-government strategy, 2004-06.

needs of citizens, and that more focused effort is required to make sure that the benefits of e-government are fully realised.

The current version of the strategy is widely seen as an improvement on its predecessor, providing clearer goals for organisations to pursue. The strategy does include measures for all of its goals that are used not only to evaluate progress against the strategy, but also to inform its ongoing development. Progress is reported to the Joint Board each time it meets, and annually to the Parliament.

In interviews organisations reported that they can find it difficult to evaluate whether their achievements are satisfactory. The majority of the measures set out in the strategy rely upon survey data collected by Statistics Denmark. This reliance upon organisations' self-reported progress against the goals of the e-government strategy does not appear adequate for forming a robust and independently validated view of whether these goals are, in fact, being adequately achieved.

Alongside the problem of the reliability of these measurements is a second problem relating to specification of the measures themselves. For example, the Danish e-government strategy is notable for establishing an economic goal of e-government releasing resources for use elsewhere in government. It states that at least 75% of digitalisation projects must release resources, and at least 25% should do so to a great extent. However, there is no clarity over what is meant by "release resources", and even less about what is meant by "a great extent". Coupled with the fact that organisations are left to

Box 4.1. **Denmark's e-government vision and strategic goals**

Denmark has a well-defined, clear and comprehensive e-government vision and strategy, which is well known across government and acts as a driver for e-government implementation at the organisational level.

The vision of the current e-government strategy is that "Digitalisation must contribute to the creation of an efficient and coherent public sector with a high quality of service, with citizens and businesses at the centre". To do this, the strategy defines five e-government goals ("signposts"), to be achieved by the end of 2006:

- The public sector must provide coherent services with citizens and businesses at the centre.
- E-government must result in improved service quality and the release of resources.
- The public sector must work and communicate digitally.
- E-government must be based on a coherent and flexible infrastructure.
- Public sector managers must lead the way and ensure that their own organisations are capable of realising the vision.

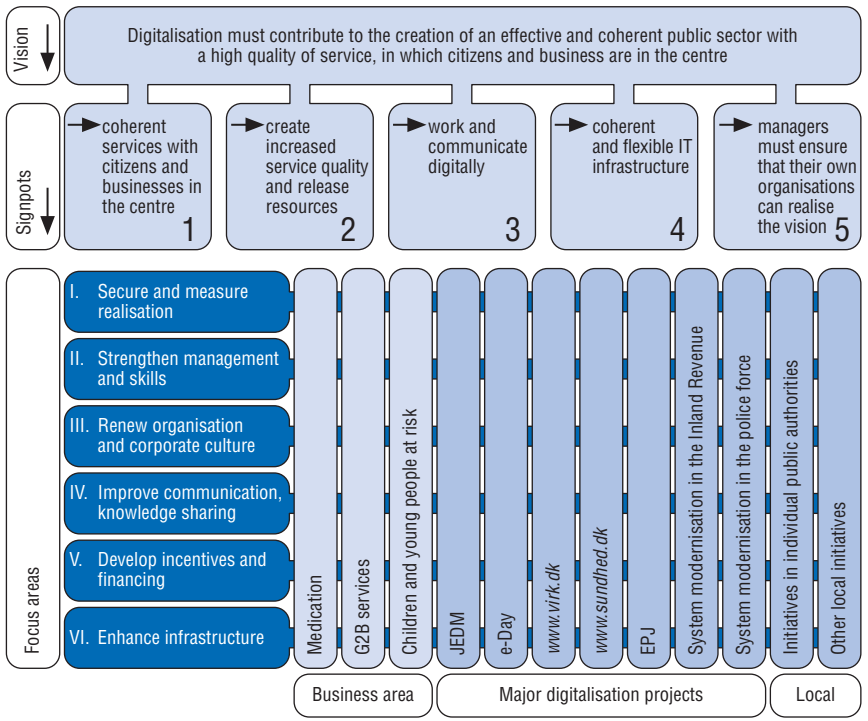
report their own achievements against this goal, the lack of specificity of the measures creates the potential for lower performance than is expected by the Government, and/or disputes over the level of actual achievements. Despite these problems, Denmark's emphasis on measurement of e-government goals is an important element of its e-government successes that could benefit from further efforts in both specification and collection of measurement data.

4.2. Implementation of the strategy

The goals of Denmark's e-government strategy are essentially to be achieved through two channels – a set of high-visibility initiatives designed to achieve the goals that have been set for 2006, and a longer-run process of technical, cultural, business process, organisational and managerial change that will occur as government organisations progressively digitalise. The strategy packages this together in a way that supports overall coherence of the e-government programme, as shown in Figure 4.2.

High-visibility e-government initiatives are overseen by the Joint Board of e-Government or allied bodies, and are undertaken directly by the Danish Digital Task Force, the Ministry of Science, Technology and Innovation's IT-Policy Centre, or steering committees that are responsible for particular projects or suites of projects addressing certain business areas. In addition to

Figure 4.2. **Design of the e-government strategy**



Source: Danish e-government strategy, 2004-06.

developing the e-government strategy and directly running projects, the Digital Task Force and the IT-Policy Centre also play roles in facilitating, co-ordinating, and providing expertise to various e-government projects.

Progress has been made towards attaining the goals set out in the strategy. The Task Force has been active in promoting initiatives to support digital communication both with and within government. A project of particular note is the *eDay* initiative. The Danish Government declared 1 September 2003 to be "eDay", after which all Danish government organisations could refuse paper-based communication and instead insist on electronic communication with other government organisations.

By 1 September 2003 all government organisations reported that they were ready to meet the *eDay* requirement. Following this success, the Government initiated a second eDay (*eDay2*), with the goal that from 1 February 2005, all communication between government organisations must be exchanged electronically. This is expected to lead to elimination of a further 40% of paper-based communications by November 2005. Going even further, with *eDay2* the

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Government has extended to both citizens and businesses the right to demand digital communication with government organisations and, as far as possible, receive electronic replies if requested. Digital signatures are used to secure and authenticate these communications as necessary.

One of the biggest impacts of *eDay2* is that virtually all Danish government organisations have now implemented digital signatures (at the organisation level, rather than for all public servants) and established means to send and receive secure e-mail. It is expected that this will allow downstream benefits in terms of easier and more secure exchange of information, better quality services, and better responsiveness to citizens and businesses. By 1 February 2005, around 95% of government organisations reported that they had met the objective of *eDay2* with the remainder (mainly small municipalities) being slightly delayed due to minor technical issues related to implementation of digital signatures. On its own, this would be a considerable achievement. It is made more so by the fact that, in the cases of both *eDay* and *eDay2*, adherence to the objectives was not mandated, but instead left voluntary. This indicates considerable levels of support for e-government across the Danish public sector. Strong central leadership and co-ordination by the Digital Task Force has clearly been a key success factor for this initiative (along with a number of other important factors such as a strong business case showing significant net benefits, which are discussed in Case Study 2).

While the Digital Task Force is leading flagship e-government projects, the IT-Policy Centre of the Ministry of Science, Technology and Innovation (MVTU) has also been conducting important work around developing the underlying framework conditions for e-government, including development and implementation of digital signatures, enterprise architecture and interoperability standards (see Chapter 6 for further discussion).

Interviews with Danish officials revealed a high level of approval for both the design and implementation of the e-government strategy, and for the roles and performance of the Joint Board of e-Government, the Digital Task Force, the IT-Policy Centre and various steering committees.

The Joint Board is regarded as an appropriate body for governing *Project e-Government*, especially because its members include representatives of all levels of government. One significant caveat was a question raised about possible risk related to the dual roles of Local Government Denmark as both a representative of municipalities on the Board and shareholder of KMD, the largest supplier of ICT systems and services to local government. While there was in no way a suggestion of any impropriety, and while it seems that there are effective measures in place for managing risk and conflicts of interest, it is still worth noting the situation (issues related to KMD are further examined in Chapter 6).

Survey results showing good levels of awareness of, and response to, the e-government strategy and its various projects were reinforced in interviews with officials from all levels of government, and other stakeholders outside of government. There was a generally positive view of the goals of the e-government strategy, the way they were developed with the broad involvement of organisations from all levels of government, and how the strategy is being implemented.

Close examination of the strategy's goals shows good coverage in the way they address the policy issues that make up the case for e-government. However, there appears to be a bias towards the policy issues of public sector modernisation and improved government efficiency (which are part of the wider responsibility of the Ministry of Finance), with less articulation of the relationship between e-government and government ICT policy.

It is worth noting that the gradual shift towards more active, centralised and co-ordinated implementation of e-government is significant not only for the impacts it may have on the overall progress of e-government in Denmark, but also because of the potential for tension around this and wider aspects of Danish public management. Along with an increasing willingness to make adoption of, or participation in, some e-government initiatives mandatory, this shift has implications for the role, responsibilities and activities of government organisations, and also for the culture of the Danish public sector.

The Danish e-government strategy anticipates that the development of e-government will drive, enable and/or be accompanied by changes to public sector culture and management. Danish traditions and institutions of public management are heavily oriented towards decentralised, consensus-based decision making wherever possible, and feature a high degree of local government autonomy. The shifting approach to e-government implementation raises the possibility of a conflict with the *status quo* that should, at least, be understood and perhaps actively monitored and managed – especially so that: 1) any benefits arising from the new approach to e-government that may be achievable elsewhere can be realised; and 2) any risks to the wider performance of the public sector that might arise from the new e-government approach can be identified and appropriately mitigated.

It is particularly important that any fundamental issues or changes related to this shifting approach be monitored, analysed and managed. If the new approach to e-government is found to be valuable in achieving the performance and results that the Government is seeking from the public sector, it may be worthwhile for Denmark to make a thorough examination of the implications this may have for its wider approach to public management. Such an examination should consider the assumptions that underpin Danish public management, and any challenges or tensions that new approaches to

e-government may create. It should also look at factors that influence successful – or unsuccessful – applications of this new approach (*e.g.* the extent to which more centralised approaches require investment in the resources that central agencies such as the Ministry of Finance make available to help line agencies adapt to, and function effectively under new realities), and also at the costs, benefits and risks of more widespread application of this approach to public management.

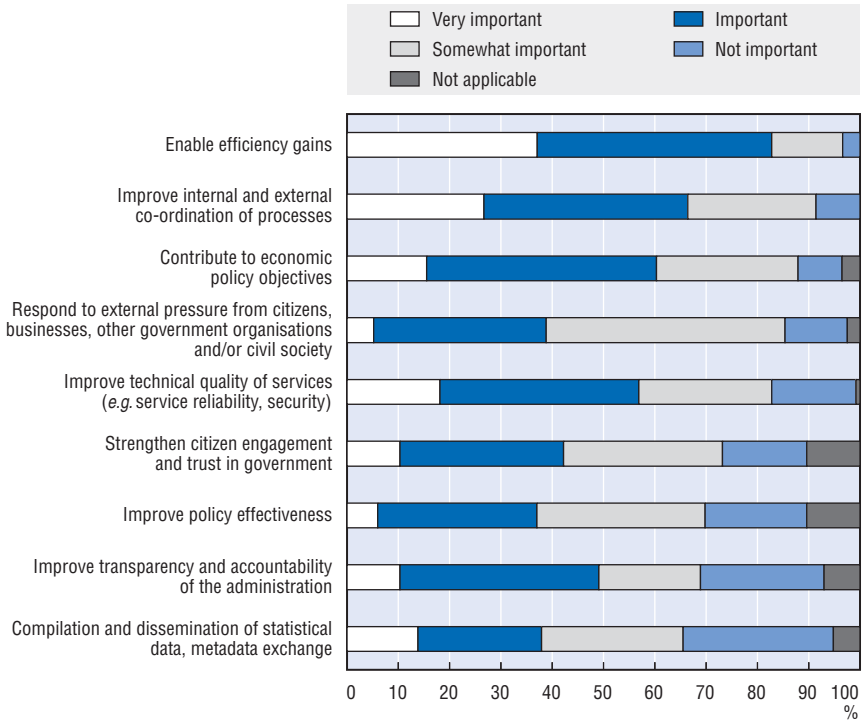
4.3. Organisational response to the e-government strategy

Overall, Danish government has reacted positively to the e-government strategy. Of the organisations responding to the OECD survey, 87% have their own e-government strategy in place, with 56% having developed them during the period 2000-04. Organisations seem to be placing a priority on e-government: 81% of respondents reported that it was a "very important" priority, 15% said it was "somewhat important", 1% said that it was the "most important" priority of their organisation and only 3% said it was "not an important priority".

As shown in Figure 4.3 below, the majority of government organisations surveyed for this review report that the national e-government strategy is a significant driver of their e-government activities. As noted above, interviews with officials from all levels of government revealed a generally positive view of the strategy. However, while there is strong commitment to e-government, there are indications that there is not a uniform commitment to the various goals of the strategy, with a bias towards economic and/or internally focused goals (*e.g.* improving co-ordination of processes). The e-government strategy is explicitly oriented towards citizens. However, when asked for the most important reasons for the implementation of e-government in their organisations, 83% of survey respondents said that achievement of efficiencies was either "important" or "very important", whereas responding to external pressure from citizens and businesses (a key public sector modernisation goal) was of importance to only 39% of respondents. Although a large percentage (nearly 47%) of respondents called this e-government driver "somewhat important", its lower overall ranking – along with even lower rankings for drivers related to strengthened citizen engagement and trust in government, and improved government transparency and accountability – reinforce the existence of this bias.

The bias towards efficiency objectives may reflect the emphasis of the surrounding ICT policy environment, where *Using IT Wisely* (2003) emphasises effective and efficient utilisation of ICT by the public sector. It may indicate that organisations' priorities are influenced by the fact that the Ministry of Finance is responsible for e-government. It may be, in part, a result of Danes' overall satisfaction with, and trust in, government which may be leading to a lack of strong pressures on organisations to improve their performance in other areas. It

Figure 4.3. **Importance of reasons for e-government implementation**



Source: OECD E-Government Survey: Denmark.

may also be a result of efficiency being an aspect of their performance that is easier for government organisations to target and measure than factors such as customer needs and expectations, and attitudes towards organisations and their services. Whatever the reason, while a strong focus on improving efficiency through e-government is obviously essential to achieving the Government's goals (both for e-government and in other policy areas), it is important that the other opportunities and benefits that can be realised through e-government are not overlooked. This situation suggests that more communication between the top level of e-government and government organisations about the purpose of the e-government programme may be worthwhile.

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Key point 4.1

The Danish e-government strategy identifies and responds to a number of external pressures on the public sector, challenging government organisations to realise the inherent potential of e-government and the positive social and technological environment that surrounds it.

Government organisations have responded positively to both the need for e-government and to the e-government strategy. Most organisations regard e-government as an important priority. A majority of organisations view the e-government strategy and some of its key initiatives as major drivers of their own e-government efforts.

While the goals of the strategy reflect the policy issues that make up the business case for e-government, the design of the goals of the strategy show some bias towards public sector modernisation and efficiency issues. This is reflected in the way that government organisations are responding to the strategy. While this focus on efficiency is positive, it is important that other goals of e-government are also acknowledged as major drivers of e-government.

4.4. Political leadership of e-government

In itself, e-government has never been a top-level priority or "headline" policy for the Danish Government. Instead, e-government has always been positioned as an enabler of other major policies – particularly those related to development of the Danish information society and public sector modernisation (see Chapter 2). In line with both this positioning of e-government within the wider context of government policies and business, and the relatively informal Danish approach to management of the executive, there has never been a special committee of ministers established to play an e-government leadership, co-ordination or oversight role.

Instead, leadership and co-ordination of e-government across all levels of government is the responsibility of the senior government officials who make up the Joint Board of e-Government. E-government matters requiring ministerial involvement are put to the Government Finance Committee, which is chaired by the Minister of Finance and meets weekly to focus on co-ordination of economic policy and government expenditure issues. Occasionally, the Government Co-ordination Committee, which is chaired by the Prime Minister, may also become involved.

Besides ministerial backing for e-government via these two committees, the bulk of political leadership of e-government is exercised by individual ministers acting in relation to their own portfolio responsibilities. No convention of collective ministerial responsibility exists in Danish government, and there

Box 4.2. **Top-level co-ordination of e-government by Government Committees**

The Government Finance Committee plays an important role in co-ordinating e-government. E-government matters that must be dealt with by ministers are usually put to the Committee, due to the fact that responsibility for the Danish e-government strategy is held by the Permanent Secretary of the Ministry of Finance. Occasionally, matters will be put before both the Finance and the Government Co-ordination committees, two recent examples being ratification of the e-government strategy and approval of plans for the *eDay* initiatives. In this way, e-government initiatives developed at the administrative level under the oversight of relevant portfolio ministers can gain top-level ministerial attention and/or endorsement, as necessary.

There is a strong link between the Joint Board of e-Government and the Finance Committee. Along with the Minister of Finance, the Ministers of Interior and Health, and Economic and Business Affairs are members of the Committee. The Joint Board of e-Government is chaired by the Permanent Secretary of the Ministry of Finance and includes among its members the permanent secretaries of the ministries of Interior and Health, and Economic and Business Affairs. Aside from the direct relationship that the permanent secretaries have with their respective ministers, which allows for discussion of e-government as required, the permanent secretaries are also involved in preparation of the Finance Committee agenda. This enables the Joint Board to both put e-government matters on the Finance Committee agenda and/or identify agenda items that have e-government implications.

has been no move to establish a specific e-government portfolio. Ministers' involvement in e-government therefore very much depends on three things: 1) their own personal interest in the subject; 2) the relevance it has to their portfolios; and 3) the extent to which their permanent secretary makes it a priority issue for discussion.

Although the absence of collective responsibility may pose some risk of uneven ministerial commitment to e-government, there is no evidence that introducing a collective responsibility (which would require constitutional change) would alter or improve the e-government results Denmark is achieving. Similarly, there is no evidence to suggest that establishing a ministerial portfolio for e-government would have any useful impact on e-government results. Indeed, given the deliberate positioning of e-government in a wider context, allocation of responsibility to a powerful

minister could have a negative impact on e-government. Certainly, interviews conducted for this review did not suggest that current arrangements for ministerial involvement in e-government are ineffective.

Instead of relying on collective ministerial responsibility, leadership of e-government is built around collegiality at the level of the Joint Board of e-Government. Participation in e-government is generally not mandatory for government organisations. Instead, Denmark has positioned e-government as almost a moral responsibility for each organisation, which they should embrace in support of delivering Danes a high-quality and efficient public sector. Interviews showed that, while this shared commitment has been developing since 2001, it has really become established since the revision of the e-government strategy in 2004. Organisations are now better able to understand and commit to what they need to do as part of the overall e-government programme, due to a combination of clearer e-government goals and measures and an improved way of framing and making decisions at the level of the Joint Board.

Additionally, some ministers currently play another e-government leadership role through participation in the *E-government Dialogue Forum*. Established in 2001, this forum meets twice a year to enable an exchange of information and views between ministers, the chairs of the county and municipal government associations, labour and industry associations, and ICT industry groups such as ITEK. This forum enables ministers to be involved with e-government outside of the standing relationship they have with it through officials, and creates the opportunity for stakeholder engagement in the ongoing development of e-government. It is notable, however, that there is no participation in this forum by any groups directly representing citizens' interests in government

Overall, the e-government results that Denmark is achieving, coupled with the favourable impressions of the role that ministers play in leading e-government, indicate that no change to the current arrangement of political responsibilities is necessary – at least in terms of gaining the commitment of government organisations to the e-government programme.

4.5. Administrative leadership

At the whole-of-government level, Denmark is providing strong leadership for e-government, and officials express high levels of approval and satisfaction with the way e-government responsibilities are structured and co-ordinated. While Denmark does not have a specific ministerial portfolio for e-government, it has placed overall responsibility for Danish ICT policy (covering citizens, businesses and the public sector) with the Ministry of Science, Technology and Innovation. In 2001, following a review of public sector progress developing

e-government, the Ministry of Finance established both the Joint Board of e-Government and the Danish Digital Task Force to increase the focus on overall e-government leadership, planning and co-ordination. These bodies now work on e-government in close co-operation with the MVTU.

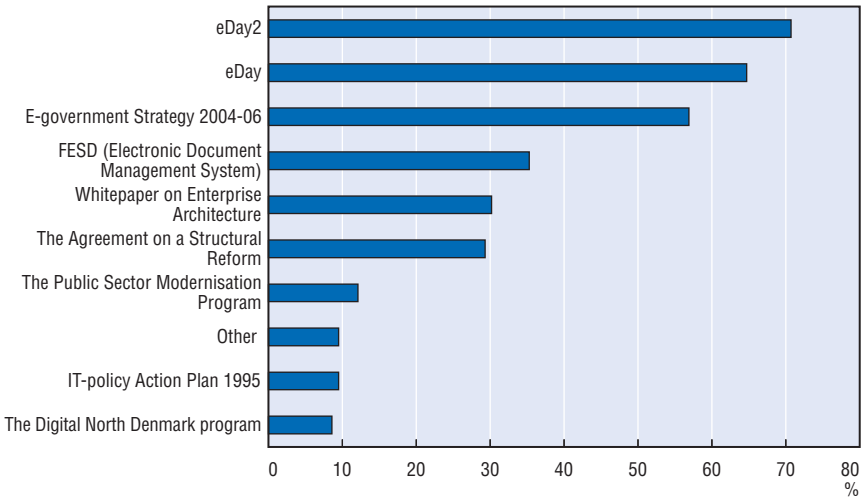
The Joint Board's approach of bringing leaders of organisations at each level of government together to take responsibility for a matter of such cross-cutting interest has been an innovation that appears to have paid off. Commentators regarded the Board as a particular strength of the Danish approach to e-government; it allows the perspectives of each level of government to be reflected in the design of the programme, and helps all government organisations become engaged in e-government implementation. This approach is now being used in a second area – governance of the *Forum for Top Executive Management* – which is seeking to strengthen top-level management across the whole of the public sector in support of better public governance.

As noted, interviews for this review revealed strong approval of the role the Joint Board plays in the design and implementation of the e-government strategy. Interviewees felt that there was a good cross-section of State government organisations represented on the Board and real benefit from including county and municipal representation as well. Many interviewees also observed that there appears to be a positive correlation between Board membership and the level of commitment to e-government shown by State government organisations, suggesting that Board membership can be a good way to engage organisations that may be lagging behind the leaders in the e-government effort.

The work being overseen by the Joint Board is clearly having a significant impact on government organisations. The OECD asked which e-government strategies, programmes and projects were significant drivers of organisations' e-government efforts. Survey respondents reported that the two most significant drivers were the *eDay1* (significant for 71% of respondents) and *eDay2* (65%) initiatives, both of which have been key government-wide elements of *Project e-Government*. The e-government strategy itself was reported to be a significant e-government driver by 57% of respondents. While these results are very positive, the fact that only 30% of respondents identified the Danish enterprise architecture as a significant driver, and only 12% cited the public sector modernisation programme, indicates that some aspects of e-government may benefit from more attention and leadership from the Joint Board.

In addition to support for the Joint Board, there was also strong support for the way the Digital Task Force and the IT-Policy Centre work together to bring a balance of public management and technology perspectives to bear on the e-government programme. It was observed, however, that the relationship between the two organisations has not always been as collegial and complementary as it is today; difficulties in alignment and co-ordination have

Figure 4.4. **Impact of national e-government strategies, programmes and projects**



Source: OECD E-Government Survey: Denmark.

been a problem in the past. However, efforts to correct this situation, including clarification of their roles and responsibilities, have evidently been successful, with the two organisations now being widely seen to form a strong partnership at the centre of the e-government programme.

The Digital Task Force and the IT-Policy Centre are seen as effective leaders, facilitators and co-ordinators of efforts to achieve e-government. The Digital Task Force has been successful as a catalyst to bring interested parties together to solve problems of e-government co-ordination and co-operation across levels of government. It is an unusual organisation for Danish government, drawing the majority of its staff as secondees from other State and local government organisations. These individuals bring essential qualities of enthusiasm and understanding of the potential of ICT to the work of the Task Force. Employment with the Task Force is regarded as recognition of prior good performance and potential, which helps attract top-quality candidates for Task Force positions.

With the revision of the e-government strategy in 2004, the mandate of the Task Force was renewed until 2006, at which point it currently expects to be dismantled. This expectation is used by the Task Force to create internal drive towards the achievement of the Government's goals, and to retain clarity about the fact that e-government is regarded as an enabler of good government in Denmark rather than being an ongoing end in itself.

In line with this time-bound mission, the Task Force has limited its staff numbers in order to remain focused, and has relied on use of seconded staff or staff recruited from the private sector to build up e-government expertise across government. Task Force staff return to their own organisations after working on e-government for, on average, 18 months, helping spread this expertise. The Task Force is perceived to be an energetic organisation whose broad-based composition enables it to understand e-government from a wide range of stakeholder perspectives. However, some interviewees expressed concern that Task Force staff members are relatively young and inexperienced in working at the top level of government. Regardless, there is a widespread view that either the Digital Task Force will still be required after its mandate expires in 2006, or that it will need to be replaced by some other means of providing leadership and co-ordination for e-government.

The role and expertise of the Task Force is complemented by the IT-Policy Centre in the MVTU, which is seen as playing a very important role in the development of many of the enablers of e-government (*e.g.* digital signatures and the enterprise architecture). Under the revised e-government strategy its work is seen as being more supportive of government organisations, with greater emphasis on developing concrete solutions to problems they face, while the Digital Task Force retains responsibilities in strategy development and oversight of all-of-government projects.

The overall strength of these top-level arrangements for leadership and co-ordination of e-government is indicated by the responses to the OECD survey question that asked organisations about the strength of potential challenges to their implementation of e-government. Duplication of actors and unclear institutional responsibilities at this level of e-government can often be significant problems in OECD countries. In Denmark's case, however, when presented with a wide range of potential challenges to their implementation of e-government, less than 1% of survey respondents identified "duplication" as being "very important" – the lowest response for any challenge (see Figure 6.1). Also, 65% of respondents did not regard this issue as a challenge at all. However, nearly 13% of respondents

Key point 4.2

The Joint Board of e-Government's approach of bringing leaders of organisations at each level of government together to take responsibility for a matter of cross-cutting interest has been an innovation in Danish public management that appears to have paid off. Particular strengths of this approach include the fact that it allows the perspectives of each level of government to be reflected in the design of the e-government programme, which assists in gaining the engagement of government organisations in its implementation.

reported that duplication was an "important" challenge, and almost 21% said it was "somewhat important". With regard to clarity of institutional responsibilities, 59% reported that this was not a challenge, while 4% said it was very important, 10% said it was important and 26% said it was a somewhat important challenge. The implication of these results is that, while Denmark has done well in this area, there will likely be benefits from further top-level efforts to organise, co-ordinate and communicate e-government roles and responsibilities.

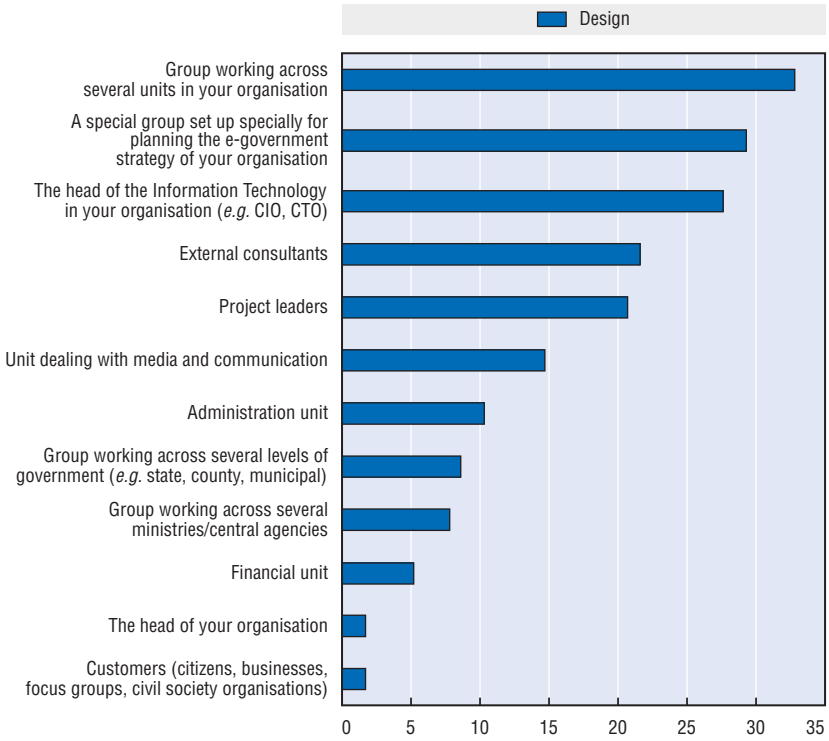
4.6. Organisational leadership

At the individual organisation level, the OECD survey results show that responsibility for e-government resides with the head of 53% of responding organisations. This is a positive result, given the incentive for placing this responsibility elsewhere that can arise from the real and/or perceived requirements for advanced ICT knowledge and expertise that it involves; an area of competence that top-level Danish officials have self-identified as a problem impacting their ability to perform this job. Aside from being able to emphasise the importance of e-government, heads of organisations are also well-placed to provide incentives and resources, and to monitor progress to ensure that: 1) e-government goals are effectively met; and 2) these goals are aligned with the wider goals of the organisation. When asked about the role of leaders, a large majority of survey respondents indicated that "ensuring that people are accountable for achieving the goals of the plan" was the most important aspect of e-government for top-level leadership.

OECD countries' experiences show that there is often a strong incentive for responsibility for e-government to be placed outside of top-level organisational leadership. In Denmark, following the head of the organisation, the second most common location for e-government responsibility was with the heads of organisations' IT function (18%) and then with an internal "administration" function (10%).

Responsibility for actual design of e-government plans was more widespread. In organisations that responded to the OECD survey the head of the organisation had virtually no involvement in this area, with an existing group working across several parts of the organisation being the most common holder of this responsibility (33%), followed by a specially created cross-functional e-government group (29%) and then external consultants (22%) and e-government project leaders (21%). Distribution of management responsibilities showed a similar pattern, with project managers taking on proportionately more responsibility than other groups or functions. Implementation of e-government plans again tended to follow the pattern for allocation of design responsibilities, although in this area external consultants had responsibility in 27% of cases (see Figure 4.5).

Figure 4.5. **Responsibility for designing e-government plans**



Source: OECD E-Government Survey: Denmark.

One other notable result was that three groups had very limited responsibility for e-government within the organisations surveyed: 1) customers; 2) groups working across several ministries or agencies in State government; and 3) groups working across levels of government. This suggests, at the least, a risk that the e-government plans of Danish government organisations might be too insular and inward focused – a possible manifestation of the "bunker" culture identified as an e-government challenge in the Digital Task Force's 2003 review of the e-government strategy.

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Key point 4.3

The Danish e-government programme is effectively organised and co-ordinated, with good leadership, appropriate involvement of all levels of government, and strong linkages to relevant policy areas – especially government ICT policy. There does, however, appear to be room for ongoing improvement, particularly through further communication about the roles and responsibilities of the various actors at the centre of the e-government programme, and broadening of the groups responsible for development of e-government in individual organisations to include a more external and cross-organisation focus.

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Chapter 5

Organisational Change

The institutional context for e-government in Denmark is currently undergoing major change. Although a nationally co-ordinated restructuring of government based explicitly on e-government ideas has never been contemplated, the large-scale Structural Reform ("the Reform") of the public sector that is underway will likely be the dominant feature of the Danish public management environment for at least the next three years.

Overall, at the government-wide level, the role of e-government and its impact on organisational change presents a fascinating picture. Denmark is currently implementing what may be some of the most extensive public sector organisational change of any OECD country. These reforms are not driven or directly informed by e-government, but do depend on it for their success, and will deliver outcomes that are closely aligned with those of the Danish e-government strategy. This is especially notable due to the fact that, while neither the Reform nor the e-government strategy are expressed in terms of achieving a "transformation" of the public sector (e.g. by making it more networked and user-centric), the combined outcomes of these two initiatives should significantly move the public sector in this direction.

The impact of the Structural Reform on change at the individual organisation level remains to be seen. Organisations will be required to act in a less independent, more co-operative way if they are to achieve the Government's objective of becoming more citizen-oriented and efficient.

This chapter looks at the impact e-government is having on organisational change in Danish government, at both the all-of-government and the individual organisation levels. At the all-of-government level, the relationship between e-government and the current Structural Reform is examined. The chapter also looks at four key dimensions of how e-government affects organisational change within individual organisations, namely: 1) information and knowledge sharing; 2) organisational structure; 3) organisational processes; and 4) organisational values and culture. It also looks at the impact of e-government and ICT on organisational skills, with a focus on assessing organisations' progress to date in developing and maintaining the skills e-government requires.

5.1. E-government and the Structural Reform

The decentralised structure of the Danish public sector sets the institutional context for the implementation of e-government. During the past 30 years, administrative power and policy responsibility have increasingly been transferred from State to local government, creating highly autonomous local government which is responsible for delivery of many government services. The resulting closeness of local authorities to the users of their services provides a helpful environment for electronic delivery of user-focused public services.

The institutional context for e-government in Denmark is currently undergoing major change. Although a nationally co-ordinated restructuring of government based explicitly on e-government ideas has never been contemplated, the large-scale Structural Reform ("the Reform") of the public sector that is underway will likely be the dominant feature of the Danish public management environment for at least the next three years. The Reform is not directly motivated by e-government, but is driven by an economic goal of increasing the efficiency and competitiveness of local government, coupled with goals of making government more open, responsive, effective and participatory (details of the Reform are provided in Annex B).

While e-government is neither an explicit driver nor a goal of the Reform, it is clearly an enabler of the reform process. It is also central to achievement of some of its key objectives, such as reorganisation of the health sector and creation of "local service centres" that will become the primary offline entry point for delivery of as many State and local government services as possible.

The Reform appears to be heavily influenced by the ideas informing the Government's overall drive for public sector modernisation, of which e-government is a key component. The *Citizens at the Wheel* (2002) modernisation programme is developing approaches to public management that shift the focus of organisational change away from structural issues (such as the shape and size of organisations and allocation of their roles and responsibilities) to the actual nature and objectives of government policies and functions, and the way that organisations work separately and collectively to achieve them. It is based on the overarching principle that public services should be provided how and where they can achieve the best outcome for their users. Within this more citizen- or user-oriented framework, e-government can be a useful tool to enable and monitor change, improve governance arrangements and enhance collaboration across government in the provision of public services.

Officials' perceptions of the role and function of e-government in the process of the Structural Reform differ within individual organisations. In extensive discussions of the Structural Reform held during interviews for this review, many officials observed that the Reform is reliant upon effective e-government as an enabler of change. Yet, the Reform is not explicitly branded as an e-government-driven or enabled reorganisation of government, which some interviewees regarded as being a lost opportunity. Others, however, felt that this was not a problem because the Reform creates a clear need for government organisations to push forward with e-government in order to meet the Government's objectives and generate the cost savings that will be necessary to pay for the cost of the Reform.

The capacity of e-government to enable cost savings will be an important element for the success of the Structural Reform, especially in light of the Government's decision to provide no new funding for the initiative and instead rely on operating efficiencies to pay for it (as discussed in Chapters 1 and 2). While there was clear support for the objectives and overall design of the Reform, many interviewees stated that this funding plan may be a weakness of the Reform, given what they believe will be significant adjustment costs, especially with regard to reconfiguring existing information systems or building new ones. There was limited concern over the question of whether the projected savings would be sufficient to cover the upfront costs of change to ICT, and provide incentives for local government to further implement e-government. Several interviewees cited the results of the "mini structural reform" that occurred on the island of Bornholm (merging five municipalities into one) as evidence that any issues that may arise in this regard should not be particularly serious or impossible to overcome. The availability of loans from the Government to cover the costs of change was also seen to offset risks in this area. Many interviewees who raised this

potential issue also expressed concerns over what the Reform might mean in terms of the future role and performance of KommuneData (KMD) as the major supplier of ICT to municipalities, seeing potential for increased dependency of municipalities on KMD.

Others believed that – at least at the municipal level, where the biggest change is occurring – the Government sensibly depended on KMD's market dominance in the outsourced supply of ICT to municipalities as an enabler of the reform process. KMD has been developing various "Structural Reform packages" that many municipalities will rely upon as the basis for their ICT environment during and beyond implementation of the Reform. It is argued that this will allow them more freedom to concentrate on other aspects of the change process, such as reorganising their physical operations and addressing matters related to their workforce. Some commentators felt that this was a pragmatic approach that actually makes the unfunded three-year reform process feasible, while others felt that it will constrain e-government innovation and set back the achievement of goals of the e-government strategy, at least temporarily (see Chapter 6 for further discussion of this issue).

Overall, at the government-wide level, the role of e-government and its impact on organisational change presents a fascinating picture. Denmark is currently implementing what may be some of the most extensive public sector organisational change of any OECD country. These reforms are not driven or directly informed by e-government, but do depend on it for their success, and will deliver outcomes that are closely aligned with those of the Danish e-government strategy. This is especially notable due to the fact that, while neither the Reform nor the e-government strategy are expressed in terms of achieving a "transformation" of the public sector (*e.g.* by making it more networked and user-centric), the combined outcomes of these two initiatives should significantly move the public sector in this direction. It is also interesting to note that that the Reform is having the least impact at the State government level.

The impact of the Structural Reform on change at the individual organisation level remains to be seen. Organisations will be required to act in a less independent, more co-operative way if they are to achieve the Government's objective of becoming more citizen-oriented and efficient. However, interviews for this review showed that many people do not see a clear relationship between the Structural Reform and e-government in achieving this goal. There was no obvious consensus on how e-government may enable the success of the Reform by contributing to:

- Strengthened governance arrangements.
- Improved communication (both with and within government).
- Enhanced collaboration across levels of government.

- Delivery of more user-focused and effective services.
- Greater efficiency and cost-effectiveness.

Key point 5.1

E-government is not a driver of major organisational change at the all-of-government level in Denmark. However, between 2005 and 2007 the Structural Reform will drive a major reorganisation of local government, giving it a greater role in delivery of government services and deliberately making it increasingly the "front-door" to government in Denmark.

E-government is not an explicit driver or goal of the Reform. However, for the Reform to succeed both organisationally and fiscally, increasing levels of e-government will be required to enable delivery of the user-focused public services and cost-savings that are the key objectives the Government has set for the Reform. These objectives are consistent with those of the e-government strategy. The Reform presents both an opportunity for further achievement of e-government objectives, and potential for progress towards those objectives to be slowed while other aspects of the change process dominate the attention and resources of organisations going through the Reform.

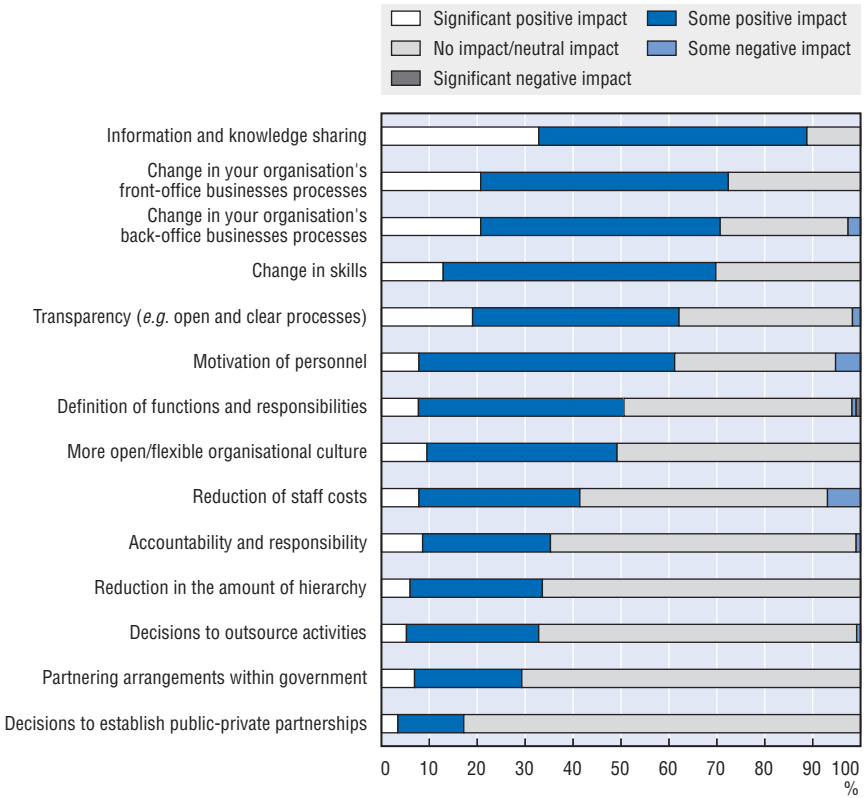
5.2. E-government and organisational change at the individual organisation level

Within individual organisations e-government appears to be having a range of impacts on organisational change, virtually all of which are widely seen as positive. The biggest effect reported in the OECD survey has been in the area of information sharing, where 89% of respondents noted a positive impact. This was closely followed by changes to front- and back-office business processes, where positive impacts were reported by, respectively, 72% and 71% of respondents. Other areas where positive impacts were reported by more that half of survey respondents were: changes in skills (70%), transparency (62%), motivation of personnel (61%), and definition of functions and responsibilities (51%).

Impact on information and knowledge sharing

Like many OECD countries, Denmark has recognised the impact ICT can have on enhancing information sharing, both within organisations and across government, through eliminating physical barriers to communication and reducing the cost associated with information sharing. As shown in Figure 5.1, this is the area where survey respondents felt that e-government has had the greatest impact on their organisations so far.

Figure 5.1. **Impact of e-government on organisations**



Source: OECD E-Government Survey: Denmark.

However, while the current e-government strategy identifies information and knowledge sharing as a key area of focus in creating the framework for ongoing development of e-government, it does not specifically address the use of ICT as a tool to promote sharing of information or knowledge (either about e-government or about the wider business of government) across government. While the strategy does include the goal of improving the systematic sharing of lessons learned regarding suppliers, finance, organisational change and human resources in order to build a solid body of e-government knowledge across government, it does not include any explicit measures to provide the public sector with some form of government-wide electronically enabled knowledge-sharing framework (*e.g.* a defined information and/or knowledge management strategy, a public sector Intranet, or a common electronic workspace using online collaboration tools). This is an area to which more effort could perhaps be devoted, building on a principle that all organisations involved in e-government development in Denmark should take responsibility

for promoting the ICT-enabled exchange of information and knowledge; both that specific to e-government projects and initiatives, and that related to wider government policies, programmes and services. Two good examples of what can be done in this area are provided by: 1) the Danish *Infostructurebase* (OIO, discussed in Chapter 6), which was put in place by the National IT and Telecom Agency to support collaboration and exchange of information related to e-government implementation; and 2) the Web site of the Digital Task Force that provides considerable information about the e-government programme.

The Task Force has initiated a project focused on using ICT to improve the exchange of information within a health-sector "service community" comprising hospitals and municipalities. This is another example of the type of initiative that can drive organisational change through improved information sharing. The project, which began in 2002, facilitates more unified treatment of patients by improving digital communication between municipalities and hospitals related to hospitalisation and discharge of patients. The project focuses on improving the exchange of information about patient contact addresses between municipalities and hospitals at the time of hospitalisation. Similar initiatives have been put in place in various areas of e-government (*e.g.* e-Agriculture, e-Business).

Impact on organisational structure

The use of ICT in government often cuts across core functions such as planning, budgeting, human resource management. This provides opportunities for government to reshape existing organisational structures and rethink traditional frameworks of responsibilities. Just over 50% of respondents to the OECD survey indicated that e-government has had an impact on the definition of such functions and responsibilities.

However, internal organisational rigidities seem to be reducing e-government's ability to create more flexible organisational structures. A review of major barriers to e-government in Denmark conducted by the Digital Task Force in 2003 identified a "bunker" (or silo) culture as one of the key obstacles to the development of e-government in Denmark. This issue is, of course, not unique to Denmark. Throughout OECD countries, the silo structure of government organisations is widely considered to be an obstacle to communication among agencies which prevents inter-organisational thinking and action – specifically in the development of e-government, and more widely in the development and delivery of policies, programmes and services. Some steps being taken to address this problem through supporting increased levels of collaboration between government organisations are discussed in Chapter 6.

The Task Force's review indicated two major barriers to the organisational change ultimately required for effective e-government in Denmark: 1) the absence of a culture that promotes staff mobility and task reallocation across

organisations; 2) a lack of incentives for organisations to participate in cross-cutting projects. This is particularly true at the State government level, where the Structural Reform process will have the least impact. A survey conducted by the Ministry of Education also indicated that the biggest impact of ICT on organisational change in government is considered by officials to be on improving the level of employees' skills, rather than on changing organisational structures. This is further evidence that e-government has had only limited impact on organisational structures.

The OECD survey results show that e-government has also had an impact on the reduction of staff costs (slightly more than 40% of respondents indicated such an impact). The introduction of electronic archiving and document management has freed resources and brought staff reductions in some ministries, though is it not clear whether these individuals have been reallocated or made redundant.

Impact on organisational processes

In addition to affecting organisational structures, the use of ICT can have a positive impact on organisational processes by speeding them up, reducing errors and eliminating duplication, enabling process re-engineering (both within and across organisations) and generally enhancing process automation. More than 70% of OECD survey respondents stated that e-government has had an impact on both front- and back-office business processes. Interviews with officials revealed that a large number of organisations are seeing and seizing the opportunity to use ICT to automate or redefine their business processes, with the goal of delivering improved services and/or improving the efficiency of their operations. The Ministry of Foreign Affairs exemplifies this type of e-government impact. It has used ICT to support real-time operations, and is using the Internet to change the way its business is conducted. According to an interview with Ministry officials, e-government is used to "give diplomats an edge by providing them with the information they require as quickly as possible, so that they can do their job better".

One area where e-government has had a significant impact on organisational change is the improvement of back-office processes, especially at the all-of-government level. For example, electronic invoicing of services provided to government, based on the OIOXML standard, has been mandatory since February 2005. The use of the new *eFaktura* invoicing system has had a positive impact in terms of generating savings for both government and businesses (see Chapter 6 for further information). As another example, an electronic data management system, the FESD electronic document management project, has been instrumental in achieving greater efficiency and more effective project management by changing work processes and strengthening internal capacities (see Chapter 6).

However, the use of ICT to improve the efficiency of business processes has a cost. The pressure of day-to-day business and the existence of different organisational functions, and competing priorities and workloads, can make it seem less convenient or desirable to invest new resources in ICT and e-government in order to improve cross-agency processes. Some commentators, while recognising the importance of the work being led by the Task Force in this area (for example, in promoting the introduction of FESD), pointed out that it can be very difficult to achieve such objectives. Organisations face internal competition for the resources required to participate in such initiatives, and must continue to meet quality and quantity standards for delivery of both internal and external processes and services while potentially making changes to those processes. Importantly, these resources are both financial and non-financial (*e.g.* project management skills, specialist e-government skills, experience in integrating ICT, and an understanding of the business of organisations). Such skills, which are costly, are also in relatively short supply in Denmark.

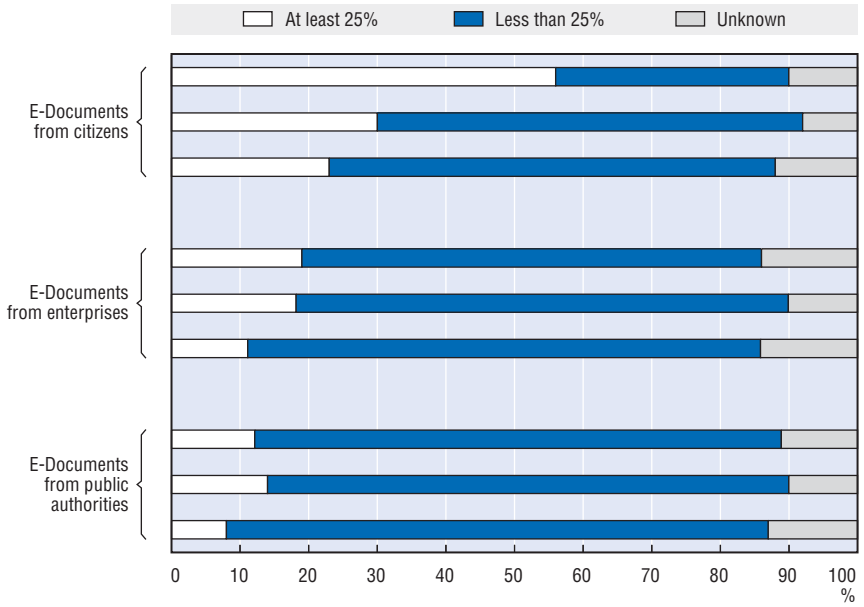
Impact on organisational values and culture

The use of ICT in government can also have an impact on organisational values and culture, helping bring about new ideas and working models based on principles such as achieving greater flexibility in working arrangements, and increasing openness and transparency in government. In Denmark a majority (62%) of respondents to the OECD survey indicated that e-government has had a positive impact on transparency.

Despite this, efforts to increase the use of ICT as a tool for effective communication with and within government have not brought about radical change in the way users deal with government. Projects and initiatives led by the Digital Task Force (especially *eDay*) have aimed to promote a culture of paperless communication across government. However, while progress has been made, users demonstrate some resistance to changing their habits when dealing with government. As shown in Figure 5.2, while an increasing number of organisations exchange at least 25% of documents electronically, the large majority of government organisations still exchange less than 25% of documents in this manner. It is notable that the lowest level of electronic document sharing occurs within the public sector.

This resistance to change extends beyond users of government services. Interviews with officials indicated that the biggest challenge related to introducing e-government may be a cultural one of changing people's mindsets and work behaviours. Despite organisations' investments in providing frameworks that allow staff to better use ICT infrastructures, resistance to change is still persistent – especially among top-level managers who are more reluctant to adapt to new ways of working than others. While systems of recognition and

Figure 5.2. **Share of documents received electronically by the public sector**



Source: Statistics Denmark, Information Society Denmark 2005.

reward for best practices and solutions in using ICT in government (*e.g. Top of the Web*) have provided some incentives for a change of mentality, it is not clear to what extent reward systems have had an impact on general staff behaviour.

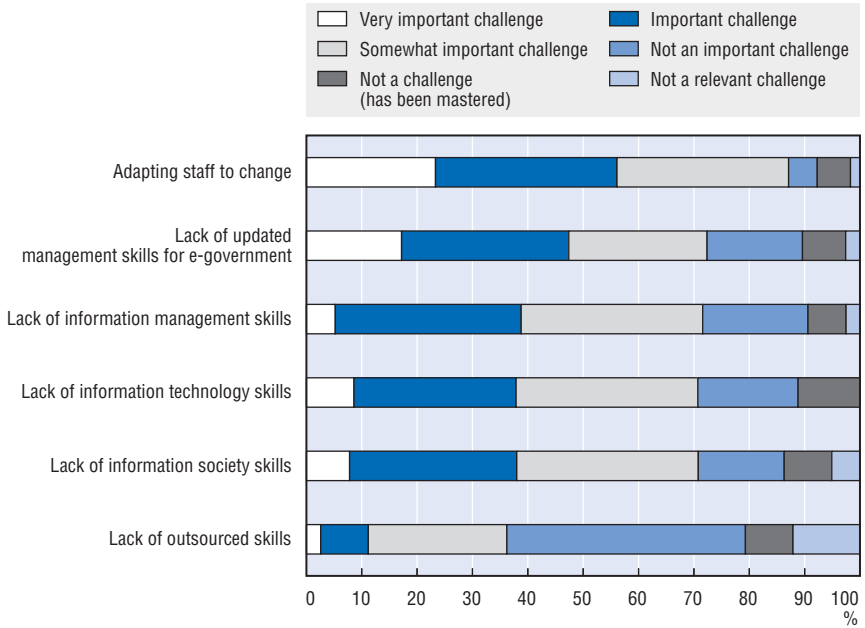
Impact on skills

Changing skill requirements can be one of the most significant organisational changes necessitated by e-government. A European Union (EU) survey undertaken in 2005 showed that Denmark leads other EU countries in terms of incorporating measures of skills and organisational change into e-government action plans, and in developing specific instruments to identify e-government skill gaps.

Although the OECD survey showed that the majority of respondents experienced positive impacts from e-government, some also reported challenges. A significant percentage of respondents (87%) reported that adapting staff to change was an "important" or "somewhat important" challenge. The challenge of updating management skills to account for e-government (important for 72%), and lack of information management, information society and information technology skills (important for, respectively, 72%, 71% and 71% of respondents) also ranked highly.

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Figure 5.3. **Skill challenges for e-government implementation**



Source: OECD E-Government Survey: Denmark.

Interviews held for this review revealed that the lack of ICT skills is a major concern in Denmark. For example, it was reported that a recent effort to fill 13 ICT positions in one ministry yielded only seven suitable applications. Other ministries report that they are facing the same problem. This shortage may be partly due to a fragmented ICT training environment, which can make it hard for students to understand labour market demand and identify the type of roles they should be training for. From a demand-side perspective, some interviewees also pointed out a lack of knowledge within organisations about the kind of ICT skills that are being offered by the market.

According to interviewees, insufficient numbers of people are learning about advanced technical issues (*e.g.* XML and system integration) during post-secondary education. This may be a result of both problems with ICT curricula, and entrenched attitudes. Danes typically believe that missing skills can be obtained through private training courses. While this can help in the short run, it can limit the progressive build-up of a set of specialised knowledge and ICT skills in support of e-government development.

Many interviewees cited a lack of project management skills as one of the most important skill-related challenges to e-government. The current level of project management skills, at both top and middle management levels, is

believed to be insufficient. While some agencies have created CIO-type positions at the top management level, most commentators felt that people in these and related positions lack the management skills to oversee large e-government projects.

A differing view was that the key problem is not at the level of top management, but at middle management (*e.g.* heads of department, etc.). The Ministry of Foreign Affairs has switched its emphasis from the top level of managers, focusing instead on developing the skills of middle managers. Ministry leaders see individuals in this level of management as the key agents for change in the Ministry. To this end, the Ministry has laid down a number of guidelines to help middle managers improve their ability to use ICT, and provides them with appropriate training and support (see Box 5.1).

Helping staff adapt to new ways of working is another major challenge, as organisational change in this area can require significant time and considerable investment in staff training. Some commentators felt that some centralised decisions taken by the Government (*e.g.* the shift to electronic invoicing) have been questionable because they have not been sensitive to this challenge, and have left too little time for organisations to prepare their staff for change.

Box 5.1. **Improving middle management ICT skills in the Ministry of Foreign Affairs**

In August 2004, the Ministry of Foreign Affairs launched a project aimed at fostering "digital leadership". The project targets middle managers (*i.e.* ambassadors, heads of department), focusing on building their skills and expertise in using ICT as a management tool. As part of the project, five "commandments" on how to practice digital leadership have been formulated:

1. Be a good example; use ICT systems yourself.
2. Make full use of the Internet and intranet.
3. Be familiar with the ICT strategy.
4. Be responsible for the ICT competencies of your staff.
5. Keep yourself up-to-date on how to best use ICT to achieve your goals.

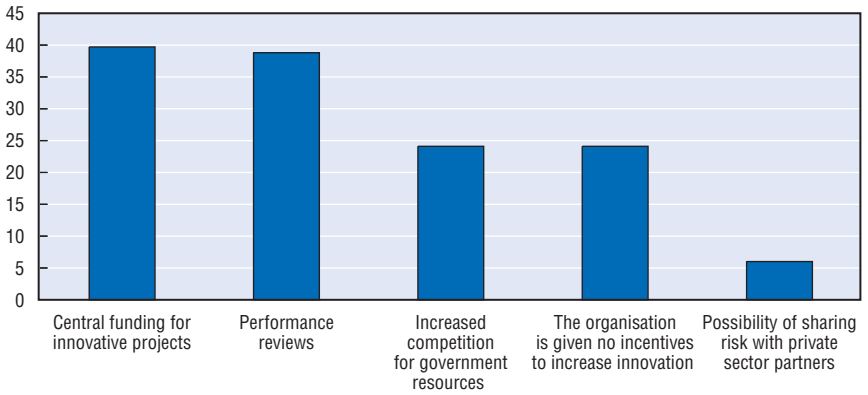
Evaluation of performance against these principles has not yet been undertaken, but the Ministry has plans to include them in the current middle management performance pay system. Ministry officials report that the project has had an impact on changing middle managers' attitudes towards ICT; some have increased their awareness of the benefits of more effective ICT use, and have requested special training.

However, while top-down change can be problematic, bottom-up change from within the organisation can equally be impeded or slowed due to a lack of strong leadership and/or internal resistance to change. OECD interviews showed that changing peoples' attitudes and behaviour is a difficult process. As one official said: "When you are talking about e-government driven changes everything is fine, but when it comes to their implementation it is much more difficult. In more stressed situations agencies prefer doing things in the way they are familiar with."

Impact on innovation

The other aspect of organisational change examined by the OECD survey was incentives for increased innovation, which e-government both depends on and can drive and enable. Denmark has many examples of innovation connected to e-government. Organisations surveyed reported that the biggest incentive for increasing innovation is provided by central funding for innovative projects (cited by 40%), followed by performance reviews (39%) and increased competition for resources (24%). The possibility of risk-sharing with private sector partners was only regarded as an incentive by 6% of respondents (a significant result due to the Government's desire for the public sector to engage in more partnering with the private sector), and 24% reported facing no incentives for increased innovation.

Figure 5.4. **Incentives for organisations to increase innovation**



Source: OECD E-Government Survey: Denmark.

Overall, this result points to the important role that central organisations such as the Ministry of Finance can play in supporting the development of e-government through their role in creating an overall public management environment in which appropriate incentives for e-government exist.

Key point 5.2

Denmark expects that e-government should have a significant impact on individual government organisations, and influence both the way they undertake their functions separately and collectively, and their culture and behaviour. So far, while organisations demonstrate that e-government is both having a range of positive impacts and imposing new challenges for them to face, the overall impact it is having on organisational change is not as significant as it either could, or should, be.

Despite the relatively slow pace of e-government-inspired organisational change, there are good examples of the types of change that are possible and that government organisations can draw on. The two biggest barriers to change appear to be: 1) a cultural challenge manifesting as a "bunker culture" in government; and 2) difficulties relating to staff skills and supply of suitably skilled workers. Alongside this, there is a question of the adequacy of incentives for e-government-enabled innovation and the role that organisations at the centre of government can play in strengthening these.

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Chapter 6

Common Frameworks and Collaboration

Collaboration is relatively well advanced in Denmark. Interviews with officials revealed a strong commitment to the concept and practice of collaboration, and general satisfaction with the way the policy and operational environments support this behaviour.

At the all-of-government level, rather than consolidating co-ordination responsibilities under a single entity such as a chief information officer, Denmark has involved several ministries in co-ordinating e-government according to how it fits with their wider responsibilities, functions and expertise. Denmark's current arrangements for top-level planning, co-ordination and leadership of e-government have contributed significantly to its achievements, and there is strong support, both within and outside government, for continuation of these arrangements beyond 2006.

In addition to putting in place a range of co-ordinating roles, responsibilities and bodies, Denmark has also been active in developing common ICT infrastructures and applications that support e-government collaboration.

Collaboration between government organisations is both a key requirement and significant challenge for the development of efficient and effective e-government in all OECD countries. Without collaboration, some of the most important results that governments are seeking through e-government simply cannot be achieved. This chapter looks at the steps Denmark has taken to facilitate collaboration on e-government, especially through co-ordination efforts and development of common frameworks to support collaborative action.

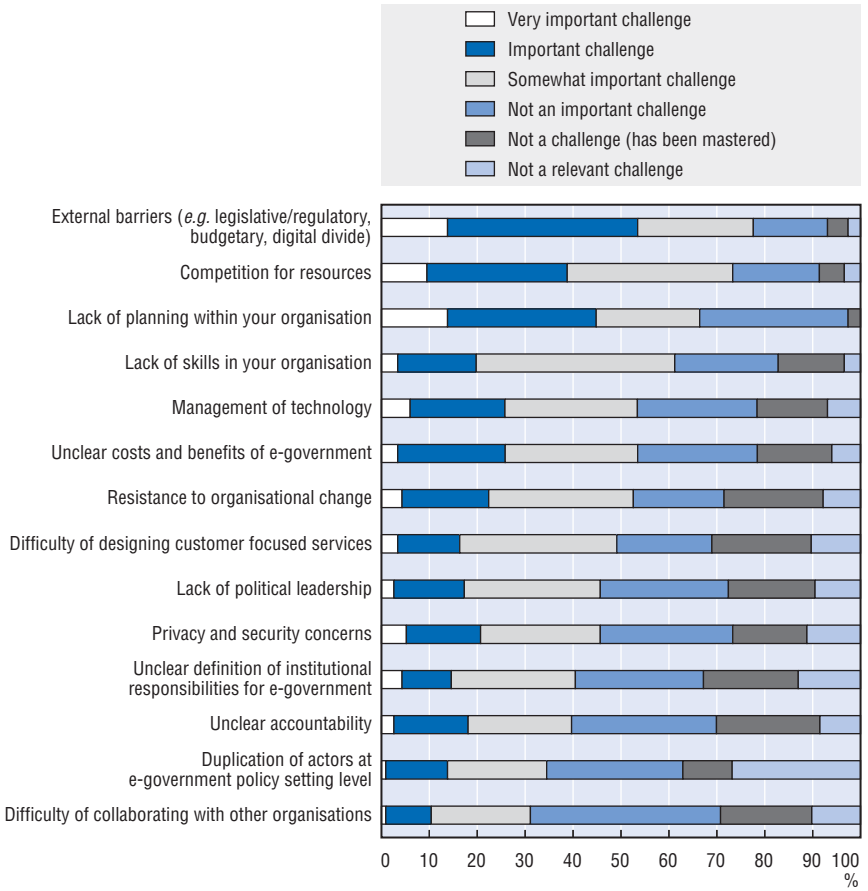
Collaboration is relatively well advanced in Denmark. Interviews with officials revealed a strong commitment to the concept and practice of collaboration, and general satisfaction with the way the policy and operational environments support this behaviour. This attitude was reflected in the OECD survey; when asked about potential challenges to their implementation of e-government, only 31% of respondents stated that difficulty in collaboration was a challenge of any importance, with less than 1% saying it was very important. This is a positive result that appears to reflect Denmark's public sector culture of consensus and compromise acting in support of e-government.

6.1. Co-ordination of e-government policies and projects

At the State government level each ministry plays a co-ordinating role for the various departments, agencies and bodies it is responsible for. This is most clearly seen in the process of budget allocation within the overall ministerial portfolio. However, internal co-ordination of e-government systems and applications development is increasingly evident. This is a result of the public sector modernisation programme, which requires all ministries to prepare strategies that include a focus on improving the efficiency and quality of their services through better ("more qualified") use of ICT.

At the all-of-government level, rather than consolidating co-ordination responsibilities under a single entity such as a chief information officer, Denmark has involved several ministries in co-ordinating e-government according to how it fits with their wider responsibilities, functions and expertise. As noted in Chapter 4, while this creates potential for duplication of roles and/or lack of clarity, this is generally not seen to be a significant problem in Denmark. However, there is still room for improvement. Overall, Denmark's current arrangements for top-level planning, co-ordination and leadership of e-government have contributed significantly to its achievements, and there is strong support, both within and outside government, for continuation of these arrangements beyond 2006.

Figure 6.1. **Importance of potential challenges to e-government implementation**



Source: OECD E-Government Survey: Denmark.

Through the Digital Task Force, the Ministry of Finance plays the most prominent e-government co-ordinating role at the all-of-government level. This role, which is focused on cross-organisational issues that arise from, or impact on, the e-government strategy, has grown alongside a broader push from the Government for more public sector co-ordination aimed at achieving better results. This push is partly a response to the cross-cutting nature of most major policy issues in Denmark, and partly due to an e-government-generated awareness of the need to develop a culture of collaboration in the public sector. It has led to increased questioning of the traditionally high levels of independence and decentralised powers of decision making that government organisations have enjoyed. In 2003, a major review of the e-government

strategy and *Project e-Government* identified the need to extend the project until the end of 2006. As already noted in Chapter 4, it also brought to light a number of challenges and obstacles in front of the project, including a widespread "bunker" (silo) culture in government that acted to inhibit collaboration.

In considering how to address these obstacles, the Joint Board of e-Government looked at the tension between co-ordination and centralisation as approaches to implementation of the e-government strategy. The outcome was an acknowledgement of the importance of using both approaches to achieve the Danish e-government vision, and a shift from "soft" to "strong" co-ordination as the overall approach to implementation of the e-government strategy. Since 2004, the overall strategic approach to e-government has involved more active direction and support from the centre of government that features a notable increase in attention to development of all-of-government co-ordination frameworks and common ICT infrastructures.

The Ministry of Science, Technology and Innovation (MVTU) has the other major e-government co-ordinating role, due both to its overall responsibility for Danish ICT policy and the close involvement of its IT-Policy Centre in *Project e-Government*. The principal task of the Ministry is to develop and implement key initiatives of the Government's ICT policy, and to contribute to creating the best possible framework for citizens, businesses and the public sector to realise information society goals. The Ministry's co-ordination responsibilities are carried out in a variety of ways, particularly through its role in developing the Danish enterprise architecture and ICT standard setting (discussed below); for example, the work of the XML Committee is managed by the National IT and Telecom Agency, located under the MVTU.

The move to base the technical implementation of e-government on common frameworks and ICT infrastructures is now highlighting tensions between: 1) the central drive to enable the whole public sector to develop information systems and applications based on common co-ordinating frameworks and systems; and 2) the challenge this creates for individual organisations to translate these frameworks into tangible developments – especially in the context of:

- Limited resources.
- A frequent need to obtain new expertise to interpret and apply the new frameworks.
- Non-standard "legacy" systems and/or reliance on outsourced systems, which, themselves, are not compatible with the new frameworks being put in place.

While interviews conducted for this review showed almost universal agreement and acceptance of the need to base public sector ICT on the common co-ordinating mechanisms being developed, there has not yet been a uniform

move by organisations to align with and implement them. To some extent this is simply a function of time, as these frameworks have only been introduced in the past two to three years. However, the business case for e-government requires the public sector to become more efficient and coherent through its use of ICT, and these new co-ordination mechanisms are clearly central to achieving those goals. To be effective, they will have to be adopted by virtually the whole of the public sector. Until then, the benefits they can deliver in terms of both increased flexibility to design and deliver services in user-focused ways, and reduced costs and/or greater benefits of ICT, will be impossible to either achieve or maximize. Also, when individual organisations that are not aligned with the co-ordinating mechanisms participate in collaborative initiatives with agencies that are aligned, all agencies are likely to incur additional (and otherwise avoidable) uncompensated costs of electronic interaction (*i.e.* non alignment creates negative externalities or "spillovers"). This issue raises a major question about how Denmark can strike the right balance between soft and strong co-ordination of e-government. This, in turn, raises deeper questions about centralised *versus* decentralised approaches to public management. The issue is discussed further in the section on the Danish enterprise architecture below.

In the area of e-government for business, an important co-ordinating role is played by the Danish Commerce and Companies Agency, located under the Ministry of Economics and Business Affairs. This agency is responsible for the development of the virk.dk portal through which businesses can access public and private sector services. The Ministry of Interior and Health plays a similarly important role in relation to e-government in the health sector. Complementing the e-government co-ordination roles played by these and other ministries are several significant councils and committees. The active involvement of county and municipal government in many policies and projects co-ordinated by State government, coupled with higher levels of autonomy and a more homogenous range of functions and services, has led to their being fewer local government bodies with e-government co-ordinating roles and responsibilities.

In addition to providing various mechanisms for co-ordination of e-government, Denmark has also taken a more active role in facilitating e-government collaboration through the creation of "new service communities". These initiatives, supported by the Digital Task Force, facilitate collaboration among organisations that have common or related functions, services or user-groups that may benefit from joint implementation of e-government. Support of new service communities includes: 1) proactively identifying opportunities for e-government collaboration and preparing relevant organisations to analyse and then pursue these opportunities; and 2) supporting collaboration initiatives

Box 6.1. **Key e-government co-ordination councils and committees**

State government

The State IT Council: convened in 2000 to contribute to effective application of ICT in the Danish public sector, the Council is a forum for exchanging information, building co-operation, issuing joint guidelines and making proposals around government ICT policy. It has a particular focus on matters related to organisational development. All ministries have a senior manager representing them on the Council, which is chaired by the MVTU.

The State IT Forum: established as a sub-committee of the State IT Council, the Forum has a more technical focus on matters related to procurement and use of ICT. All ministries are represented in the Forum by their senior information or technology manager. Again, the Forum is chaired by the MVTU.

Council for IT Security: established in 1995 as a successor to the National IT Security Council, which had primary responsibility for advising the Danish Government on ICT security matters, the Council has seven members appointed by the Minister of Science, Technology and Innovation. Its work involves promoting an informed public debate on ICT security, and contributing to Danish ICT security policy. The Council co-operates with the IT Security Division of the National IT and Telecom Agency to strengthen ICT security in Denmark.

The Co-ordinating Information Committee: established in 1999 to ensure co-ordinated use of ICT by the different levels of government, the Committee has supported implementation of various e-government initiatives since the inception of *Project e-Government*. Chaired by the MVTU, the Committee consists of representatives from State, county and municipal government. The Committee has two technical sub-committees working on the Danish enterprise architecture and the government XML framework.

Local government

The Municipal Digitalisation Council: responsible for anchoring and focusing work on digitalisation in the municipalities, this council of municipal managers is appointed by Local Government Denmark. The Council helps to prioritise and co-ordinate implementation of specific e-government initiatives, with a focus on the organisational, structural and managerial side, rather than the technical side, of implementation.

The Digital Counties: the counties' e-government co-ordinating body conducts projects in areas of common interest such as digital signatures, electronic document management and XML standardisation.

developed by organisations themselves. Examples of service community initiatives supported by the Task Force since 2002 include:

- Administration of medical benefits.
- Digital services for families with small children.
- Digital vehicle registration.
- Establishment of the *www.virk.dk* business portal.
- Selection of "medication" as a special focus area for development of a cross-sectoral business model.

Many of these initiatives have either become significant e-government projects managed by steering committees established under the auspices of the Joint Board of e-Government and supported by the Digital Task Force, or may do so in the future. As noted in Chapter 3, the Task Force has a relatively small fund of about DKK 30 million to invest in these collaborative initiatives, which can help overcome some of the initial financial challenges that can occur when individual agencies are asked to justify expenditure of their core budgets on projects with unproven costs and benefits.

Key point 6.1

Denmark has not consolidated responsibilities for co-ordination of e-government under a single entity. Instead, it has allocated co-ordination roles on the basis of how e-government fits with various organisations' wider responsibilities, functions and expertise.

At the State government level, several ministries play co-ordinating roles. Interviews and survey results indicate that these roles are reasonably clear and free of duplication, but also that there may be room for further improvement. At the local government level there is less co-ordination, in line with higher levels of organisational autonomy. However, local government is widely engaged in the national e-government programme, and is therefore included in State government co-ordination activities.

Recently, there has been a move towards stronger co-ordination of e-government, in response to both a push from the government and identification in 2003 of a silo culture in the public sector – a major impediment to e-government. A key element in achieving better co-ordination and collaboration is development of some common e-government frameworks and ICT infrastructures. This has been supplemented with centralised facilitation of collaboration, particularly through the work of the Digital Task Force in supporting "service communities".

6.2. Common ICT infrastructures and applications

In addition to putting in place a range of co-ordinating roles, responsibilities and bodies, Denmark has also been active in developing common ICT infrastructures and applications that support e-government collaboration. Several of these systems are examined below.

The Civil Registration System

The Civil Registration System (CRS) is an example of how public registers, which are a long-standing element of the Danish system of public administration, have developed into a consolidated ICT infrastructure that provides each Danish citizen with a personal identification number for dealing with government. Established under the National Registration Act of 1968, the CRS was set up by copying the contents of manually kept municipal civil registers. There were two main reasons for the establishment of the CRS:

- Growing need for government to keep individuals' personal data (especially addresses).
- Need for a public-sector-wide system of identification (a precondition for the introduction of the P.A.Y.E. tax system in Denmark).

Today, the CRS system is managed by the Central Office of Civil Registration (the CPR Office) under the Danish Ministry of Interior Affairs and Health. The CPR Office is charged with administering the Danish personal identification number system and supplying personal data to both public and private sector organisations in a technically and/or economically suitable manner, in compliance with the legislation governing registers and civil registration. This promotes efficiency and coherence in the use of personal information in government, allowing organisations to avoid collecting and verifying citizens' general personal data. Citizens also benefit; they report changes of name, address, etc. only to the CRS system, rather than notifying multiple agencies.

The CRS encompasses a number of registers:

- *The Civil Register:* this contains current information about each citizen including personal identity number, address, name, civil status and citizenship.
- *The Road System Register:* this contains current information on all Danish roads. Each road is assigned a road code and a name, and the register also contains information about its administrative relationship (parishes, postal districts and voting districts).
- *The Housing Register:* this contains the addresses of all Danish dwellings and is used where it is necessary or practical to access the CRS using an address rather than a name, and to determine whether people are moving to an "approved" dwelling (in terms of various government policies and services).

- *The Register of Authorities:* this is the index of all public authorities that deal with the CRS. The register lists each authority's address, telephone number and facsimile number, along with administrative information such as authorities' place in the public sector in relation to courts, counties and police districts.

Individuals' CRS file contains their identification number, name, address, marital status, place of birth, citizenship, kinship, declaration of any incapacity, profession, membership of the Lutheran Church of Denmark, voting rights, municipal circumstances, registration notes and, eventually, death. When name, address, civil status and citizenship are updated the old data remains in the CRS as historical data. Each identity number is unique, and thus functions as individual identification. The entire public sector uses the identification number for administrative purposes. It is also used for a variety of reasons by the private sector under tightly proscribed arrangements. Citizens can request that their information be confidential, and available only to public institutions and creditors.

Two pieces of legislation regulate the operation of the CRS: *The Act on Processing of Personal Data 2000* and the *Danish Act on the Civil Registration System 2000*. The latter law enhanced private sector access to the CRS, allowing private actors to obtain information on individuals that has been made public under data processing legislation without advance permission from the Danish Data Protection Agency.

In interviews, officials often mentioned the CRS as a core piece of the e-government environment that provides a significant advantage in development of more user-focused services. Aside from its functionality, the long-standing existence of the CRS has brought two major benefits. First, it has to some degree preconditioned public servants for the introduction of e-government by getting them used to relying on common stores of data that have been developed on the basis of a "collect once, use many times" principle. Second, it has enabled Danes to develop high levels of experience and trust in government's ability to collect, store and use their personal information without compromising their privacy, and readied them for the wider introduction of administrative data sharing in support of e-government.

Public Key Infrastructure

Some OECD countries have chosen to rely upon a public key infrastructure (PKI) as the means by which they will: 1) secure the transmission of electronic information between citizens, businesses and government organisations; and 2) verify the identity of people (*i.e.* authenticate) who are providing and/or using electronic government information or services. Public key technology is currently the strongest form of information security technology being put into general service in either the public or private sectors worldwide. It is very complex and costly to implement within government, and also presents

significant challenges in terms of equipping external users (both people and businesses) with the required knowledge, software and/or hardware to use the digital certificates that are the publicly visible manifestation of the technology. To date, PKI implementations in OECD countries have been challenged by their complexity, risk and high costs, which become especially acute when the size of the PKI user base is expanded beyond relatively small numbers.

PKI is an area of e-government where some significant failures have been seen in recent years. This is not the case in Denmark, which has recently implemented a working government PKI and is making ever increasing use of digital signatures in delivering services to both individuals and businesses. Under the leadership of the Joint Board of e-Government, development of the PKI and public sector adoption of digital signatures have been key parts of *Project e-Government*.

In late 2001, following passage of Denmark's electronic signature legislation in 2000, the Joint Board took a major decision that free software-based digital signatures would be offered to citizens and businesses. Based on the results of digital signature pilot projects initiated by the Ministry of Research and Information Technology in 1998, the MVTU put in place a project to establish the necessary technological and organisational framework required for the introduction and use of digital signatures (*i.e.* to develop the PKI). Through a project called OCES (*Offentlige certifikater til elektronisk service* – Public Certificates to Electronic Services) the MVTU, with the support of the National IT and Telecom Agency (ITST), set out to create a PKI that would enable:

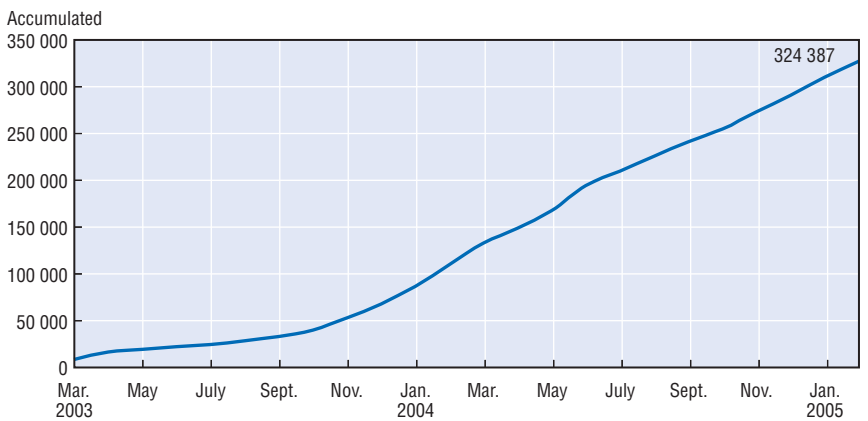
- An accessible, effective, secure and inexpensive digital infrastructure for citizens, businesses and public authorities.
- An innovative and co-ordinated implementation of government ICT initiatives.
- Optimal and secure use of ICT and other technologies by citizens and businesses.

Key project activities included establishing standards for digital certificates used to communicate with public authorities, creating contracts for implementation of the PKI and providing support to public authorities in implementing digital signatures. By 2003, OCES standards for the production and management of digital certificates had been developed, and TeleDanmark A/S (TDC) had been selected as the supplier of these certificates and the supporting PKI infrastructure and management services to government. It is worth noting that a pragmatic decision was made to make OCES-approved certificates software-based and "non-qualified", which means they are not included under the provisions of the Act on Electronic Signatures and consequently need not meet requirements for face-to-face identification when applying for a certificate; something that had been an obstacle to take-up of digital signatures in Denmark.

Now that the PKI is implemented, the ITST is focused on regulating the PKI provider and providing guidance and advice to public authorities and the public on the implementation and use of digital signatures. To do this it has established a Web site (*www.digitalsignatur.dk*) offering information targeted to the needs of both groups. This includes an explanatory video presentation on digital signatures, marketing material for public authorities to use in promoting digital signatures, and guidelines on digital signature implementation. In addition to maintaining the Web site, the ITST also provides active consultation and guidance for digital signature implementation projects. This guidance has proved very important to the introduction of digital signatures in Denmark. As the OECD survey shows, it is the second highest area of State government provision of e-government guidance (see Figure 6.4).

Digital signatures are now being widely used by both citizens and businesses to access a growing range of e-government services, and take-up is constantly increasing. As a result of the *eDay2* initiative led by the Digital Task Force in early 2005, there is now near universal adoption of digital signatures by government organisations (see Chapter 4 and Case Study 2). The current e-government strategy aims that, by 2006, at least 1.1 million digital certificates fulfilling the OCES standards will have been issued to citizens and businesses. While it is not certain that this goal will be achieved, progress is nonetheless impressive: 425 817 digital signatures had been issued by September 2005.

Figure 6.2. **Uptake of digital signatures**
Number of digital signature certificates issued

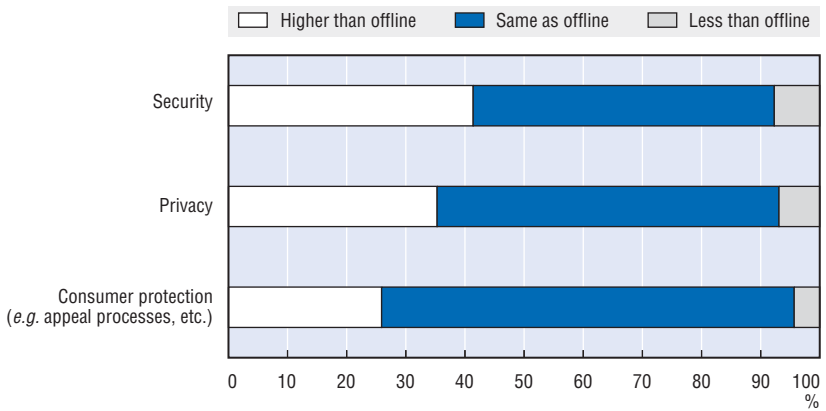


Note: Estimates based on weekly numbers. A digital signature certificate is a programme that is installed on computers of businesses or private persons. Digital signatures make electronic communications secure, *i.e.* the sender is known, and the contents cannot be altered by anyone else. Examples of use include tax returns, entry control to home pages.

Source: TDC, 2004.

Interviews with officials showed that the PKI has become a widely understood and accepted part of the common ICT infrastructure underpinning their e-government efforts. It was clear that its availability has made a major contribution to their development of confidence that e-government can be relied upon in terms of information security and privacy. When asked about protection of on- *versus* offline processes in their organisations, the vast majority of OECD survey respondents felt that security, privacy and consumer protection was either the same or better using digital approaches, with security being the area where the largest number of respondents (41%) felt there were improvements. At the same time, however, some respondents felt that online processes were less protected than offline ones (nearly 8 % in the case of security). This indicates that: 1) there is some understanding of the very important fact that PKI and other approaches being employed to secure e-government can never be 100% effective due to problems of design, implementation and/or use; and 2) investing in providing government organisations with further information, guidance, education or other forms of support in this area of e-government may be worthwhile.

Figure 6.3. **Attitudes towards protection of online processes**



Source: OECD E-Government Survey: Denmark.

While Denmark has made strong progress with implementation of PKI and uptake of digital signatures, the process has not been without challenges. One major issue that has arisen relates to the government's decision to use the PKI proposed by TDC, rather than the system proposed by the consortium of Danish banks that was the other major party in the tender process. The consortium went on to develop its own PKI-based security and authentication system called Net-ID. Developed and provided by PBS (Payment Business Services, a banking sector ICT infrastructure supplier owned by most Danish

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banks and the Danish central bank), Net-ID is available to some 2.1 million customers of Danish banks, and is also being made available to private sector organisations as part of PBS's business in supplying e-commerce payment systems. It is not, however, compatible with the public sector PKI.

Arguments for adopting the Net-ID system proposed by the banking consortium largely revolved around projected economies of scale and scope, and the convenience for users of digital signature which would result from the public and private sectors using the same PKI solution. In the end, Denmark decided to develop a separate public sector PKI. There appears to have been two main reasons for this. Although the digital signatures provided under the Net-ID system are based on the same broad PKI standard (*i.e.* the X.509 standard) codified in the OCES standard that governs public sector use of PKI in Denmark, there were concerns that the Net-ID implementation of the standard did not meet strict government requirements. There were also concerns about government use of what amounts to a proprietary PKI, particularly in relation to: 1) possible cross-border problems this could create in the future; 2) costs of government use of the system, which continued to rise as discussions with the banking consortium proceeded; and 3) possible future loss of government sovereignty in relation to a critical piece of ICT infrastructure underpinning the functioning of government organisations and public trust in (e-)government.

Opting to build the TDC-provided PKI was clearly a difficult policy choice, and one that is still the subject of discussions between government and the banking sector regarding long-term strategic issues and consumer interests relating to alignment of public and private PKIs and digital signatures in Denmark – something that could be achieved through "mutual recognition" of public and privately issued signatures. Government is willing to recognise privately issued signatures as long as they comply (as appropriate) with the standards specified in Denmark's electronic signature legislation. However, it appears that for the foreseeable future it will be using the PKI and digital certificates provided by TDC.

Implementing the PKI has brought some challenges. Free, software-based, digital signatures with passwords linked to CRS numbers were provided to individuals to install and use on their PCs. While this process is relatively straightforward, the issuing of so-called "employee signatures" is more difficult due to the need to establish the actual and legal relationship between employees and their employers as part of the chain for issuing and managing digital signatures. Achieving this has required a complex process of installing special software on employers' information systems, and implementation of a fee system for employers who wish to have more than 10 employee signatures issued to their staff. This fact, along with some user-education issues and technical difficulties experienced in deploying and managing digital signatures across the

diverse platform of PCs in use in Danish homes and businesses, contributed to slower than desired uptake of digital signatures during 2004 – especially among businesses, for which more PKI-enabled services are currently available. To counter this, in late 2004 the Danish Commerce and Companies Agency began a telemarketing campaign to encourage Danish businesses to adopt the digital signature, promoting the benefits of doing so in connection with the e-government services provided through the virk.dk business portal. In interviews, officials advised that the campaign was proving successful, with an approximately 50% success rate in convincing businesses to adopt digital signatures.

In interviews where the question of uptake of digital signatures was discussed, two major challenges were identified: 1) the need to develop useful e-government services to drive use of digital signatures (more so for citizens than businesses at this stage); and 2) the fact that the architecture of the PKI does not allow for development of PKI-enabled services designed to be delivered on mobile platforms. While not yet a real problem, it is expected that this situation will become more problematic as demand for mobile e-government increases over the medium to long term. Other interviewees mentioned the long time frames required to implement a large-scale ICT infrastructure of this type as being another challenge.

Key point 6.2

Denmark has chosen to develop a Public Key Infrastructure (PKI) as a key part of its common public sector ICT infrastructure. As a result of the eDay2 initiative, virtually all government organisations are now able to handle electronic communications involving digital signatures.

The Government chose to develop its own PKI instead of adopting the Net-ID system proposed, and subsequently implemented, by a consortium from the Danish banking sector. The decision-making process highlights both the complexity of PKI and its strategic importance to both e-government and e-commerce in Denmark.

Government and the banking sector continue to discuss the future development of their respective PKI systems. Meanwhile, the e-government strategy targets distribution of 1.1 million digital signatures by the end of 2006; 425 817 had been issued by September 2005. To achieve the goal, government will have to make sure that: 1) it is developing useful PKI enabled e-government services; 2) difficulties in implementing digital signatures for employees are effectively addressed; and 3) the benefits of digital signatures are promoted to e-government users.

FESD – Joint electronic document management

The *FESD* or "joint electronic document initiative" has been a key part of *Project e-Government* for two main reasons. First, it has provided an important early example of the benefits that can be achieved by adopting applications that conform to the interoperability standards developed as part of work on the Danish enterprise architecture (see below). Second, it has been used to showcase the benefits of increased inter-organisational collaboration in managing government information.

The initiative was launched by the Joint Board of e-Government in 2002 in response to a number of problems foreseen in the increasing adoption of electronic document management (EDM) in the Danish public sector. Significant issues were:

- Observation of a number of relatively poor, stand-alone (and thus divergent) implementations of EDM. Failures were often evident when there was too much attention paid to implementing the EDM solution, and too little to business process redesign and organisational change.
- A concern that unco-ordinated development of EDM systems would lead to long-run problems related to the archiving of government information.
- Failure of the ICT market to provide EDM solutions that were fully aligned with the operational and business process requirements of government organisations, or with emerging Danish government interoperability standards.

The Board determined that the best response to these problems was an initiative designed to bring government organisations together to identify what their real ongoing EDM requirements (covering both document and case management) would be, and then to ensure that the ICT market could supply products that would meet them. The resulting *FESD* project is based on a clear vision for how this aspect of e-government should best be handled in the future.

Staffed by employees from the Digital Task Force, the Agency for Governmental Management and Local Government Denmark, the project was initially advanced as a partnership among 11 State, regional and municipal government organisations. This group worked together to: 1) determine their mutual requirements for an EDM solution; 2) learn about business process re-engineering as a key part of successful EDM implementation; and 3) establish a framework contract for supply of EDM solutions that is open to all public sector organisations and meets their collective requirements. At the same time, the MVTU ran a second project to develop the necessary technical standards and data models that have guided private sector development of FESD-compliant EDM applications.

Box 6.2. **Vision and aims of the FESD project**

The *FESD* electronic document and case management solution has been developed on the following vision and aims for a common EDM solution:

- Government organisations should need only one EDM solution for registration, management, control and archiving of all cases and documents.
- The solution should deliver efficiency gains in excess of the cost of the solution.
- The solution should be based on approved interoperability standards (defined by the Ministry of Science, Technology and Innovation and regarding, for example, handling of XML and digital signatures), and also be able to be integrated with the specialised in-house ICT systems and applications used by government organisations.
- The solution should be able to be implemented quickly and effectively, without extensive use of external consultants.

The overall aim of the project has been to facilitate the efficient use of EDM in a way which maximizes the benefits for both individual organisations and the public sector as a whole, while minimizing the collective costs of EDM. The focus has been on facilitating, as part of the broader process of digitalisation of the public sector, the adoption of standardised approaches to EDM that improve the efficiency and quality of both the internal operations of government organisations and the inter-relationships that they have with citizens, businesses and the rest of the public sector. The process also aims to reduce the overall technical, operational and financial risks of implementing EDM.

In early 2004, following a tender process commenced in early 2003, three consortia of ICT providers were selected as suppliers of EDM solutions that meet the requirements established by *FESD*. This created a competitive market for the supply of approved, standards-compliant, public sector EDM solutions, backed up by vendor expertise in the process of effective re-engineering and digitalisation of government business processes. Since then, organisations have moved on to implementation of the new EDM solutions, with each pursuing its own EDM vision and goals that all have some common elements, including:

- Providing impetus for e-government-enabled change within and across organisations.
- Developing better and more effective business processes.
- Better management of information.
- Developing up-to-date ICT infrastructure.

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- Increasing the openness and transparency of public administration.
- Providing employees with more attractive workplaces featuring a culture of technology-enabled knowledge sharing.

During interviews, the *FESD* project was frequently cited as a leading-edge example of the wide range of benefits that e-government can deliver to both government organisations and those who use their services. Officials view it as a practical demonstration of the many advantages that they believe will result from basing the future development of government ICT on common standards. Many also noted that the project had been very beneficial in developing the ability of government organisations to collaborate with one another.

e-Faktura

Another major new element of the public sector's common ICT infrastructure and applications is the *e-Faktura* electronic invoicing system developed by the Agency for Governmental Management, in co-operation with Local Government Denmark and Danish Regions, and under the initiative of the Danish Ministry of Finance (of which the Agency is a part). Since 1 February 2005, under *e-Faktura* all government organisations have been required to accept only electronic invoices from suppliers. This has necessitated that they convert their processes and systems from physical to digital handling of invoices, credit notes and other transactions.

Authority for this change was provided in December 2003 by the passage of the *Law Pertaining to Public Payment*. This legislation gave the Minister of Finance the authority to set rules and regulations governing the public sector's use of electronic payment systems and the handling of accounts payable to private suppliers. Among these powers is the authority to delay payment to any creditor who does not abide by the Finance Minister's regulations. Adopting this compulsory implementation approach, with strong incentives for full participation, was deemed essential because the risk and costs to both public and private organisations of maintaining parallel electronic and digital systems were judged to be unacceptable. The compulsory change to the new approach was favoured because it ensured modernisation of the entire payment infrastructure at one time, and enabled permanent closure of the non-digital channel.

This change has involved major reform of the handling of some 15 million invoices presented to government each year by any of approximately 500 000 Danish businesses. Change of such magnitude and finality has been made possible partly because the business case for the initiative was very strong. The logic behind the change was that paper-based invoicing was a generic and expensive process that was very suitable for digitalisation, with significant benefits for both business and government. Analysis indicated that the potential annual savings from electronic invoicing

could be as high as € 120-150 million per year across government, and about € 50 million for businesses. Savings achieved in the public sector will be retained by the Ministry of Finance (through reduced budgets and/or other forms of fiscal reallocation) rather than being left in individual organisations.

Implementation of *e-Faktura* required changes to the way businesses present invoices and the way government organisations receive and handle them, along with adoption of an electronic communication system and a means of addressing invoices to the correct recipient. Rather than build a new communication network, the government decided to adopt the Danish VANS network – a privately owned communication network that had been used by businesses for standardised electronic data interchange since the 1980s. The electronic postal address is provided by an EAN number, which uniquely identifies each public-sector entity.

Importantly, while it is now compulsory for suppliers to submit electronic invoices, those who cannot, or do not, wish to do so directly can still meet the new requirements by sending them in paper format (complete with the EAN number) to one of two private "read-in" bureaux set up by the Government. The bureaux convert the invoices to the digital "OIOXML electronic invoice" interoperability format, which can be read directly by public sector accounting systems. They then forward the invoice to the correct organisation. The read-in service is free for very small businesses, and there is a modest fee for larger ones.

In late 2004, when the OECD was conducting interviews for this review, this project generated considerable comment. Much was positive, citing it as a good example of rapid e-government innovation. Officials said the initiative struck a balance between the need for common infrastructure (*i.e.* the EAN addressing system and VANS EDI network) at the heart of the *e-Faktura* system with the need to preserve flexibility for both government and its suppliers in terms of how they integrated their own business systems with this infrastructure. Some negative comment was focused on the implementation process, which some interviewees felt was occurring too rapidly and without adequate consultation and understanding of how the change to the new system, and associated costs, would be handled by those being required to adopt it. Despite these concerns, by mid-2005 the new system was in place and handling a large proportion (around 70%) of the invoicing transactions that it is eventually expected to facilitate.

Some of the concerns expressed about the implementation of *e-Faktura* have indeed been borne out in practice, creating a risk that the expected savings will not actually be achieved, at least in the short term. This is because introduction of the new system has resulted in unexpected additional work for government organisations, and has also led to some suppliers charging additional fees to cover costs they face in submitting electronic invoices – mainly related to lost invoices or delays in payment.

The additional workload is connected to problems many businesses (particularly smaller ones) are experiencing in complying with new invoicing requirements. These include wrong or missing information, creation of duplicate invoices, and disappearance of some invoices within the system. Government organisations have been obliged to use manual processes (*i.e.* telephone calls) to complete or correct these invoices before they can be processed. They have also had to handle an unanticipated level of enquiries from suppliers wanting to know that their invoices have been received. These costs are proving significant. Evidence of these problems is provided by municipalities, which have had their State funding reduced on the basis of the expected savings from *e-Faktura*. Because these savings have yet to materialize, they have asked the Ministry of Finance for compensation for the extra costs they have been incurring while dealing with these problems.

Danish businesses have been strongly critical of the way *e-Faktura* has been implemented, to the point that the Minister of Finance issued a request that government organisations be flexible in their implementation of the new invoicing rules during the first months of their enforcement – especially by paying invoices on time and refraining from imposing penalties for incomplete and/or paper invoices.

None of these problems appear to be insurmountable, and there is every indication that the new system will eventually meet its objectives. However, it is important that Denmark treat this experience as a valuable lesson in: 1) the need to fully identify and plan for the risks that exist around rapid digitalisation of government processes on such a wide scale; 2) the sensitivity of the costs and benefits of e-government business cases to unanticipated events; and 3) the importance of committing sufficient resources to processes of stakeholder engagement and change management.

e-Income

Another good example of Danish efforts to develop common infrastructure and applications is provided by the e-Income system. It has been developed to address a number of problems experienced by government, employers and citizens in relation to provision and use of information about incomes by government. For government, payment of income-related welfare benefits has often been based on inadequate information about people's income. This can result in payment errors, and create opportunities for benefit fraud. For employers, the fact that they have to report income information to a range of government organisations creates a large administrative burden. For citizens, information deficiencies in this area can lead to inaccurate benefit payments, sometimes creating a risk of citizens becoming unwittingly indebted to the State.

Box 6.3. **E-government implementation risks and challenges**

Denmark's *e-Faktura* electronic invoicing system is a good example of how government can apply ICT to redesign common (or generic) back-office business processes in pursuit of significant benefits, both for government and/or businesses and citizens. It is also a very good example of some of the risks and challenges that can accompany e-government-enabled change of such magnitude.

The business case for *e-Faktura* identified significant savings from moving to a purely electronic approach to invoicing of government organisations. The estimated efficiency and economic benefits of making this change were judged to be of sufficient size that a legislatively mandated move to electronic invoicing, coupled with closure of non-electronic channels for invoicing, was justified.

As part of the rapid implementation of this change, consideration was given to the impact it would have on both businesses and government organisations, with special attention paid to ensuring that small Danish businesses without the necessary ICT capability were provided with alternative means to present electronic invoices. Despite this, during implementation a range of unanticipated problems has threatened achievement of expected savings from *e-Faktura*, at least in the short-term. Technical implementation has been more difficult than expected, and businesses have responded by charging additional invoicing fees and presenting incomplete or duplicate invoices. Government organisations have also reacted in unexpected ways. For example, municipalities have requested financial compensation for implementation costs. In addition to risks to the business case for *e-Faktura*, these problems also created political risk, with the Government being extensively lobbied by businesses critical of the implementation process and the problems it has created for them.

In the short term, the Government has responded by requiring government organisations to take a more flexible and lenient approach to the failure of businesses to fully comply with the invoicing rules. In the longer run, it appears that the problems currently being encountered will be rectified, and that the new system will eventually deliver the full benefits expected of it. In the meantime, the experience of implementing *e-Faktura* provides a good opportunity for Denmark to learn important lessons about making successful e-government-enabled change of such large scope. It is especially important to ensure that e-government business cases factor in risk, and to plan for adequate levels of resourcing for stakeholder engagement and change management.

The solution to this problem has been to establish what is called the e-Income Register, a common database into which employers provide information about employee income and working hours. This information is used across the public sector in support of those functions to which the information relates. This new arrangement delivers benefits by: 1) reducing employers' reporting burden; 2) increasing the accuracy of citizens' benefit entitlements and payments; 3) reducing government's information collection costs; and 4) increasing the overall accuracy of operations.

e-Procurement

Like many OECD countries, Denmark has made efforts to apply e-government to the business of public procurement. The Danish Public Procurement Portal (DOIP) is an electronic marketplace to which both private and public purchasers and their suppliers have access. Launched in early 2002 under the initiative of the MVTU, the DOIP is an example of the typical Danish approach to partnering with the private sector to develop e-government. The public sector has not directly invested in establishment of the DOIP, which has instead been developed and is owned by a consortium of Maersk Data, Danske Bank, Post Denmark and the telecom company TDC. The DOIP is operated by an entity they have created called "gatetrade.net", and the public sector simply pays fees for using the system.

The Agency for Governmental Management acts as co-ordinator of government interests in the DOIP, focusing on issues related to functionality, interfaces, security and transaction costs. Use of the DOIP portal is not mandatory, but is recommended for all government agencies. Some regional and local authorities make use of private marketplaces, and the State-owned company National Procurement Ltd. (SKI) has also set up a simple e-tendering system (ETHICS, Netindkøb and Netkatalog).

6.3. Common frameworks

In addition to having some common ICT infrastructures in place, Denmark has also been at the forefront of government efforts to develop common frameworks to support e-government collaboration, as outlined below.

Enterprise architecture

Currently, the most prominent of these common frameworks is the Danish enterprise architecture. This architecture is intended to provide the common conceptual framework for design of ICT solutions in the public sector. Work on its development began in late 2002, when the MVTU circulated the *Green Paper on Enterprise Architecture* for public consultation. The green paper asked three key questions: 1) did government need a common framework for enterprise

architecture; 2) how could such a framework be designed; and 3) how its use could be ensured? These questions were answered in mid-2003 with the MVTU's publication of the *White Paper on Enterprise Architecture*.

The white paper, developed by the *Working Group on IT Architecture* established to report to the MVTU's Co-ordinating Information Committee, noted the need to remove technological barriers to e-government across the public sector. It confirmed that a significant challenge in this area was the lack of an enterprise architecture (including common standards for data exchange) to serve as the basis for the development of common ICT solutions and infrastructure.

The white paper contained three main recommendations:

- Government organisations should take more active responsibility for enterprise architecture.
- A common enterprise architecture framework should be established for planning public sector IT systems, especially to ensure system interoperability.
- There should be a major effort to spread knowledge and develop competencies in enterprise architecture, especially in relation to cross-organisation initiatives.

It went on to recommend that a common enterprise architecture framework should include:

- Co-ordination mechanisms, including the appointment of an enterprise architecture committee reporting to the Co-ordinating Information Committee.
- A common methodology (covering processes, concepts and specification of standards) for development of enterprise architecture.
- Common choices and principles with regard to technical standards, ICT infrastructure, etc. (to be codified as the "Reference Profile").
- Common tools to facilitate use of the architecture, such as databases and libraries of contract models, process specifications, data definitions, software "components", and specifications for infrastructure solutions.

As a result of these recommendations, the goal of basing public sector use of ICT on a common design framework was incorporated into both government ICT policy and *Project e-Government*, with significant resources being put into achieving this goal by the National IT and Telecom Agency (ITST). As well as leading processes to develop the wide range of standards required to implement the enterprise architecture, the ITST has worked with the Digital Task Force to communicate its growing knowledge and expertise in enterprise architecture to participants in a number of e-government projects. Experience gained from these projects has then been fed back into the ITST's ongoing development of the enterprise architecture (especially the Reference

Profile or "e-government interoperability framework" – see below), and into handbooks and guidelines being produced to assist organisations in implementing it in their own applications and systems.

The fundamental purpose of the enterprise architecture is to harmonise individual organisations' decisions about ICT in order to achieve interoperability of government information and systems – a precondition to creating the more efficient, coherent and user-centric public sector targeted by the Danish e-government vision. In addition to supporting delivery of better services, the Danish enterprise architecture is expected to enable optimization of the value of government ICT investments, minimisation of the risk for individual projects, and creation of a more flexible and competitive ICT market.

The white paper proposed five core architectural principles: 1) interoperability; 2) security; 3) openness; 4) flexibility; and 5) scalability. To give effect to these it recommended that government adopt a "service-oriented architecture" (SOA) model based on various international standards. The SOA model treats individual ICT solutions (developed as either single-agency or shared initiatives) as modularly designed "services" with well-defined interfaces with each other and to legacy systems.

Interoperability

To implement the architecture, the *National Enterprise Architecture Committee* was established under the Co-ordinating Information Committee and charged with developing and maintaining the common architecture framework. This work has manifested itself as the Danish e-government interoperability framework (formerly called the Reference Profile), which documents selected standards, technologies and protocols to give effect to the architectural principles noted above. In June 2005, an updated version (release 1.2.1) of the interoperability framework, containing 461 standards, was launched. Three notable features of this release were: 1) the change of its name from the Reference Profile to the "OIO Catalogue"; 2) the inclusion of a decision support tool to aid in the adoption of multi-media standards; and 3) inclusion of the first process standard (on information security processes) alongside existing technical and data standards.

Beyond simply developing these frameworks, Denmark has made sure that they are well communicated and easily accessible to those who are expected to implement them. In 2004, the ITST organised a major conference to present and discuss the enterprise architecture with State and local government, and repeated this successful initiative in February 2005.

To make the architecture accessible, the OIO Catalogue and other common data and ICT frameworks and standards are combined to form part of the Danish *InfoStructurebase*, an online knowledge management and collaboration

tool that supports exchange and reuse of data related to service delivery, with a focus on enabling co-operation, business re-engineering and alignment of services across organisational boundaries. The *InfoStructurebase* is open for use by both the public and private sectors, within and outside Denmark. There are four main areas to the *InfoStructurebase*:

- ***Infosite:*** a database of information about standardisation initiatives and communities.
- ***Repository:*** a repository of international standards covering: 1) business processes; 2) data model and interface descriptions; 3) complex XML schemas; and 4) XML schema fragments developed by both public and private organisations.
- ***Forum:*** a forum for discussions about XML, Web services and other relevant service-oriented issues.
- ***UDDI:*** a UDDI (Universal Discovery, Description, and Integration) repository containing information on XML Web services.

Denmark, like many OECD countries, is embracing the use of XML (e**X**tensible **M**arkup **L**anguage) as a standard means of managing information use across the public sector. In essence, the *InfoStructurebase* allows public institutions to find out what data exists in public databases and how it can be accessed. This enables improved public administration through more effective use and reuse of that data, based on use of XML and related technologies. The process of developing the various XML schemas used in different areas of government activity (*e.g.* the health sector, business services, internal document management, etc.) involves both public and private experts in sub-committees established under the oversight of an *XML Committee*, which is subordinate to the Co-ordinating Information Committee. The aim is to ensure that, as it develops, this aspect of the enterprise architecture reflects the real-world operating environment of the organisations that implement it. It also provides a good opportunity and environment for development and exchange of knowledge and expertise in this area of e-government.

Finally, the *InfoStructurebase* is an element of a Web site called OIO (Public Information Online – *www.oio.dk*), again provided by the ITST. This Web site is designed as a central resource for people dealing with e-government and public sector ICT implementation. It works by linking relevant information resources and tools, covering areas such as architecture, digital signatures, electronic document management, ICT and software strategies, ICT security, metadata, interoperability and standard contracts.

The above is by no means an exhaustive account of the common frameworks and systems that have been put in place to support and guide development of e-government in Denmark. Denmark has put significant effort into this aspect of e-government. In interviews with officials and other

stakeholders it was clear that, while there are the inevitable issues and challenges around implementation of each initiative, overall this is seen as an area where the collaborative e-government efforts of the public sector are well supported. However, officials raised a number of issues, including:

- A major concern that, while the enterprise architecture and supporting standards and frameworks have been very well developed at the conceptual level, they are proving more difficult to translate into the actual standards and schemas required for implementation. Many people working to implement the architecture find it abstract and difficult to understand.
- A second major concern that, while municipalities are solidly committed to the concept of enterprise architecture and common standards, their heavy reliance on one ICT vendor that provides them with many proprietary (*i.e.* non-standard) systems significantly slows the pace of their adoption of standards, and therefore the rate at which collaborative e-government goals can be achieved (see the discussion of local government below).

There was also frequent mention of a concern that, while the enterprise architecture and other frameworks governing how information and ICT can be better used across government are now relatively well established, organisations are not yet putting enough effort into applying these frameworks to redesigning services and business processes, and developing the common systems and applications required to deliver the e-government results the Government is seeking. Five main explanations for this were advanced:

- In development of these common frameworks, the ITST has engaged mainly information and technology specialists across government, with comparatively limited involvement of people responsible for broader management of service delivery, policy development or public management.
- Some officials felt that, despite its work with new service communities, the Digital Task Force has not placed sufficient emphasis on facilitating organisational adoption of the enterprise architecture and related frameworks.
- There was a suggestion that organisations' use of these frameworks is lagging behind their actual development simply because they are relatively new, and that rates of adoption at the business level in organisations would eventually increase.
- Some officials felt that, given the complexity of these frameworks, more guidance on how they relate to achievement of e-government objectives, and can be used to enable collaboration, would be useful.
- Adoption of the frameworks is voluntary.

From the results of the OECD survey it is clear that government organisations face some significant challenges in developing the technological environment for e-government, with the single most important challenge

being sharing standards and ICT infrastructure among agencies (see Figure 3.6 in Chapter 3). These results reinforce the views expressed in interviews that this is an area of e-government in Denmark where increased collaboration among agencies may, in part, depend on increased levels of support from the centre of government. The recent updating of the interoperability framework is an example of the type of activity required in this area.

Local government common systems and frameworks

Counties

As well as common ICT systems and frameworks specific to State government, and those that cover the entire public sector, it is also worth examining developments at the county and municipal level. In the counties, the most significant initiatives have been occurring in relation to the health system. Two major developments have been: 1) the creation of a shared data communication infrastructure called MedCom; and 2) the Danish health portal *www.sundhed.dk*. These developments, which illustrate some important aspects of e-government, are looked at in detail in Case Study 1.

Municipalities

Two features of Danish municipalities have had a heavy influence on their development of e-government. First, they have traditionally operated relatively independently of one another. Second, in many cases their small size has limited their financial and human resource capacities to adopt and use ICT on their own behalf (as opposed to outsourcing their provision). As a consequence, at the municipal level there are few common ICT systems and frameworks that have been developed by municipalities themselves.

In Danish municipal government there is, however, a very interesting situation; a large majority of the ICT systems and services used by municipalities are provided by a company called KommuneData (KMD). KMD is a 100% publicly owned company, created in 1972 by counties and municipalities through a merger of three regional government data centres.

Danish counties ceased to have any ownership of KMD in 1990. Today, KMD is 100% owned by a holding company Kommune Holdings A/S, which is in turn wholly owned by Local Government Denmark (KL). Municipalities have a share in Kommune Holdings A/S (which also owns "Kommuneinformation" – a former unit of KL that provides information management and ICT application services to municipalities) meaning that, in effect, KMD is owned by municipalities through the collective vehicle of KL. This arrangement was apparently established as a response to two things:

- Changing conditions in the public sector ICT market, where an increasing number of large vendors are moving towards adoption of open standards, in

parallel with the move to base e-government on the Danish enterprise architecture and interoperability standards.

- Recognition that the situation where a publicly owned "IT society" had a virtual monopoly on delivering many ICT systems and services to municipalities was unsustainable, particularly in the face of moves (including e-government) to make the Danish ICT market more competitive.

An important aspect of the change in ownership arrangements was the desire to move KMD away from the real or perceived status of being a *quasi* or *de facto* authority in relation to municipal ICT (the risk arising from its dominant market share, and unclear status and relationship with the KL board) towards being a pure ICT supplier and service provider to municipalities and other organisations (KMD provides systems and services to both municipalities and the private sector). As noted in Chapter 4, governance arrangements around KMD are a potentially complicating factor for e-government, due to potential, but apparently unrealised, conflicts of interest this creates for KL in its dual roles as member of the Joint Board of e-Government and owner of KMD on behalf of municipalities.

New governance arrangements have led to changes in KMD's presence in the municipal government ICT market. Although the changes are more of appearance than substance, people interviewed for this review generally felt that they have helped clarify and delimit the respective roles of KL and KMD in relation to e-government at the municipal level. Other benefits are expected to accrue to municipalities as a result of the fact that KMD now faces a more competitive market; KMD will likely become more responsive to customer demand for more open standards-based products, and become freer to enter into business relationships with other ICT vendors. Although the changes to governance of KMD have helped clarify its standing in relation to supply of ICT to municipalities, they have seemingly had little impact on its share of the municipal government market for outsourced ICT where, while no market share data is available, by all accounts it remains so dominant a player that is has a virtual monopoly position in many product or service areas.

The ICT solutions provided by KMD can be described as "full suite" services, ranging from application development to hosted operations. Some idea of the scale of KMD's public and private sector operations can be obtained from KMD's own publications. For example, KMD develops and maintains the electronic infrastructure of approximately 90 000 PC users, is involved in providing payroll systems covering some 900 000 public sector employees, and provides Web hosting services for several hundred private customers. KMD also provides the netborger.dk portal – a central part of the municipal e-government infrastructure.

Again by its own account, KMD's stated mission is to enhance the efficiency of the public sector and improve the service it delivers. KMD's long-term vision is to be the ICT business that takes the lead in making Danes the foremost digital citizens in the world. Its business model is to create products rather than run projects and, where possible, to do so using a "cookie cutter" development approach that looks for multiple possibilities to sell the applications in develops.

While many systems KMD provides to municipalities can be described as "legacy"* systems that many Danish commentators feel impose a fundamental limit on the ability of municipalities to fully embrace and deliver e-government, some KMD systems are undeniably innovative. The best example of this is the *e-Boks* system, which has been widely acclaimed and is heavily used.

Following discussion of the relationship between e-government and the Structural Reform, one of the issues most frequently raised in interviews for this review was the role of KMD in the municipal ICT market and the impact this has on e-government. A wide range of often contradictory and polarized views was expressed, including:

- KMD uses its position of market dominance to lock municipalities in to using outdated, expensive, and non-interoperable (in terms of their

Box 6.4. **e-Boks**

e-Boks is a free electronic "mail box" service developed by KMD that allows Danes to electronically receive and save communications with both government and businesses. Almost all municipalities and many businesses are registered to use *e-Boks* as "senders". *e-Boks* users can choose from whom they want to receive electronic communications, which are then securely filed in the *e-Boks* system. People can also store important electronic documents or objects, such as birth or marriage certificates, in their mail boxes. *e-Boks* is tied to the Danish CPR number, meaning that documents can be saved indefinitely regardless of changes in users' names, addresses (including e-mail address) and other contact information. The use of the CPR number by the *e-Boks* system is tightly regulated, and notification is always sent to the mailbox owner when the *e-Boks* has been used. It is possible to log on to *e-Boks* using either a digital signature or a pin code. Users can also log on via their online banking service.

Source: www.kmd.dk.

* The Free On-Line Dictionary of Computing (FOLDOC) defines legacy systems as "A computer system or application program which continues to be used because of the prohibitive cost of replacing or redesigning it and despite its poor competitiveness and compatibility with modern equivalents. The implication is that the system is large, monolithic and difficult to modify".

alignment with the Danish enterprise architecture) information systems. It is also seen as unresponsive to customer demands, due to the fact that it faces little or no competition in many areas.

- Municipalities' heavy reliance on KMD has led them to under-invest in developing the knowledge and skills necessary for effective and independent participation in e-government.
- The existence of KMD is a vital element of successful implementation of the Structural Reform, as it will both provide for continuity of municipal operations while mergers take place, and support changed administrative functions through various "structural reform packages" that many municipalities will rely upon as the basis of their ICT environment during and beyond the Reform.
- Widespread reliance on KMD allows for more cost-effective development of municipal ICT systems and applications, especially due to economies of scale. It also allows for more consistent levels of front- and back-office service provision across municipalities.
- KMD distorts the structure of the municipal ICT market, which reduces competition, lowers quality, and inhibits innovation. This situation is said to be contrary to general Danish competition policy, and also to the Government's plans to make the ICT industry as competitive as possible.

The bias of comment was heavily towards the negative, with widespread emphasis on the view that KMD is a monopolist in most areas of municipal ICT and that it is thus, in a sense, currently the most significant common framework for municipal e-government. Commentators consistently noted that the effect KMD has on e-government is complex. They cited the usual downside effects of monopoly, while also acknowledging benefits, such as the fact that KMD has provided the necessary ICT capacity to allow for relatively uniform implementation of many different municipal e-government applications and services. This is seen to have been of particular benefit to the smallest municipalities, which might otherwise have struggled to develop any e-government capacity. The creation of larger municipalities through the Structural Reform will, however, reduce this as an argument in favour of the *status quo*.

At the time of this review, critics of the situation with KMD – particularly municipalities and Danish ICT specialists – focused on two particular issues. First, there was criticism of KMD's ability to deliver solutions that were compatible with the common e-government frameworks being developed in Denmark. A particular example of this is the implementation of FESD. Government organisations now face a competitive market for EDM products from three accredited suppliers whose products meet the FESD EDM interoperability standards. However, administrative systems supplied to municipalities by KMD, including an EDM system called EDH, could not be made to interoperate with

FESD-compliant systems. Municipalities were therefore locked into dealing with one supplier, and the seamless State-local service provision being sought through e-government was much more difficult to achieve in this area.

It is important to acknowledge that this type of problem can arise not only from issues of market structure, but also from the simple fact of technological evolution and the challenge of ensuring that ICT systems and applications remain compatible with changing standards, many of which are not in existence when systems are developed and put into service (*i.e.* in time, everything becomes a legacy system). It is also important to note that KMD has publicly committed to both developing future systems that are complaint with government-wide open standards, and standards-compliant "gateways" for those legacy systems that cannot be redeveloped. Nonetheless, municipalities' reliance on ICT that does not comply with many Danish e-government standards will continue to impact on the e-government programme for the foreseeable future.

The second major criticism expressed about KMD at the time of this review relates to the push towards use of so-called "open-source" software in Denmark through the *Danish Software Strategy*. This strategy arose from research undertaken by the Danish Board of Technology (an independent body established by the Parliament), which in late 2002 produced a report entitled *Open-source Software in e-Government*. The report presented an analysis showing that that the Danish public sector could save several billion DKK per year by switching from proprietary (*i.e.* closed-source) to open-source software.

The resulting software strategy was put in place by the Ministry of Science, Technology and Innovation (MVTU) in 2003. The overarching goal of this strategy is to foster competition, quality and coherence of the public's software solutions, on the basis of the following principles:

- Maximum value for money irrespective of software type.
- Competition, independence and freedom of choice.
- Interoperability and flexibility.
- Development and innovation.

In adopting this strategy Denmark has taken a pragmatic approach to the use of open-source software in government. The strategy expresses no particular preference, instead pushing government organisations to voluntarily choose software on the basis of how it fits with wider e-government and economic objectives.

As part of the development of the strategy, the MVTU commissioned the consulting firm Fischer and Lorenz to assess the context surrounding a possible shift to greater use of open-source software products in government. In its report, Fischer and Lorenz identified proprietary systems based on closed-source software, such as those provided to municipalities by KMD, as one of the

barriers to government use of open source software. The report stressed that this inhibited municipalities' basic need to freely choose software based on their organisational needs with assurance that this software could interoperate with other systems as appropriate. Detailed analysis of systems provided by KMD showed where this either did, or could, present a real barrier to municipalities being able to achieve these objectives.

According to the report, if a maximum-value-for-money principle governs the procurement and use of software in the public sector, that software must be selected on the basis of merit. To achieve this principle, the report argued that certain problematic conditions must change. The conditions identified were:

- A lack of knowledge about the cost structures related to managing government ICT systems, and a lack of knowledge about different types of software solutions.
- Partial public sector lock-in to certain software suppliers.
- Instances of unavailability of – or inability to use – non-proprietary open formats necessary for the exchange of information between public ICT systems, citizens and businesses.
- Very limited sharing and reuse of software solutions between government organisations.

The report also emphasised that competition in the software market must be stimulated through the use of open standards, which would also help to ensure citizen and business access to public information regardless of what ICT systems were being used to collect, store, manage and/or access it.

Key point 6.3

Denmark faces a unique market structure for supply of ICT to municipalities. Public ownership of the major supplier (KMD) has given rise to a contradictory set of circumstances. While most observers believe that KMD has played a very important role in enabling municipalities to use ICT, many express significant concerns about the negative implications of KMD's market dominance for both the future development of e-government (especially where it cuts across boundaries between State and local government), and the competitiveness of the Danish ICT market and industry.

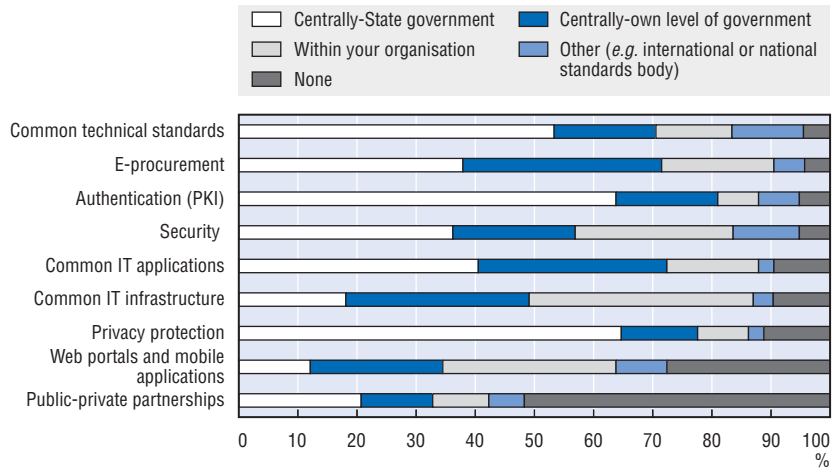
The current situation has evolved over more than three decades, and does not appear to have ever been formally and independently publicly evaluated. Until such an investigation is carried out, Danish government will not be able to arrive at any clarity regarding the real issues and impacts of the current situation, and the best arrangements for the local government ICT market in the future.

In 2004, a Danish ICT magazine called *ComOn* presented survey results showing that only 12% of municipalities were using open-source software to any extent. This sparked major criticism of KMD by many municipal ICT managers and public sector ICT experts, with a call for united action to urge KMD to open up its ICT systems. As a result, by December 2004 KMD announced that it would construct open-source interfaces between its proprietary administrative systems and desktop productivity suites such as Microsoft Office, Star Office and Open Office. KMD has become a member of the Danish open-source association (OSL), and is espousing support for greater competition based on the drivers provided by the Danish Software Strategy. It remains to be seen how these moves will impact the big question of how the present structure of the ICT supply market for municipalities is affecting development of e-government and/or the competitiveness of the ICT industry in Denmark.

6.4. E-government guidance

The OECD survey looked in detail at the e-government guidance available to government organisations – an area of e-government which increases in importance in line with the degree of collaboration required of individual organisations. The highest numbers of respondents reported receiving guidance (from a varying mix of sources including State government, regional and municipal bodies, respondents' own organisations and international bodies) on: 1) common technical standards and e-procurement (each 96%); 2) authentication and IT security (each 95%); and 3) common IT infrastructure and applications

Figure 6.4. **Areas of e-government guidance**



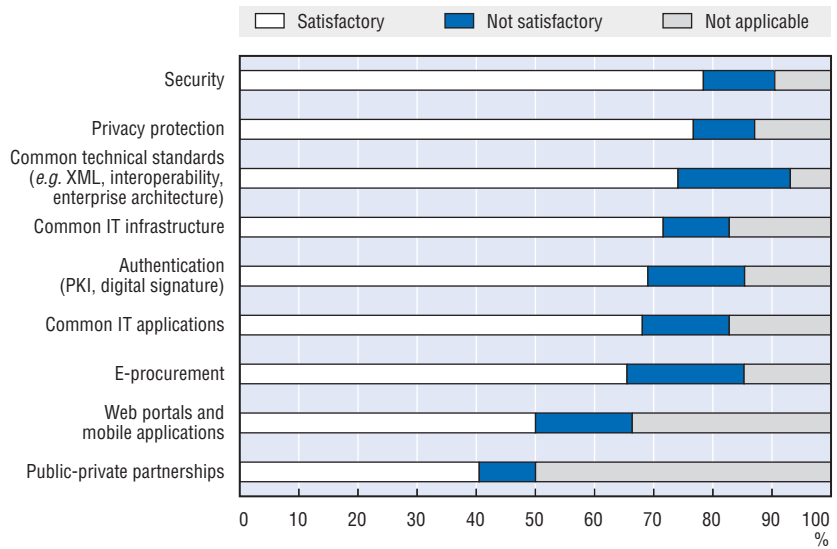
Source: OECD E-Government Survey: Denmark.

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(each 90.5%). The area where the least number of respondents reported receiving guidance was public private partnerships (49%).

In general, despite the concerns noted above about the need for greater support in this broad area, survey respondents reported high levels of satisfaction with this guidance. The highest levels of satisfaction were reported for guidance on security (78%) and privacy protection (77%). This is not surprising, given that guidance in both these areas is of a binding nature (*i.e.* there are many mandatory elements), and the areas themselves are of long-standing importance to government use of ICT, which has allowed for widespread development of relevant expertise in these areas within organisations. Following this, and in apparent contradiction to the concerns expressed in interviews, 74% of survey respondents reported satisfaction with the guidance available to them in the area of common technical standards. This should not, however, negate the view that more guidance in these areas could be beneficial to achieving more e-government collaboration, as achieving high levels of satisfaction with e-government guidance does not mean that an optimal level or quality of guidance is yet in place.

Figure 6.5. **Perceptions of the quality of e-government guidance**



Source: OECD E-Government Survey: Denmark.

6.5. Public-private partnerships

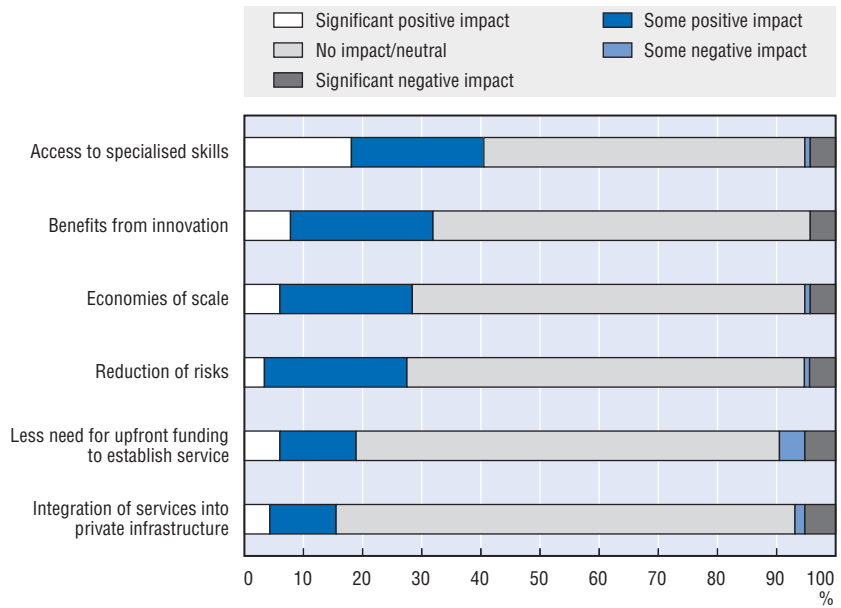
Project e-Government identifies public-private partnerships as a relevant part of the Danish approach to e-government. The project has included work on this subject, under the heading of "digital partnerships", focused on understanding when such partnerships are appropriate, and how they can be successful.

Public-private partnerships were not frequently discussed in the OECD interview process. Clearly, they are not seen as a significant element of Danish e-government. Survey results show, however, that activity is occurring in this area. The greatest amount of "partnering" with the private sector was reported in contracting out of services (*i.e.* outsourcing), where 45% of respondents indicated past (1%), current (38%) or planned activity (6%). Partnering to develop joint systems or services was the next highest level of activity (at 41%), followed by acquisition of private sector skills (36%) – again more a form of outsourcing than a true partnership.

Looking at a range of possible obstacles to partnering, respondents felt that these generally presented only modest barriers, with the most significant being lack of accountability mechanisms (important for 41% of respondents) and lack of budgetary incentives (also 41%). Lack of private sector partners presented the least obstacle to partnering (important for 26% of respondents).

In terms of the impacts that partnerships have had on respondents' organisations, the overwhelming response was that these impacts have been neutral, with some reports of negative impacts. The highest reported positive impact was in the area of gaining access to specialised skills (a benefit for 41% of respondents), followed by benefits from innovation (32%). The lowest level of positive impact was in the area of integration of services into private sector infrastructures.

Figure 6.6. **Impacts of partnerships with the private sector**



Source: OECD E-Government Survey: Denmark.

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On the surface, these results suggest that the limited amount of partnering activity in development of e-government is not due to serious impediments, but instead may be a result of weak incentives and low perceived benefits. However, there may also be an issue surrounding different understandings of the concept of "public-private partnerships" (PPPs) and how they can be part of e-government development. There are few strong examples in Denmark of PPPs conforming to the classic prescription of a project involving shared risk and reward between a public and private sector partner (the business portal *www.virk.dk* being the most notable exception). However, government has been actively working in a "looser" way with the private sector in the implementation of e-government initiatives by determining where to draw the line between public and private sector contributions to such developments. A very good example of this is the *e-Faktura* electronic invoicing system discussed earlier in this chapter.

Box 6.5. **e-Faktura – a case of effective private sector involvement in e-government**

From 1 February 2005, as a result of new legislation, the Danish public sector only accepts electronic invoices from suppliers. Several factors led to the successful implementation of this project: a strong business case; the use of legislation to ensure rapid take-up of the new arrangements by both public and private sector organisations; basing the format of invoices on a Danish government interoperability standards; and provision of a variety of ways for suppliers to comply with the new requirements, depending upon their size and ability to use electronic channels.

One particularly important factor in implementation of the project was use of existing private sector ICT infrastructures rather than development of new ones. The *e-Faktura* infrastructure is based on the existing Danish VANS network, which has been used to send EDIFACT messages (Electronic Data Interchange for Administration, Commerce and Transport) between commercial partners since the early 1980s. VANS is a privately owned "digital postal service" comprising five private VANS providers, who receive electronic invoices and forward them to the correct public institution. For those businesses that cannot directly provide invoices via the VANS network, the government has established two private "read-in" bureaux that scan and forward invoices on their behalf. The Agency for Governmental Management feels that this, coupled with the use of existing proven private infrastructures, has been a key success factor for this project.

6.6. Perceptions and practice of collaboration

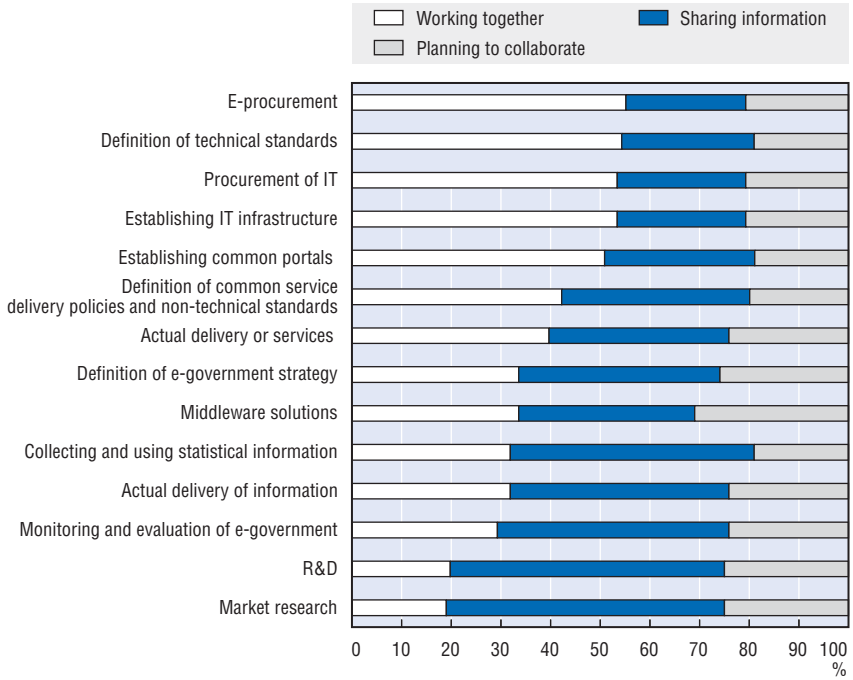
It is widely understood that one of the keys to success with e-government is achievement of greater collaboration between government organisations. E-government implies a shift from a "silo" style of public sector towards one where government organisations work across their traditional boundaries to share information and ICT systems, and develop common approaches to meeting the needs of citizens and businesses. Denmark has identified the silo or "bunker" issue as a barrier to e-government, and set out to reduce the problem through its revised e-government strategy.

Clearly, Denmark has many arrangements in place for achieving greater e-government co-ordination and collaboration. However, while the idea of collaboration is widely supported by officials, the results of the OECD survey indicate that, overall, e-government has so far only had a moderate impact on current levels of collaboration. Of all the areas of potential e-government impact reported on in the survey, a positive impact on partnering (collaboration) within government was only indicated by 29% of survey respondents, while the remaining 71% reported that e-government was having a neutral impact in this area (no negative impact was experienced).

Survey respondents did report that their organisations were either sharing information or actively working with other organisations in a wide variety of areas, ranging from definition of technical standards and undertaking market research, to developing common portals, defining common service delivery policies, and actually delivering services. Information sharing was highest in the areas of market research (56% of respondents), and research and development (55%), while joint work was highest in the areas of e-procurement (55%), definition of technical standards (54%), and establishment of ICT infrastructure (53%). The area where the highest numbers of respondents were planning to collaborate was in developing "middleware" solutions (31%).

Government portals are an important manifestation of the benefits of more co-ordinated and collaborative e-government. The survey results paint an interesting picture of the way the Danish public sector is becoming accessible via provision of information and services through a range of portals. In terms of information delivery, the highest level of access to individual organisations' Web sites was provided by Denmark's official public sector portal *www.danmark.dk*; 86% of respondents said they are linked to this portal. The next highest level of information delivery occurred through "theme" portals in areas such as health and education, through which 51% of respondents reported their Web sites were accessible. Following this, 49% of respondents said their Web sites were accessible through local government portals (*e.g. www.netborger.dk* operated by KMD), and the same number reported Web site accessibility through

Figure 6.7. **Areas of e-government collaboration**



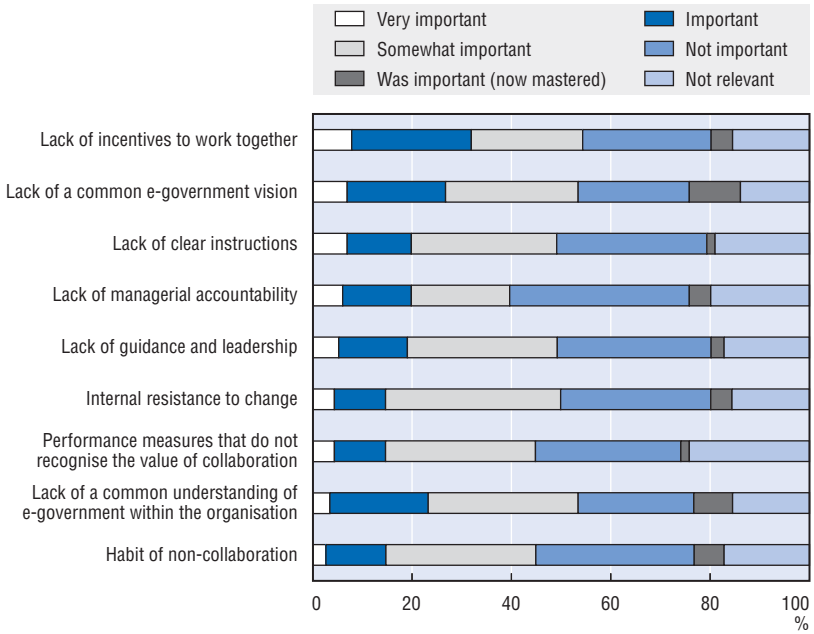
Source: OECD E-government Survey: Denmark.

www.denmark.dk – Denmark's official Web site aimed at an international audience. Finally 42% of respondents said their Web sites were accessible through businesses portals such as *www.virk.dk*.

Delivery of agencies' services through portals presents a slightly different picture, with the highest level of service delivery occurring through business portals (34% of respondents), followed by the theme portals (33%) and then *www.danmark.dk* (30%).

When asked about the importance of a number of obstacles to collaboration, survey respondents indicated that the biggest challenge they face is a lack of incentives (important for 54%), followed by a lack of a common e-government vision, and lack of common understanding of e-government within organisations (each 53%). Overall, respondents indicated a wide range of obstacles to collaboration including internal resistance to change, a habit of non-collaboration and lack of leadership, direction and guidance and appropriate performance measures and managerial accountabilities. These results indicate the complex set of issues that Danish government organisations must individually and collectively address as they move towards greater e-government collaboration.

Figure 6.8. **Importance of obstacles to collaboration**



Source: OECD E-Government Survey: Denmark.

It is important to recognise that the requirement for, and benefits of, collaboration vary depending on which level of government is being considered. Many of those interviewed for the review felt that the greatest need for collaboration currently exists at the State government level, where a wide variety of cross-agency and cross-sectoral e-government initiatives occur or originate. There was frequent mention of the experience with the development of the business portal, where there is evidence of smaller organisations participating quite actively while large ones have been more reluctant to get involved. Some attribute this to the effect of *www.virk.dk* adding quite substantially to the service delivery capability of smaller organisations that have made less e-government progress on their own, but representing less of a benefit (perhaps even a cost) for larger organisations that have made much more progress developing their own e-government offerings.

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Key point 6.4

Denmark has identified collaboration as a key aspect of achieving its e-government goals. The idea of collaboration is widely accepted by government officials. However, the actual behaviour of government organisations is characterised by a silo rather than a collaborative style of operations.

The e-government strategy targets this challenge with a significant range of activity designed to facilitate more collaboration on e-government, and many frameworks and ICT infrastructures designed to facilitate this. However, while officials appear generally satisfied with what has been put in place to assist them, there is still only a moderate level of collaboration actually occurring. A range of obstacles to collaboration, including a lack of incentives and appropriate performance measures, have been identified. Efforts made to rectify these and other deficiencies would presumably lead to higher levels of collaboration on e-government in the future.

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Chapter 7

User-focus

The Danish vision for e-government is clearly user-focused. It is informed by, and consistent with, the broader set of user-oriented goals articulated under the Citizens at the Wheel (2002) public sector modernisation programme. Interviews conducted for this review revealed that both on- and offline service delivery at all levels of the Danish public sector is informed by inherently user-focused attitudes. Danes' high level of overall satisfaction with government services indicates that these attitudes do translate into user-focused services.

Officials believe e-government can enable organisations to move even further in this direction. Most are conscious of Danes' relatively high levels of satisfaction with government services, and regard the question of how to develop more user-focus through e-government as being of less concern than other challenges, such as how to deliver more effective and efficient cross-organisation services.

However, examination of the ways that government organisations are attempting to assess and meet users' needs for better services through e-government shows that this is an area where there are opportunities for significant improvement.

In the early phases of e-government, many OECD countries implemented programmes that were focused on a simple push to put all government information and services online. Now, governments are pursuing more sophisticated approaches to e-government, aimed at more targeted, efficient and effective delivery of better public services through improved use of public sector information and ICT. As part of this new approach to e-government, a growing emphasis is being placed on providing services that better meet the needs of users, rather than reflecting the imperatives of government agencies.

This chapter looks at the extent to which Denmark has developed this type of user-focused approach in implementing e-government. In particular it examines: 1) what government has done to understand user needs and the demand for e-government; and 2) the extent to which e-government service delivery is user-focused. The chapter also looks at measures designed to improve online access and openness in government.

Overall, the Danish vision for e-government is clearly user-focused. It is informed by, and consistent with, the broader set of user-oriented goals articulated under the *Citizens at the Wheel* (2002) public sector modernisation programme. Interviews conducted for this review revealed that both on- and offline service delivery at all levels of the Danish public sector is influenced by inherently user-focused attitudes. Danes' high level of overall satisfaction with government services indicates that these attitudes do translate into user-focused services.

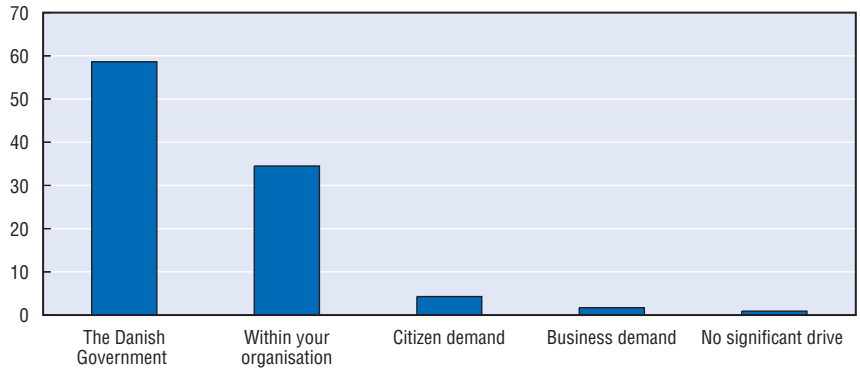
Interviewees made it clear that a focus on service users is part of the *status quo* for Danish government, and that officials believe e-government can enable organisations to move even further in this direction. Most people interviewed were conscious of Danes' relatively high levels of satisfaction with government services, and felt that the question of how to develop more user-focus through e-government was of less concern than other challenges, such as how to deliver more effective and efficient cross-organisation services.

Interviews revealed that somewhat more emphasis is being put on delivery of user-focused e-government by organisations whose roles and functions relate to businesses. Two main reasons for this are: 1) service delivery to businesses is more easily e-enabled; and 2) it is less complex to focus on the needs of business users.

While there is a pervasive commitment to delivery of user-focused services, many interviewees indicated that they experience little public demand for

consultation or participation in the design and delivery of e-government services. As shown below, few organisations are taking strongly proactive steps to ascertain what users need and expect in terms of user-focused e-government. This may mean that demand for participation is latent, rather than non-existent. It is, however, much more likely to reflect the fact revealed by the OECD survey that government organisations feel that the main drive for their e-government efforts comes from the Government or from within their own organisations, rather than from citizens and businesses.

Figure 7.1. **Drivers of e-government in individual organisations**



Source: OECD E-Government Survey: Denmark.

7.1. Demand for e-government

As outlined in Chapter 3, Danes are among the highest users of the Internet in the world, with both individuals and (especially) businesses going online in large numbers to communicate with government. Despite this, individual government organisations are generally not putting a great deal of effort into ascertaining users' demand for e-government services.

This may reflect the overall levels of public satisfaction with government services, and the focus that Danish organisations have placed on using e-government to achieve efficiency gains and develop more cross-cutting services. It is notable that the OECD could not identify civil society or consumer interest groups focused on the quality of government services with whom to discuss this aspect of Danish e-government.

Government-wide assessment of users' e-government needs, demands and experiences

Individual organisations are not placing heavy emphasis on assessing demand for e-government. However, as a result of a partnership agreement set up in 2000 between the Ministry of Science, Technology and Innovation

(MVTU) and Statistics Denmark, at the all-of-government level there is a very good body of relevant statistical information about the Danish information society and economy, and public sector use of ICT, that is readily available to government organisations. Much of this research has been produced in connection with the various government ICT action plans and strategies put in place since the mid-1990s. The MVTU has been particularly active in this area, but other organisations such as the Ministries of Finance, Education, and Economic and Business Affairs have also been producing relevant research.

The three most notable studies of demand for e-government recently undertaken at this level (all conducted in 2004) are:

- A quantitative study conducted for the Digital Task Force that asked 2 200 citizens about their knowledge and use of e-government services, and their attitudes towards them.
- A qualitative study undertaken by the MVTU that looked at citizens' digital communication with the public sector.
- A survey of how Danish businesses perceive and use e-government, conducted jointly by the Danish Commerce and Companies Agency and the Confederation of Danish Industries.

Quantitative study of citizen demand for e-government

The Digital Task Force study again highlights Danes' relatively high level of use of the Internet to deal with government, with 82% of respondents stating that they had used a public sector Web site, and only 13% saying that they had never communicated digitally with the public sector. It also showed that the Internet has not yet become the primary channel for contact with government; at 34% it was second to the telephone, which was the preferred means of contacting government for 43% of Danes.

The study also showed that, for many e-government services, the majority of Danes did not know about the service and/or did not find it relevant to their own circumstances. This was particularly the case for services that have a relatively narrow user base, such as online access to waiting lists for day care institutions or applications for various allowances. The most widely known e-government services were: 1) the generic "self-service/filling in forms" type of service; 2) online access to the health sector via the *www.sundhed.dk* health portal; 3) access to municipal e-government services via the *www.netborger.dk* municipality portal; and 4) searching for employment via *www.jobnet.dk*. There was also good awareness of e-government services related to dealing with property, and moving and changing address. In terms of actual service usage, the most heavily used were online job searching, and access to information and services through the health and municipality portals.

The survey revealed that Danes' attitudes towards digital communication with government were significantly positive, with 53% of respondents saying that they were completely convinced that e-government made it easier to deal with government, 51% saying that it saved them time, and 37% saying that they fully believed that e-government would make the public sector more efficient. Nearly half (47%) of respondents expected to use more e-government services in the future, and 40% were fully convinced of the benefits of acquiring a digital signature. Overall, almost 80% of the respondents felt that e-government made everyday life easier.

The most significant outcome of this study so far is that it has provided the basis for the Digital Task Force to proceed with a major national marketing campaign for e-government. The three-month campaign was launched in August 2005. Considerable resources are being put into this project, which so far involves almost 100 of Denmark's 382 government organisations. Some key features of the campaign are:

- There will be more than 800 TV commercials advertising eight different digital services for citizens. These services will also be marketed through newspaper advertisements, Internet banners and radio spots.
- The project has developed marketing templates that all public organisations can freely use and adjust to their needs. These templates make it possible to develop local marketing campaigns (*e.g.* for a municipality to advertise the digital services it provides for its citizens). There are templates for newspaper advertisements, Internet banners, radio spots, bus advertisements, posters, brochures, post cards, e-mail attachments, etc.
- To ensure internal knowledge of, and support for, the campaign within the public sector, a total of 7 000 posters and 70 000 brochures have been distributed to all government organisations.
- The campaign also features direct marketing of e-government to selected businesses, focused on promoting the business portal *www.virk.dk*.

Qualitative study of citizens' e-government experiences

The qualitative analysis of citizens' experiences and opinions of digital communication with the public sector, published by the MVTU in June 2005, provides a useful complement to the Digital Task Force study. The analysis, which aimed to build a picture of citizens' demand, behaviour, desires, and experiences regarding e-government services, was based on interviews with 24 families representing the following profiles: "the modern working family", "poor families", "the young" and "the old".

The analysis focused particularly on peoples' experiences of coherence (or lack thereof) in using e-government, and on barriers that they face in searching for online information and/or using digital self-services. There was also a focus

on identifying barriers that people experience in communicating digitally with the public sector (*e.g.* lack of user-friendliness, lack of information, lack of overview, lack of knowledge of where to look, etc.) and on determining how an e-government communication initiative aimed at citizens should be designed.

The analysis defined four typical profiles of users of online public services – "the passenger", "the searcher", "the programmer", and "the leader". Aside from building understanding of how users of e-government differ from one another, these profiles may in future be used to assist in developing e-government services. On the basis of the analysis, recommendations to make the supply and the quality of Danish e-government more user-focused included:

- Simplification of the present supply of e-government services.
- Provision of a single e-government portal for access to online services for citizens.
- Taking steps to allow government services to be found through widely used search tools such as the Google search engine.
- Implementing a common "design manual" for public Web sites, to increase the recognition and user-friendliness of online services across the public sector.
- Development and marketing of codes for various aspects of citizen-oriented e-government (*e.g.* a citizen code, a digital signature code, etc.).
- Using a "life events" model to design and co-ordinate the supply of e-government services on the basis of citizens' needs, rather than those of public sector organisations.
- Adopting more citizen-focused language, increasing the consistency of language and graphic design used in printed and digital media, and providing guidance to better align public and private sector delivery of online information and services.
- Increasing feedback to citizens by providing confirmation of actions undertaken online.
- Allowing citizens to track the progress of their online dealings with government.
- Increasing the availability of information and services delivered via personalised Web pages.

The report stressed that future e-government service initiatives should be developed with a focus on people fitting the *passenger* and *searcher* profiles, as those fitting the *programmer* and *leader* profiles are already using e-government.

It also suggested two broad approaches to development of e-government initiatives – the "secure way" and the "quick way". The *quick way*, which essentially involves using less complicated language, developing much simpler user-interfaces and providing higher levels of guidance and assistance (*e.g.* hotlines), is appropriate for developing e-government for citizens who are

insecure about their ICT skills and who need more support in order to effectively conduct two-way online communication with government (*i.e.* for *passengers* and *searchers*). The *secure way*, which involves much more sophisticated ways of using ICT for service delivery, is appropriate when dealing with citizens already using e-government who do not need guidance, and who may be used to both test new e-government offerings and promote existing initiatives.

Finally, the report proposed that e-government be promoted to citizens on the basis that it saves them time, is convenient to access, and could deliver future economic benefits; this strategy is expected to increase the use of e-government services. It also recommended that more press releases about e-government be issued in order to increase its visibility, and that a variety of media be used to market e-government in more user-focused ways. The recommendations in this report all appear to be sensible steps for Denmark to take towards more user-focused e-government. However, while the report has now been published, aside from the e-government marketing campaign discussed above it is not yet clear how the Government will respond.

Survey of e-government for businesses

The joint Danish Commerce and Companies Agency/Confederation of Danish Industries e-government survey looked at how Danish enterprises view e-government, and how e-government can make them more competitive in the global economy. The study revealed a positive picture of strong business demand for the further development of e-government. The study concluded that e-government can enable good public administration; particularly in combination with regulatory simplification, re-engineering of government business processes and increased co-operation among public authorities.

The four main findings of the study were that:

- Danish businesses are "e-ready" and want e-government.
- Businesses want government to reduce administrative burdens, both as an incentive for using e-government, and as a general feature of good public administration.
- The three main barriers for further business usage of e-government are:
  - The quality of some existing e-government solutions does not encourage business uptake of e-government.
  - Lack of information.
  - Conservatism and paper-based habits.
- The lack of information and the quality of e-government solutions are key usage factors. Provided that quality improves, 61% of businesses will accept that contact with public authorities should only occur through digital channels.

The survey gave some clear indications of what user-focused e-government means for Danish businesses. The most important factor is that their enquiries be answered as quickly as possible, and that the treatment they receive be consistent and predictable. In terms of incentives to use e-government, saving time is strongest, followed closely by the ability to deal with government at one time and in one place, and then faster handling of dealings with government. In terms of barriers to uptake of e-government, the biggest challenge is a lack of knowledge. This barrier is most acute for those businesses that have not yet used e-government.

All three studies are very useful for helping Danish government organisations to understand the demand for e-government and how they can individually and collectively meet that demand in a more user-focused way. The Digital Task Force study has already led to development of the e-government marketing campaign. It is yet to be seen what will result from the research done for the MVTU. The study of business attitudes towards e-government has been used to both reinforce the relationship between e-government and other aspects of improving government, and to inform the further development of the *www.virk.dk* business portal.

Each of these studies was undertaken independently of the others, and none occurred within the context of a strategic initiative to build knowledge across government about e-government user needs or demands. While the studies have been useful, it is not clear that maximum value has been extracted from them; the Government has neither communicated their results widely, nor

Key point 7.1

Danish State government organisations have recently undertaken significant research into citizen and business demand for, and attitudes towards, e-government. This research is already being used to improve the user-focus of Danish e-government initiatives by, for example, informing the development of a major e-government marketing campaign and the ongoing development of the www.virk.dk portal.

More use can, however, be made of the results of this research – especially the recommendations made in the report prepared for the MVTU on a qualitative analysis of citizens' experiences and opinions of digital communication with the public sector. Benefits can be derived at both the all-of-government and individual organisational levels. It is not clear that all government organisations are aware of the research or its implications for making their own e-government efforts more user-focused. There is no comparable research at the county or municipal level, and Denmark has not considered formalising this type of user-focused research as an ongoing element of its e-government programme.

acted as comprehensively as possible on their findings. Additionally, it is not clear that there are plans in place to repeat these studies so that government-wide progress on developing user-focused e-government can be monitored and evaluated over time.

Besides these and other studies at the all-of-government level, there appear to be no published studies that have been produced by individual State government organisations. There also appears to have been no equivalent research undertaken at the local government level to date.

Source and type of e-government demand – OECD survey results

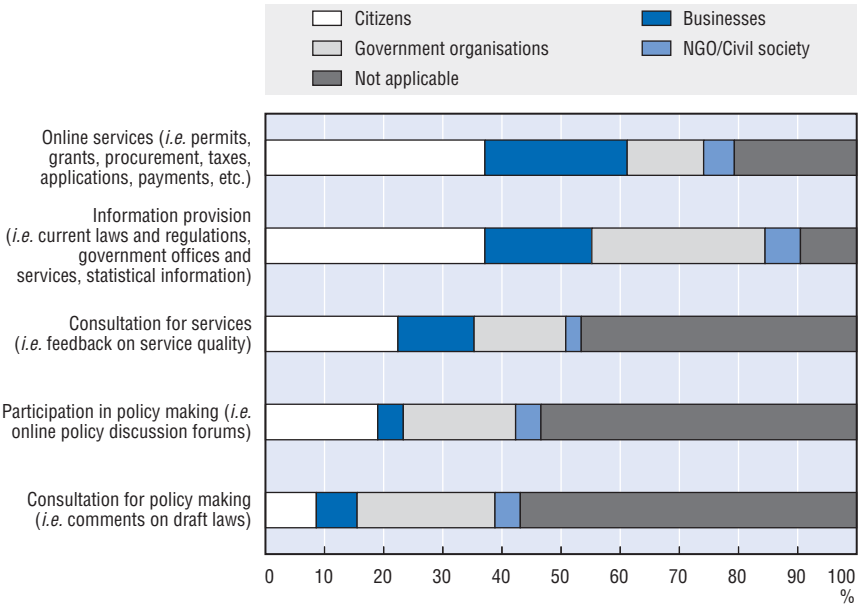
The OECD survey results show that, despite the readiness of Danish businesses to use e-government, the largest overall demand for e-government comes from citizens. This applies to both online access to information and services, where citizens generate 37% of the demand in each case, and opportunities to participate in e-government – an apparent contradiction of the views of interviewees who stated there is little demand for participation. Citizen demand for participation is strongest for consultation about services (22%).

Aside from revealing the contradiction noted above, there are three particularly notable aspects to this set of survey results. First, a significant number of organisations (over 50%) report that they do not experience any user demand for e-government consultation or participation, especially in relation to consultation for policy-making. Setting aside the fact that many organisations will have little or no policy-making functions, this result does suggest that there is an opportunity to develop more user-focused e-government in the broad area of participation in government.

Second, nearly 10% of organisations reported that demand for information was not applicable to them. While it is to be expected that the demand will vary according to the differing functions of government organisations, it is hard to imagine that any organisation could face no demand for at least basic online information, such as a description of its activities and details of how it can be contacted. One implication of this result is that it suggests that some organisations may not yet have Web sites. Whether this is the case or not is unknown, because organisations are not compelled to have Web sites, and there has apparently been no systematic stocktaking of the existence of public sector Web sites (notwithstanding the *Top of the Web* initiative discussed below).

Third, for all areas of demand other than provision of online services, survey respondents identified other government organisations as the second largest source of demand. This result illustrates the fact that, when organisations are looking at how they can use e-government to become more user-focused they need to consider their relationships within government as well as with citizens and businesses. The high demand within government for information and

Figure 7.2. **Source and type of e-government demand**



Source: OECD E-Government Survey: Denmark.

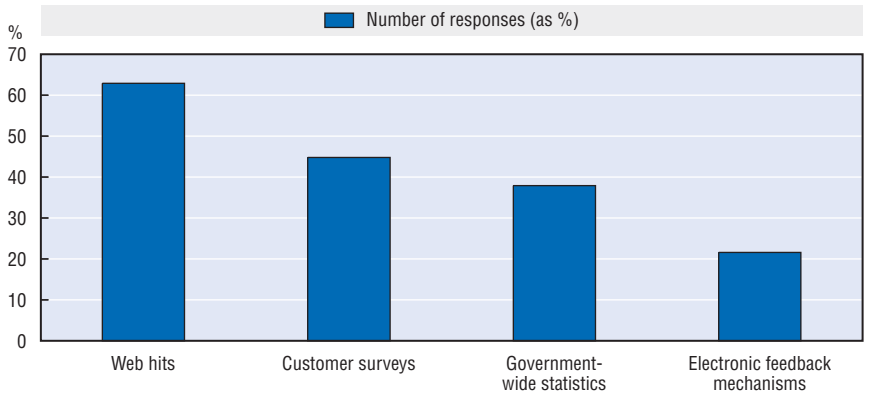
consultation is a useful indicator of the potential for e-government to help improve co-ordination and collaboration within government – especially through use of online tools to support improved management of information and knowledge, and inter-organisational work and decision making.

Organisations' assessment of demand

OECD survey respondents indicated that the most widely used method for assessing demand for e-government was counting hits on Web sites (used by 63% of respondents), significantly ahead of user surveys, government-wide statistics and electronic feedback mechanisms.

Clearly, organisations use a variety of methods to assess demand, although it is not known to what extent they are using either just one or a combination of these or other methods. What is important to note is that the most heavily used approach is the one that is least useful in terms of helping organisations learn about their service users, as it does not enable understanding of users' actual service needs, online capabilities and priorities. Used on its own, measurement of Web hits can only reveal the historical demand for a pre-existing "menu" of e-government services, rather than provide a forward-looking view of e-government needs and demands like that offered by the studies discussed

Figure 7.3. **Mechanisms for assessing user demand for e-government**



Source: OECD E-Government Survey: Denmark.

earlier in this chapter. Furthermore, assessment of Web hits confines analysis to those e-government services delivered through Web sites, rather than through all the delivery channels that e-government can enable and support.

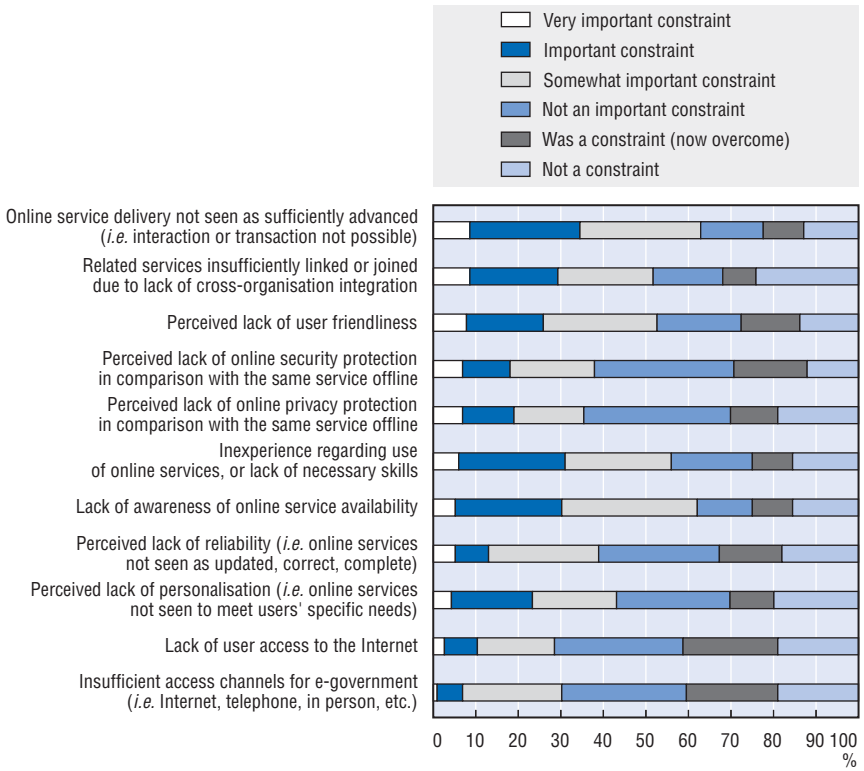
Organisations' experience with user demand

As already noted, despite the fact that Denmark is a leader in provision of online information and services, the vast majority of respondents to the OECD survey reported that the biggest drive for e-government in their organisation was coming either from the government (57%) or from within the organisation (35%). Less than 5% of respondents indicated that the biggest drive was coming from citizens, and even fewer stated that businesses provided the biggest drive. This an indication of an innately user-focused public sector being prompted to use e-government to move further in this direction as a result of government policy and strategies, rather than in response to external demand.

Constraints on demand

Survey respondents identified a range of possible constraints on demand for e-government, the two most important (*i.e.* rated as being "very important") being: 1) a lack of service linking or integration, whereby organisations do not work in an integrated fashion; and 2) user perceptions that e-government service delivery is not sufficiently advanced in terms of offering possibilities for online interaction or transactions. These constraints were each rated as being very important by 9% of survey respondents, with the latter seen as the largest constraint overall, being regarded as important to some degree by 63% of respondents (see Figure 7.4). This is a notable survey result because, despite indications that government could take a more user-focused approach to

Figure 7.4. **Constraints on demand for e-government (existence and importance)**

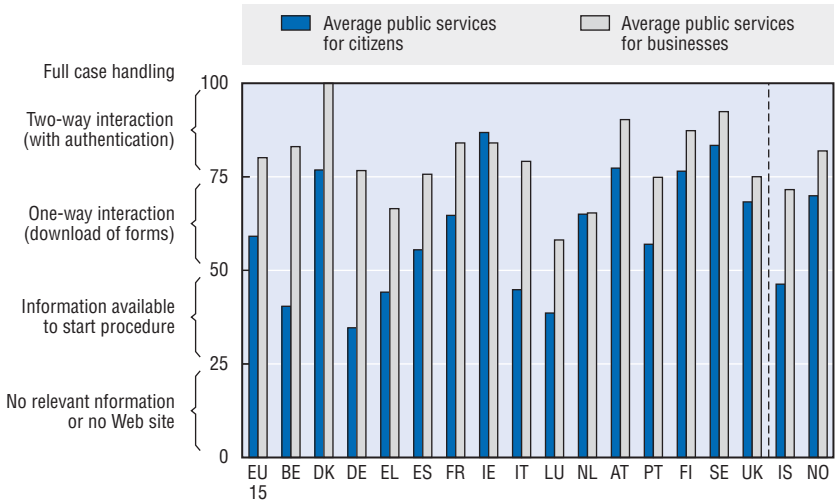


Source: OECD E-Government Survey: Denmark.

understanding the demand for e-government, identification of both constraints reflects an awareness of the fact that user-focused e-government involves provision of services in ways that are more sophisticated than simply posting information on Web pages and/or allowing forms to be filled out online.

The result is also notable because, in comparison to other European nations, Denmark has made considerable progress in this area of e-government. In the 2003 European Commission eEurope benchmarking exercise, Denmark ranked first in terms of full availability of public services online, and second in terms of the sophistication of those services. In 2004, according to EU measures, Denmark's online public services for both citizens and businesses were, collectively, the most "sophisticated" (i.e. allowed the most interactivity) in Europe.

Figure 7.5. **Sophistication of online Danish public services**



Source: Eurostat (2005), e-Government: Internet based interaction with the European businesses and citizens, http://epp.eurostat.cec.eu.int/cache/ITY_OFFPUB/KS-NP-05-009/EN/KS-NP-05-009-EN.PDF.

Two very important steps that government can take to encourage this type of e-government service integration and sophistication are to:

- Provide common frameworks for service integration (*e.g.* enterprise architectures and interoperability frameworks, etc.).
- Implement Internet portals as the "single-window" online service delivery environment that can provide: 1) the necessary focus and incentives; and 2) the common ICT platform for creation and delivery of more user-focused e-government services.

Denmark has been making solid efforts in both of these areas, which have eliminated or reduced barriers to this aspect of user-focused e-government. Common frameworks are discussed in Chapter 6, while portals are discussed later in this chapter.

The OECD survey showed that, at all levels of perceived importance, the second biggest reported constraint on demand for e-government is lack of awareness of the availability of online services. This can be regarded as a positive result, as it is relatively easy to address this constraint by effective marketing of e-government through initiatives such as the marketing campaign currently being developed by the Digital Task Force.

Lack of awareness is also, to some extent, self-correcting in the longer run; as more users experience e-government services, they become more likely to make others aware of them (the caveat being that it is important that

services are high quality and user-focused, so that people do not convey a negative impression of e-government).

Tow other constraints on demand that were seen as being important to some degree by over half of the survey respondents were user inexperience or lack of skills needed to use online services, followed by a perceived lack of user-friendliness. Again, these results indicate an awareness of the needs of e-government users that aligns with the overall impression of Danish government organisations being inherently user-focused. Constraints related to the issue of the digital divide were seen as the least important (see Chapter 3 for further discussion of this issue).

Box 7.1. **Addressing lack of user experience**

Denmark has developed a way of addressing the lack of user experience, which is also an interesting early step towards multi-channel service delivery. *1881* is a call centre developed in conjunction with the *www.danmark.dk* portal providing users with equivalent access to the Danish public sector via telephone.

1881 is an alternative way of accessing e-government for people unaccustomed to using the Internet or without Internet access. In addition to directly answering specific questions about matters of public interest, and referring users to government organisations, *1881* provides guidance in using *www.danmark.dk* and other public Web sites.

7.2. Provision of user-focused services

As already noted, the inherent user-focus of Danish government applies to e-government. At the all-of-government level, e-government is positioned as an important part of the user-focused public sector modernisation programme. The e-government strategy reinforces this by stressing the role of e-government in providing high-quality services and placing citizens and business at the centre of government. This commitment is made concrete through the various targets and measures established by the strategy.

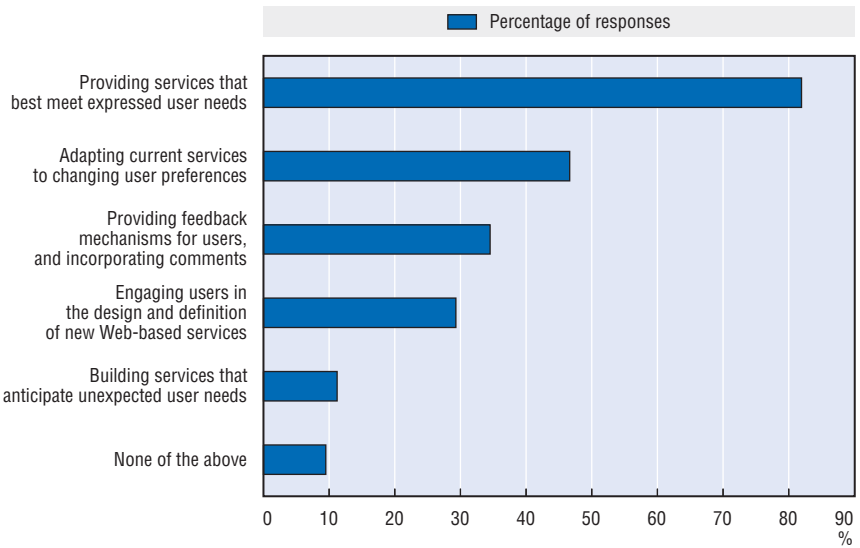
When asked about the level of importance that e-government leaders in their organisations should place on various aspects of e-government, 96% of survey respondents stated that strengthening a user-centred approach was important to some degree, with 68% saying it was very important. Other survey results indicate that the importance organisations have placed on different drivers for e-government implementation reflects this view. When asked about these drivers, 85% of respondents said that responding to external demand (from citizens, business, etc.) was important to some degree. However, only 5% of all survey respondents rated it as a very important driver, *versus* the 37% who

felt that enabling efficiency gains was very important. Municipalities differed somewhat in this regard, with 13% stating that external demand was a very important driver – perhaps indicating the inherently closer relationship they have with users of their services.

The OECD survey also looked at how user-focus was being incorporated into the e-government strategies and plans of individual organisations. The results show that the e-government strategies of 82% of respondents' organisations target a generic goal of user-focused service provision. After this, there is a significant drop to the goal of adapting current services to changing user preferences, which is part of the e-government strategy of 47% of respondents. Following this were: 1) providing mechanisms for user feedback (35%); 2) engaging users in the design of new services (29%); and 3) building services that anticipate unexpected user needs (11%).

The trend shows that organisations' strategies are less likely to include proactive approaches to providing user-focused e-government services based around asking users about their needs and how to meet them through e-government. It also mirrors the fact that proactive measures of demand for e-government are used less than passive ones, such as counting Web site hits. This is perhaps a further reflection of the fact that government organisations feel that the major drive to implement e-government comes from the Government. It may also be another demonstration of Danes' traditionally

Figure 7.6. **User-focused elements of e-government strategies**



Source: OECD E-Government Survey: Denmark.

high degree of satisfaction with government services, which may be manifesting as a relative lack of citizen or business expression of demand for more user-focused services.

Government-wide drivers of user-focused e-government

A very good example of the external drive towards user-focused e-government in Denmark is the *Top of the Web* project. Since 2001, under the responsibility of the MVTU, the National IT and Telecom Agency has conducted this annual benchmarking evaluation of public sector organisations' Web sites. Launched as part of the *Denmark on the Web* strategy of 2000, and originally scheduled to run for three years, the aim of the project has been to improve the quality of public Web sites.

In 2003, nearly 2 200 public Web sites were evaluated, representing a 23% increase from 2001. The evaluation was based around three key criteria: 1) user-friendliness; 2) usefulness of content (including provision of options for self-service); and 3) "openness" (*i.e.* the extent to which users can determine how decisions are made and how they can influence the process, along with the ability to electronically communicate with service providers).

The 2003 evaluation process focused specifically on accessibility for the disabled, which led to a decline in the ratings of many Web sites due to the more stringent requirements for accessibility. Only 25 Web sites managed to

Key point 7.2

Positive Danish attitudes towards public services, and interviews conducted for this review, indicate that Danish government organisations are inherently user-focused. However, survey responses show that:

- ***Many organisations report that user demand for e-government is not applicable to them.***
- ***Most organisations regard the major drive for e-government as coming from either the Government or within their organisation, not from users.***
- ***Efforts to assess demand for e-government appear to be relatively unsophisticated, limiting their ability to understand what users' actual service delivery needs and priorities are.***

Despite this, organisations show strong awareness that a lack of user-focused e-government services can constrain demand for e-government, and most have included developing more user-focused approaches as a goal in their e-government strategy or plans. However, a major opportunity remains to improve delivery of user-focused e-government across the public sector. Organisations must take a more proactive approach in this regard – especially by working more directly with users of their services to understand and respond to their needs and demands.

achieve a score of five "net crowns" – the highest rating possible. However, nearly all Web sites achieved at least three crowns, a result judged to be an extraordinarily high overall standard. Officials concluded that the *Top of the Web* project had contributed to a marked increase in the quality of public Web sites and decided to extend it to 2004.

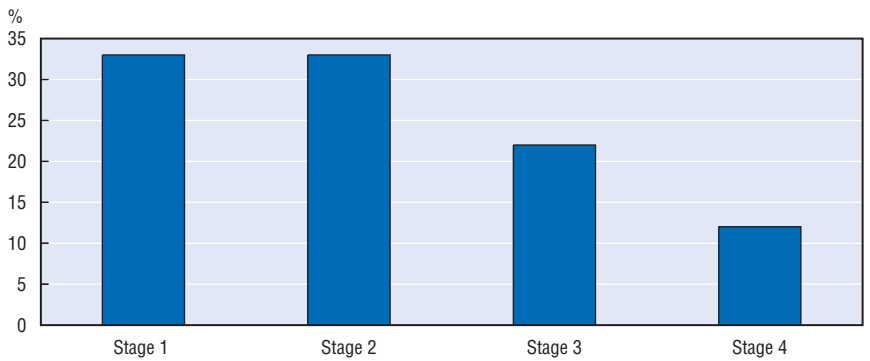
Online delivery of user-focused e-government

One widely used indicator of user-focused e-government is a four-stage model that examines the extent to which government organisations have moved beyond simple provision of information via their Web sites (stage 1) towards enabling online interaction (stage 2), then electronic transactions (stage 3), and finally implementing significant ICT-enabled transformation of how their services are organised and delivered, both on- and offline (stage 4). The OECD survey asked respondents to both identify who their e-government services are aimed at, and to categorise them according to this four-stage model.

Respondents reported on a total of 392 services, of which 64% were aimed at citizens and 32% had a business audience. In another 4% of cases, organisations did not know what the primary audience for the service was, which is most likely due to the difficulty of categorising some services as being for one group or another (*e.g.* online access to legislation). None were exclusively targeted at "other" groups (*e.g.* government organisations).

In terms of the stage of development of these services, 33% were at stage 1 (basic information provision), and another 33% at stage 2 (simple interactivity). About 22% were at stage 3 (vertical integration allowing transactions), and 12% were at stage 4 (horizontal integration of services across organisations). The relevance of this model is that, as services move from stage 1 to stage 4, government has much greater ability to focus on and meet the needs of users – increasingly at the level of the individual.

Figure 7.7. **Levels of e-government development**



Source: OECD E-Government Survey: Denmark.

Even though there is no possible measure of how many services should be at each stage of development, this information paints a good picture of the degree of user-focus in Danish e-government (at least in terms of this measure). Denmark's strength in this area is also indicated in the Eurostat data looking at the sophistication of Danish e-government services presented in Figure 7.5.

Key point 7.3

While Danish organisations clearly regard development of user-focused e-government as being important, this attitude appears to be driven more by the Danish government than by individual citizens and businesses. In practice, for most organisations this user-focus manifests in e-government strategies as a generic commitment, with fewer organisations appearing to take more proactive steps towards this goal.

Despite this, Denmark has made significant achievements in this area of e-government. In Europe, it is a leader in terms of the sophistication of its online services (especially those for businesses), and by their own assessment, significant percentages of the e-government services provided by Danish organisations are of an interactive or transformational nature.

Providing user-focused access to e-government

In Denmark the Government has neither explicitly directed nor provided guidance to organisations over how e-government delivery should be undertaken (for example through implementing some form of government-wide "channel management" or "multi-channel service delivery" strategy). The most common means of delivering e-government services is through organisation-level Web sites, which are used by 95% of all organisations that responded to the OECD survey. Following this, 61% of respondents reported using portals to deliver e-government, after which there was a significant drop to the use of voice services (*i.e.* call centres), and finally mobile phone-based channels (WAP and SMS).

This strong tendency towards use of Internet-based delivery is consistent with the relatively high capacity of the Danish public to access and use e-government over the Internet, due to the high rates of PC and Internet access (see Chapter 3). Clearly, Web sites and portals are the delivery channels that present the least challenge to Danish e-government in terms of achieving equity goals, and are also viewed as the delivery medium where there is the least constraint on user demand.

The significant difference between organisations' delivery of e-government to users of home and/or business PCs (through Web sites and portals) *versus* users of mobile phones (via WAP and SMS) mirrors the situation in other OECD countries. With Danes being among the highest users of mobile phones in the world, there is a significant opportunity for Danish e-government to become more user-focused by increasing the extent to which e-government services are delivered via mobile phones (so-called "m-government"). There is no data available on the channel preferences of Danish e-government users but it can be assumed that, across time, more Danes will be interested in accessing government services via their mobile phones where this is a feasible and appropriate mode of delivery. Among the wide range of issues related to adapting services to mobile delivery that organisations will have to face, one particular government-wide concern will arise from the fact that the current approach to securing e-government through the use of PKI in Denmark is a PC-centric model that may not be compatible with mobile platforms (see Chapter 6).

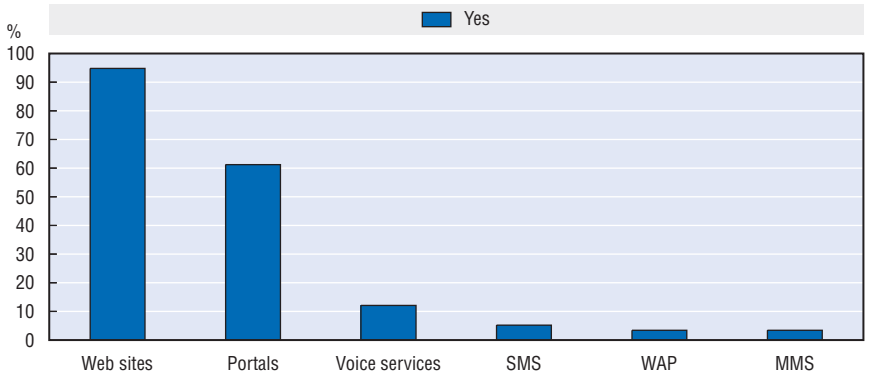
The large difference in the level of service delivery through organisation-level Web sites *versus* portals indicates a significant opportunity for Denmark to increase the level of user-focus it is already achieving. The number of Web sites in the Danish public sector is large and growing, with more than 2 000 now in service, none of which are subject to any formal or mandatory design guidelines (something recommended in the MVTU study of study of citizens' e-government experiences). In their absence, there is potential to present users with a bewildering and inconsistent array of options for accessing e-government, and also to fail to achieve the most efficient and effective use of the Internet as a delivery channel.

Portals are potentially a much more user-focused way of delivering online information and services than individual Web sites. Currently, most OECD government portals can be described as first-generation sites that aggregate the Web-based information and services of individual organisations into a more coherent and conveniently accessed bundle of e-government offerings. Future generations of portal development are expected to increasingly enable integration and customisation/personalisation of services into even more user-focused offerings.

Danish organisations make significant use of a wide range of portals for delivering e-government (see Figure 7.8). As noted in Chapter 6, activity related to portals is a significant aspect of e-government collaboration, with 51% of OECD survey respondents reporting that they were actively working together to establish portals.

In looking more closely at how portals are being used, the survey treated delivery of information and delivery of services separately. In terms of information delivery, the most widely used portal is the all-of-government

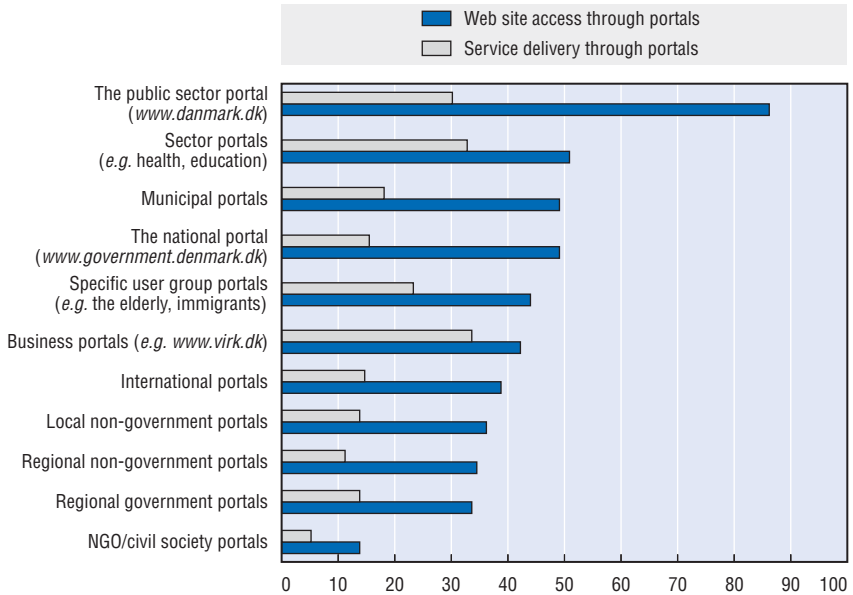
Figure 7.8. **Use of electronic delivery channels**



Source: OECD E-Government Survey: Denmark.

www.danmark.dk, which is designed to provide a convenient way of guiding users towards the Web sites of government organisations. Given its function, it is interesting to note that not all organisations surveyed provided information through this portal. Sector portals are the second most widely used portals for information delivery, followed by specific user-group portals, and finally the business portal *www.virk.dk*.

Figure 7.9. **Information and service delivery through portals**



Source: OECD E-Government Survey: Denmark.

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With regard to service delivery, the most heavily used portal is *www.virk.dk*, followed by the health sector portal *www.sundhed.dk*. This is not surprising; both portals are regarded as integral to the future success of online service delivery to their respective user groups, and much effort and resources have been put into their ongoing development and operation. The next most widely used portal for service delivery is the public sector portal, which by May 2005 provided links to 372 online services.

Overall, Danish government makes significant use of portals and survey results indicate that this will increase. Given the fact that portals are currently the main channel by which government is pursuing more user-focused delivery of e-government, it is notable that there is no overarching government policy or strategy regarding the development and operation of portals, or mandating organisations' participation in them. In this absence, Denmark has developed a disparate array of portals that feature different technical and information architectures and, like organisation-level Web sites, present their users with widely varying approaches to visual design and navigation.

The lack of an overarching approach to portals (and potentially also organisation-level Web sites) – either as a stand-alone initiative or as part of a wider multi-channel service delivery strategy – may be having a negative effect on both the degree of user-focus that can be achieved by each individual portal, and the overall coherence and user-focus of government services that is a goal of the Danish e-government strategy. It may also be having a negative effect on the efficiency of resource use in delivery of e-government (for example, through failure to fully leverage economies of scale or duplication of efforts, etc.).

Any negative impacts on user-focus arising from the current situation regarding Danish portals may be being felt most acutely by citizens, who are faced with a larger number of portals where they may potentially find information and services than may be strictly necessary. In particular, the danmark.dk and netborger.dk portals appear to have some significant overlaps in both their constituencies and functions.

These types of issues have already been identified in Denmark, and some thought has been given to how they might be addressed. As noted earlier in this chapter, the Government has not yet acted on relevant recommendations made in the MVTU's qualitative study of citizens' e-government experience (including provision of a single e-government portal for citizens, standardisation of Web site design and possible use of a life events model to improve supply of co-ordinated e-government services). Developing an all-of-government policy or strategy for both portals and Web sites, either as a stand-alone initiative or as part of a wider multi-channel service delivery strategy, could provide a good vehicle to act on such recommendations, in pursuit of the efficient and effective development of more user-focused e-government in the future.

Box 7.2. **Major Danish government portals**

The public sector portal *www.danmark.dk*

Danmark.dk is the top-level government portal in Denmark. As such, it aims to provide Danes with an overview of government and a means to easily find information and services by guiding users to providers through short descriptions that are constantly updated in co-operation with relevant authorities. In effect, it functions as a guide or directory to both State and local government organisations and the services they provide. The portal is overseen by the IT and Telecommunications Board under the Ministry of Science, Technology and Innovation.

The health portal *www.sundhed.dk*

Sundhed.dk is the main Internet point of access to the Danish health system. It provides access to a wide range of health information. It also enables communication with and between health authorities and health professionals, facilitating the delivery of health services. Users can also book appointments with GPs, receive e-mail consultations, and renew of prescriptions via sundhed.dk, now a key element of the Danish health system.

The municipal self-service portal *www.NetBorger.dk*

NetBorger.dk provides access to the information and services of each municipality. These services are provided on a self-service basis, with the portal serving as the electronic conduit between individual citizens and businesses and their municipalities. NetBorger.dk also links to a large number of other public sector organisations. It is developed and owned on behalf of municipalities by KMD A/S.

The national portal *www.denmark.dk*

This portal is Denmark's official international Web site providing an online entry point for anybody interested in a wide range of information about the Danish State, economy and society. The content of the portal is provided by a wide range of government organisations, and private and public companies. Launched in 2002, the portal's funding is assured through 2005. The Ministry of Foreign of Affairs has overall responsibility for the portal, which is maintained and run by the National IT and Telecom Agency.

The business portal *www.virk.dk*

The business portal provides Danish businesses with access to a wide range of both public and private sector information and services. The portal was developed as a Private-Public Partnership under the mandate of *eErhverv* – a service association consisting of the Ministry of Economy and Business Affairs, the Ministry of Employment, the Ministry of Food, Agriculture and Fisheries, the Ministry of Environment, municipalities and Danish regions. A large number of Danish government organisations and businesses contribute content to the portal.

Box 7.2. **Major Danish government portals** *(cont.)*

The Danish counties portal *www.arf.dk*

This portal is operated by Danish Regions. It provides an overview of the structure, functions and administration of Danish counties for citizens and businesses, and serves as an entry point to information resources and tools used for the administration of individual counties. It also provides news about Danish counties.

The Danish municipalities portal *www.kl.dk*

This portal is provided by Local Government Denmark. It fulfils essentially the same functions as the counties portal.

Key point 7.4

The Danish public sector uses many Web sites and portals to deliver e-government, and indications are that the number of Web sites and portals will continue to grow. There is, however, no government-wide policy or strategy regarding the design and development of Web sites and portals, either as a stand-alone initiative or as part of a wider strategy on multi-channel service delivery.

Denmark is already making good progress in delivery of user-focused e-government. However, in the absence of such overall guidance, there is potential for results to be sub-optimal in terms of both users' e-government experiences, and the achievement of maximum efficiency and effectiveness in government use of the Internet as a delivery channel.

E-government and offline service delivery

Given that the majority of government service delivery occurs at the local government level, perhaps the most significant user-focused step currently being taken is the proposed establishment, as part of implementation of the Structural Reform, of "Local Service Centres" under the authority of each municipality. The logic is that the public sector should be as accessible as possible, and users of government should be able to find services in one place, regardless of which public authority or administration has final authority.

Local Service Centres are intended to increasingly become the physical front door to State, regional and municipal services – another reflection of the general Danish trend to make government closer to people and more user-focused. The functioning of the new Service Centres will be analogous to that of an Internet portal, and will depend on e-government for their

implementation. The cross-organisation information management that will be required for their effective operation provides an excellent example of how e-government can expand beyond enabling online delivery channels, and is instead now becoming integral to improving the performance of government when it is involved in face-to-face delivery of information and services.

This relationship between e-government and offline service delivery is highlighted in some of the following design principles, which will underpin implementation of the Service Centres:

- Digital self-service solutions will be developed for all citizen-related services.
- The most important citizen services provided by regions and the State will be delivered by municipalities enabled by Service Centres.
- Existing barriers to coherent service delivery will be removed.
- A "Service Centre Act" that lays down the rules for the Service Centres' authority regarding service delivery on behalf of other public authorities, including rules for exchange of personal data, will be enacted.

The last two principles in particular will not only enable the functioning of the new Service Centres, but will also further contribute to the ability to implement user-focused services online. Interviews revealed a universally positive attitude towards the Service Centre concept, and clear identification

Key point 7.5

The plan to establish Local Service Centres as part of Denmark's Structural Reform is a clear demonstration of the level of political commitment to making government more user-focused that exists in Denmark.

The proposal, which enjoys strong support within the public sector, will depend upon advanced e-government for its effective implementation – especially to facilitate information exchange and business process redesign across different services areas, organisations, and levels of government. Several steps that will be taken to implement the Service Centres will also benefit the ongoing implementation of e-government.

Once in operation, the Service Centres will function in a manner similar to an Internet portal. The Centres will depend significantly upon e-government, and concerns remain about the potentially negative effect of the large number of existing Internet portals. It is interesting that the Government has not yet considered developing an overall approach to user-focused service delivery that explicitly links on- and offline approaches to delivery (i.e. a multi-channel service delivery strategy).

of the relationship between this initiative and many aspects of the Danish e-government programme (and, to a lesser degree, to public sector modernisation). Given this strong support – along with concerns about the plethora of government portals currently in existence, the drive for increased government efficiency, and the strong political and administrative commitment to more user-focused offline service delivery – it is again interesting to note that Denmark has not yet looked at development of either a multi-channel service delivery strategy or, more narrowly, a complementary government-wide policy and strategy on service delivery through Internet portals and Web sites.

7.3. Enabling participation in government

As noted earlier, participants in the OECD survey indicated low levels of user demand in areas of e-government involving consultation or participation. This does not mean either that the Government has no goals in the broad area of "e-engagement" of its citizens, or that government organisations have been taking no steps in this direction.

In its modernisation programme, the Government has committed to the use of ICT to underpin "creation of a more open, user-oriented and democratic administration" where both citizens and businesses have greater access to the workings of government and are able to participate in strengthened dialogue with politicians. While this commitment has not translated into any specific goals under the e-government strategy, it has nonetheless been acted on at the all-of-government level through the development of an online system for public debate called *DanmarksDebatten* ("Denmark Debates").

Launched under the 2003 *Using IT Wisely* telecommunications policy action plan, *DanmarksDebatten* is a tool for generating online dialogue. Developed by the National IT and Telecom Agency, it is designed to be integrated into the Web site of individual State and local government organisations. At the same time, it functions as a national "debate portal" allowing citizens, businesses, politicians and journalists to participate in debates organised by level of government, subject, etc. *DanmarksDebatten* can handle debates at the local, regional and national levels.

Other forms of e-engagement are also being used in Denmark. A particularly topical example is use of the Internet to facilitate learning and dialogue over the establishment of the new Danish regions, as described in Box 7.3.

Box 7.3. **Online consultation over the Structural Reform**

On 15 November 2005, as part of the Structural Reform process, Danish citizens will elect councils in the five new regions (*North Jutland*, *Mid Jutland*, *South Denmark*, *Sealand*, and the *Capital Region*). Leading up to these elections, citizens have been invited to join "regional citizen panels" on the Internet. The panels enable citizens to learn about the design and function of the new regions, and to share with future regional councillors and public servants their expectations of the new regions. The regional panels are also expected to help increase participation in the regional elections.

The participation process will involve dialogue in the form of a continuous debate about regional matters, publication of regional newsletters, and five polls. The first poll investigates citizens' habits, incomes, ages and opinions about questions such as the environment, growth, political parties and integration. The panel members will later be asked to provide insight into more concrete issues. In the Capital Region, the goal is for between 8 000 and 10 000 of the regions' 1.6 million inhabitants are expected to join the panel.

Source: http://europa.eu.int/idabc/en/document/4177/194.

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Chapter 8

Monitoring and Evaluation

At the all-of-government level, e-government monitoring and evaluation occurs in the context of the Danish e-government strategy. The strategy is notable for setting relatively sophisticated targets (i.e. not simply blunt objectives, such as having a certain percentage of services online by a certain date) called "signposts" for achieving e-government by 2006. It also specifies how these targets will be measured. The emphasis on setting measurable targets in the latest version of the strategy reflects the Government's vision that e-government will deliver tangible results for Danes, as expressed in the subtitle of the strategy – "Realising the Potential".

However, the actual practice of monitoring and evaluation is a relatively low-priority and under-developed aspect of e-government in Denmark, as it is in other OECD countries. Useful steps to improve this situation have been taken, and more work is underway. Denmark should continue to develop its capabilities and performance in this regard, so that it can assure itself the e-government goals are being met, and develop even better e-government initiatives in the future.

This chapter examines the Danish approach to monitoring and evaluating e-government, at both the all-of-government and individual organisation levels.

8.1. Monitoring and evaluation at the all-of-government level

At the all-of-government level, e-government monitoring and evaluation occurs in the context of the Danish e-government strategy. The strategy is notable for setting relatively sophisticated targets (*i.e.* not simply blunt objectives, such as having a certain percentage of services online by a certain date) called "signposts" for achieving e-government by 2006. It also specifies how these targets will be measured. The emphasis on setting measurable targets in the latest version of the strategy reflects the Government's vision that e-government will deliver tangible results for Danes, as expressed in the subtitle of the strategy – "Realising the Potential".

The targets set by the strategy are expressed in outcome-oriented terms. A mix of internal and external targets is included in the strategy. The external targets focus on the Government's vision of e-government helping to create a coherent, citizen-focused public sector providing an improved quality of government services. The internal targets focus on the major steps that the public sector must take to achieve the e-government vision, namely creating an improved operating environment, achieving increased efficiency and effectiveness, and changing organisational behaviours. Each signpost is accompanied by measures that will be used to assess whether government organisations have achieved the goal (see Box 8.1).

The targets and measures apply equally to State, regional and local government. In many cases, measurement will be based on the extensive data collection activity of Statistics Denmark.

Government organisations have generally responded positively to the establishment of these targets and measures. Where they have been fully specified, they have reduced ambiguity about what is expected of them and how they will know whether they are succeeding. However, as noted in Chapter 6, they do have some concerns about how achievement against these targets will actually be measured. It also remains to be seen how monitoring against these targets will affect their achievement, and how the results of monitoring will be used to inform future e-government developments, or in any management of organisations' performance. Consequences for non-participation in either the overall achievement of the strategy, or in its various objectives and initiatives (*i.e.* uptake of interoperability standards), are also unclear.

Box 8.1. **Design of Danish e-government targets and measures**

The Danish e-government strategy does not set blunt targets for e-government, such as putting all government services online by a certain date. Instead, it includes five major "signposts" that together support achievement of the Government's e-government vision. Two signposts involve outcomes that are external to the public sector, while the other three are internal. The signposts are:

External outcomes

Signpost 1: The public sector must provide coherent services with citizens and businesses in the centre.

Signpost 2: E-government must result in improved service quality and the release of resources.

Internal outcomes

Signpost 3: The public sector must work and communicate digitally.

Signpost 4: E-government must be based on a coherent and flexible infrastructure.

Signpost 5: Public sector managers must lead the way and ensure that their own organisations are capable of realising the vision.

Achievement of each signpost will be assessed using a number of measures. For example, measures for Signpost 1 include:

"By the end of 2006, the aim will be to ensure that:

- At least 60% of the population uses the public sector's digital services (2003: 40%).
- At least 95% of all businesses use the public sector's digital services (2002: 72%).
- At least 60 per cent of all public authorities receive at least one-quarter of all documents from citizens and businesses in digital form (2003: citizens 15%; businesses 21%).
- The level of satisfaction of citizens and businesses with the coherence of digital services/task performance is increased (specific goals will be formulated and defined).
- The level of satisfaction of citizens and businesses with the public sector's digital services is increased (specific goals will be formulated and defined)."

Source: Danish e-government strategy 2004-06, www.e.gov.dk/english/project_egovernment/egovernment_strategy/index.html.

Key point 8.1

Denmark has set clear e-government targets for all government organisations and, in most cases, has backed them up with measures for assessing achievement of the targets. Organisations have found this helpful, but the effect of monitoring and evaluation against these targets is yet to be seen.

Costs and benefits of e-government

Another element of effective e-government monitoring and evaluation involves the preparation and use of business cases that allow assessment of e-government costs and benefits. At the pre-investment stage of e-government initiatives, business cases are useful evaluation tools. They can help decision makers rank and compare the tangible and intangible financial, economic and social costs, benefits and risks of proposed investments in e-government. Comparisons can be made against both other e-government initiatives and alternative uses of public funds.

In the implementation stage of an initiative, well-developed business cases provide an important framework for monitoring and managing project costs and risks. At the post-implementation stage they are especially useful for holding organisations accountable for delivering projected benefits within proposed costs and other constraints. They also provide lessons about how to plan, manage and benefit from future e-government initiatives. Overall, successful efforts in this area can assist governments in maximising the benefits of e-government while containing its costs and risks, and in prioritising resource allocation decisions (especially if the approach to evaluation and monitoring is consistent across government).

In response to OECD enquiries about the use of e-government business cases in the public sector, the Digital Task Force advised that organisations have based their projects on analysis of financial costs and benefits, and sometimes on some non-financial indicators. However, most investment in e-government initiatives has so far not been based on a robust, systematic and commonly applied approach to developing business cases. Task Force representatives observed that development and use of business cases and evaluations in the Danish public sector is at an early stage, and that the need to provide organisations with tools for developing business cases in a more systematic way is increasingly evident. This aspect of Danish e-government mirrors the current situation in most OECD countries.

The 2004 e-government strategy included a "focus area" on securing realisation of the value of e-government initiatives and measuring their results, recognising the need for evaluation and monitoring to be based on stronger and

more consistent business cases. The importance of prioritising this issue is indicated by a question in the OECD survey that looked at budgetary barriers to e-government, where the difficulty of establishing and proving the costs and benefits of e-government initiatives was reported to be a barrier by 65% of respondents (see Figure 3.3).

Working with the Ministry of Science, Technology and Innovation (MVTU), the Task Force has developed a financial business case tool and a cost estimation tool, both of which have been made available online to the public sector. Currently, these tools emphasise a focus on the financial or economic aspects of e-government initiatives, in response to what was seen as an urgent need to improve organisations' ability to establish evidence of the economic costs and benefits of e-government initiatives. In 2005, this was augmented by building the business case tools into an e-government project management model, based on the PRINCE2 methodology developed in the UK.

Use of these tools is not mandatory, and is not directly linked to organisations' access to funding for e-government initiatives at any level of government. Instead, they are being promoted as a best practice, especially through their application in cross-sector e-government projects that involve the Task Force and multiple organisations. An example of this is the recommendation that they be used by municipalities and counties when seeking access to special loan facilities established in 2005 for funding one-off ICT costs related to the Structural Reform. The Task Force reports a need to further refine these tools, to communicate their existence and purpose, and to work with organisations to ensure that they are used properly and consistently. Its goal is to change organisational practices to the point that e-government initiatives are always based on robust business cases, and are evaluated against those business cases after they have been implemented.

One result of the current situation is that there is no comprehensive overview or evaluation of the costs and benefits of the Danish e-government programme against which: 1) the costs and benefits and achievements of individual e-government initiatives can be benchmarked; or 2) the Government can assess how well its e-government goals are being met by the public sector. Again, this is a problem many OECD countries have in common. Improving this situation presents a significant challenge to the Digital Task Force and the MVTU which, despite having jointly produced the tools mentioned above, themselves use divergent approaches to developing business cases for e-government initiatives. The Task Force prefers to use a methodology that looks separately at costs and benefits for the public sector, citizens and business, while the Ministry focuses on "users" and the public sector, splitting the latter into ICT and organisational costs and benefits.

Key point 8.2

E-government initiatives in Denmark are not proposed, monitored and evaluated on the basis of a sound and consistently applied business cases detailing their expected financial, economic and social costs, benefits and risks. Some tools to help organisations improve their performances in this area have been developed by the Digital Task Force and the Ministry of Science, Technology and Innovation. However, their use is not mandatory, and they require further development and communication.

External audit

Another important element of effective e-government monitoring and evaluation can be provided by audit organisations working independently of other government organisations. In Denmark, the National Audit Office (NAO) is charged with examining whether State funds are administered in accordance with the decisions of the Parliament. In addition to undertaking financial audits, the NAO also conducts performance audits that look at how well specific tasks or projects have been conducted by government organisations, with a focus on economy, efficiency, and effectiveness. To date, the NAO has undertaken audits of specific IT projects and established recommendations around the development and evaluation of the business case for e-government projects, but it has not yet carried out an audit explicitly focused on e-government (despite having discussed the possibility of conducting such an audit with the Digital Task Force).

This lack of independent information for the Parliament about e-government activities is mirrored by a relative lack of information on e-government provided to both ministers and officials. This lack of communication contrasts with the reporting that exists around the Government's various IT Action Plans (within which some information about e-government is provided). The Digital Task Force does provide some information about the results of the e-government strategy on its Web site. This reporting is, however, descriptive rather than evaluative, and is not comprehensive in its coverage of all the targets of the strategy.

Overall, this apparent low level of demand and supply of rigorous monitoring and evaluation of e-government to the Parliament, ministers and officials stands in contrast to the practices of many OECD countries.

External audit at the local government level

The Structural Reform proposes establishment of an "independent evaluation institute" under the Ministry of the Interior and Health (subject to discussion with municipalities). The intended purpose of this institute will be

to support effective decentralised provision of public services by examining and publishing comparisons of the performance of individual municipalities. It is expected that municipalities will benefit from access to knowledge about how best to deliver results, and their efficiency in using resources will improve, especially through improved financial management. The overall outcomes of establishing the institute are expected to be: 1) an improvement in the basis for political decision making; 2) assurance that citizens will receive the best quality public services in return for their taxes; and 3) an increase in public sector openness and transparency.

Interview participants expressed a general consensus that, in principle, the proposal is a good idea which should contribute to improved local government performance. It was not clear, however, exactly where the institute would be established, how it would be governed, resourced or organised, and whether it would focus on e-government as part of its activities.

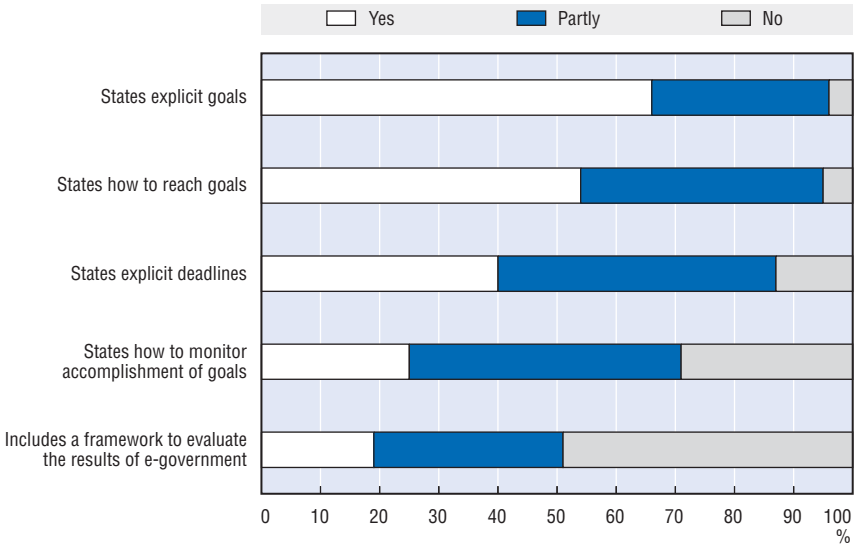
Given the contribution that e-government is expected to make to the goals that the institute will support, and also the widespread benefit that increased sharing of e-government experience and good practices among local government organisations could deliver, many interviewees felt that e-government could be a very important focus area for the new institute. Some also questioned the decision to limit the scope of the institute to work only with municipalities, wondering whether it could also add value at the regional level.

8.2. Monitoring and evaluation at the organisational level

Perhaps reflecting limited emphasis at the all-of-government level, monitoring and evaluation of e-government is given a relatively low priority at the individual organisation level as well. Among organisations participating in the OECD survey that had an e-government plan, a majority have either fully or partially built explicit goals into their plan (96%) and have stated how they expect these to be achieved (95%). Fewer have included elements of monitoring (71%) and evaluation (51%) in their plans.

In the majority of cases, monitoring and evaluation is only partially included in e-government plans, which further emphasises the lower priority given to these activities. Beside the fact that monitoring is generally easier to undertake than evaluation, the fact that monitoring is more common than evaluation may be related to the lack (until recently) of centrally provided evaluation tools, and a need for greater communication of the existence of those tools.

Figure 8.1. **Inclusion of monitoring and evaluation in e-government plans**



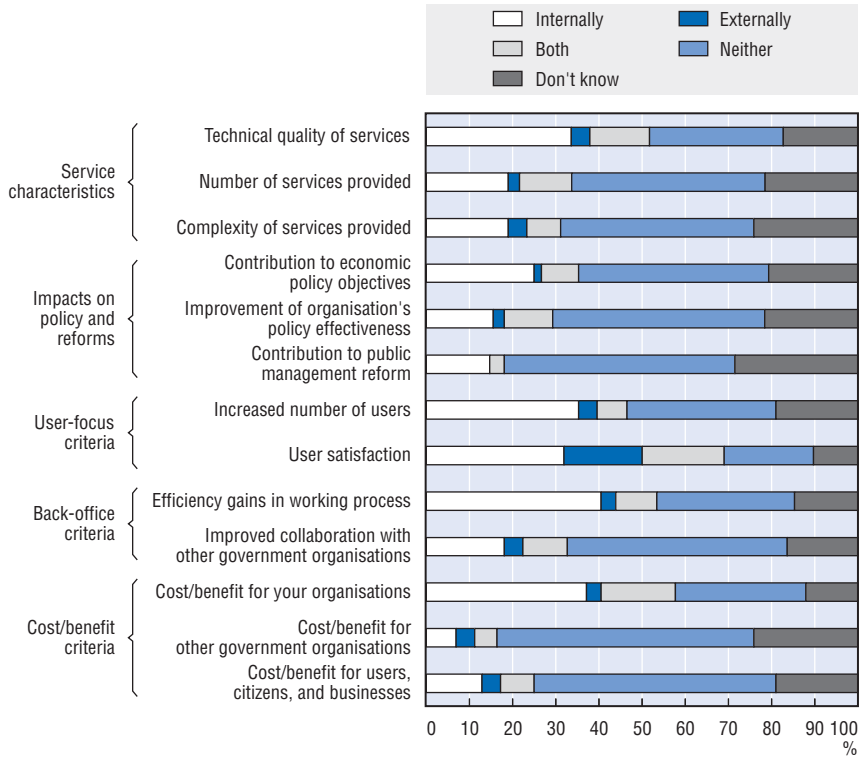
Source: OECD E-Government Survey: Denmark.

Focus of e-government monitoring and evaluation

Evidence suggests that monitoring and evaluation is not a high priority for organisations, and is not widely regarded as an essential element of e-government planning. However, monitoring and evaluation of e-government does occur. Individual government organisations monitor and evaluate e-government, although it is not clear how actively or uniformly this is undertaken. The OECD survey looked at the criteria used for monitoring and evaluation. Organisations surveyed were asked whether they undertook internal, external or combined assessment in the following areas where e-government can have impacts: 1) "service characteristics"; 2) government policy and reforms; 3) users of government services; 4) back-office operations; and 5) costs and benefits. The results presented in Figure 8.2 show that monitoring and evaluation is most focused on services, service users and the back office (with an emphasis on efficiency), followed by a focus on the costs and benefits of e-government, and lastly on wider government policies and reforms.

While this result is encouraging in terms of what it shows about the user-focused nature of Danish (e-)government, it also reflects the challenge of achieving greater collaboration between organisations. The monitoring and evaluation work being undertaken is biased towards individual organisations and the users of their services, and is undertaken internally rather than externally to a significant degree. This situation, which does not appear to

Figure 8.2. **Focus of organisations' e-government monitoring and evaluation**

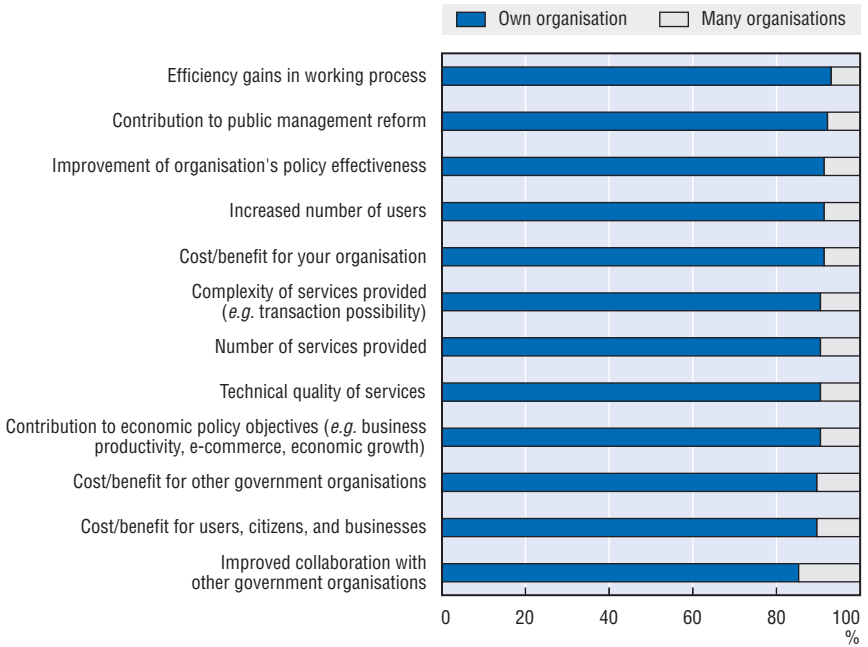


Source: OECD E-Government Survey: Denmark.

provide good support for increased co-ordination and collaboration between organisations, is further highlighted by the results presented in Figure 8.3, which show the very high bias of e-government evaluation towards the performance of individual rather than multiple organisations.

Another notable survey result in this area is the very limited focus on monitoring and evaluating the costs and benefits of e-government (for services users, citizens and businesses or other government organisations). This again reflects the relative weakness of Danish organisations in this area, reinforcing the need to prioritise development, communication and use of business case tools. Finally, a significant number of respondents were unaware of the criteria that their organisations use for evaluation and monitoring e-government, again underscoring the fact that this aspect of e-government is of relatively low priority in Denmark.

Figure 8.3. **Focus of monitoring and evaluation**



Source: OECD E-Government Survey: Denmark.

Responsibilities for monitoring and evaluation

Responsibilities for e-government monitoring are relatively widely distributed within Danish government organisations. In line with other evidence that shows that organisations place a lower priority on monitoring and evaluation than they do on other aspects of e-government, monitoring responsibility resides with the head of the organisation in only 9% of those organisations responding to the OECD survey. This impression was reinforced in interviews, where monitoring and evaluation was a topic of little concern and one that very few participants discussed in any real depth.

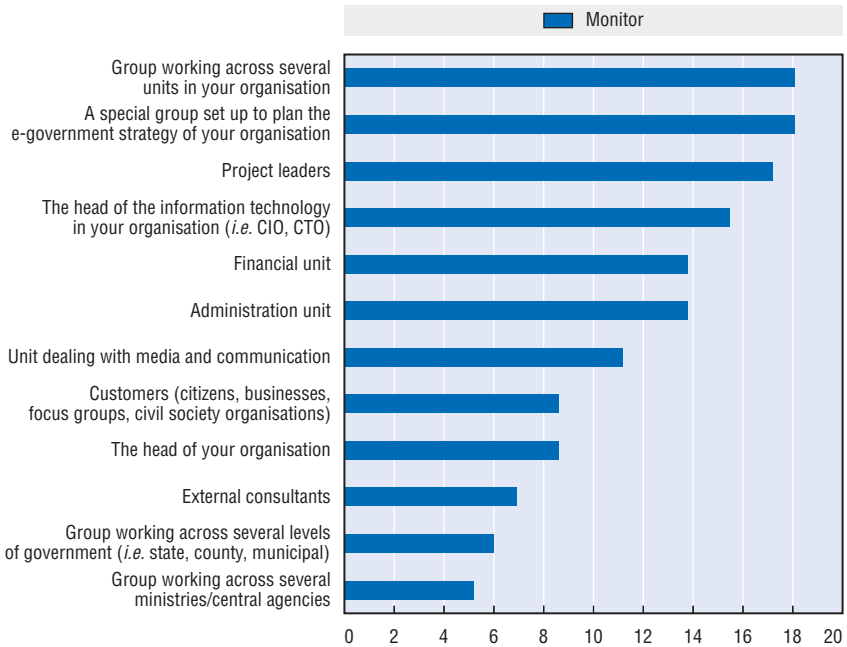
The appearance of an internally focused bias in monitoring activity is reinforced by the fact that monitoring responsibilities reside with groups working across several ministries or central agencies, or across several levels of government in, respectively, only 5% and 6% of organisations that responded to the survey.

E-government monitoring responsibilities are most likely to be given to either a group working across several units of an organisation or a special group set up to plan the organisation's e-government strategy (18% each), followed by e-government project leaders (17%), the head of IT in the organisation (16%) and then either a finance or internal administration unit

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(14% each). Aside from pointing out a lack of consistency in allocation of monitoring responsibilities, these results do not really say anything conclusive about this aspect of e-government in Denmark. An important element in effective development of e-government is that it not be seen as simply an ICT issue and thus the automatic responsibility of the ICT people in an organisation (although this may well be the best choice for some organisations). Clearly, this is not the case in Denmark, where there is instead a relatively wide distribution of monitoring responsibilities.

Figure 8.4. **Responsibilities for monitoring e-government**



Source: OECD E-Government Survey: Denmark.

Use of results of e-government monitoring and evaluation

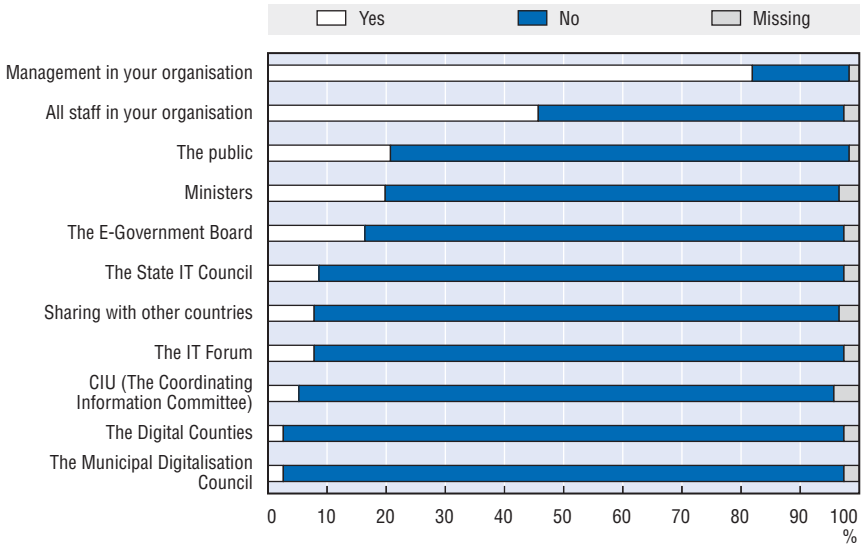
In addition to being valuable to individual organisations, the results of monitoring and evaluation of e-government can be of wider value to government (both ministers and officials), the Parliament and the public (both citizens and businesses). Monitoring and evaluation information can be used to plan, manage and improve e-government performance of both individual and multiple organisations, and across the whole of government. Parliament can use such information to hold the Government accountable for its use of public resources in developing e-government. The public can become more aware of and (potentially) engaged with e-government, which can benefit

individuals in terms of their use of government information and services, and society and the economy as a whole in terms of the efficiency, effectiveness, transparency and openness of government.

OECD survey respondents indicated that the results of their internal e-government monitoring and evaluation are most often made available to management within their own organisation (83%), followed by all staff in the organisation (47%). After this, there is a significant drop to provision of results to external parties, with 21% of organisations providing results to the public, and 20% providing them to ministers.

Interviews with officials did not reveal any particular reasons for the low level of provision of this type of information about e-government to external stakeholders. They did, however, reinforce the impression that e-government monitoring and evaluation is a relatively low priority activity for most organisations, and that external demand from ministers, the Parliament or the public is relatively limited. The fact that there are no mandatory processes in place for government-wide reporting on progress against e-government goals may be a reflection of the decentralised and relatively autonomous nature of public management arrangements in Denmark. It may also reflect the fact that e-government is neither a headline policy of the Government nor a goal in its own right, but rather an enabling element of public sector reform and modernisation; it therefore generates less demand for reporting of results than would otherwise be the case.

Figure 8.5. **Use of results of e-government monitoring and evaluation**



Source: OECD E-Government Survey: Denmark.

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Key point 8.3

E-government monitoring and evaluation is a voluntary activity given relatively low priority by many Danish government organisations. The monitoring and evaluation that occurs is biased towards individual organisations and the users of their services, and is undertaken internally rather than externally to a significant degree. Results of monitoring and evaluation are not widely diffused outside most organisations, and there appears to be limited external demand for this type of information.

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Case Study 1

Standards-based E-government in the Health Sector

1.1. Organisation of health care in Denmark

Approximately 85% of Danish health services are provided by public institutions. Wherever possible, services are provided at the level closest to their users. Management of the health sector is decentralised, with regional government providing the majority of services. Municipalities also provide health services and State government, through the Ministry of the Interior and Health, has an overarching role in national health policy and strategy. The health sector has administrative bodies at the State, county and municipal levels.

1.2. Strategic context

National Health Sector IT strategy

Since 1999, e-government in the Danish health sector has been guided by the *National Strategy for IT in the Hospital Sector*, which is now in its second iteration, covering the period 2003-07. This strategy reflects the Government's overarching view that effective use of modern ICT is crucial to both the quality of health services, and the ability of the health sector to contribute to overall goals relating to the sustainability of the public sector.

Co-operatively developed by the Ministry of Interior and Health, the National Board of Health, Danish Regions and Healthcare Copenhagen, the strategy encompasses the whole of the health sector. The aim is to create a common framework for full digitalisation of the health system. The strategy is designed to strengthen centralised co-ordination of health sector ICT while, at the same time, creating conditions for effective decentralised use of ICT by service deliverers (hospitals, local health bodies, general practitioners, etc.). A key goal of the strategy is to enable data sharing between the many disparate ICT solutions that exist in the sector. Achieving this goal requires the widespread use of electronic data networks and electronic health records (EHRs) based on common standards, which were due to be introduced in all Danish hospitals by the end of 2005.

Structural Reform

The Structural Reform will impact significantly on the health sector. Through the Reform, the health aims to promote a strong public health service that offers patients unrestricted, equal and free access to high-quality prevention, examination, treatment and care services.

The five new regions that will supersede the current counties will retain significant responsibility for delivery of health services. Municipalities will play a stronger role in provision of those services that are not provided by hospitals. Regions and municipalities will be legally required to co-operate with one another; the grounds for this co-operation are established through obligatory regional health care agreements.

At the State government level, the National Board of Health (part of the Ministry of Interior and Health) will act as co-ordinator of the health system. Its responsibilities will include specifying certain standards for quality application of ICT in health services, with a particular emphasis on ensuring quick implementation of EHRs.

1.3. E-government in the health sector

Denmark has taken a strong interest in the use of ICT in its health sector since the 1960s. In 1995, the Government established a *Hospital Commission* to investigate whether hospitals could be organised in a better way. The Commission's report had a special focus on how ICT could be used to increase the efficiency and quality of health services. Two particularly relevant initiatives were in the background:

1. The Government's 1995 IT Action Plan, which stated that the use of IT offered extensive opportunities for improved health services, and identified EHRs and health data networks as essential in this context.
2. A 1994 action plan for EHRs, which funded development of eight to ten EHR solutions by counties. The National Board of Health evaluated these proposals and, in 1999, made some suggestions regarding standards for EHR concepts, technology and information security.

The Commission's report identified the need for common EHR data standards to support communication between EHR systems, and for a minimum of content and substance in those EHRs. The report also highlighted the need for changes in the legislation relating to patient registration, to enable smooth communication of relevant information between health sector organisations. It also noted that, in many hospitals, there was a need for investment in the physical ICT infrastructure (networks, etc.), and adjustments in organisation and business processes to allow for introduction of EHRs.

The opportunities and challenges pointed out in the Commission's report were all issues covered in national health sector IT strategies from 1999 onwards.

1.4. Standards-based health sector ICT

Today, Denmark provides two clear and contrasting examples of the development and use of standards-based ICT and data management in the

health sector. These are: 1) MedCom, a co-operative national programme between public and private organisations that enables electronic communication between all parties in the health sector – both administrative and clinical; and 2) the ongoing process of developing EHRs.

MedCom – the Danish health care data network

Development of the Danish healthcare data network started in the late 1980s, when interest in electronic communication in the health sector led to the launch of local projects by the Association of County Councils. These projects highlighted the need for cross-sector communication in health care. A trial electronic data interchange (EDI) project took place between 10 pharmacies and 11 medical practices in 1990. The first regional EDI projects began in 1992.

In 1992, as a reaction to these projects, Funen County proposed a national EDI initiative bringing together State and county government, private companies and health care organisations under the name "MedCom – The Danish Healthcare Data Network". The objective was to develop national standards for the most common communication flows between medical practices, hospitals and pharmacies (*e.g.* referrals and discharge letters, laboratory results, X-ray letters, prescriptions and hospital billing, etc.) This first project (MedCom I) ran from 1994 to 1996.

Slow dissemination and adoption of MedCom I standards led to a second project (MedCom II), undertaken during 1997-99. The primary purpose of MedCom II was to ensure rapid and widespread adoption of MedCom I standards. In addition, the scope of the project was broadened to include local authorities, physiotherapists, dentists and telemedicine initiatives. Internet technology was also starting to be used widely in Danish government, and so was incorporated into the design of the MedCom standards. MedCom II resulted in EDI-based communication in the health sector between hospitals, medical practices, and pharmacies becoming more common, with around 1.3 million "messages" exchanged each month (representing 30-50% of the total number of messages exchanged in the sector at that time). By the end of 1999, more than 2000 medical practices, pharmacies, hospitals, and laboratories were connected to the MedCom healthcare data network.

In a 1999 financial agreement between counties and the State government, MedCom was made a permanent fixture, with the goal that it would contribute to the development, testing, dissemination and quality assurance of electronic communications in support of good patient progression thorough the health system. It became clear that large-scale usage of EDI was creating quality assurance problems, mainly due to EDI service providers implementing the MedCom standards differently. This led to establishment of the MedCom III project, which focused on this issue, during 2000/01.

Since 2002, work has been ongoing on MedCom IV which, to a large extent, builds upon MedCom III. MedCom IV consists of four sub-projects:

1. An Internet strategy aimed at fully developing the national, Internet-based health care data network.
2. Municipal projects aimed at achieving large-scale use of MedCom standards for communication between hospitals and municipal health services.
3. The XML-EHR communication project, aimed at achieving nation-wide use of all relevant MedCom standards for communication within and between hospitals.
4. The SUP project aims at achieving Internet access to EHRs, both within a county and across county boundaries.

Today, standards-based EDI has overtaken paper-based communication in the Danish health sector. EDI is used by 88% of general practitioners, 57% of specialists, 100% of pharmacies and hospitals and 26% of local authorities. Examples of the benefits include time savings of around 50 minutes per day for medical practitioners, and a 66% reduction in follow-up telephone calls for hospitals.

One of the most significant and public outcomes of MedCom so far has been the development of Denmark's health sector portal, *www.sundhed.dk* (Health Denmark), based on MedCom standards. The portal is the main Internet access point to Danish health authorities, facilitating communication and services between health professionals and citizens and allowing users to book appointments with GPs, receive e-mail consultations, and renew prescriptions.

Standards-based electronic health records

In a discussion paper that was the basis for the 1999 health sector IT strategy, the Ministry of the Interior and Health, in co-operation with Danish Counties and the Copenhagen Hospital Corporation, presented a picture showing that, despite the efforts of the 1990s, the majority of processing of patient data in hospitals was still being done manually using paper-based health records. From an ICT perspective there was great variety in the information management technologies being used in hospital; additionally, their development was not occurring quickly enough.

From an operational/process perspective, all hospitals had a patient administration system handling essential administrative and operational tasks. The functionality and user-friendliness of these systems varied widely. The quality of data in these systems was generally regarded as being a significant problem. From a management perspective, hospitals' ICT systems were not providing sufficient basis for management decision making, planning or quality

control. The paradox was that the required data was being manually registered in patient records – the problem was not a lack of data, but inadequate data management.

This analysis resulted in further recommendations with regard to EHRs that became part of the 1999 and 2003 national health sector IT strategies.

One of these strategies' goals has been to enable the sharing of data between the disparate ICT solutions that exist in the sector through the use of EHRs based on common standards. Plans were to introduce these EHRs in all hospitals before the end of 2005. However, due to problems with the implementation of the national EHR standard, and the impact of the Structural Reform, in 2004 this goal was changed to be more open-ended. Under the broad oversight of the Ministry of Interior and Health, work in this area has been moved forward by the National Health IT Strategy Group (with members from all levels of government) and a mix of working and steering groups working on specific initiatives. Two particularly important initiatives in this context are the BEHR (Basic structure for Electronic Health Records) project and the work of the steering group dealing with the implementation of the national standard for EHRs.

The national BEHR project will create the basis for co-ordinated development of EHR concepts, tying health sector ICT to a common architecture with all the associated organisational and performance advantages such an approach allows. The resulting EHRs will be based on common standards for clinical definitions, administrative processes and technology, ensuring that interoperability between different systems can be achieved. The Board of Health has the role of setting standards.

The EHR work is focused on introduction of EHRs into the health service delivery environment in a way that ensures interoperability across the health sector. Achieving this requires a number of initiatives and/or changes to be undertaken at both the whole-of-sector and individual organisation levels, including a reference implementation of BEHR, establishment of a common data model, development of XML schemas for communication of health data based on the reference implementation of BEHR, and education of health sector personnel.

In the background, as a result of the Structural Reform reducing the number of hospital administrations, there has been a policy question regarding the best way to achieve integrated data management at the regional level. The National Board of Health has identified two possible approaches to this issue: 1) develop a single system for all of Denmark; or 2) make the existing systems interoperable. The weight of opinion is in favour of the interoperability approach, as it both reduces the operational risks relating to implementation of Structural Reform and fits with the wider Danish approach of flexible decentralised development of e-government based on a common architecture and standards.

1.5. Observations

The two standards-based initiatives described above present a contrast in terms of the pace of achievement of strategic goals that have been set for the health sector. While Denmark is acknowledged as having made impressive progress with the overall development of e-government in its health sector, the development of its common health data network has occurred more steadily and quickly than its implementation of EHRs.

There are a number of reasons for this situation. First, electronic transmission of health data is a more straightforward and non-controversial activity than the design and implementation of EHRs. Transmission of electronic messages between different health organisations is clearly much more a technological challenge than the business of defining and implementing standards relating to the structure and content of such messages. Second, defining standards for EHRs is very complex for two reasons – the sheer variety of potential EHR standards that need to be taken into account (especially in the pan-European context), and the fact that an EHR must meet the sometimes very different requirements of clinicians and hospital administrators.

A third factor that has slowed nation-wide implementation of EHRs is the impact that the Structural Reform is having on the health sector, imposing a major reorganisation of hospitals, and a reallocation of service delivery responsibilities that sees municipalities playing a larger role in the health sector in the future. While some commentators feel that the Structural Reform presents a strategic opportunity to make significant progress towards the goal of a fully standardised and interoperable health ICT environment, the weight of opinion is that the organisational changes already imposed by the Reform are of such magnitude that adding a further drive towards health ICT goals to these changes would risk successful implementation of the Reform as currently proposed, and also threaten the continuity and quality of service provision through the reform period.

A fourth factor behind the slower pace of EHR development is the major investments that health sector organisations (especially hospitals) have each made in their current clinical and administrative systems and surrounding business processes. Each organisation has taken its own approach to systems and processes, meaning that as well as being faced with significant costs of change they also face a very complicated environment for achieving interoperability. These costs and complexities are not evenly spread among all actors, meaning that each has differing incentives and challenges to face in arriving at some satisfactory sector-wide and collaborative outcome. Discussions about this with representatives of a number of Danish regions highlighted the existence of strong and divergent vested interests acting as obstacles to finding the most optimal way forward with the implementation of EHRs.

1.6. Conclusion

Health care is one of the most complex areas for e-government implementation in OECD countries. It is an area where significant outcomes hinge upon the way that information is used, both in service delivery and back-office administration. There is a very high requirement to ensure the privacy and security of health information, and high costs associated with the development and operation of health ICT systems and applications. There is also often a significant difference between the goals, incentives, views, knowledge and skills, and informational requirements of hospital administrators, clinicians and vendors of health sector ICT products and services.

The effects that these complexities can have on the development of e-government in this area are usefully illustrated in Denmark by the contrasting rates of achievement of its goals for use of electronic health data networks and implementation of electronic health records. In both cases the path forward involves standardisation, to which nobody is opposed. However, in the case of data networks progress has been steady and relatively easy in comparison to the difficulties being experienced around health records.

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Case Study 2

Achieving E-government Readiness – *eDay*

The *eDay* initiative (implemented as *eDay* and *eDay 2*) has been a key element of the Danish e-government strategy. Developed under the auspices of the Joint Board of e-Government with project leadership provided by the Digital Task Force, *eDay* is unique among OECD countries. The overarching goal of *eDay* has been to rapidly achieve government-wide readiness to securely exchange electronic information, and create public expectations of electronic communication being the norm for the public sector.

2.1. *eDay*

The first *eDay* occurred on 1 September 2003. The goal was to remove the need for paper-based communications within government as far as possible. All government organisations were given the right to demand that exchanges of information with other authorities be conducted electronically, and to refuse to accept non-electronic communications. The only exemptions allowed were for documents that contained identifiable personal information about citizens, information which for reasons of confidentiality or security can only be communicated electronically using digital signatures, or pre-existing information only available in paper form. The initiative included all State, regional and local government organisations. Although *eDay* did not create a right for citizens and businesses to insist on digital communication with government, each organisation was encouraged to offer them this ability.

By the end of *eDay*, 100% of public authorities had met the criteria required for taking full advantage of their new right. In October 2003, a survey of all government organisations showed that 75% of public government organisations both sent and received either no or very few paper communications that should have been exchanged electronically. The goal of *eDay* was to reduce paper-based communication across government by 40% within six months. Measurements showed that this goal was reached. For example, there was a 60% reduction of paper-based communication in the Ministry of Finance after only two months.

For a majority of organisations, the first *eDay* was seen as being more of an organisational than a technological challenge. One of the key issues was the need for effective controls over outgoing and incoming communications, as the choice of whether to send information electronically or on paper is usually in the hands of individual employees. Organisations generally addressed this by deciding to handle all types of incoming communications in a decentralised way, while managing all outgoing communications centrally.

Collaboration among organisations over this and other aspects of *eDay* implementation was one of the keys to the success of the initiative, enabling both co-ordination and a concerted focus on breaking existing traditions and patterns of communication.

2.2. *eDay2*

eDay2 occurred on 1 February 2005. Building on the achievements of the first *eDay*, and the availability of the government public key infrastructure, from this date forward all communication between government organisations, including the exchange of secret and personal information, has been required to be handled electronically wherever possible. On top of this, through *eDay2* all Danish citizens and businesses were granted the right to insist on electronic communications with government as far as possible. Among the objectives for *eDay2* was an expectation of achieving a further 40% reduction in paper-based communications by November 2005.

By 1 February 2005, nearly 92% of the 382 organisations subject to the requirements of *eDay2* had met them. This required that they implement digital signatures and establish appropriate means for the receipt and management of secure digitally signed e-mail. The remaining 8% of organisations (mainly small municipalities) were simply being slightly delayed due to minor technical issues related to their implementation of digital signatures. Aside from a further round of cost savings (which were expected to double with *eDay2*) the initiative was expected to deliver flow-on benefits in terms of easier and more secure exchange of information, better quality services, and better responsiveness to citizens and businesses.

A survey of the impact of *eDay2* conducted in April 2005 showed that 19% of organisations still sent and/or received a lot of paper-based communications, while a further 71% did so to a more limited extent. Even though it is not feasible that paper-based communication with and within government can be completely eliminated in the foreseeable future, these figures indicate that there are still opportunities for government to increase the use of digital communication, and enhance the resulting performance benefits and cost savings.

Other conclusions drawn from the survey suggested that achieving a higher degree of electronic communication was conditional upon time and adjustment of the communications behaviour of government organisations, citizens and businesses. Again, organisations considered *eDay2* to have been both an organisational and technological challenge, but with *eDay2* the organisational aspect was generally considered slightly more difficult than the technical one. Internal business processes changed as a result of *eDay2* for approximately 90% of organisations.

2.3. Lessons from *eDay* implementation

The importance of the eDay *business case*

One of the biggest impacts of the *eDay* initiative is that, once it is fully implemented, all Danish government organisations will have adopted the use of digital signatures and established means for exchanging secure electronic communications via e-mail. This has created a level of e-government readiness that, at least in the area of electronic communication, is yet to be achieved in many if not all other OECD countries. On its own, this would be an impressive achievement. It is made more so by the fact that, in the case of both *eDays*, adherence to the objectives was not made mandatory by the Government, but instead left entirely voluntary.

One of the keys to achieving this level of commitment has been the strong business case underpinning *eDay* implementation. For the first *eDay* there was an expectation that 75% of internal paper-based government correspondence would be able to be conducted electronically. Some of the direct benefits (*i.e.* excluding gains in organisational performance and the quality of public services) expected were:

- Annual savings of 300 tonnes of paper and € 25 million in postage costs, and undefined savings from reduced costs of internal mail handling.
- A doubling of uptake of digital signatures in the public sector.
- Benefits related to wider use of electronic document management systems.

Estimation of benefits for both *eDays* was confined to those which would accrue internally to the public sector. In the case of *eDay2*, for instance, estimated cost savings only encompassed those arising from improvements in each organisation's communication. Calculation of benefits that would be directly experienced by either citizens and/or businesses was deemed too difficult. Also, given that the *eDay* initiative did not impose any costs on citizens and businesses, there was no need to assess the external cost-benefit ratio of the initiative. Another incalculable element in the overall business case for both *eDays* was the all-of-government costs and benefits that would arise from altered processes of internal communication, presumably because such costs and benefits are either intangible or too difficult to quantify and assign.

Within government the *eDay* initiative was not, of course, costless. As an example of these costs, for *eDay2* the forecasted average cost for each organisation was estimated to be DKK 100 000. The actual average cost came in under budget at DKK 73 158. The DKK 100 000 estimate included both internal adjustment costs and the costs of communication with citizens, businesses and other government organisations about the change in communications rights and processes.

Having a sound business case for the *eDay* initiative has been an important element in its success. The existence of such readily achievable and (partially) tangible benefits, coupled with imposition of relatively small costs that did not necessitate large investments in new ICT, acted to easily convince the majority of government organisations of the merits of voluntarily participating in the *eDay* initiatives.

The role of central leadership and support

The Digital Task Force played a very active role in the implementation of both *eDays*. As project leader, it acted as a central point for all communication about *eDay* and provided direction on how organisations could best meet the requirements of the *eDays*. It produced guidance on issues ranging from how to communicate the *eDay* concept and objectives to collaborators through to purely technological questions, such as what format to use for electronic communications and when to use digital signatures. The Task Force also identified selected organisations that could act as "representative institutions" for the *eDay* initiative. These institutions implemented the changes required by *eDay* and *eDay2*, providing examples of best practices for other organisations to follow.

Marketing of the *eDays* was also important to their success. To minimize the use of paper-based communications, many organisations used promotional tools provided to them by the Digital Task Force to advertise their participation in the *eDays* and the impact that this would have on people and organisations with whom they communicated.

Another important element of the successful implementation of *eDay* was the appointment of *eDay* co-ordinators in each government organisation. These co-ordinators were asked, with the active support of the Digital Task Force, to act as champions for the *eDay* initiative and provide leadership in preparing their organisations for the changes required.

Creating appropriate incentives for participation

Aside from the strong incentive created by the positive business case developed for the *eDay* initiative, government organisations were encouraged to participate by provision of incentives in four ways:

1. The fact that the initiative was developed under the leadership of the Joint Board of e-Government with the backing of ministers in the Government Finance Committee gave it credibility and ensured a sense of responsibility to participate.
2. Under the leadership and co-ordination of the Digital Task Force, marketing of the initiative to citizens and businesses created public expectations that acted as a powerful external driver for organisations to participate. Most

organisations, even if they were not convinced by the business case, did not want to be seen by either ministers or the public to be failing to participate in delivering the benefits promised by *eDay*.

3. Giving the public and businesses a right, through *eDay2*, to insist on electronic communications with government effectively reinforced the incentive to participate in the *eDay* initiative created by the *eDay* marketing programme undertaken by the Task Force and individual organisations.
4. Building on ministers' and the public's expectations of change, in the small number of instances where organisations did not want to participate, the threat that the Digital Task Force would publicise non-participation provided the necessary incentive.

This last point should not be overemphasised. By all accounts, very few organisations seriously resisted being involved in the *eDays*. As already noted, one of the most outstanding features of *eDay* is the scope of change that was achieved on a "voluntary" basis. Also, despite the fact of a positive business case, the provision of strong leadership and support by the centre of government, and creation of powerful incentives for participation, it is important to understand that the success of both *eDays* would not have been possible without consensus and co-operation among the organisations involved.

2.4. Next steps

Following *eDay2*, work in this area has been concentrated on encouraging government employees to use secure digital communication effectively, and on working closely with those organisations still significantly using paper-based communications to assist them in closing those non-electronic channels (where possible) in due course. Further work will also be undertaken to assist citizens and businesses in communicating electronically with government, and developing robust practices for management of sensitive communications.

2.5. Conclusion

The *eDay* initiative has clearly had a positive impact on achieving Denmark's e-government goals, enabling the public sector to take a collective step forward in its capacity to operate digitally. It has also had a positive impact on individual organisations' information and ICT policies, strategies and capabilities, has generated considerable cost savings, and has been a powerful demonstration of the benefits of e-government, both within and outside of government. *eDay* offers OECD countries a very interesting, and potentially replicable, example of how a country can rapidly advance its e-government readiness and achievements.

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ANNEX A

Overview of Political and Administrative System

Form of government	**Constitutional monarchy:** Parliamentary system of government. Functions of the monarch are mainly ceremonial.
State structure	**Unitary:** Two tiers of government – State and local. Local is divided into 14 counties (soon to become 5 regions) and 275 municipalities (being reduced to 98).
Executive government	**Intermediate/Consensual:** Since WWII, there has been a tradition of minority governments without firm agreements on co-operation. This has resulted in issue-based compromises with different parties outside government.
Centralised/decentralised	**Decentralised:** Danish counties and municipalities have a high degree of regional autonomy. Local government independence is established in Section 82 of the Constitution. Many administrative powers are delegated to counties and municipalities. **Fairly fragmented:** State government ministries are relatively independent, and each minister is individually responsible to the Parliament (*Folketing*).

Political/administrative interface	**Separate:** Ministers and officials have "separate" career paths. **Not politicised:** Public servants do not openly discuss their political leanings.
Public management responsibility	**Shared:** Split between the Ministry of Finance, the Ministry of Interior and Health and the Ministry of Social Affairs and Gender Equality.
Diversity of policy advice	**Mainly public service:** Input also comes from trade/business unions/organisations.
Administrative culture	**Pluralistic/consensual:** The administration is the major part of the Danish State apparatus. The administration is the "executive power"; it is dependent on the Parliament and does not have its own independent legal authority. Public duties are shared by State, county and municipal authorities. There is a culture of compromise and consensus between political players, and there are good opportunities for broad popular participation in the political process at the national and local levels through membership in the political parties, interest groups, user committees and other organisations and associations. This "consensus" culture also characterises the public administration.
Major affiliations	The United Nations (1945), The European Union (1973), NATO (1949), the Nordic Council (1952).

ANNEX B

Institutional Context and Public Governance Arrangements

Constitutional environment

United into a single kingdom at the end of the 10th century, and an independent nation ever since, Denmark is a constitutional monarchy with a unicameral system of parliamentary government. The monarch (currently Queen Margrethe II) is the Head of State and heads the Government, but has no political power and performs only formal and ceremonial functions. Executive power is vested in the government, which consists of ministers under the leadership of the Prime Minister. The monarch has the prerogative (based on recommendations from the Prime Minister) to appoint and dismiss ministers and to decide the delegation and distribution of duties among ministers.

Ministers are responsible for all actions of the ministries over which they have control. There is no constitutional convention of collective ministerial responsibility. The prerogatives of the Government are guaranteed by the Danish Constitution and cannot be interfered with by the Parliament. However, specific acts of government, (especially those concerning foreign policy) require the consent of the Parliament.

Legislative power rests with the Government and the Parliament (the *Folketing*) conjointly. The Parliament consists of 179 members, two of whom are elected in Greenland and two in the Faroe Islands. The members of the *Folketing* are elected for four-year terms.

The Constitution provides for separation of judicial and executive powers. The monarch appoints judges; in contrast to other state-appointed employees, judges cannot be dismissed on the basis of an administrative decision, but may only be dismissed by way of court judgement.

Denmark is a member of the European Union. In 1992, Danes voted against the Maastricht Treaty, which proposed monetary union and a common European defence force, and the country was granted opt-outs from these

provisions (among others). In a referendum held in September 2000, Danes voted against the adoption of the Euro.

Political environment

The Danish political system is a multi-party structure with several parties represented in the Parliament. Danish governments are most often minority administrations, governing in coalition with one or more supporting parties. Danish politics is therefore characterised by inter-party compromise. Since 1909, no single party has held the majority of seats in Parliament. The Social Democrat and Liberal parties have each led a number of coalition governments during the 20th century. Since November 2001, a Liberal-led coalition has been in power.

The system is characterised by a culture of compromise and consensus between the political players, and there are good opportunities for broad popular participation in political processes at the national and local levels through membership in the political parties, interest groups, user committees and various organisations and associations. Danish counties and municipalities have a high degree of political autonomy – for example, they have their own elections and regional administrations.

Social environment

Danish society uses a consensus-based approach to find answers to the questions that confront it – a situation that mirrors the political environment.

Danes express the highest levels of satisfaction with "the way democracy works" of any EU citizens. In a survey conducted in 2001, 93% responded that they were either very or fairly satisfied with the way democracy worked. In 2003, trust in Danish politicians was at its highest level since first measured in 1971.

The public sector appears to benefit from these public attitudes. Danes exhibit high levels of trust in government, which is notably transparent and free of corruption. Danes have an overall willingness to interact with the State, and there is a general satisfaction with public services, creating a positive environment for e-government implementation.

Economic environment

Denmark has been near the top of the OECD's income rankings for many years – its 2003 per capita GDP of USD 29 800 was 15% above the OECD average. In the period 1993-2003, the average annual growth in GDP was a little below total OECD (2.25% compared with 2.6%) and considerably above that of the

Euro area (1.8%). However, in both 2002 and 2003 the annual growth in GDP was well below the OECD average, with growth in 2003 being 0.4%, although growth was very close to the Euro area.

Over the last few decades, Denmark has changed from being an agricultural/industrial society to becoming a service society, with almost 75% of all employed persons working in the service sector. In 2002, there were about 280 000 enterprises in Denmark, the majority being small and medium-sized enterprises: 55% had no employees, 36% had one to nine employees, almost 8% had between 10 and 99 employees and only 2 200 (0.8%) had 100 employees or more. However, the latter category represents 62% of total employment.

Denmark has the most equal income distribution among OECD member countries, partly because of its comprehensive welfare state. Given an ageing population, a key economic challenge is to maintain growth in living standards while preserving the social welfare system. According to population projections, the working part of the population (individuals aged 25-64 years) will decline by 13% over the next four decades, while the population aged 65+ will increase rapidly from 15% of the total population in 2004 to 23% in 2050.

The Government's approach to addressing this challenge, laid out in the year 2000 in its 10-year economic framework called *A Sustainable Future – Denmark 2010* ("the 2010 plan") is to boost employment, restrain public spending growth and pay down debt. The Danish public sector is large, providing over one-third of jobs. Achieving efficiency improvements in the public sector will have an important impact on the fiscal sustainability of the welfare state. Denmark has recognised that achieving these improvements requires, among other things, public investment. In *Investing in Denmark's Future, 2001* (the public investment strategy that is one of the responses to the 2010 plan) there are two particular measures that have a direct bearing on e-government – investing in Denmark's transition to being a knowledge-based society with increasing use of ICT, and developing more efficient public administrative procedures to free resources for care and nursing.

Administrative environment

Organisation of State and local government

The Danish public sector is divided into State and local government. State government is comprised of both national and local functions and services. The structure of local government is (currently) based on a two-tier system of counties and municipalities, where municipalities "belong" to one of the counties. However, the general rule is that the counties are not superior to the municipalities – they each have their own sphere of responsibility.

The public sector in Denmark is characterized by its very decentralized structure and management. Local authority independence is established in the Danish Constitution, and many administrative powers are delegated to the 14 counties and the 275 local authorities into which Denmark is currently (June 2005) divided; the municipalities of Copenhagen and Frederiksberg each have the dual status of municipality and county. The current Government is pushing forward with the "Structural Reform", which will replace the 14 counties with 5 regions, and reduce the 275 local authorities to around 98.

The Danish public sector is very large. In the third quarter of 2004 the breakdown of public sector employment was: total Danish workforce, 2 188 000; total public sector workforce, 839 000 (38%); municipality workforce, 431 000; county workforce, 176 000; central government workforce, 54 300; public corporations, 78 500.

State government

The functions of State government are divided into ministerial portfolios which define the structure of Danish ministries. In principle, ministers make all decisions that fall within a ministry's responsibilities. In practice many decision-making powers are delegated to various administrative bodies. The top-level of administration in a ministry, serving as the day-to-day advisor to the minister, is called the Ministerial Department.

Directorates and agencies are the general terms for the State government bodies belonging to a ministry. Normally, their function is to make decisions and carry out functions within a specified area and to advise the Ministerial Department and the minister. Directorates and agencies are usually subordinate to the Ministerial Department, but in some cases they have a more independent position.

State government at sub-national levels

State government is represented at the sub-national level through local branches of central government organisations that provide nationwide services (*i.e.* the police, the prison service, and the post office), and institutions or bodies that provide localised services (*i.e.* universities, regional archives, the lifeboat service, etc.).

Currently, at the local government level there are 14 County Prefect Offices (*Statsamter*), which cover the same geographical area as the counties. The prefect (*Statsamtmand*) is nominated by the State government. The main task of the prefect's office is to make decisions concerning family law. It also acts as the secretariat for the County Board of Appeal, which examines decisions made by municipalities on social questions.

Municipalities are subject to specific legislation, operate under a presumption of powers of "general competence", and are overseen by the Ministry of the Interior and Health and 14 County Supervisory Boards. This arrangement is designed to ensure that desired levels of competence are achieved in practice. Each Supervisory Board oversees all the local authorities of a county, and consists of the County Governor and four members of the County Council. The resolutions of the Supervisory Board may be appealed to the Ministry of the Interior and Health.

These arrangements will change following implementation of the Structural Reform between 2005 and 2007 (discussed below and in Chapter 5). The current legislative provisions regarding County Prefects will be repealed, and five new regional government offices will be established under the Ministry of the Interior and Health to handle tasks involving family and personal rights, free legal aid, appeals, etc.

Local government

Danish local government currently consists of 14 county councils (*amtskommuner*) and 275 city or district councils (*primærkommuner*), including the two metropolitan areas of Copenhagen and Frederiksberg. The counties are collectively represented by an organisation known as Danish Regions (*www.arf.dk*), which speaks for the county councils in all matters related to State government. Municipalities are collectively represented by Local Government Denmark (KL – *www.kl.dk*).

Local government is based on the citizens' right to handle – through their own representatives – a number of local and regional tasks within their own municipality and county. The Danish Constitution gives the Parliament the role of delegating a number of public functions to municipalities, and provides for the right of municipalities to manage their own affairs independently under the supervision of the State. The rules concerning local government are laid down in the Local Government Act of 1968 (with later amendments). The effect of this law is that, by international standards, Danish local government autonomy is extensive.

The Structural Reform

In 2004, based on the recommendations of the Government-appointed Commission on Administrative Structure, the Danish Government adopted *An Agreement on a Structural Reform* of Danish government. The Reform – which aims sustain a decentralised public sector that can ensure efficient, high-quality performance of tasks and contribute to the development and support of local democracy – will have a major impact on the structure of government during the 2005-07 period.

Current distribution of functions between central and local government

The Parliament and the Government allocate roles and responsibilities between State and local government in such a way that they are handled at the level where they are best performed, and that overlap is avoided. This allocation is characterised by a high level of local government provision of government functions and services. Local government activity is regulated by means of legislation, executive orders and adjustment of statutory financial frameworks.

State government functions

Aside from its role in developing national social and economic policy, State government is currently solely responsible for the police, courts and the prison system, foreign affairs and national defense. Within the areas of education and the labour market, it is responsible for higher and continuing education, vocational training and research, the unemployment insurance system (which is, however, administered by the unemployment funds), the Employment Service and the Working Environment Service.

Other State government responsibilities include control of agriculture, fisheries and food; customs and tax administration; provision of trade and industry subsidies; reception of asylum seekers; and the nationwide planning of traffic and environmental regulation.

Following the Structural Reform, certain roles will be transferred to State government, including responsibility for: 1) upper secondary schools and higher preparatory examination courses; 2) adult education centres and preparatory adult education programs; 3) a new national knowledge and special counseling organisation; 4) the general road network and any county railways that are not transferred to new regional transport companies; 5) taxation and debt collection (although day-to-day tax services for citizens will still be carried out by municipalities); and 6) some environmental, planning and culture tasks currently residing in the counties.

County functions

Currently, the most important responsibilities of the counties are: 1) hospitals and health insurance; 2) upper secondary schools, courses towards the Higher Preparatory Examination, and adult education centres; 3) care of mentally and physically disabled people; 4) certain cultural activities; 5) regional public transport; 6) environmental management; and 7) industrial policy and regional planning.

Under the Structural Reform proposals, the new regions will be responsible for: 1) the health care service, including hospitals and the entire national health insurance service, general practitioners and specialists; 2) preparation of regional development plans addressing the environment, trade and industry,

tourism, employment, education, and culture; 3) responsibility for a number of institutions for groups with special needs; and 4) establishment of regional public transport companies providing regional bus services, and train services in instances where county railways are not transferred to central government. Subject to agreement with municipalities, the regions will also be able to act as contractors for provision of municipal services in areas that are naturally related to regional concerns (*e.g.* rehabilitation).

It should be noted that, although the pre- and post-Reform responsibilities look similar, in practice the new regions' roles and responsibilities will be much narrower than those of the counties they will replace except in the area of health care. Also, as a result of the Reform the new regions will not inherit the counties' taxation powers, instead relying on State government for their funding.

Municipal functions

Municipalities handle a wide range of functions, including: 1) childcare for children from newborn to six years of age; 2) primary and lower-secondary education; 3) preventive public health measures for children and children's dental care, and care for the elderly; 4) libraries, local sports facilities and other cultural activities; 5) job activation and employment projects for non-insured unemployed persons; 6) granting and payment of cash assistance, anticipatory pension and certain other social benefits; 7) integration of refugees and immigrants; 8) public utilities, environmental measures, and emergency services; 9) public housing, urban renewal, and planning permits in connection with rebuilding; and 10) maintenance of local government roads (which comprise about 80% of the Danish road network).

A significant area of municipal activity is the conduct of personal tax assessments, which form the basis of imposing direct tax on income taxed at source, and on self-employed traders. As a consequence of the fact that the responsibility for assessment of businesses was transferred from local authorities to the central government in 1998, the task of business tax assessment was divided between the Central Customs and Tax Administration and municipalities.

Larger and more sustainable municipalities will be given the responsibility to handle most citizen-related tasks. Along with current functions, in future they will also undertake: 1) a strengthened role in the health care service, where the municipalities are encouraged to make an effort to improve prevention, training and care; 2) any rehabilitation that does not take place during hospitalization; 3) operation of job centres, to be established through collaborations between municipalities and the Danish Employment Service; 4) responsibility for all social services for citizens; 5) operation of

institutions for children and young people with social or behavioral problems; 6) responsibility for special education and special schools (with the exception of national and regional schools); 7) business services; 8) increased responsibility for public transport; 9) responsibility for the majority of the existing county roads; and 10) the majority of current county environmental responsibilities. Furthermore, municipalities will have the opportunity to provide a number of services on behalf of State and local government authorities in what will be called "local service centres".

Public sector modernisation

In May 2002, under the leadership of the Ministry of Finance, the Danish government launched its public sector modernisation programme called *Citizens at the Wheel*. The basic purpose of the programme was to give citizens greater freedom of choice in dealing with the public sector and the services it provides, to strengthen their legal rights, and to use government funds as effectively as possible so as to achieve the highest possible public welfare within tight budgetary constraints. In addition, the programme recognised a need for the public sector to apply fewer resources to the internal processes of public administration, and more to service delivery for the benefit of citizens and businesses.

The program contained a multi-year framework for the renewal of the public sector that set out the Government's goals, and specified initiatives to be undertaken to achieve those goals. All initiatives in the programme were aimed at creating three things: 1) freedom of choice; 2) greater simplicity; and 3) improved quality.

Implementation of e-government constitutes a significant part of the ongoing programme. Some particular e-government initiatives in the programme are:

- *Freedom of choice in key social service areas:*
  - An Internet-based tool allowing citizens to receive up-to-date and comparable information on local government services was to be set up at the disposal of municipalities and counties.
- *Simplification – an open, uncomplicated and responsive public sector:*
  - By June 2003, all ministries were obliged to eliminate any unnecessary legislative or other requirements that could constitute an obstacle to e-government, including any requirements that could hinder the use of digital signatures.
  - A review of the Public Access to Information Act was to be undertaken in order to create greater openness in the public sector.

- Models to support inter-organisational collaboration in central government, including technical frameworks, were to be developed.

- *Openness and coherence:*
  - A prioritised list of co-ordinated digital services that the State and the local authorities ought to be able to supply to citizens was prepared in 2002.
  - The use of digital signatures would be accessible to anyone who wanted in winter 2002/03.
  - A public business portal was to be launched in 2003.
  - At the end of 2002, an action plan to create better conditions for the disabled in the area of IT and telecommunications was to be launched.
  - A strategy for allowing people easy access to their personal information was to be formulated.
- *Value for money:*
  - The Government was to encourage public authorities to exchange information electronically, including through the *eDay* initiative.
  - Electronic case and document processing was to be extended to the entire public sector.
  - The state and local authorities were to collaborate on *Project e-Government*.
  - Digital solutions and greater efficiency in case procedures were to be introduced in the following areas: services aimed at families with children; business services; the integration of immigrants and refugees; social welfare and health services; car registration; the labour market; mapping and geospatial data.

Technological environment

Overall, the technological environment (particularly the communications infrastructure) is strongly supportive of the development of e-government in Denmark. On the supply side, the telecommunications market is competitive, providing for a high level of access to relevant technologies such as broadband Internet connections and mobile services. On the demand side, Danish consumers (individuals and businesses) show strong rates of adoption of PCs, broadband services, and mobile phones.

As a measure of this positive environment, in 2004 Denmark placed at the top of the annual IDC Information Society Index, and in 2005 placed first in *The Economist* magazine's annual "e-Readiness Rankings", both of which are partly determined on the basis of countries' ICT environment (see below for details).

Danish telecommunications sector

Following a 1990 EU directive, in 1994 the Danish Government introduced an action plan for telecommunications with a goal that, through gradual introduction of competition, Danish telecommunications services and products would become the "best and cheapest" by 2000. This marked a departure from the 1980s and early 1990s, when Denmark was fairly reluctant to infringe upon the power and privileges of its State-owned monopoly operators.

In 1990, the Government created "TeleDanmark" (the Danish telecommunications company commonly called TDC) through a merger of the State-run international operator and the four regional monopoly operators. The main reasons cited for the merger were the need to create a more powerful national operator able to compete on the international market, and a powerful company as a partner for Danish industry. Since then, in order to foster development of the telecommunication market as a basis for social and economic growth, the emphasis has shifted from international competition to lowering barriers to entry for new operators.

In 1995, full liberalisation of telecommunications began; it was implemented in two main phases. The first phase introduced price-cap regulation on end-user tariffs alongside interconnection regulation. At the time the main focus of the National Telecom Agency (the government telecommunications regulatory body established under the former Ministry of Research and Information Technology-MITR) was to reduce interconnection rates to encourage alternative providers to enter the market.

Legislation abolishing the exclusive rights of TeleDanmark was passed in the spring of 1996 (and revised and expanded in 1997 and 1998).The Mobile Communications Act provided the basis for the licensing of additional mobile services, such as GSM 900. The Interconnection Act stipulated that operators with a significant share of the market (more than 25%) were to grant interconnection to other operators at cost-based prices and on terms that were objective, transparent and non-discriminatory. The new legislation also created boards of appeal for both consumer matters and disputes occurring between the various operators and service providers.

The next phase followed a political framework agreement signed in September 1999. During this phase, the Government added to the "best and cheapest" policy the goal of promoting public access to the network society. Fostering competition was seen as the principal means to achieve this goal; the Government implemented initiatives aimed at stimulating the creation of competing access routes for consumers ("several pipes to the home"). In 2000, much of the existing legislation for the telecommunications sector was consolidated into the Act on Competitive Conditions and Consumer Interests in the Telecommunications Market.

In 2002, a new National IT and Telecom Agency replaced the former National Telecom Agency. This new agency is under the Ministry for Science, Technology and Innovation, which was created in November 2001 as a successor to the former MITR. The new ministry is responsible for research and education (universities), industrial research, and national technology and innovation policy. The principal mandate of the new regulatory agency is to develop and implement initiatives within key areas of the Government's ICT policy and strategy – a strategy that aims to ensure an optimal framework for IT and telecommunications and conditions that will enable citizens, businesses, and the public sector to realise the network society.

Overall, this market-based strategy has proved successful. A large number of telecommunication operators are now active in the marketplace, competing not only on price but also on quality of services, and Denmark is clearly well placed in terms of achieving its network society goals. However, despite the elimination of its monopoly, some telecommunication operators in Denmark have experienced significant difficulties as a result of the market dominance of the largest operator, TDC. If this continues, there is concern that some of the larger operators will leave the Danish market, which would mean less technological innovation, less competition and higher prices.

ICT usage

As discussed in Chapter 3, Denmark is among the top 10 ICT using nations in the world (in terms of both supply and demand). Denmark's number-one ranking in the 2005 *Economist* e-Readiness Rankings placed it ahead of the United Kingdom, Sweden, Norway and Finland. The ranking is based on assessment of countries' connectivity and technology infrastructure (25% weighting), business environment (20%), levels of consumer and business adoption of ICT (20%), legal and policy environment (15%), social and cultural environment (15%), and supporting e-services (5%).

Further confirmation of the strength of the technological environment for e-government in Denmark is provided by IDC's Information Society Index (ISI) for 2004. The ISI combines 15 variables in four infrastructure "pillars" to calculate and rank nations' ability to access and utilize information and information technology (53 nations were included in 2004). Denmark received high scores in a number of variables across all four pillars and placed first ahead of Sweden, the United States, Switzerland, Canada, the Netherlands, Finland, Korea, Norway, and the United Kingdom (IDC).

ANNEX C

Relevant Reports, Strategies, Decisions and Acts

1994

- Info-Society 2000 (Informationssamfundet år 2000).

1995

- From Vision to Action – Info-Society 2000: Statement to Parliament on "Info-Society 2000" and IT Political Action Plan (*It politisk handlingsplan; Fra vision till handling*).

1996

- The Danish IT Security Policy (*Danmarks IT-sikkerhedspoltik*).
- The Portable Revolution – IT in the Education System (*Den bærbare revolutionen; IT i undervisningen*).
- IT for All – The Danish Model (*Info-samfundet for alle; den danske model*).
- Electronic Commerce in Denmark – A National EDI Action Plan (*Elektronisk handel i Danmark*).
- Electronic Filing – Current Possibilities and Recommendations (*Elektroniske arkiver*).
- Freedom to Choose – Action Plan for IT Use by People with Disabilities (*Frihed til vælge; Handlingsplan for handicappedes IT-brug*).
- Get going with e-mail now! (*I gang med e-post nu!*).

1997

- IT Policy Plan – Action for Change (Handling gir forvandling – IT-politisk handlingsplan 97/98).
- E-Government – Requirements for Systems (Digital forvaltning; Krav till systemerne).
- Get going with e-Government (I gang med Digital forvaltning).

OECD E-GOVERNMENT STUDIES – DENMARK – ISBN 92-64-01234-6 – © OECD 2006

1998

- IT Design for All (*Digital IT design for alle*) (Research and Information Technology).
- Digital Signature (*Digital Signature*).
- The Use and Reuse of "Base" Data (*Brug af grunddata*).

1999

- Digital Denmark – Transformation to the Network Society (*Det digitale Danmark; omstillning till nætverkssamfundet*).
- Promotion of IT Research and Education – Action for Change.

2000

- Denmark on the Web (*Danmark på Nettet*).

2001

- Electronic Document Management in the State – an Element Within e-Government (Elektronisk sags-og document handtering i staten et element i digital forvaltning).
- From Hardware to Content – A Strategy for Fast, Cheap and Secure Internet For All of Denmark (Fra isenkram til indhold; Strategi for hurtigt, billigt, og sikkert Internet til hele Danmark).

2002

- IT for All – Denmark's Future (IT for alle; Danmarks fremtid; IT-og telepolitisk redegørelse og handlingsplan 2002) (Innovation).
- Towards e-Government – Vision and Strategy for the Public Sector in Denmark.
- Citizens at the Wheel – Modernising Danish Government.

2003

- Using IT Wisely – An Action Plan for ICT and Telecommunications Policy (*IT med omtanke; It og telepolitisk handlingsplan*).
- White paper on Enterprise Architecture.
- Digital Signatures to Citizens.
- *eDay*.

2004

- The Danish e-Government Strategy 2004-06 – Realising the Potential.
- *eDay2*.
- EDMS.
- Architecture for e-Government (Arkitektur for digital forvaltning).

ANNEX D

Policies, Strategies and Plans Related to E-government

Introduction

Denmark's first notable use of information and technology in government dates back to the 1970s and 1980s, when computerisation of the public sector was viewed as way to achieve efficiencies through process automation. The first significant government ICT initiatives outside of public administration were, to a large extent, concentrated on the introduction of new technologies into the Danish economy and society (a concern that is still a major feature of Danish government ICT policy). These were mainly undertaken to increase economic growth, increase the employment rate and attain an improved quality of life. From an early date Danes also saw the potential for ICT to help create a more open and decentralised society.

In the 1990s, the focus of government policy shifted away from traditional non-networked ICT towards exploiting the power of communications technologies, especially with the use of the Internet. In recent years, the policy focus has been more on how these technologies can be used to create added value for users of government within an information society context.

An overarching feature of Danish government ICT policies and strategies is the goal of including all Danes in the process of developing a Danish information society, regardless of their age, economic status, abilities or health status. Another key feature of Denmark's approach to ICT is the proactive way in which it has identified and addressed the challenges of ICT development in government, the economy and society.

Until 2001, all national ICT and e-government-related policy and strategies were formulated by the Ministry of Science, Technology and Innovation (MVTU) or its predecessor, the Ministry of Research and Information Technology. In 2001, the leadership responsibilities for e-government were augmented by creation of the Joint Board of e-Government and Danish Digital Task Force, situated within the Ministry of Finance.

First steps towards an Information Society

Info-Society 2000 (The Dybkjaer Report)

In 1994, the Danish Government appointed a two-member *Information Society 2000 Committee* under the responsibility of the former Ministry of Research and Information Technology. The goal was to radically upgrade the political priority given to ICT and strengthen Denmark's efforts in development of the information society. The Committee drafted the *Info-Society 2000* report (the "Dybkjær report"). This landmark report was the basis for what can be regarded as Denmark's first "real" ICT strategy, *From Vision to Action – Info-Society 2000*, which was aimed at bringing Denmark to the international forefront in development of an information society.

The strategy (which formed the basis for the first government "IT action plan") identified the possibilities inherent in a future information society, formulated an overall policy for ICT, identified specific target areas for coming years and (where necessary) identified the need for new laws and other reforms. The plan identified specific benefits that ICT could deliver to Danes, such as a better quality of life and increased economic growth. It also pointed out that "new" jobs would go to the "front-runner" countries. Denmark's use of ICT could henceforth be considered a question related to the welfare of Danish society.

The Danish model for ICT development formulated in the report was based on a mix of market forces and public sector involvement. This mix was considered necessary to attain the following goals:

- ICT should support free access to, and exchange of, information.
- ICT should support democracy and give individuals the opportunity to exercise their influence.
- ICT should support peoples' personal development, both at work and in their leisure time.
- ICT should support openness and transparency in the public sector, contribute to the promotion of efficiency and rationalisation in public institutions, and enable them to provide better services.
- ICT should be used to sustain the disadvantaged of society.

The report emphasised the importance of public institutions and businesses being tied together by means of modern ICT in order to create new and better services for citizens. It determined that the public administration at both the State and local levels must be connected by an "electronic service network", which would enable it to provide better services for both citizens and businesses, and result in a more efficient administration with which businesses and citizens would have the ability to communicate digitally. In

support of this, legislation around public registers had to be reviewed and simplified so that registration, combination and use of data for all legal and administrative purposes could take place without barriers being created by unnecessary bureaucratic procedures.

Other major objectives set by the report included establishment of a nationwide health network for exchange of information between doctors, hospitals, pharmacies and health authorities, and an electronic network where all businesses could exchange business documents (*i.e.* EDI). Overall, the objectives were very wide-ranging, covering not only general public administration and the health and business sectors, but also research, personal data protection, information security, education, culture, the media, telecommunications, transport, and issues related to people with disabilities. A key policy goal was creation of a "public network" of computer and telecommunications networks which, to average citizens and businesses, would appear to be as easy to understand and as readily accessible as the telephone system.

The Danish Government's IT action plans

Publication of the first IT action plan started a tradition of government submitting annual IT action plans to the Parliament. Created by the Ministry of Research and Information Technology, the plans put the major themes of the information society in the foreground of public attention and political debate, took stock of the current situation, and adjusted the course if ICT developments in Denmark.

The 1995 IT action plan contained specific goals and deadlines; priority was given to solving some key problems such as infrastructure development, legislative updating, and the establishment of standards. The strategy was to advance along a broad front aimed at generating a synergy between public and private sector ICT developments, with the aim of reaching the "critical mass" required for the Danish information society goals to move from rhetoric to reality.

The action plan aimed at establishing a continuous interplay between the government, parliament, the public sector and business to enable establishment of new goals and implementation of new initiatives as progress was made towards the overarching policy goals noted above. This emphasis on cross-sectoral co-operation has become a characteristic of all of Denmark's ICT strategies.

The 1995 plan did not include implementation details for every year, nor was it funded as a lump-sum plan with amounts earmarked for each initiative (although the 1995 budget did provide for a "pool-scheme" under the Ministry of Research and Information Technology of DKK 35 million to follow up on the Info-Society 2000 report). Outside of this funding, the Government felt that the

measures proposed in the plan could be implemented within existing State and local government budgets. In a number of cases, the Government considered that a change of organisations' budgetary priorities in favour of ICT initiatives would be required. The Government also expected that many organisations would be able to fund ICT initiatives out of the savings they would enable. Overall, in the State government area, additional costs connected with the various ICT proposals were to be kept within the framework appropriations of individual ministries, while local government would have to realise any expensive proposals on the basis of a solid economic business case.

The 1995 IT action plan's principal political message was for the public sector to proactively work with the private sector on a strategy for Denmark's development towards the information society. The Government expected the public sector to aim at achieving a position of leadership and demonstration in regard to efficient use of ICT. A wide range of these initiatives was successfully completed in 1995, and the rest of the initiatives were completed in 1996 and 1997.

The 1995 Plan was followed in 1996 by the IT action plan entitled *Information society for all – The Danish model*. The three main elements of this plan were:

1. A social responsibility to ensure all Danes were involved in information society developments.
2. The push for a broad information society dialogue out of which everyone assumed responsibility for action.
3. Forward-looking infrastructure development.

This plan was also an overall success, with most of the initiatives being implemented within approximately two years.

The 1997/98 Plan, called *Action for Change*, was to a large extent based on the proposition that "actions speak louder than words". The plan had four areas of focus:

1. Ensuring citizens' rights in the information society.
2. Ensuring existence of IT literacy at all levels of society.
3. Revitalising the interaction of citizens and the administration to ensure an open public sector.
4. Development of security solutions to ensure the uptake of electronic commerce and other digital communications requiring a high level of security.

Overall, these action plans were successful, with most of their initiatives being achieved within specified time frames. Perhaps the most important outcome was creation of broad awareness in Denmark of the importance of continued development of the use of ICT in government, business, and everyday life.

Digital Denmark – Transformation to the Network Society

In 1999, the Government appointed the *Digital Denmark Committee* to report on Denmark's progress in transforming itself into a "network society" (the change of focus from the information society reflecting the impact of the Internet on policy thinking). The Committee produced an evaluation report of Denmark's ICT status called *Danish IT Pictures*. The report concluded that ICT had had a clear impact in Denmark since 1994, affecting work life, leisure activities, public administration, businesses, etc. In 1999, more than 50% of Danish households owned a computer and one-third had access to the Internet. Furthermore, two-thirds of small businesses, and all businesses with over 50 employees, were using the Internet. In the same period the public sector had established 1 600 Internet homepages.

The resulting report, titled *Digital Denmark – Transformation to the Network Society*, focused on the question of how Denmark could become a leading ICT-using nation and participant in the emerging global network society, while still keeping the basic values of the Danish welfare society intact. The future ICT policy goals established in the report were:

1. Providing for lifelong learning for everybody.
2. Positioning Denmark as an e-commerce/trade nation.
3. Provision of better and cheaper public services.
4. Creation of a clear Danish profile on the Internet.
5. Establishment of two IT "lighthouses" (*i.e.* ICT demonstration initiatives).

The report replaced the earlier *Info-Society 2000* report as the basis for the Government's future ICT policies and action plans, formulation of which was the responsibility of the new Ministry of Science, Technology and Innovation.

The report made clear recommendations on what needed to be done in various sectors of society, emphasising that quick action was a prerequisite for Danish participation in the global network society. It stated that Denmark was well positioned to achieve these goals, with Danish citizens among the world's best equipped for life in the network society.

Denmark on the Web

Formulated in 2000, *Denmark on the Web (Danmark på Nettet)* was a strategy to encourage the public sector to provide electronic services to citizens. Two notable initiatives arising from this strategy in 2001 were the *Top of the Web* project evaluating the quality of all public sector Web sites, and establishment of the danmark.dk portal which provides information about and from government organisations.

The next action plan, called *IT for All – Denmark's Future*, was published in 2002. The plan reflected a significant shift in the thinking behind Danish

ICT policy, based on the premise that ICT policy had been too heavily focused on information technology. By 2002 there was a clear need for a more balanced and "realistic" policy approach. The report urged shifting the focus of government policy to how new technologies could help create value for individuals, businesses and society; and on incorporating a user perspective in policy formulation.

The 2002 action plan stated that "Denmark's future depends on the ability to create and use knowledge technology", and called for major efforts on education, research, innovation, and individual citizen use of ICT. Reflecting the new emphasis on user-focused development of ICT, the plan again pointed out the importance of all Danes having access to the ICT-related opportunities that Denmark had to offer, and the skills required to exploit them. Thirty-seven explicit goals were stated on the basis of seven principle policy areas:

1. More IT in Danish businesses and industry.
2. A competitive telecommunications sector.
3. Strong IT competences in Denmark.
4. An IT-based public sector.
5. IT security.
6. Useful content on the Internet.
7. Danish impact on IT in the EU.

The current IT action plan, *Using IT Wisely*, was published in October 2003. It showed that Denmark had come a long way in achieving the 37 objectives established in the 2002 action plan. Rather than allowing government to rest on its laurels, the 2003 plan aimed to strengthen Denmark's position as one of the world's leading ICT nations. In this plan government efforts were targeted on areas where the use of ICT could generate the highest value – particularly in identifying and converting new information to useful knowledge that could contribute to strengthening Denmark as a knowledge society.

Today, Danish government ICT policy has three major goals: 1) creating growth in Danish business and industry; 2) qualifying Danes for the future knowledge society; and 3) reforming the public sector.

Other major ICT initiatives

IT for people with disabilities

The 1996 IT action plan was complemented by an action plan for people with disabilities, called *Freedom to Choose*, supporting the aim established in the Dybkjaer Report of ensuring that all Danes were able to access and use ICT. The plan pointed out that, although a special plan was being created for

people with disabilities, their use of ICT should be treated as a mainstream issue by those developing ICT in Denmark.

E-mail addresses for everyone

Another initiative that was launched in 1996 was called *Get going with e-mail now! (I gang med e-post nu!)*. This aim of this initiative was to ensure all private businesses, public authorities and citizens would have an e-mail address. A national e-mail address book was created to make e-mail addresses accessible in the same way as telephone numbers. This initiative made Denmark the first country in the world where Internet service providers changed e-mail addresses by consulting a nation wide directory.

IT in the education system

In 1996, a report called *The Portable Revolution (Den baerbare revolutionen)* was published. This was an initiative to include ICT in the education system, in response to 1993 education legislation that required use of ICT by the education system. The concern was to include everyone (teachers as well as pupils) in the use of ICT.

Electronic records management

In January 1996, the State Archives made it possible for public institutions to introduce full electronic case administration and filing systems. This made Denmark the first country in the world where a national archiving authority allowed public authorities to discontinue using paper archives and introduced full electronic systems.

Electronic commerce

An e-commerce action plan entitled *Electronic Commerce in Denmark; a National EDI Action Plan* was established in 1997. This initiative aimed to increase the level of electronic communication between businesses, and between the public and private sectors. It also had a focus on procurement. The expectation was that this would increase dynamism and accelerate growth in the economy. The target group for the report was decision-makers and managers who had the responsibility for implementing e-government projects. The report *Danish IT Pictures*, published in 1999, gave a clear picture of the fact that Denmark was a world leader in business-to-business commerce; the total turnover in this area was about twice the average for Western Europe.

In September 2002, another e-commerce action plan was launched as an extension of the 2002 *IT for All* action plan. The purpose of this plan was to

stimulate Danish consumers, businesses and the public sector to further use of electronic commerce. The plan contained four major areas of initiative:

1. Electronic commerce in the public sector.
2. Security and knowledge about e-commerce.
3. Legislative and technical e-commerce infrastructure.
4. International dimensions.

IT Design for All

The 1998 report *IT Design for All* aimed to stimulate the development of IT products which could be used by everyone regardless of age or ability. The report resulted from a project launched in 1997 by the Ministry of Research and Information Technology which invited Danish architects, designers and product developers to participate in a competition on ideas for such products. The initiative was successful, and products such as Web pages accessible to all were created.

From Hardware to Content – Internet all over Denmark

This strategy, launched in 2001, aimed to stimulate the creation of a nationwide ICT infrastructure which was fast, cheap and secure. The strategy was based on ensuring an optimal framework for a market-based Danish ICT infrastructure, and on measures for increasing demand for ICT-based services and digital content. The strategy identified target areas for new forms of digital content exchange within the public sector, between the public sector and private sector, and between various private players including the general public.

Use and Reuse of "Base" Data

In 1998, a report was published on the use of basic information held in the Danish public registries. This was an essential element in the Danish strategy towards the information society. The two major principles for future use of this data promulgated in the report were that: 1) basic information reported to a public institution would only have to be provided once; and 2) it should be easy to access that information (within the constraints imposed by data protection legislation).

In essence, the report stated that public information held in registries should be treated as a common resource, and that technical/organisational barriers should not unnecessarily stand in the way. The report also focused on issues related to the quality of public sector data. The conclusions and recommendations of the report were based on examination of the three basic public registers in Denmark: the Building and Housing Register, the Central Personal Register and the Central Business Register.

Security

In 1995, the Government established the *IT Security Council*, charged with advising government on IT security issues and formulating proposals for a Danish IT security policy. The vision for Denmark's IT security policy was that it should create a security framework (including regulations) that would enable people and businesses to confidently undertake electronic transactions, such as online electronic payments. The Government required the expected IT security policy to address the security interests of all Danish citizens, businesses and organisations.

This was the first time that discussion of ICT policy in Denmark included examination of security issues (and related regulatory issues). The Council's proposals, made in the report *Denmark's IT Security Policy*, became the basis for future Danish ICT security policies. One of the most significant proposals made by the Council was for an initiative to develop a public key infrastructure as the basis for secure online communication with the public sector.

Digital Signatures

In 1998, the Ministry of Research and Information Technology launched a pilot project on digital signatures. The objectives of the project were: 1) to make the use of digital signatures among public authorities more widespread; 2) to stimulate the market-based development of products and services; and 3) to prepare necessary standards and protocols.

In 2000, evaluation of the project's progress showed that all these objectives had been met. The project had demonstrated that digital signatures could successfully be used among public authorities. It had developed extensive practical knowledge in the area, and also identified barriers that needed to be overcome if government was to use digital signatures on a wide scale. The two biggest problems identified were inadequate knowledge of the use of digital signatures, and technical difficulties in installing and configuring digital signature solutions.

In 2003, the digital signature project advanced significantly when government decided to distribute signatures to citizens, businesses and public organisations free of charge.

The Danish Knowledge Strategy

Introduced in 2003, this strategy aims to develop a Danish "knowledge system" that ranks among the best in the world in terms of its efficiency and competitiveness. While primarily focused on the Danish knowledge system (the public and private sector knowledge institutions and companies which produce, attract, disseminate and apply research-based and other advanced

knowledge) the strategy recognises the fundamental relationship between public sector use of ICT and the future success of the knowledge system.

The strategy notes the major efforts made throughout the 1990s and into the 2000s to ensure that e-government provided Danes with easier access to the public sector, and stresses the importance of maximizing the benefits of this in terms of achieving both better government and stronger economic growth. It then notes the e-government challenge of developing and using ICT to support better collaboration and exchange of data across traditional organisational boundaries, both within the public sector and between the public and private sectors. The strategy identifies or cross-references e-government initiatives in the areas of IT security, digital signatures and the development of common XML schemas for data exchange. It also states that the Government's future ICT and telecommunications policy action plan will focus on making progress in areas where State government can "usefully be viewed as one unit in relation to IT usage" such as development of ICT architecture and common networks, benchmarking, and software strategy.

First steps towards e-government

Get going with e-Government

In 1997, the first explicit e-government step was taken under the leadership of the Ministry of Research and Information Technology. Called *Get going with e-Government*, the report was an attempt to put e-government on the policy agenda and improve the implementation of e-government by emphasising benefits such as efficiency gains, rationalisation, and delivery of better public services to citizens and businesses. The report aimed to guide and inspire public sector organisations that had plans to implement e-government, especially in relation to electronic document management systems (EDMS). It gave examples of how e-government visions and goals should be formulated, as well as how management should behave.

The report was complemented by another report called *E-government – Requirements for Systems*, which contained advice to government organisations on specifying requirements for EDMS. The report identified common core needs, issues and check points that should be identified and addressed within each organisation. The main recommendation was for organisations (ministries in particular) to buy one system for the whole organisation, rather than allowing each part of the organisation (*i.e.* departments, agencies, etc.) to make its own choices.

It also proposed development of a common strategy for electronic document management across the whole of State government. The proposal pointed out that top management in organisations was responsible for

formulating the vision of electronic document management, and had to show commitment to the vision and ensure its transmission to all levels of the organisation. The report gave examples of how such visions could be formulated, and pointed out the importance of concrete action plans that included deadlines.

Project e-Government and e-government strategy

Project e-Government was launched in 2001 as a joint initiative of the Danish Government, Local Government Denmark, the Danish Regions, and Copenhagen and Frederiksberg Municipalities. Its goal is to co-ordinate the transition to e-government across the whole of the public sector. The guiding idea behind the project is that, while responsibility for the implementation of e-government lies with individual organisations, in several areas there is a need for centralised guidelines and solutions to general problems of legal, technical and organisational character in order to support the implementation process.

As discussed in Chapter 4, Project e-Government is led by the Joint Board of e-Government. Responsibility for implementing the project rests with the Danish Digital Task Force, located in the Ministry of Finance, and the IT-Policy Centre in the Ministry of Science, Technology and Innovation (MVTU). The MVTU also plays a major role in the development of e-government through its ongoing responsibility for other aspects of the Government's ICT policies. It has a particular focus on the technical aspects of e-government development, including the compilation of standards and policies.

Under the leadership of the Joint Board, e-government strategies covering the whole of government were published in 2002 and 2004. Three key features of these strategies are: 1) their relationship to wider government policies; 2) the involvement of all tiers of government in the governance, development, and implementation of the strategies; and 3) partnership between two strong ministries with complementary roles and expertise in support of the strategies. Details of each strategy are provided in Chapter 4.

ANNEX E

Methodology

Definition of the analytical framework

The methodology used for this peer review was developed by the OECD over the period from 2002 to 2004. The methodology is based on the OECD framework for examining e-government that was developed in *The E-Government Imperative* (OECD 2003), and takes into account the work that went into the OECD publication *E-Government for Better Government* (OECD 2005). The methodology was tested in a pilot review of e-government in Finland, which led to the publication of the report *OECD E-Government Studies: Finland* (OECD 2003). In 2004, the OECD E-Government Project adopted the OECD methodology for its peer reviews, following the protocols laid out in *Peer Review: An OECD Tool for Co-operation and Change* (OECD 2003). Using this analytical framework, the OECD has conducted reviews of Mexico and Norway. Further reviews (Turkey, the Netherlands and Hungary) are ongoing.

The development of the OECD e-government peer review methodology is an ongoing process, but the general framework will be preserved to allow for comparability among countries. The OECD will continue to ensure that the methodology used is updated and as relevant as possible for OECD countries.

In the development of the methodology, the OECD has kept in mind that:

- The OECD should assign great importance to statistical rigour and quality when measuring and describing variables.
- Comparable descriptive characteristics of variables are necessary for building an international classification of e-government experiences.
- The OECD E-Government Project should compare its approach to those of other OECD directorates, and collect lessons learned for future reference and sharing with other directorates.

As the first step in a country review, the OECD Secretariat develops an agreement with the country authorities concerning the objectives, analytical framework and timeline of the study. The terms of reference set out and

structure the areas to be studied to provide an overarching view of e-government implementation and impacts.

The review is structured around the notion of a policy cycle in which e-government goals, strategies and initiatives are developed and diffused centrally, and individual e-government projects are initiated and implemented at the agency level. How these elements interact leads to a focus on issues of co-ordination in the development and implementation of e-government across the public sector – a recurring issue in the OECD's discussions with e-government officials and experts.

Inputs

The Denmark study is primarily qualitative in nature, presenting a combination of observations, analysis and judgements gleaned from reports and official documents, survey responses and interviews. The study has four main inputs:

- Reports and official documents.
- The OECD e-government survey.
- Interviews with government officials.
- Peer review meeting with OECD members.

Reports and official documents

The study brought together a wide range of government documents across sectors and functions, which provided insights into the way that various public management and e-government polices, strategies and initiatives are planned, co-ordinated and implemented in Denmark. Information was also drawn from recent relevant OECD reports and reviews of Denmark (*e.g.*"Diffusion of ICT to Business", December 2004). The study also drew on academic research and journal articles on public management reform, e-government and the information society in Denmark. This approach was based on the notion that e-government cannot be addressed in isolation, but should be observed from a wider public management perspective.

OECD survey of e-government in Denmark

The OECD survey on e-government was originally developed in 2002 and revised in 2003 based on the experience of the Finland review. A revised version of the survey was presented to the *OECD Steering Group on the Complementary Areas of Work on E-Government* at a meeting in Paris in December 2003. Comments from the Steering Group were incorporated into the final version of the survey. The survey has been adapted to reflect the Danish institutional and administrative framework.

In October 2004, the OECD conducted the survey with Danish State and local government organisations. The survey was targeted at officials with responsibilities relevant to e-government, who were asked to present their organisations' responses to the survey, rather than respond in their capacity as individuals. The survey sample was jointly selected by the OECD and the Danish Government (through the Danish Digital Task Force with the involvement of Statistics Denmark).

Table E.1. **Responses to the OECD survey**

	Total	OECD sample	Responses	Valid responses	Response rate %
State government ministries (including subordinate departments, agencies, etc.)	123	106	66	66	62
Counties	14	14	10	10	71
Municipalities	275	101	40	40	40

The survey asked State and local government organisations for their opinions regarding e-government challenges, barriers and priorities, and allowed them to self-evaluate the progress of their e-government initiatives. It should be kept in mind that the data results are qualitative and subjective, implying no possibility of performing tests of significance from which definitive conclusions can be drawn.

Interviews with government officials

The review team conducted two sets of interviews with Danish government officials and other commentators from relevant interest bodies, industry associations and the Danish ICT industry. All interviews were scheduled by the Danish Digital Task Force within the Ministry of Finance, with joint approval from the OECD. The mix of organisations and interviewees was selected to show a broad and representative insight into the main issues and problems regarding e-government in Denmark.

The first set of interviews, which took place in November 2004, involved exploratory discussions designed to help the OECD understand the key elements of e-government in Denmark. The OECD team met with 22 people from 11 organisations. These exploratory interviews were not meant to be comprehensive, but to assist the OECD in developing an understanding of areas that merited further research.

The second set of interviews took place in December 2004. These in-depth interviews were carried out by three members of the OECD Secretariat and three peer reviewers from OECD member governments: Peter

Reichstädter (Austria), Gustaf Johnssén (Sweden), and Kees Keuzenkamp (the Netherlands). The interview team undertook a total of 22 interviews with 35 participants. In addition, two focus group sessions, involving several participants from county and municipal government organisations, were held.

All interviews, which were strictly confidential, followed a structured set of questions, covering each of the main themes of the report. The interviews focused on the more informal issues that could not be captured with the written survey.

Peer Review Meeting

In the assessment phase of an OECD Peer Review, the main findings of the review are discussed in a plenary meeting of the body responsible for the review. The examiners lead the discussion, but the whole body is encouraged to participate extensively. Following discussions, and in some case negotiations, among the members of the body, including the reviewed country, the final report is adopted, or just noted by the whole body. Generally, approval of the final report is by consensus, unless the procedures of the particular peer review specify otherwise ("Peer Review: An OECD Tool for Co-operation and Change", OECD 2003).

The preliminary findings of the OECD Peer Review of E-Government in Denmark were presented to, and discussed by, government officials at the meeting of the OECD's Network of Senior E-government Officials held in Paris in March 2005. Countries took this opportunity to use their own expertise in e-government to provide insightful commentary on the review. This discussion provided an important input for the finalisation of the report. The report was submitted to the Danish Digital Task Force in September 2005 and presented at the meeting of the Danish e-Government Board on 30 September 2005.

Independence, neutrality and verification of inputs

Within a framework agreed with the Danish Government, the OECD conducted this study with its own staff and independent peer reviewers. The study was conducted with guidance and financing from the Digital Task Force within the Ministry of Finance, but the Ministry did not bias the study or influence the final conclusions in any way.

The report was drafted by the OECD Secretariat with the input of the three peer reviewers from Austria, Sweden and the Netherlands. The OECD regularly briefed the Danish Digital Task Force on the progress of the review. The text also benefited from fact-checking, consideration and feedback by the Danish Digital Task Force, other relevant organisations that participated in the survey and interviews, and the Steering Committee established in Denmark to oversee its participation in the review process.

ANNEX F

Glossary

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

AUTHENTICATION – a security measure for checking a user's identity before being allowed access to an information system or application.

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

EXTERNAL BARRIERS – external barriers to e-government are obstacles that 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 effective e-government implementation.

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

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

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 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.*

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

INFORMATION NETWORK – a system of ICT 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 electronic processing and transfer of data.

INTEROPERABILITY – the ability for organisations to share information systems and/or data, generally based on 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 office applications and processes, both within and across organisations, and is increasingly perceived as a technology for delivery of joined-up e-government services.

ONE-STOP SHOP – a government office where services from multiple government organisations are available.

ONLINE GOVERNMENT SERVICES – services provided by, but not necessarily supplied by, the public administration to citizens, businesses and organisations (including other government organisations) through information networks.

PORTAL – a Web site that co-ordinates and presents information and services from a variety of providers, with the content presented in accordance with criteria related to users' needs.

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

PUBLIC KEY INFRASTRUCTURE (PKI) – PKI is a method for authenticating a message sender or receiver and/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 cryptographic key pair that is obtained and shared through a trusted authority. It provides for a use of a *digital certificate* that can identify an individual or an organisation, and directory services that can store, verify and, when necessary, revoke the certificates.

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OECD e-Government Studies

Denmark

Denmark has been using ICT in government for several decades. Following a pattern common in OECD countries, during the 1970s and 1980s the focus was mainly on achieving efficiencies in public administration through process automation. Then, during the 1990s, there was a shift towards exploiting the potential of ICT to develop what, by the later part of the decade, was referred to as "e-government". This new approach demonstrated a broadened understanding of the potential impact of ICT on the improvement of public administration. Today, the Danish government is pursuing a vigorous e-government programme spanning the whole of the public sector.

Denmark has made considerable progress with e-government. In the 2003 European Commission eEurope benchmarking exercise it ranked 1st in terms of full availability of public services online, and 2nd in terms of the sophistication of those services. In 2004, according to EU measures, Denmark's online public services for both citizens and businesses were, collectively, the most "sophisticated" (*i.e.* allowed the most interactivity) in Europe. Many other international assessments of countries' e-government achievements have consistently ranked Denmark as one of the leading e-government nations.

Despite this, Danish e-government faces a range of challenges including: 1) maintaining momentum during a time of major restructuring of responsibilities across levels of government; 2) increasing government organisations' awareness and understanding of the purpose and scope of the e-government programme; 3) developing more collaboration on e-government between agencies and across levels of government; and 4) striking the right balance between centralised co-ordination and decentralised implementation of e-government.

The overarching e-government challenge currently faced by Denmark is the question of how, during a period of major organisational change and fiscal constraint, it can maintain or even increase progress towards its e-government goals of developing a more efficient, user-focused public sector supporting a more competitive economy, and a vibrant Danish information society.

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