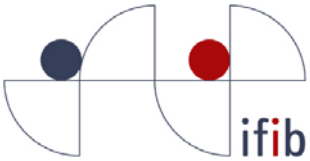

Institut für
Informationsmanagement
Bremen GmbH

DANISH
TECHNOLOGICAL
INSTITUTE

Reorganisation of government back-offices for better electronic public services – European good practices (back-office reorganisation)

Final report to the European Commission

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Volume 1: Main report

Prepared by

Jeremy Millard and Jonas Svava Iversen
Danish Technological Institute

Herbert Kubicek, Hilmar Westholm and Ralf Cimander,
Institut für Informationsmanagement GmbH, University of Bremen

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1 Executive summary

This report presents and analyses the detailed results of one of the first studies at European level to systematically research how public agencies are using ICT to reorganise, and the impact this has upon how electronic public services are experienced by citizens and business – in other words, on the changing relationship between the front and back-office.

Overall result

The study demonstrates that there is a clear and strong link between reorganising government back-offices and the electronic public services experienced by users. Back-office reorganisation thus matters a great deal:

- within public sector agency(ies) by reducing costs, increasing productivity, more flexibility, simpler organisational structures, greater interoperability, improving staff working conditions, etc.
- at the front-end for users by reducing the number of offices to visit, faster, cheaper more accessible services, fewer errors, more transparency, new possibilities, better service fulfilment, greater ease of use and greater user control.

Purpose and background

The study is sponsored by the European Commission as a 'benchmarking' exercise to support the eEurope and Lisbon Strategy processes. It attempts to fill the yawning gap left to date by most attention being focused on documenting the roll-out of electronic public services, but very little focused upon how government, its various agencies and (back) offices, is, or should be, adapting and reorganising to meet the challenges and opportunities presented by ICT.

This study attempts to fill this gap by drawing upon a large scale survey across the EU Members States (plus Iceland, Norway and the European Commission itself) based upon eEurope's common list of 20 basic public services (see section 2.1.2), culminating in 29 in-depth case studies. The survey and the case studies reflect the many good practices found, i.e. clear and beneficial links between back-office reorganisation and improvements to front-office services.

Structure of report

The study is divided into nine main sections, apart from this executive summary.

Section 2: Introduction and background – provides an overview of the study context, the importance of back-office reorganisation for electronic public services, and the organisation of the study.

Section 3: Objectives – summarises the study objectives and relates them to the European Commission's stated eGovernment goals.

Section 4: Methodology and approach – describes the overall methodology adopted, based upon a series of concepts and definitions.

Section 5: Highlight results – summarises the main results of the study and links to the detailed results and analysis elsewhere in the report.

Section 6: presents and exemplifies eight major good practice strategy options currently being pursued within the most advanced European eGovernment initiatives:

1. Digitisation of largely unchanged back-offices
2. Deep reorganisation of back-offices
3. Centralisation of back-office and de-centralisation of front-office functions
4. Back-office clearing house
5. Generic types of interaction between user and agency
6. Portals

7. Pro-active services
8. Greater user responsibility and control

Section 7: Major good practice issues – describes and exemplifies a series of major issues which seem to be critically related to good practice regardless of the type of strategy mix being pursued.
1. Meeting user needs and expectations
2. Managing change and human resources
3. Costs and efficiencies
4. Institutional and legal structures
5. Technology issues

Section 8: Good practice by service cluster – presents good practice reports on 16 clusters of services.

Section 9: Transferability of good practice in eGovernment – discusses the notion of good practice in eGovernment and presents an example of a strategy transfer matrix.

Section 10: Conclusions and recommendations – provides an overall conclusion to the study and presents two recommendations, one each for eGovernment decision makers and the European Commission.

In addition, six annexes are separately available
Annex 1: On-line check list and manual
Annex 2: Telephone interview questionnaire and instructions
Annex 3: Tables for service clusters with criteria and reasons for selection
Annex 4: Case study report template and face-to-face interview guidelines
Annex 5: Tables with national responsibilities for service delivery
Annex 6: European good practice case studies.

A note on case study selection

The 29 in-depth case studies presented in this report illustrate a very large number of good practice strategies, indeed that is why they were selected. They each exemplify different aspects of good practice, both as regard back-office re-organisation and front-office service delivery. They can provide an excellent basis for comparing and analysing good practice in eGovernment through a learning process which emphasises dialogue and the exchange of experiences and good ideas, rather than direct replication as each case and its context and circumstances are different and cannot be directly transferred on a one-to-one basis to other places or other times.

It must be stressed that the 29 cases selected and analysed in this study as European good practices have not been ranked against each other or against those not selected. Indeed, non-selection does not imply unsuitability or inferiority in any way. Selection took place in order to obtain a balance of countries, institutional and service types, within the time and resources available for the study. It was also affected by access to case material, relevant personnel and data. Thus, the 29 cases should be seen as representing European rather than national good practice, given that most of them could easily have been replaced by a similar case from another country. The analyses developed from the 29 cases should thus be seen as instructive and illustrative examples of the best in Europe anno 2003, but are far from being the only examples which could have been used.

The study reported in this document has been sponsored by DG INFSO of the European Commission, and was carried out in 2003.

The research team responsible for this report consisted of:

- Jeremy Millard, Jonas Svava Iversen and Lars Schmidt of the Danish Technological Institute
- Herbert Kubicek, Hilmar Westholm and Ralf Cimander of the Institut für Informationsmanagement Bremen

All results, conclusions and views expressed are those of the research team alone, with the active support of 14 National Experts (see section 2.3), and do not necessarily represent the views of the European Commission. While every effort has been made to avoid errors and misjudgements, the research team takes full responsibility for any that have been made. Notwithstanding this, enthusiastic acknowledgement is given to Giuseppe Zilioli and Paul Timmers of DG INFSO, the European Commission, who have provided invaluable support and advice throughout the work.

2 Introduction and background

2.1 Context of study

2.1.1 eGovernment

The way we are governed in Europe is undergoing dramatic change, to which the introduction of information and communication technologies (ICT) is making its own powerful contribution, hand-in-hand with other societal trends. According to the European Commission[1], these new technologies can help public administrations cope with the many challenges. However, the focus should not be on ICT itself. Instead it should be on the use of ICT *combined with* organisational change and new skills in order to improve public services, democratic processes and public policies. This is what **eGovernment** is about.

eGovernment is defined by the European Commission as the use of ICT in public administrations combined with organisational change and new skills in order to improve public services and democratic processes and strengthen support to public policies. eGovernment is an enabler to realise a better and more efficient administration. It improves the development and implementation of public policies and helps the public sector to cope with the conflicting demands of delivering more and better services with fewer resources.

eGovernment enables the public sector to maintain and strengthen good governance in the knowledge society. This means[2]:

1. a public sector that is open and transparent: governments that are understandable and accountable to the citizens, open to democratic involvement and scrutiny.
2. a public sector that is at the service of all -- user-centred public sector will be inclusive, that is, will exclude no one from its services and respect everyone as individuals by providing personalised services.
3. a productive public sector that delivers maximum value for taxpayers' money -- it implies that less time is wasted standing in queues, errors are drastically reduced, more time is available for professional face-to-face service, and the jobs of civil servants can become more rewarding.

Over the past few years the concepts of government and governance have been dramatically transformed. Not only is this due to increasing pressures and expectations that the way we are governed should reflect modern methods of efficiency and effectiveness (that governments should 'do more for less' year on year), but also that government should be more open to democratic accountability.

This cauldron of change is now finding itself once again brought to the boil by the impact of new digital technologies on government. Many claim that eGovernment enables both efficiency and democracy to be met more cheaply and easily than previously envisaged, and that the application of ICT enables government to reduce the trade-off there has traditionally been between these two admirable goals. But the new technologies go much further than this. They are starting to redefine the landscape of government by changing the relationships (power and responsibility) between players – between service providers and industry, between the public, private and third sectors, and between government and citizen. New forms of governance are emerging, reflecting inter alia changing organisational and economic structures, with profound consequences for the way we understand and exercise citizenship. It is clear that eGovernance is not just about putting government services online and improving their delivery, but also constitutes a set of technology-mediated processes that could change the broader interactions between citizens and government.

2.1.2 eGovernment benchmarking

The move towards eGovernment and the need for administrative reform are both increasingly part of the political agenda of most European countries, and the rapid diffusion of Internet use is resulting in an increasing supply of electronic services offered by the institutions of the government and administration to citizens and business.

[1] European Commission, 2003 'The role of eGovernment for Europe's future' Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, Brussels, 26.9.2003, COM(2003) 567 Final.
[2] op cit.

The EU has also attached enormous significance to the urgent realisation of the potential economic and social gains associated with the Information Society. In 2000 the European Commission[3] started the eEurope initiative with the key objectives of:

- bringing every citizen, school, business and administration on-line
- creating a digitally literate Europe, supported by an entrepreneurial culture ready to provide finance
- ensuring that the whole process is socially inclusive, building consumer trust and strengthens social cohesion.

To achieve these objectives, the Commission proposed 10 priority areas of action of part of the eEurope 2002 Action Plan with ambitious targets to be achieved through joint actions by the Commission, the Member States, industry and the citizens of Europe. One of these areas of action was government on-line which aimed at ensuring that citizens have easy access to government information, services and decision-making procedures on-line. Such public eServices are today available on supra-national (e.g. G8, OECD), national and local levels of policies in all Member States (for example, OL2000 in the Netherlands, Digital Denmark, Modernising Government in the UK, etc.).

Most Member States have adopted or are in the process of adopting eGovernment strategies for the provision of online services for citizens and businesses[4]. The *e*Europe target was to have all basic services available online by the end of 2002. The Internal Market Council agreed to a definition of basic services covering 8 services to business and 12 to citizens, as shown in the table below.

Two groups of indicators for these eGovernment services are being investigated:

- percentage of basic public services available online
- use of online public services by the public for information purposes or submission of forms.

Progress in bringing these services online is being measured using a four stage framework: 1 posting of information online; 2 one-way interaction; 3 two-way interaction; and, 4 full online transactions including delivery and payment. Data has been collected in surveys twice a year. Section 1.3 below presents the latest benchmarking results in terms of the roll-out and use of eGovernment.

In addition to electronic public service provision and take-up, there is also the issue of governance "*Publishing council agendas over the Internet, electronic voting or e-mail addresses for politicians will not by themselves stem falling voter turnout,* […] *or recreate confidence in public institutions and decision-making structures*".[5] eGovernment can only be a tool to achieve more open, more participatory, more accountable, more effective and more coherent governance (cf. ministerial declaration of the eGovernment conference in Brussels on 29-30 November 2001, which also states that increasing attention should be given to the provision of pan-European eGovernment services).

This significant report shows how the eEconomy is emerging in Europe[6]. It displays sharp contrasts and a mixed picture as regards the arrival of the Information Society in EU Member States. The main policy conclusions to be drawn from the benchmarking exercise are the following:

The ministerial declaration of the eGovernment conference, together with the benchmarking survey should give political momentum to the development of online public services and to the identification of the needs for these services at pan-European level. This will have to be complemented by a focus on back-office reorganisation, the creation of electronic marketplaces for public procurement and investment in new equipment in administrations.

This benchmarking report is only a first step. Progress is not always measurable over a short time period. Measurements need to be carried out continuously to see the speed at which development takes place.

Benchmarking is a learning process. Statistical methodology and practical studies were improved during the process and still need to improve further. A crucial advantage of eEurope benchmarking over other measurements is the comparability of results which follow a single methodology in all EU countries.

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[3] European Commission, 2000a, eEurope -- an information society for all, 23-24 March 2000, Lisbon: <http://europa.eu.int/comm/information_society/eeuropa/pdf/com081299_en.pdf>.

[4] The study can be found at http://europa.eu.int/information_society/eeurope/benchmarking/list/2002/index_en.htm

[5] Council of European Municipalities and Regions on eGovernance (28.11.01).

[6] It confirms the conclusions of the Communication by the Commission on the impact of the e-economy on European enterprises (COM (2001)711, November 2001).

eEurope common list of 20 basic public services[7]

	Public Services for Citizens
1.	Income taxes: declaration, notification of assessment
2.	Job search services by labour offices
3.	Social security contributions: a) Unemployment benefits b) Family allowances c) Medical costs (reimbursement or direct settlement) d) Student grants
4.	Personal documents: a) passport b) driver's licence
5.	Car registration (new, used and imported cars)
6.	Application for building permission
7.	Declaration to the police (e.g. in case of theft)
8.	Public libraries (availability of catalogues, search tools)
9.	Certificates, request and delivery: a) birth b) marriage
10.	Enrolment in higher education / university
11.	Announcement of moving (change of address)
12.	Health related services (e.g. interactive advice on the availability of services in different hospitals; appointments for hospitals.)
	Public Services for Businesses
13.	Social contribution for employees
14.	Corporation tax: declaration, notification
15.	VAT: declaration, notification
16.	Registration of a new company
17.	Submission of data to statistical offices
18.	Customs declarations
19.	Environment-related permits (incl. reporting)
20.	Public procurement

The focus should now shift to the policies behind the quantitative results. What are the examples for good practices? Member States need to see and compare different approaches and solutions. The thorough analysis of examples also requires the willingness to learn from each other[8].

Benchmarking also needs to be put into the long-term perspective of the objectives set in Lisbon for 2010. At the outset, eEurope was designed as a short term measure. A direct, immediate impact was felt necessary. Benchmarking indicates that technology can move fast, that penetration of the Internet can explode, but that societal change takes more time. It requires organisational changes, a shift in mindsets, modernisation of regulation, different consumer behaviour, and political decisions.

[7] European Commission, 2000a, eEurope -- an information society for all, 23-24 March 2000, Lisbon: <http://europa.eu.int/comm/information_society/eeuropa/pdf/com081299_en.pdf>.
[8] See the Best eEurope Practices knowledgebase: http://www.beepknowledgebase.org and http://www.beepgovernment.com.

2.1.3 eEurope 2005 Action Plan

When the eEurope Action Plan 2002 was launched, it was foreseen as an action to get Europe online quickly. Overall it has been a success and has contributed to many more people and most companies now being connected. Benchmarking has highlighted new problems in relation to usage: connections are too slow and broadband is needed to stimulate new services and help accelerate the growth of eCommerce; schools are connected but the Internet is not yet part of the pedagogical process; government online has far to go before full electronic transactions are possible. These findings indicate that eEurope should be continued beyond 2002 and shift its focus more towards effective usage and availability of the Internet, in line with the Spring Report.

In June 2002, the eEurope 2005 Action Plan was adopted by the European Council in Seville[9]. The main thrust of the new plan is that there should be two groups of actions which reinforce each other:
i) actions to stimulate services, applications and content, covering both online public services and eBusiness
ii) actions to stimulate broadband infrastructure and security matters.

The plan also states that, by 2005, Europe should have:
- modern online public services (eGovernment, eLearning services and eHealth services)
- a dynamic business environment
- and, as an enabler of these, widespread availability of broadband access at competitive prices and a secure information infrastructure.

The action plan comprises four separate but interlocking tools:
i) policy measures
ii) good practices
iii) benchmarking
iv) overall coordination of existing policies.

Experience to date shows that much progress towards the Lisbon objectives for 2010 has already been made. The 2002 Action Plan has had the task of putting government services on-line. The second task, addressed by the 2005 Action Plan, is to ensure that these services are used and that interactive services are available. Here, the focus is more on demand-side issues, such as awareness, confidence, security and public services.

Overall, this strengthened position of eGovernment in the 2005 Action Plan, shows that eGovernment is one of eEurope's next big challenges. It is building on the lessons already learnt, including that both long term vision and day-to-day commitment are needed, and that, in future, this must include back-office re-organisation and greater investment in human capital in government. Built-in goals include progress in interoperability within and between administrations by the end of 2003, a much greater availability and use of interactive services by the end of 2004, and the necessity of much faster broadband roll out across all regions. eProcurement is seen as an essential set of services to improve government productivity and to support eBusiness and SMEs. Public Internet Access Points are an important focus to ensure widespread social inclusion, also in the context of culture and tourism services. Practical experience has shown the need to start small, learn from other administrations as well as from users, and then scale fast.

2.1.4 European eGovernment Conference, July 2003

Building on the November 2001 Conference, ministers and national delegations came together again in Como, Italy, 7-8 July 2003, to take stock and discuss progress and future priorities. High level analysis of both the state of affairs and the future vision of European eGovernment took place[10]. In the final Ministerial Declaration[11] the importance of effective eGovernment throughout Europe was emphasised in order to achieve the Lisbon Strategy objectives, as was the need to strengthen cooperation with acceding and candidate countries.

Ministers:

[9] European Commission, 2002, eEurope 2005 Action Plan, see: http://europa.eu.int/comm/information_society/eeurope/ http://europa.eu.int/comm/information_society/eeurope/documentation/index_en.htm
[10] See Leitner, C. (ed.), 2003, *eGovernment in Europe: the state of affairs*, presented at the eGovernment 2003 Conference, Como, Italy, 7-8 July, European Institute of Public Administration, http://www.e-europeawards.org/.
[11] available from http://www.e-govconference2003.org

- Recognised the role of eGovernment in creating on-line applications and services for the users, favouring at the same time innovative technologies for the benefit of the Information Society.
- Acknowledged the role of eGovernment as a driver for the modernisation of the entire European public sector and as a key in increasing productivity and efficiency of Public Administration, thereby freeing resources and delivering more value for taxpayers money.
- Underlined that European competitiveness can be strengthened by reducing administrative burden (i.e. red tape) on enterprises and costs for administrations.
- Emphasised the importance of eGovernment as a means to improve efficiency and transparency in the public sector and the European institutions and thus increase attractiveness for investment.
- Pointed out the role of eGovernment as a tool for enhancing the quality of life of European citizens through inclusive public services for all.
- Recognised the relevance of using ICT to develop and enhance new forms of involvement and participation of the citizens in policy definition and decision-making processes.
- Pointed out the role of eGovernment as a means to achieve a modern European administration through electronic cooperation between different levels of government and across national borders.
- Welcomed ongoing experiences in the European Countries in cooperation between levels of administration.
- Recognised the need of close cooperation between European Commission and the European Countries in order to define pan-European standards and to identify and implement effective pan-European online services.
- Recognised the World Summit on Information Society to be held in Geneva, December 2003 and Tunisia, November 2005, as a unique opportunity for all stakeholders to discuss at global level the establishment of a Global Information Society. Hence, Ministers recommended that due relevance be given to eGovernment in the Summit's discussion and in the WSIS Action Plan.

More specifically, the Ministers emphasised the need to turn objectives into actions, and expressed their conviction that the deployment of secure and reliable eGovernment throughout the EU, respectful of the autonomy of each country, requires a shared user-centred vision of innovation in the public sector focused on the following priorities:

- pan-European eGovernment services
- improved service delivery
- trust, security and privacy
- interoperability of Public Administration systems
- getting the best from public funding.

As far as eGovernment implementation is concerned, the Ministers acknowledged that the fulfilment of electronic government depends on the ability to adopt models ensuring coordination between different government levels. They also recognised the importance of the exchange of strategic and operational experiences among their countries, in particular through the European Public Administration Network. Issues to be addressed in this context include:

- organisational change
- central-local cooperation and coordination
- public-private cooperation
- reuse and best practices
- eGovernment evaluation and monitoring.

Many of the issues highlighted in this section are addressed in depth in this report.

2.2 The importance of back-office reorganisation for electronic public services

Much research to date has focused on the front-office, on the use and take-up of electronic public services by citizens and business[12]. However, there has been little attention systematically focused upon how government, its various agencies and (back) offices, is, or should be, adapting and reorganising to meet the challenges and opportunities presented by ICT. More specifically, no systematic research has to date focused upon how public agencies are using

[12] For example, the on-going CGEY reports to the European Commission which survey the roll-out and sophistication of electronic public services based on an examination of web-sites: Cap Gemini Ernst & Young, February 2003, *Overall report October 2001 to October 2002 online availability of public services: how does Europe progress? Web based survey on electronic public services*, January 2003; and the 'Top of the Web' survey by PLS for the European Commission which examined the quantity and quality of use of electronic public services, December 2003.

ICT to reorganise and the impact this has upon how electronic public services are experienced by citizens and business; in other words, on the changing relationship between the front and back offices.

This study attempts to fill this gap by drawing upon a large scale survey across the EU Members States (plus Iceland, Norway and the European Commission itself) based upon eEurope's common list of 20 basic public services (see section 2.1.2), culminating in about 30 in-depth case studies. The survey and the case studies reflect the many good practices found, i.e. clear and beneficial links between back-office reorganisation and improvements to front-office services. The methodology and approach adopted is summarised in section 4, highlight results are presented in section 5, and in sections 6, 7 and 8 the detailed results are presented and analysed.

The overall result of the study demonstrates that there is a clear and strong link between reorganising government back offices and the electronic public services experienced by users. Back-office reorganisation thus matters a great deal:

- within public sector agency(ies) by reducing costs, increasing productivity, more flexibility, simpler organisational structures, greater interoperability, improving staff working conditions, etc.
- at the front-end for users by reducing the number of offices to visit, leading to faster, cheaper more accessible services, fewer errors, more transparency, new possibilities, greater ease of use and greater user control.

2.3 Organisation of the study

The study was carried out during 2003 and led by two partner organisations:

- the lead partner: the Danish Technological Institute, with researchers Jeremy Millard, Jonas Svava Iversen and Lars Schmidt
- partner: the Institut für Informationsmanagement Bremen, with researchers Herbert Kubicek, Hilmar Westholm and Ralf Cimander.

In this report the two organisations above are referred to as the partners.

In order to conduct the survey across Europe and carry out case studies, fourteen National Experts were sub-contracted representing all EU Member States, plus Iceland, Norway and the European Commission. Denmark, Germany and the European Commission were covered by the lead organisations.

Country	National Expert	Researchers involved
Austria	The Institute of Technology Assessment, Austrian Academy of Sciences, Vienna	Georg Aichholzer, Martin Spitzenberger, Roman Winkler
Belgium and Luxembourg	CITA - Computer Science Institute, The University of Namur	Claire Lobet-Maris, Jean-Marc Galand
Finland	Association of Finnish Local and Regional Authorities, Helsinki	Heikki Lunnas (Vice-President of ELANET)
France	Services Trading European Partners (STEP), St.-Denis	Lucie Foucaud, Theresa Saal
Greece	Cyclotron Ltd., Consulting Engineers, Athens	Marina Moula
Iceland	GoPro, Kopavogur	Ragnar Thorgeirsson
Ireland	Work Research Centre Ltd., Dublin	Kevin Cullen, Ivica Miliceciv
Italy	Nomisma S.p.A. - Società di Studi Economici, Bologna	Patrizia Fariselli Julia Culver-Hopper and Olana Bojic
The Netherlands	ICTU	Matt Poelmans
Norway	STEP-Gruppen, Oslo (since June 2003)	Anders Ekeland
Portugal	University of Aveiro (CEIDET) Departamento de Ambiente e Ordenamento	Eduardo Castro, Gonçalo Santinha, Rui Simão
Spain	TID Telefónica Investigación y Desarrollo (TID), Madrid	Pedro Concejero Cerezo, Carlos Gonzaléz de Herrero
Sweden	Intersecta, Uppsala	Daniel Hallencreutz, Per Lundequist
United Kingdom	The Nottingham Trent University, The Department of Economics & Politics	Christine Bellamy

Other international eGovernment experts have also been involved on an ad hoc basis, and Giuseppe Zilioli and Paul Timmers of DG INFSO, the European Commission, have provided invaluable support and advice throughout the work.

In this report the two partners and the National Experts are together referred to as the researchers.

3 Objectives

The overall objectives of the study are to:

1 Present relevant good practices of reorganisation of government back offices which contribute to the full realisation of eGovernment and efficient electronic public services.

2 Demonstrate a link between back-office reorganisation and the quality of the delivery of the service at the front office.

3 Highlight the potential of transferability of good practice to other contexts, administrations or levels of government.

In relation to the European Commission's tri-partite definition of eGovernment as[13]:

1. a public sector that is open and transparent: governments that are understandable and accountable to the citizens, open to democratic involvement and scrutiny.
2. a public sector that is at the service of all -- user-centred public sector will be inclusive, that is, will exclude no one from its services and respect everyone as individuals by providing personalised services.
3. a productive public sector that delivers maximum value for taxpayers' money -- it implies that less time is wasted standing in queues, errors are drastically reduced, more time is available for professional face-to-face service, and the jobs of civil servants can become more rewarding.

This study directly addresses the concerns of points 2 and 3, but also provides important insights for point 1 inasmuch as government openness and transparency are served by eEurope's common list of 20 basic public services (see section 2.1.2), which form the focus of front-office study. The study does not directly address eDemocracy, eVoting , eParticipation or the wider issues of eGovernance.

The purpose of this report on the detailed results of the survey is, by examining good practices across Europe, to highlight and explain the main challenges, developments and issues involved in eGovernment from the perspectives both of government itself and the citizens and businesses who use its services.

[13] European Commission, 2003 'The role of eGovernment for Europe's future' Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, Brussels, 26.9.2003, COM(2003) 567 Final.

4 Methodology and approach

4.1 Concepts and definitions

4.1.1 Understanding back-office reorganisation

The Ministerial Conference "eGovernment – From Policy to Practice", held in November 2001 in Brussels, clearly demonstrated what key note speakers had called a generational change from a shop window of isolated examples to a second generation characterised by integration. The quality of service delivered to the customer/citizen decisively depends on the degree of such integration. The same is the case with respect to increases in efficiency which administrations can, and must, achieve by putting services online. The 2001 Ministerial Conference suggested different types (or dimensions) of integration, including the integration of services and their integration with back offices, in particular with existing so-called legacy or ERP applications which are often up to 20 years old and which form the basis of existing workflows. In order to achieve progress it is necessary to better understand the complexity of back office integration and reorganisation and of the different dimensions creating this complexity. Because e-government services themselves are very heterogeneous there is not one general model of back office integration. On the other hand it would not be very helpful to insist that each case is unique and that no generalisation is possible. This paper suggests a conceptual framework with four models of different levels of complexity which are able to grasp the diversity of the cases and still allow for generalisations and comparability.

4.1.2 Definition of back-office reorganisation

Back office is a term relative to the front office which in this context is a user interface to an online service. The back office receives and processes the information which the user of a service enters in order to produce and deliver the desired service. This may be done completely manually, fully automatically or by any combination of both. In some cases such a service is produced by one unit or back-office, in other cases several back-office of the same service supplier agency or of different agencies, at the same government level or at different levels may be involved. In order to recognise the complexity involved and to achieve comparability of different cases a common terminology is needed.

We use the concept of a *government agency*, which contains one or more back-offices. An agency is defined as a formal organisation with a separate legal standing and which has one or more formal purposes (e.g. a public administration, a hospital, a passport agency, a school, a railway authority, a tax authority, etc.). The difference between an agency and a back-office is that the latter, although it may or may not be a formal organisation, does not have a separate legal standing. A back-office may be located at the same or a different physical address as other back-offices within the agency, and is normally distinguished within the agency from other back-offices by having one or more formal functions and normally by its own organisational structure and management, although these are joined at the higher levels within the agency.

The term *reorganisation* refers to changes in workflows (process reorganisation or re-engineering) or changes in the structure of one or more agencies involved, i.e. the distribution of authority, functions and of tasks, which occur when making services available online. The interest in reorganisation is based on long experience of applying information technology to government, i.e. that the greatest benefits do not come from replicating paper based processes directly on a computer, but rather from using the potential of the technology to re-engineer the process, to check whether each step is still necessary, whether steps might be merged, etc. In terms of the quality of service experienced by the user, this might include a change in the way service delivery is initiated. For example, some agencies have changed from reacting to requests to the pro-active delivery of the service based on information (such as dates) available to the system.

4.1.3 Two basic dimensions: stages and services

In order to estimate and categorise the complexity of the whole process of service production and delivery, it is necessary to examine the relationships between the back-offices involved arising from the division of labour and of authority between them. There are two basic dimensions which combined lead to four models, as described below.

In industrial analysis, the concept of the supply chain helps to distinguish different stages of the production and delivery of a product. If the division of labour in the overall governmental organisation results in the production and delivery of a service being divided into two or more stages assigned to different agencies, a need for coordination arises which increases complexity.

It is useful to distinguish between one stage and multi stage services. A one stage service is, for example, the request and delivery of a birth certificate from the local government. An example of a multi-stage-service is the request for a passport made at the local government which has to be forwarded to a national agency. In more general terms, a stage is defined as a task performed by a back-office which is necessary for producing and delivering a service. Of course, complexity increases with the number of stages and the number of back-offices involved. From a technical point of view, the ideal case is where the technical systems of different back-offices are integrated in such a way that incoming data are processed automatically and the result is forwarded to the back-office in the next stage, until the service is delivered online to the customer. However, for reasons of equitable judgement or of security, human intervention may still be necessary, thus interrupting the electronic process.

Different overall divisions of labour and distributions of authority, and thus different degrees of complexity, result from different organisational principles applied at each stage. In the passport example, several back-offices at the local level need to forward applications to one central second stage back-office. In the German context, citizens registering a new address need to de-register their former address, which means forwarding the de-registration to one of 14,000 local governments. In such cases, it is useful to build an index of supply chain complexity which takes account both of the number of stages and the number of potential back-offices being addressed in each stage.

In order to increase benefits or convenience for the customer, as well as reduce the cost of processing data, the integration of two or more services is promising. But this also calls for coordination and thus increases complexity. A service is defined as a public eService experienced by the user (whether citizen or business) which directly serves an ultimate user objective. For the purposes of the present study, these are eEurope's 20 benchmarking services (see section 2.1.2), except that number 12, health-related services, has been excluded because of the large variation and number of such services and which are the subject of other studies. Other specific services were also considered, but none in practice included. All services may be offered to the user either singly or integrated into bundles, such as built around citizen life events or in other user-centred formats. Integration, from the user perspective, means more than listing different services in one menu. It is better understood, for example, as the automatic re-use of a user's data input made into one service by other services. These 'primary' services are distinguished from 'secondary' (or 'auxiliary' or 'horizontal') services which do not directly serve an ultimate user objective themselves but which may be used to support the attainment of such objectives. In the context of the present study there are two main types of horizontal service: identity management and on-line payment.

4.1.4 Institutional configuration

The challenge of achieving the necessary coordination depends to some extent on the kind of agencies involved and their organisational affiliation. Because of its common decision making authority, it is easier to coordinate two back-offices within the same agency than two back-offices at two different levels of government, or governmental agencies with private companies. In order to capture such institutional configuration we distinguish:

- horizontal relations, i.e. interaction between public agencies at the same level of government, whether local, regional, national or European
- vertical relations, i.e. interaction between public agencies at two or more levels of government, e.g. between local, regional, national, European level.

In addition, agencies can be distinguished by ownership, funding and/or purpose:

- public agency, i.e. financed mainly or wholly by public expenditure for non-profit purposes
- private agency, i.e. businesses operating within a market context, designed to make a profit, and privately owned by one or more legal entities
- third sector agency, i.e. community, voluntary, charitable or other non-profit and non-public agency.

For the purposes of the present study we are only interested in electronic public services (i.e. involving at least one public agency) offered to non-public agency users (i.e. individual citizens, third sector agencies or private agencies). We are interested in PPPs (public-private partnerships), as long as they include at least one public agency.

4.1.5 Four models of back-office reorganisation

The two dimensions of service and stage result in four models of back office reorganisation differentiated according to their degree of digitisation.

Front-office / *Back-office*	One service	Several services
One stage	**Model A**	**Model B**
Several stages	**Model C**	**Model D**

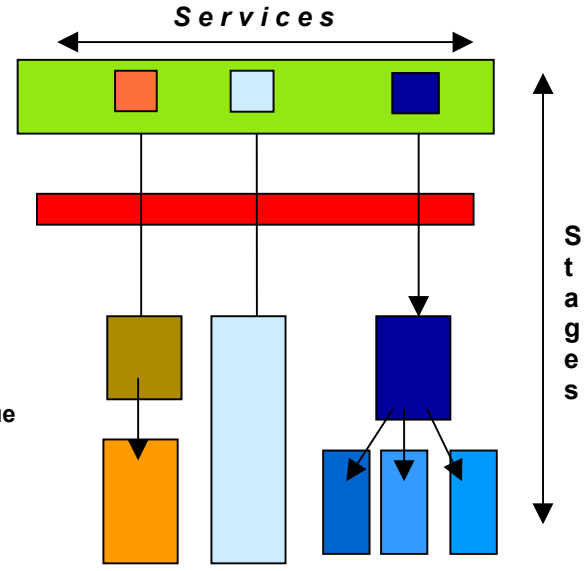
Model A: one service, one stage

Most of today's eGovernment applications in Europe can be assigned to Model A in which only one service is involved and interaction is only between the user and the back-office. The following three steps show increasing automation, and thus represent a framework for evaluation and analysis of the degree of BO process digitisation:

1. Human interface break in both data input and data output -- the interaction between the user and the back-office is only partially digitised so that the process of both user data input and data output response by the system are still mediated by a human agent, e.g. by an employee who reads email or pdf-forms from the user, checks the data, then keys them into the back-office application, and where the data response also needs a human interface break.
2. Automatic input but human interface break in output response – the interaction between the user and the back-office is subject to more digitisation so that no keying-in by human mediation is necessary, but checking and response initiation still need to be undertaken by an employee, so there is no automatic data response but one which requires a human interface break.
3. Full automation -- the interaction between the user and the back-office is now fully digitised and the only need for human intervention is in exceptional circumstances, i.e. there is full automatic data input, checking and response.

Additional process digitisation can be provided by the integration of horizontal services, such as authentification or electronic payment.

- **Integration of services according to life or business situation of users (horizontal Integration)**
- **Integration of horizontal services, e.g. authentification, payment.**
- **Integration of front-offfice with one or several back-offices (stages) in the same or different institutions (vertical integration along the value chain)**



Model B: multi service, one stage

In Model B, two or more services are integrated (for example in citizen or business life events) but interaction is still only between the user and the back-office. Integration here means more than just a list of links between services but rather the integration of data, i.e. some of the data entered for one service in the bundle are at least used by one other service as well. The three steps of back-office process digitisation and additional process digitisation are as in Model A. Further, the total number of services integrated can also be taken as a measure of the sophistication of process digitisation.

The quality and ease of use of services for the customer and the efficiency for the administration at this level depend upon what has been described during the Ministerial Conference in 2001 as the integration of data, in particular whether there is single filing or redundancy free data entry, and whether open standards for Electronic Data Interchange (EDI) are applied. These standards refer to the syntax, such as XML as well as to the semantics of different messages such as EDIFACT, HBCI or OSCI and to protocols for secondary services.

Model C: one service, multi stage

In Model C, only one service is involved but there are two or more types of electronic interaction, including between the user and the back-office and between back-offices. The three steps of back-office process digitisation and additional process digitisation are as in Model A. Further, the increasing progress of back-office process digitisation can be analysed as follows:

- Stage 2: electronic interaction type 2 between back-office 1 and back-office 2 (note: if more than one back-office is involved but the interaction type is the same with each one (e.g. interaction type remains type 1), then the stage remains stage 1 and the appropriate model is Model A)
- Stage 3: electronic interaction type 3 between back-office 2 and back-office 3
- and so on for additional stages.

In Model C, a variety of back-office interactions are possible depending upon the agency involvement and whether the interacting back-offices are within the same or between different agencies, and which types and levels of agencies these are. These differences can be described and analysed.

Model C is characterised by increasing degrees or intensity of backend integration with regard to the whole supply chain. In many governmental services it is not the case that only one agency is involved, but rather that the primary agency needs to forward data to another agency in order to satisfy certain preconditions for providing its services. For example, the request for a new passport or personal document is normally made at the local government level, it is checked there and then forwarded to a national agency. There is no real gain if the application is sent online by the customer to the local government but then the second step in the supply chain is still paper-based. Thus, the degree of integration in multi-agency, multi-stage processes is of great relevance to back-office reorganisation.

Model D: multi service, multi stage

In Model D, two or more services are integrated (for example in citizen or business life events), and there are two or more types of electronic interaction, including between the user and the back-office and between back-offices. Integration here means more than just a list of links between services but rather the integration of data, i.e. that some of the data entered for one service in the bundle are at least used by one other service as well. The three steps of back-office process digitisation and additional process digitisation are as in Model A. Further, the total number of services integrated can also be taken as a measure of the sophistication of process digitisation. Finally, the increasing progress of back-office process digitisation can be analysed as in Model C.

In Model D, a variety of back-office interactions are possible depending upon the agency involvement and whether the interacting back-offices are within the same or between different agencies, and which types and levels of agencies these are. These differences can be described and analysed.

The quality of integration at this highest level can be evaluated by:

- the completeness of the service according to usability (e.g. through availability of transactions, data re-use) and the degree of fulfilment (i.e. how much the service fulfils user need)

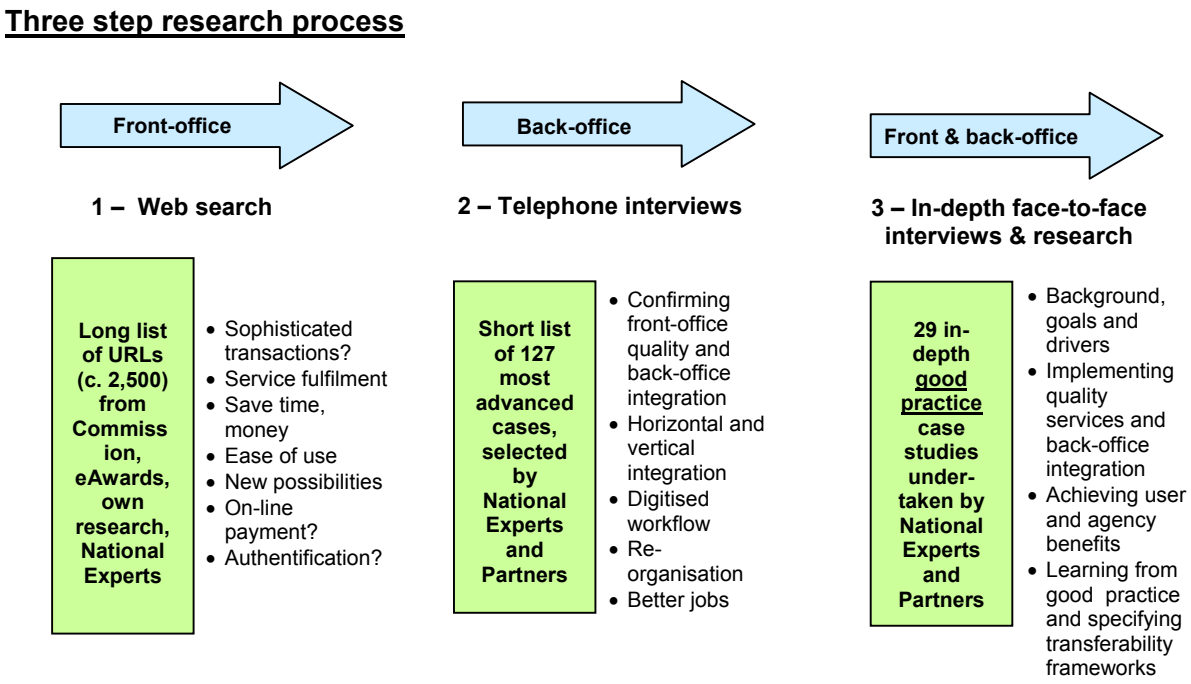
- the integration of horizontal services like identity management or payment according to open standards (syntax such as XML, including semantics such as EDIFACT, HBCI / OSCI messages)
- the completeness of integration of sub-processes in all stages of the supply chain (i.e. technical interoperability within and between government agencies and other involved actors)
- the intensity of integration -- electronic data exchange only, or integration of workflows, with the highest level also enabling monitoring/tracking by the customer, or re-organisation of back-office interaction e.g. through platform and project-oriented work
- the application of open standards in the whole supply chain (syntax such as XMLor semantics such as EDIFACT, OSCI messages).

4.2 Methodological steps

At the outset of the study it was not clear whether cases could be found that fulfil the most advanced model, nor whether it possible to start from previous studies, given that all benchmarking studies to date have been front-office focused. Hence, the study started by examining the quality of the front-offices, and examined many hundreds of web-sites using an on-line check-list and manual in order to narrow down the number of potential good practice cases.

The research included three main phases:
1. Web-search: gathering initial lists of potential cases for a front-office oriented web-search and developing key criteria to select potentially well developed front-offices, plus indications of back-office integration and/or reorganisation
2. Telephone interviews: confirming the results of 1 but focused on the extent and relevance of back-office reorganisation, developing a questionnaire and its application in telephone interviews with the most promising cases found in each country
3. In-depth face-to-face interviews and research: selection and in-depth examination of about 30 cases for the final European good practice analysis of the relationship between back-office reorganisation and front-office service quality.

The figure below illustrates this approach.



4.2.1 Web-search

The project started with various lists of URLs (web- site addresses) from various sources (the numbers in brackets include all country sites):

- the European Commission's list of web-sites of public services in Member States, Norway, Iceland and within the Commission itself (also used in the quantitative benchmarking exercise undertaken by Cap Gemini Ernst & Young) focusing on the eEurope common list of 20 basic public services (see section 2.1.2) the roll-out and use of which are measured twice a year by the Commission (some 1,500 of a total of about 12,000 sites)
- further research results (e.g. findings of the Brussels eGovernment conference in November 2001, the European eGovernment Conference in July 2003, the Prisma IST research project, the Keelan IST research project, and from various research reports, prepared both by academics and consultancies (about 570 cases)
- additional input from the National Experts (about 200 cases).

These URL's cover both single services (or service groups) like www.incometax.## and websites of public bodies at various levels of government (like www.myhometown.##) which might include several services within (and without) the scope of this survey.

Each National Expert (and the partners in Denmark and Germany) developed a 'national long list' of URLs for their country, compiled from the above sources. The total number of URLs searched was about 2,500. This was to ensure the widest possible trawl of relevant web-sites. Each country long list was searched using the search criteria, as described in detail in Annex 1. Important points to note in this process are:

- A general assumption was made that the level of electronically available service sophistication and transactions would correspond with the level of back-office integration, given that high transaction levels are normally dependent on good integration. This enabled many potential cases on the long list to be discarded from further consideration.
- A point-system was used to score the level of transactions and sophistication (as explained in Annex 1).
- Because, it is possible that some back-offices have been extremely effectively reorganised and integrated, but that their front-office presentation and performance is poor, some good examples of back-office reorganisation may have been missed. However, given that the objective of the survey is link back-office reorganisation with good front-office performance, this is not a problem.
- National Experts were also requested to look for other good service examples not covered by the eEurope common list (excluding health-related sites for the reasons given above), and although many were found, the final selection focused on the common lists for reasons of comparability.
- It was also the task of national experts to try to avoid cases that are pilots only without sufficient experience of real world service delivery, as well as which are restricted to a very small target group.
- In order to understand the national context so that a sensible search could be made in each country, each National Expert prepared a 'national responsibilities' table setting out for each type of service which level(s) of government have responsibility, which agencies are involved and any special national conditions. This was necessary because services are organised very differently in each country, depending on state structures (e.g. centralised or federal state) and on the administrative framework and culture (e.g. pro-active delivery of services). These differences need to be taken into account in making selections of cases and presenting results. Tables with national responsibilities for service delivery are given in Annex 5.
- A Brussels workshop to brief National Experts on their tasks was held early in the study process in order to ensure high professional and consistent standards across all countries surveyed. Results of some early pilots undertaken by the partners were presented and discussed, and the methodology and approach explained in detail (stressing that comprehensiveness, methodological care and accuracy are extremely important), as was the search plan with the web-site search criteria.

4.2.2 Telephone interviews

As a result of the web-search, each country drew up a 'national short list', comprising 127 cases in total. Whereas the web-search of each country's long list focused inevitably on the front-office presentation of services, short-listed cases were subject to a telephone interview of about 30 minutes duration with one or more responsible agency staff (using the

questionnaire and guidance shown in Annex 2). The purpose was to ascertain the extent of back-office reorganisation and level of integration, as well as whether and to what extent the back-offices changes affect front-office performance.

The 127 telephone interviews resulted in a total of 115 confirming the suitability of the case to be included in the 'national good practice list', and thus go forward for further consideration. The overall distribution of these by country and type of service is shown in the table in section 5.1. During the telephone interview the following information was *inter alia* recorded:

- the overall ranking (if any) given to the case in relation to its importance
- the type of service
- a score of the front-office service in relation to the level of transaction achieved
- a process digitisation score relating to the back-office
- a complexity score estimating the number of stages times the number of back-offices in each stage
- the most appropriate model (A, B, C or D) applied to the case
- special remarks

Due to time restrictions and depending on the openness of interviewees, the National Experts sometimes had to make subjective estimations of the quality of the cases.

4.2.3 In-depth face-to-face interviews and research

Taking the 115 cases from each country's national good practice list, a final selection of 31 cases was drawn up comprising the 'European good practice list'. The need here was to generate about 30 of the 'best' good practices across a range of service types and levels of integration and across countries. Also taken into account was that each case selected should be open to in-depth analysis, including face-to-face interviews, and that the practical achievements of the cases are clear and documentable, and likely to provide highly useful good practice lessons for consideration by public sector agencies across Europe interested in introducing or improving electronic public services.

Unfortunately, two very good cases later had to be discarded for operational reasons. The only European Commission case selected (on job search) , because it was not possible to arrange suitable interviews or examine all necessary documentation, and the only Norwegian case (business submission of statistical data) because it transpired that insufficient live service delivery experience had been gained as the case was first fully launched at the end of 2003. This left 29 European good practice cases, the overall distribution of which by country and type of service is shown in the table in section 5.

A European good practice case selection matrix was developed, as shown below indicating the final 29 cases subject to in-depth study, in order to ensure a fair distribution across services and countries.

User type **Service cluster**		**Citizen eServices**	**Business eServices**
Income-generating eServices		1. income tax (Finland, France, Spain)	13. social contributions for employees (Belgium) 14/15. corporation tax and VAT (Ireland, Portugal, Greece) 18. customs declarations (Austria)
Registration eServices		5. car registration (Italy, the Netherlands) 9. certificates (Austria, Germany)	16. new company (Italy)
eServices providing direct benefits	financial	3b. family allowances (Ireland, Spain) 3d. student grants (Denmark, Netherlands)	20. public procurement (Austria)
	social	7/8. declaration to police (Finland) and public libraries (Denmark)	
eServices for licences and permits		6. building permission (Germany, Italy) 10. enrolment in higher education (Finland, UK)	19. environment-related permits (Finland)
Portals		• Denmark, including announcement of moving • Austria, including birth certificates above	• Spain, both business and citizen • Sweden, business tax, VAT and social contributions

Key: service numbers refer to the eEurope common list of 20 basic public eServices used for benchmarking (see section 2.1.2)

Each case is allocated to a 'service cluster'[14], and is either targeted at citizens or at businesses. A full good practice analysis of each of these service clusters comprises section 8 of this report.

Before the National Experts undertook their own in-depth analysis of the selected cases in their respective countries, the two research partners piloted the methodology, questionnaire guidelines and case study template report by preparing a case each in Denmark and Germany.

The following annexes provide background material on this step of the research:

- Annex 3 shows all cases from the national good practice lists grouped by service cluster and provides reasons for allocation to the European good practice list.
- Annex 4 comprises the case study report template and in-depth face-to-face interview guidelines.
- Annex 5 provides tables with national responsibilities for service delivery.
- Annex 6: full good practice case reports of each of the 29 cases in the European good practice list.

Overall, the research process was very successful. One possible weakness, however, is that it is of course impossible to be fully sure that all potentially good cases across Europe have been captured during the course of the research. In some countries for many services only one single central access URL is given, so that it is relatively easy to find all relevant cases. In other countries, however, where many services are organised de-centrally and often multiplied across all municipalities, each with important differences, it was impractical to survey all potential web-sites, for example in Germany.

[14] Based upon the categorises used in the Cap Gemini Ernst & Young, *Overall report October 2001 to October 2002 online availability of public services: how does Europe progress? Web based survey on electronic public services*, February 2003.

5 Highlight results

The results and conclusions put together in this report derive exclusively from the examples of eGovernment good practice cases investigated in this study, and particularly from the 29 cases examined in depth and presented in Annex 6. This report is, thus, not a comprehensive review of all aspects of European eGovernment, especially given its geographical focus only on current EU Member States plus Iceland, Norway and the European Commission itself. However, this report does, where relevant, place these results and conclusions firmly within the wider European eGovernment context. That said, this report does claim to be a thorough review and analysis of eGovernment success stories within this geographical realm, as well as a significant repository of inspiration for decision-makers in eGovernment seeking to learn from the experiences of others.

5.1 Overview of services

It must be stressed from the outset that the 29 cases selected and analysed in this study as European good practices have not been ranked against each other or against those not selected. Indeed, non-selection does not imply unsuitability or inferiority in any way. Selection took place in order to obtain a balance of countries, institutional and service types, within the time and resources available for the study. It was also affected by access to case material, relevant personnel and data. For example, in some situations, although excellent cases could be identified, it was not possible to pursue all the necessary multiple strands of evidence necessary for doing the case justice. Thus, the 29 cases should be seen as representing European rather than national good practice, given that most of them could easily have been replaced by a similar case from another country. The analyses developed from the 29 cases should thus be seen as instructive and illustrative examples of the best in Europe anno 2003, but are far from being the only examples which could have been used.

An examination of the table overleaf, in conjunction with the results presented later in this report, provides some interesting observations:

- Examples of multi-service/multi-stage cases (model D in section 4.1.5) are quite infrequent. Of the most advanced 127 cases analysed in step 2 of the research, only 22 fully digitised cases were found in 11 out of the 17 countries. Thus, it is clear that, despite some forerunner examples, electronic public service investment within Member States has to date tended to leave established processes and organisational and service structures largely in place.

- The pattern of services shown in the table overleaf shows that not all types of service are equally well represented:
  1. **front runner services**:
     - 'income generation' (for government) aimed at citizens or business (e.g. tax, customs, employers service contributions) – 16 countries out of 17
     - registration services plus licenses and permits aimed at citizens or business (e.g. car, documents, new company, etc.) – 16 countries out of 17
  2. **second rank services**: 'providing direct financial benefits aimed at citizens or business' – 12 countries out of 17
  3. **third rank services**: 'providing direct social benefits for citizens'' – 9 countries out of 17
  4. **absent services**, which raises the question of whether, at least at this point in time, some services are not suitable for full digitisation for various reasons:
     - passport and driving license – photographs and signatures are necessary, so that personal presence is likely to be a high priority especially in the current highly security conscious climate
     - unemployment benefit – again personal presence is desirable in order to control behaviour and ensure the applicant is actively seeking work
     - medical cost reimbursement – this perhaps represents a financial loss for government.

Table showing the distribution of 115 good practice cases from the 'national good practice lists' by country and service

The 31 selected for in-depth study, as 'European good practices', are shaded, two of which (marked with an asterisk*) could not be completed.

Service	eServices for citizens																	eServices for Business									
	Income generating eSer-vices	Registration eServices			eServices providing direct financial benefits					eServices providing direct social benefits			eServices for licences and permits					Income generating eServices				Registration eServices		eServices for licences and permits	eServices providing direct financial benefits		
Country	1. Income Tax	5. Car registration	9a/b. Birth & marriage certificates	11. Change of address	2. job search	3a. Unemployment benefit	3b. Family allowances	3c. Medical expenses	3d. Student grants	8. Public libraries	7. Declaration to police	12. Health related services	4a. Passport	4b. Drivers licence	6. Building permission	10. Enrolment in higher ed.	Citizen portals	13. Social contributions	14. Corporation tax	15. VAT	18. Customs declaration	16. New company	17. Submission of data	19. Environment permits	20. public procurement	Business portals	Total
Austria	1			1	1										1		1				1	1	1		1		**9**
Belgium			1		1													1				1					**4**
Denmark				1					1	1							1				1		1				**6**
Finland	1			1							1	1			1	1		1					1	1		1	**10**
France	1		1		1													1		1					1		**6**
Germany	1		1						1	1					1			1							1		**7**
Greece	1		3		1													1		1			1				**8**
Iceland	1	1							1						1												**4**
Ireland	1	1					1									1			1		1						**6**
Italy	1	1								1					2	1		1				1		1			**9**
Luxembourg			2																								**2**
Netherlands	1	1			1		1		1		1	1				1							1	1			**10**
Norway												1				1			1				1*		1		**5**
Portugal			1								1								1		1	1					**5**
Spain	1						1				1				1				1		1					1	**7**
Sweden				1	1											1			1		1	1				1	**7**
UK				1			1			2	1				1	1				1	1						**9**
EC					1*																						**1**
Total	**10**	**4**	**9**	**5**	**7**	**0**	**4**	**0**	**4**	**5**	**5**	**3**	**0**	**0**	**8**	**7**	**2**	**6**	**5**	**3**	**7**	**5**	**6**	**3**	**4**	**3**	**115**

Note: service numbers refer to the eEurope common list of 20 basic public services (see section 2.1.2)

- Although the above results are based upon a qualitative investigation, and are not taken from a fully scientifically developed sample, they do reflect the results of other more large scale and quantitatively rigorous research[15]. This lends credence to the belief that the present study has been able to analyse a relatively representative sample of European eGovernment cases at least in relation to the types of services selected.

- It seems that services provided by a single centralised administrative unit have the highest levels of online service delivery and back-office integration. For example, income tax is generally the responsibility of a centralised treasury office, and helps generate income for government. It can be put online with a single application suitable for all tax payers and has the highest rollout of any eGovernment service.

- Other centrally coordinated services that are well represented are job search, business services (especially those generating income for the government), registration and licences/permits, enrolment in higher education, public libraries and declaration to the police. Although many of these are delivered locally, some with local adaptations, they tend to be national systems run by one agency involving large amounts of data.

- There is also a clear distinction between services which generate income for government, which are very well represented, and those which do not which are less well represented.

5.2 Major good practice strategies

Detailed analysis of the 29 good practice cases has identified eight major strategy options currently being pursued within the most advanced European eGovernment initiatives. They represent successful major approaches in using ICT to improve services and/or reorganise back-offices. It must be emphasised that these strategies are not, of course, exclusive, but are typically combined in various ways, depending on circumstances, needs and aspirations.

1. Digitisation of largely unchanged back-offices – typically where existing back-office arrangements function well, so are easy to digitise without significant changes enabling high quality on-line services to be implemented for users.

2. Deep reorganisation of back-offices – this strategy is required where existing back-office arrangements are complex, unintegrated and maybe in crisis, so that significant reorganisation is required in order to implement high quality services for users.

3. Centralisation of back-office and de-centralisation of front-office functions – represents a rationalisation of back-offices and their functions (e.g. data-storing and management) in order to increase efficiency and make savings, whilst recognising that users require local contact or adaptation.

4. Back-office clearing house – a useful strategy where existing back-office arrangements are relatively complex and often unintegrated but are difficult to change, so a separate data exchange mechanism is established for use both between agencies and with users thus ensuring high quality on-line services.

5. Generic types of interaction between user and agency – can provide important economies of both scale and scope by modularising common back-office or service components over a broad area, whilst retaining flexibility to adapt to specific requirements.

6. Portals – a user-centred approach which presents bundles of existing services in a manner and context suitable for particular user activities or profiles, rather than reflecting existing back-office arrangements.

7. Pro-active services – as back offices become more and more integrated and able to share data and resources amongst themselves, it is possible to offer services which require little or no initiative from, or action by, the user, thus saving the user time, expense and effort.

[15] For a recent comprehensive review of this research, see Millard, J. (2003) *ePublic Services in Europe: past, present and future – research findings and new challenges*, prepared for the EC's Institute of Prospective Technological Studies, Joint Research Centre (http://www.jrc.es), Sevilla, Spain, September 2003.

8. Greater user responsibility and control – greater back-office integration and interoperability enables users to take more responsibility and initiative, so the user can determine, largely on an individual basis, precisely where, when and how the service is to be used.

The above strategies are described, analysed and exemplified in detail in section 6.

5.3 Major good practice issues

Detailed analysis of the 29 good practice cases has also revealed a number of major issues and sub-issues which seem to be critically related to good practice regardless of the type of strategy mix being pursued.

1. Meeting user needs and expectations
   - Service design
   - User support
   - Marketing and take-up

2. Managing change and human resources
   - Management and decision-making
   - The locus of pressure for change
   - Public-private partnerships
   - A phased implementation process
   - Human resources

3. Costs and efficiencies
   - Cost-benefit analysis and impact measurement
   - Costs and staff savings
   - Assessment, quality control and measuring impact

4. Institutional and legal structures
   - Legal and regulatory conditions
   - Pressure from legal changes
   - Cultural and institutional dependencies

5. Technology issues
   - Standards and interoperability
   - Identity management
   - On-line payments
   - Data security

The above issues are described, analysed and exemplified in detail in section 7.

5.4 Good practice by service cluster

As described in section 4.2.3, the 29 good practice cases were selected, not only on a country basis, but also to balance the different services represented in the eEurope common list of basic public services (see section 2.1.2). Services are also grouped into 16 clusters representing the two main target users (citizens and businesses) as well as in relation to the purpose(s) of the service, as follows:

Citizens eService clusters:
- income tax (Finland, France, Spain)
- car registration (Italy, the Netherlands)
- certificates (Austria, Germany*)
- family allowances (Ireland, Spain)

- student grants (Denmark, Netherlands)
- declaration to police (Finland) and public libraries (Denmark)
- building permission (Germany*, Italy*)
- enrolment in higher education (Finland, UK)
- citizen portals (Austria, Denmark)

Business eService clusters:
- social contributions for employees (Belgium)
- corporation tax and VAT (Ireland, Portugal, Greece)
- customs declarations (Austria)
- new company (Italy*)
- public procurement (Austria)
- environment-related permits (Finland)
- business portals (Spain, Sweden)

** Countries marked with an asterix do not deliver the service nationwide but at the municipal level, or cover several but not all entities.*

Detailed good practice reports for each of the above 16 service clusters are presented in section 8.

5.5 Good practice cases

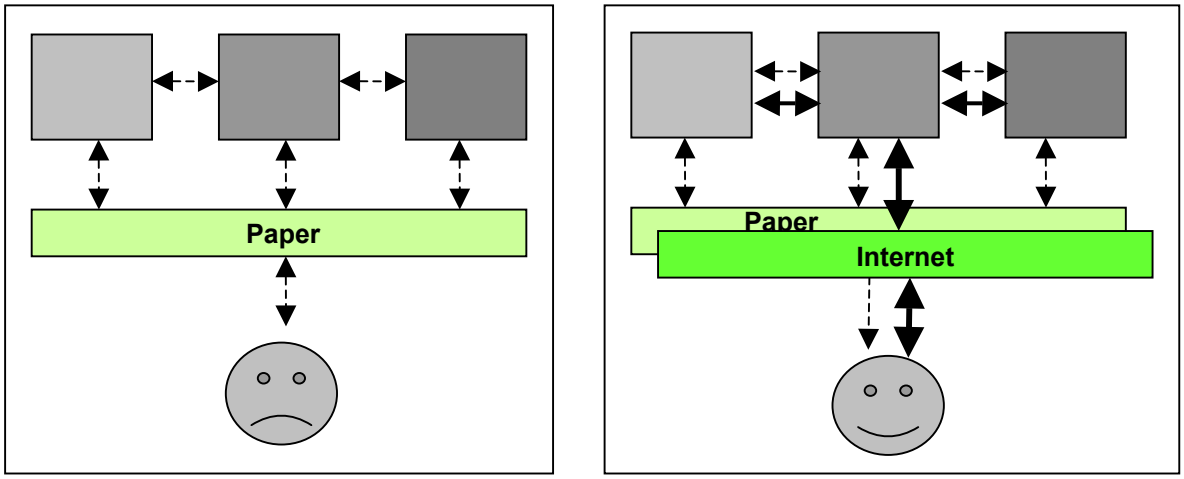
Individual and detailed good practice reports for each of the 29 cases are presented in Annex 6.

6 Major good practice strategies

Detailed analysis of the 29 good practice cases has identified eight major strategy options currently being pursued within the most advanced European eGovernment initiatives. They represent successful major approaches in using ICT to improve services and/or reorganise back-offices. It must be emphasised that these strategies are not, of course, exclusive, but are typically combined in various ways, depending on circumstances, needs and aspirations.

6.1 Digitisation of largely unchanged back-offices

Rapid progress in eGovernment often depends on whether or not there is a history of back office integration and cooperation, particularly if this incorporates interoperable legacy technology. Thus, the historical organisational and technological legacy can be a decisive factor. Where this history has resulted in existing back-office(s) and legacy technology which are relatively well integrated and functioning successfully, it may not be necessary to undertake significant organisational or even technological changes when introducing eServices. In many cases, it can be quite easy and quick to simply digitise existing workflows and organisational inter-linkage, and/or just erect a virtual front office using web technology on top of the existing legacy technology in the back-office, or even some combination of both. In all such cases, the existing back office integration is more or less cemented as is. For relatively modest investment, this can lead to not insignificant savings, improved jobs, better, faster and more transparent user services, and better user interaction, for example by giving the user greater access and more responsibility and control.



Even in cases where the existing organisational arrangements are quite complicated and not necessarily operating optimally, if the traditional service is anyway functioning relatively well and not in crisis, it is unlikely to be a top priority candidate for significant reorganisation of back-offices or of workflows. However, what is typical of this strategy, is that services have been put on-line nonetheless, and that so doing can improve service quality for users and save costs for the agencies, as well as enhance the working conditions of agency staff.

Further, these improvements are often, compared to initiatives requiring large scale reorganisation and/or technology investments, relatively easy and cheap to undertake because there are no, or very few, new organisational or workflow changes nor new work process structures to introduce. Thus, digitising a largely unchanged back office, and/or erecting a virtual front office on top of this, takes advantage of existing systems to avoid developments from scratch, emulating the existing service on the Internet to improve service delivery.

A relevant example of this good practice strategy is the **Austrian customs declaration** for out-of-EU trade, which arose from strong pressure from the Austrian business community. This was not because of an inherently poor service as traditional customs services go, but because better services were being provided by rivals in other EU countries for such trade which had put their services on-line, resulting in the threat by Austrian importers and exporters to move their business out of Austria.

In this Austrian customs declaration case:

- the existing organisational arrangements were relatively simple and well integrated, thus little reorganisation was necessary
- the technology solution for introducing an eService was the digitising of existing workflows and architectures and the addition of a web-based front-end
- the job functions, tasks and skills of staff changed for the better, and some staff resources were saved, and other costs reduced.
- considerable decentralisation of responsibility and control direct to the users themselves (business importers and exporters) took place, providing them with a more rapid, accurate and fulfilling service.

Other examples of the digitisation of largely unchanged back-offices include:

Citizens eServices:

- **Income tax in France**: while putting the service online, the basic principle of income tax declarations did not change as a result of digitisation, the same information has to be provided in basically the same period; what was done in the past via post and traditional payment can nowadays be done via the Internet.

- **Car registration in Italy and the Netherlands**. In both cases, digitisation of the service has led to a reorganisation of service provision, as certain databases are now digitally connected, and thus to changes to the working steps for staff and users, but this has not involved any changes to the organisation of back-offices..

- **Student grants in Denmark**, in which only a web front-end was laid on top of the existing organisational cooperation, workflows and legacy technology, resulting in much less and more interesting work for staff and a much more responsive and accessible service for users, who were also given much more responsibility and control.

- Social benefits, **public libraries in Denmark and declaration to the police in Finland**, in both cases few or no changes to existing well functioning organisational structures and integration have been necessary; in Denmark, new flexible and highly compatible eSystems have been laid on top of existing software which varies from library to library; in Finland, new technology has been installed at the front-end of the citizen interface of the existing system, leading to fast dissemination and take up of the service.

- **Building permission in Bologna, Italy**, which emulated the existing working steps on-line to the greatest possible extent without huge reorganisation of the service.

- **Enrolment in higher education in the UK**, where there has been a long and stable history of relationships between stakeholders, so digitisation and integration have been relatively easy and successful.

Business eServices:

- **Registration of new companies in Italy** where there have been few or no changes to existing well functioning organisational arrangements and integration, and mainly just digitisation of existing workflows.

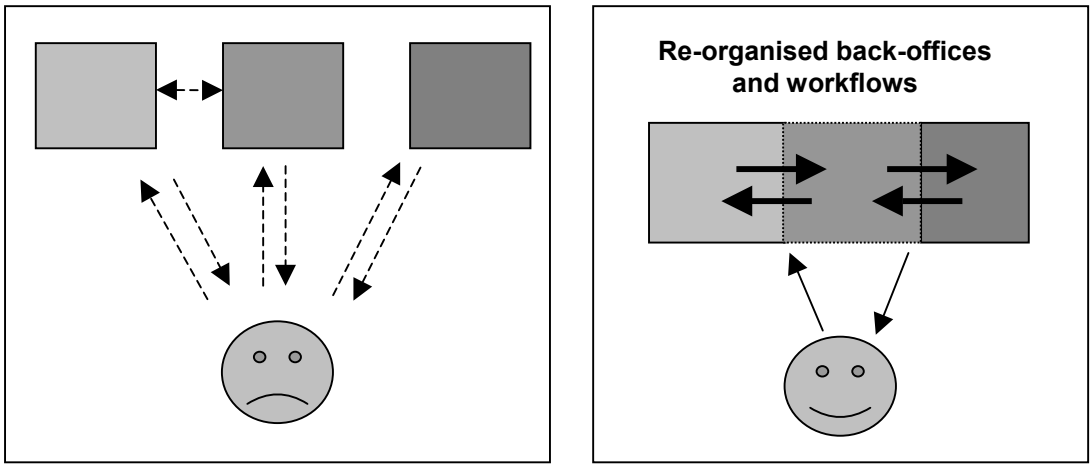
- **Public procurement in Austria**: the SBA-Online service is based on the need for a change in service provision and triggered only slight modifications to the organisation of back-offices, given that the new online service involves all those actors who have already been cooperating for a long time regarding schoolbook orders. The re-organisation of back offices was not envisaged since there was no need or option for changing organisational structures.

- **Portals in Spain and Sweden**, where in both cases there has been no need for re-design from scratch; in Spain, the majority of processes and working routines between the different agencies involved were already in place before the portal was created, and consequently the major challenges were related to the integration of front-end and back-end IT systems, integration with banks, security issues and the legal framework; in Sweden, most organisational relationships and data integration, including with banks, were largely in place before the web-based services were introduced.

6.2 Deep reorganisation of back-offices

As described in section 6.1 above, the history of back office integration and cooperation, particularly if this incorporates interoperable legacy technology, is an important consideration when introducing on-line services and seeking to reap rationalisation and quality benefits. A given organisational configuration is often directly reflected in the technology which supports it, indeed they are normally mutually dependent, so a deep change in one would typically require a deep change in the other, thus making change even more challenging, potentially difficult, time consuming and expensive. However, deep change may be necessary if the back-offices are malfunctioning to any significant degree and/or the service is not living up to acceptable standards or to widespread user demands. Whether or not deep change is occasioned by such a crisis, or propelled by central government initiatives or other irresistible drivers, the rewards can, on the other hand, also be considerable, and not only in the long-term.

Contemplating a deep reorganisation of back-offices, and the concomitant front-office changes that go with them, can enable, indeed is often driven by, a complete re-think from scratch of the whole system and philosophy of service design, production and delivery. This may be the result of badly integrated back-offices, at least in relation to the needs of digitisation, or where the legacy technology is unsuitable (or too expensive) for continued use when improving services.



Where a service is not functioning well, is inherently in crisis or otherwise needing reform, independently of any role ICT could play, digital technologies have been shown to be both an excellent catalyst and an important means of fundamental reform. Thus, deep reorganisation of back-offices normally involves a re-thinking of the complete service organisation and delivery, of the work process structures and of the interoperability between back-offices and different organisations.

A relevant example of this good practice strategy is **student grants in the Netherlands**, where there was a pressing need to improve customer services and customer relations, which would in turn lead to improved public perception of the IB-Group, responsible for administering student loans and other student services. In 2000-2001, the IB-Group had an extremely negative image and reputation resulting from very poor performance over previous years, and the group recognised that relationships with its customers would only improve if it improved its performance overall. The only way to achieve this was to initiate fundamental changes at both ends of the organisation. Improvement in customer services generally would lead to more efficiency in the front-office, and was also dependent on dramatic changes in the back-offices and a complete re-think of the way the service is organised.

In this Dutch student grant case:

- the service needed reform (it was in fact in crisis, with questions being asked in the Dutch Parliament), independently of whether or not digital technologies would be introduced
- the legacy organisational arrangements were relatively complex and not well integrated, necessitating comprehensive back-office and inter-agency reorganisation, which could have met resistance from lower level or

departmental managers, but has not been a problem in practice because the drive for change has also come from these staff themselves, as well as from users
- the technology solution was quite fundamental and far reaching, not only adding a web front-end to the legacy systems but also digitising, sometimes for the first time, many workflows, introducing new communications software to provide cooperation between previously un-cooperating back-offices and agencies, etc.
- significant changes in the job functions, tasks and skills of staff arose, many of whom have experienced less routine and more interesting work as a result, but there has also been a considerable loss of staff overall
- there has been a decentralisation of responsibility and control direct to the student users themselves, not just to improve data accuracy and more responsive services, but also to remove the chore of data input from staff as much as possible.

Other examples of the deep reorganisation of back offices include:

- **Citizens personal documents, residence registration, in Austria**, and, to some extent, birth and marriage certificates in Bremen, Germany, where both are characterised by comprehensive reorganisation of the service provision. While Austria's solution is characterised by a strong integration of front-office and back-office with a sophisticated service provision which can be accessed fully on-line, the main emphasis of Bremen's solution lies on the integration of the back offices responsible for service delivery with the back office of the cash desk responsible for all payable transactions within the public administration.

- **Citizen family allowances in Ireland**, which shows how the process of claiming child benefit payments have been changed quite radically. The relevant developments included a major reorganisation and development of the back-end child benefit system as well as developments in the civil registration process in Ireland that support automatic and proactive triggering of the initiation of the child benefit claim after the birth of a child. The redesign of the child benefit service encompassed the implementation of a new service delivery framework that involved the re-engineering of back office systems (business processes and procedures, and technology architecture, tools, development platform, redesign of legacy systems) around customer access channels and the adoption of a pro-active/automated approach to delivering customer services.

It may not be the case that all aspects need deep reform, at least at the same time. For example, the focus may be mainly upon a re-configuration of formal organisation structures and arrangements, or on new and integrated workflows, or new types of working arrangements, manning and use of technology. Such on-going reform could involve the continued use of existing networks and relationships, but combined with reorganisation involving digitisation of workflow, or where reorganisation and integration seem to be ongoing over many years so that only partial reorganisation may be necessary when digitisation is first undertaken and on-line services are introduced. Examples of such partial or on-going change include:

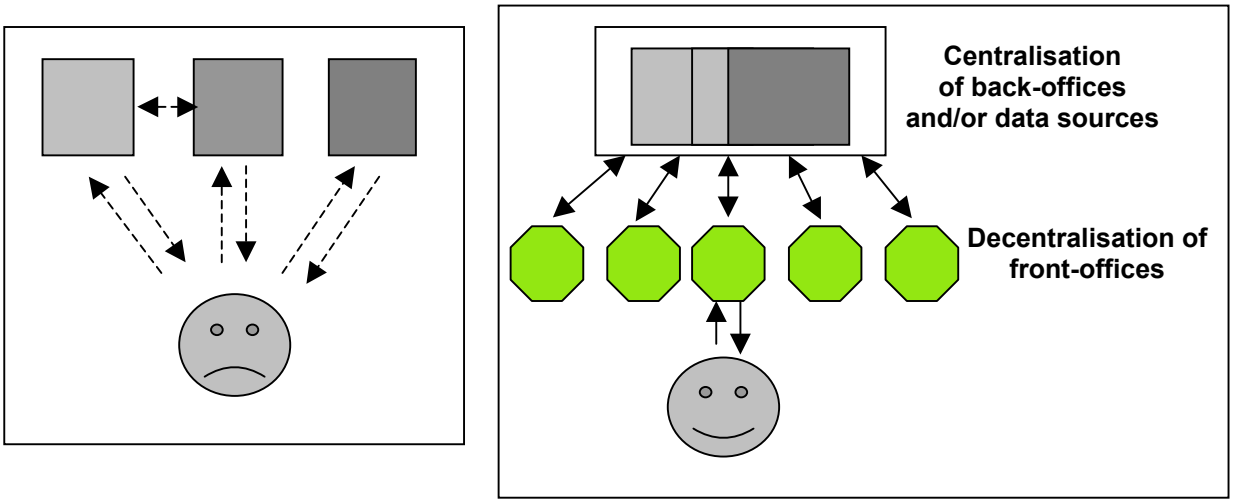
- **Citizen incomes tax in Finland and Spain**, where both are part of longer term changes and, in fact, connected to packages of services as part of portal development.

- **Citizen building permission in Esslingen, Germany** and, to some extent, in **Bologna, Italy** where partial but still deep-seated changes have been introduced.

6.3 Centralisation of back-office and de-centralisation of front-office functions

An important strategy in eGovernment, driven by the need to increase efficiency whilst providing a more effective, higher quality service, is to centralise some or all back-offices and/or their functions (e.g. data-storing). Such concentration can provide a strong rationalisation effect which focuses expertise, reduces errors and time delays, and is able to exploit economies of scale which a large number of de-centralised units undertaking largely similar functions cannot hope to emulate. There may be legal or political barriers to such centralisation, as well as intractable problems resulting from a long tradition of separate operation and identity, but where these can be overcome, centralisation can provide significant cost savings and better services. A centralised back-office can sometimes appear in the guise of a 'middle-office' or 'shared service centre'.

A concomitant to centralisation of the back-office is de-centralisation of the front office. Occasions when the latter can provide benefits often depend upon the type of service, and particularly whether there are direct user benefits resulting from multi-channel and devolved delivery. Such a situation can arise, for example, when an on-line service delivered from a centralised back-office or data-source is complemented by a series of local front-offices providing face-to-face support and advice, as well as necessary local knowledge. It can also be important to satisfy the interests of local democracy and subsidiarity, so that service delivery is adapted to suit precise local conditions. A centralised on-line service complemented by local refinement need not, of course, only be based on in-person delivery, as the interests of local relevance and local democracy could also manifest themselves in locally adapted on-line services.



As a general rule, the centralisation of the back-office and/or of data sources can make sense for services or aspects of services which are standardised across a large geographic area (normally a nation or federal state, although, of course the efficiency and quality advantages multiply if undertaken at a European level where this makes sense and is possible). Where a service or an aspect of a service is dependent upon local needs or democracy, or where physical delivery is a necessary component of service delivery, it may make sense to de-centralise the front-office. In cases where a service has a mix of both standardised and locally-dependent aspects, clearly centralisation and de-centralisation can complement each other.

A relevant example of this good practice strategy is the **citizen car registration service in Italy**, which, prior to the launch of the on-line service, was characterised by numerous steps which both users and staff had to go through. Thus, after purchasing a car, the car owner had to make five visits to different public offices to register ownership. Later on, applying for, or renewing, the yearly road tax required a similar time consuming procedure. The main challenge was therefore to by-pass this huge bureaucracy and time-wasting procedure. An on-line solution was needed which centralised the various databases maintained by the different agencies. Now, car owners can register their car directly at the car dealer, for example when purchasing a car, or go to a registration office and register their car within one single visit. Staff undertake the online-registration via the 'e-counter' procedure on behalf of the car owner. The result is a

unified 'e-gateway' database, linking the various public, car dealer and auto club databases. This provides instant on-line access anytime and anywhere to the whole system. Today, when purchasing a car from a dealer, a user with the help of the staff can register ownership on the spot and in a few minutes. If a car is not purchased from a dealer, or when road fund taxes have to be paid or renewed using the e-payment facility, this can be done from any of the offices of the two public administrations, or at any one of thousands of car dealers spread throughout the country, regardless of where the car was initially registered.

This Italian example shows how:

- centralising back-office databases as a standardised and unified service maximises interoperability, enables service provision in real time and minimises errors
- de-centralising the front-office exploits the existing widespread car dealer network as qualified mediators of car registration and e-payments, so that resources do not need to be spent on extending the existing but limited public office network.

Other examples of the centralisation of back-offices and data sources, and/or the de-centralisation of front-offices, include:

Citizen eServices:

- **Income tax in Finland and Spain** which have centralised a large number of data sources across the country to provide a unified, instant access service. In addition, the Finnish case also involves some de-centralisation in which 446 local tax back- offices were reduced to 130 in a context where these offices are generally not acting as front-offices, and where 70% of citizens accept a pre-filled form sent to them as part of the of the pro-active service offered.

- **Car registration in the Netherlands** illustrates both the centralisation of back offices and data sources, as well as the decentralisation of front-offices. In the 1990s, car owners persistently campaigned for a reorganisation of the car registration procedure which required the separate registration of vehicles on three different registers, with low data integrity. Reorganisation resulted in one centralised database, which is also now fed by a large number of other organisations, and the complete reorganisation and centralisation of the car registry agency itself. In addition, a very large number of additional front-offices, through both the existing post office and car dealer networks, was made available.

- Personal documents, **residence registration in Austria** where a new registration system was developed based on digitisation of workflows at both national and local levels. A key component was the establishment of a central electronic register of residence in March 2002. Before that, residence information was kept on paper forms and on stand-alone computer systems. A copy of the registration form, which had the status of an official document, was handed to the citizen upon registration. Citizens had to produce this form whenever their place of residence had to be verified. Today, programming interfaces are provided to allow agencies and privileged private organisations to query information on citizens directly from the centralised registry.

- **Family allowances in Spain**, where relevant data sources have been centralised to provide the pro-active child allowance service within the tax agency, as part of the wider on-line tax programme. Data is needed both on births and on income tax paid by mothers, so that the child benefit in this case is seen as a tax allowance to encourage mothers to work, paid either by reducing the tax burden or by a corresponding payment to compensate for tax paid.

- **Student grants in the Netherlands**, where both the back-offices of the responsible agency have been centralised, as part of a deep reorganisation of the service, as has data from relevant tax agencies, the Central Bureau of Statistics, the Educational Inspectorate, the municipalities and bank and insurance companies. Further, de-centralisation of front-offices has taken place through thirteen regional front offices providing a face-to-face and regionally-geared service on student grants, as well as a range of other services for students.

- **Building permission in Esslingen, Germany, and in Bologna, Italy**. In Esslingen, the centralisation of all planning data allows faster service delivery by giving the various stakeholders access to all relevant data in one place. In Bologna, the data has been centralised and the relevant offices moved closer together geographically so are now situated at one single address. Now the users need to visit only a 'single point of access' within a single building to apply for a building permission. This also unifies all necessary functions under a joint desk for enterprise

and construction companies. This means that customers only have to go to one place in order to deal with planning-related services, and that the various relevant public offices can use geographic closeness for improved cooperation, including face-to-face communication.

- **Enrolment in higher education, both in Finland and the UK**, where, in the both cases, very large amounts of data need to be collated, for example, about students, their results, wishes, universities, types of courses, etc., and various legacy systems need to be incorporated. This has been one of the major technical challenges, and has been successfully achieved through the use of data standards and conversions, and by ensuring scalable, flexible, resilient and secure systems, including the centralisation of relevant data by the agencies concerned.

- **Portal development in Austria and Denmark** has seen both the centralisation of back-offices combined with the decentralisation of front-offices. Both cases show that it takes time and resources to build a successful portal, and both show that what is needed is a strong organisation with resources, development competencies and persistence that undertakes this kind of task. It is also quite clear that even though portals must developed centrally they can never become a success if the local administrative offices see no benefit from use and integration with them. Development of portals and specific services must therefore pay special attention to the heterogeneous group of stakeholders (normally local service providers) in order to satisfy all needs. It should be noted that both cases are from countries with a very de-centralised structure, which is why the issue of the central development and local implementation is so important.

Business eServices:

- **Business corporation tax and VAT in Greece, Ireland and Portugal** all demonstrate data source centralisation and processing taking place at national level, coupled with a face-to-face user interaction role at local tax offices. In the Greek system, the centralised data bases of the National Office for VAT provided the means for the development of local autonomous applications to ensure operational self-dependence of the local tax offices. This system architecture has proved successful, bringing about the automation of linked internal procedures at national level and significant improvements in the operation of local tax offices. In Ireland, a major exercise in digitisation and back-office reorganisation was needed involving the integration of the previously separate back-end tax systems into the Integrated Taxation Processing system, and providing electronic links to the regional offices. Similar data centralisation linked to regional offices is taking place in the Portuguese corporation tax system, although the main issues to overcome here were the need for cultural changes and a strong driving vision to ensure necessary integration.

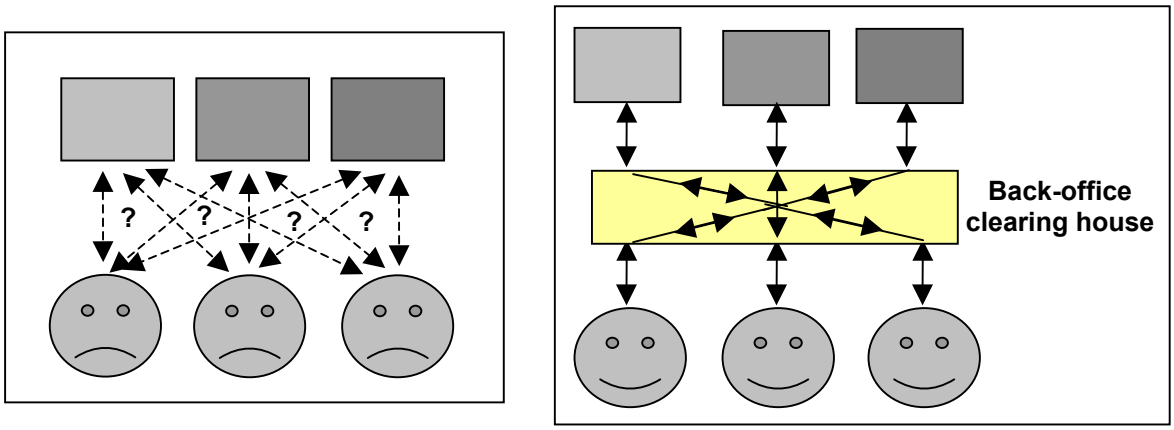
- **Business public procurement in Austria**, for the ordering of school books, where all relevant data relating to the whole schoolbook ordering procedure is centralised in strongly interwoven databases under a common roof, from which several services can be accessed at the same time, for use by the responsible Ministries (the Ministry of Social Security, Families and Consumer Protection and the Ministry of Education, Science and Culture), the schoolbook publishers, the schoolbook sellers and the schools themselves.

- **Business environmental-related permits service in Finland**, which integrates all data in a central database necessary for permit purposes as well as for data about the state of the environment. Relevant data is obtained from businesses, municipalities, the Environmental Permit Authority, private operators running a data clearing-house, and thirteen Regional Environment Centres which also provide a de-centralised front-office service.

- **Business portal in Spain** which provides ten different business services related to tax, most of which have been developed using a common template, and where data submitted by users is stored centrally so it can be re-used across all services. Standardised payment and authentification (digital signature) services are also available linked to the centralised database.

6.4 Back-office clearing house

An alternative to data source centralisation is the creation of a back-office clearing house. Whereas a centralised database of data sources contains the pooled data, and thus consists of both intelligence and raw data, even where these data are constantly refreshed from their original source, a clearing house enables data exchange and data interoperability by providing intelligence which registers and routes data remaining in existing databases. The clearing house thus ensures data exchange compatibility where this does not exist, and thus may be a cheaper solution than the wholesale centralisation of data sources where data standards, languages, semantics and syntax are incompatible and need to be able to communicate.



A separate back-office clearing house can sometimes appear in the guise of a 'middle-office' or 'shared service centre'. Its function is to provide a platform for the interoperability of diverse data, thereby enabling individual agencies to continue using their own legacy technology and data, and to continue to use their own processing systems, all of which have often been separately developed and built up over many years. Thus the clearing house is a data exchange mechanism, an intelligent messaging conduit, rather than a data capture repository. In many cases, a clearing house is outsourced, either within the public sector or to private sector specialists.

A relevant example of this good practice strategy is **business social contributions by employers in Belgium**. In this case, an autonomous public office called the "Crossroads Bank for Social Security" (CBSS) was established in 1991, not as a centralised database, but in order to manage registers about the location and type/format of the data it needs, and for whom and for which purpose these data can be accessed. The objective of the CBSS clearing house is therefore to identify and route data, regardless of its format. It is thus a highly intelligent data exchange mechanism rather than a large centralised database in its own right.

The users in this case are different employers, each of whom may have different data systems and formats, and each of which needs to communicate with a variety of different social security institutions, which again use different data systems, on behalf of each of their individual employees regarding social insurance, holidays, illness, accidents, family allowances, etc. Facilitating successful data interoperability and exchange between all these different organisations and their different systems is the role of the CBSS clearing house. Each employer needs to process the data obtained from the different social security institutions within its own system. The clearing house does not undertake this processing, but provides an exchange mechanism so that the employer receives data, in a format it can understand, regardless of their provenance.

Other examples of back-office clearing houses include:

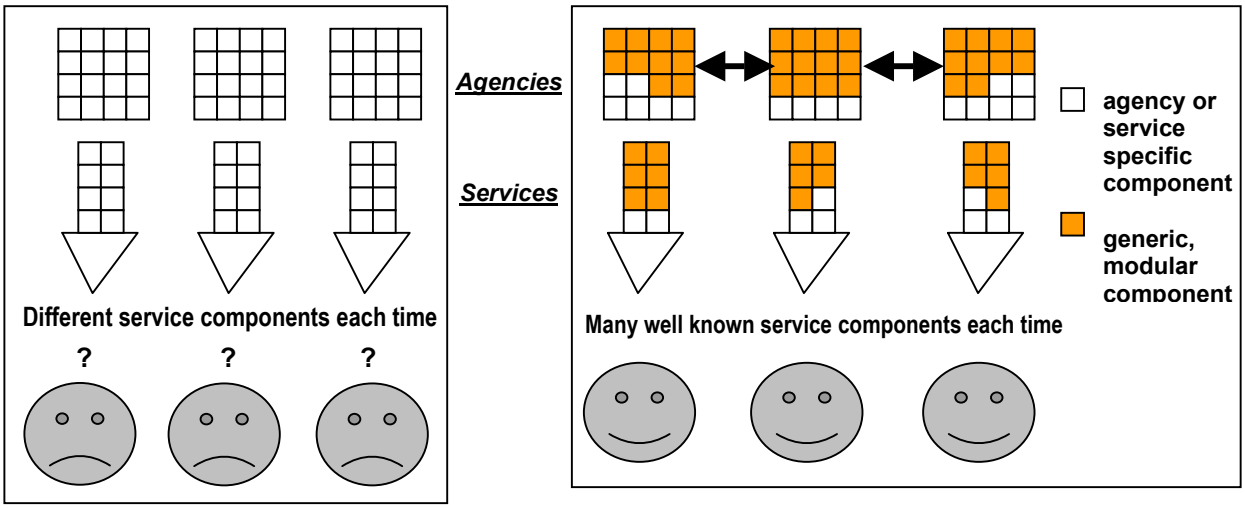
- **Citizen income tax, company VAT and corporate taxes in Finland**, where data-flow for all different types of tax information is managed by the TYVI-platform[16] and the messages between the applications, and especially between the big users, are mainly based on the EDIFACT-standard (although the use of XML is increasing).

[16] The TYVI-platform is the backbone of the Finnish data transfer that takes place mainly at the application to application level. The platform is described in the Finnish case studies in the annex.

- **Business environmental permits, also in Finland**, which, in addition to a centralised environmental information database also uses a private operator run clearing house, again on the TYVI platform, and used for data authentification, data validation and storage of registration data about customer and permits. One of the best and strongest features of the TYVI service is that it can inter-operate with a high number of technical and organisational combinations, and provides a low-cost and simple solution easy to implement in new contexts.

6.5 Generic types of interaction between user and agency

Many interactions between the user (represented by the front-office) and the agency (represented by the back-office) exhibit a large number of similar, if not identical, features. For example, at the front-end, web-functionality, accessing both general and specific information, accessing, completing and returning forms, making enquiries, identity management, making payments, etc. Similarly, at the back-end, agencies often need to provide all of the aforementioned, as well of course as digitising and rationalising work processes, providing security and data protection, implementing and exploiting knowledge management concepts, using standards in architectures, data formats, languages, semantics and syntax, linking to other back-offices and agencies, taking account of the needs of staff and of their skills and training, etc. There is a whole raft of potential similarities across many different types of on-line service, how they complement traditional services, and how back-office reorganisation takes place. If a given service or set of services does not share such similarities at the outset, it is likely to do so as a result of the re-think, re-design and digitisation which takes place. Indeed, this is an important driver of the digitisation re-think.



Economies of scale, as well as of scope, can thus provide many qualitative and efficiency benefits by standardising some common features to achieve savings, simplicity, ease of maintenance and upgrade, ease of use (whether by end users or staff) and re-use of successful features. These obvious benefits give rise to the development and use of generic types of interaction between a user and an agency, enabling the implementation of consistent services very fast and cost effectively. These systems can be made available at a relatively low price, and can also be designed to be locally customisable to fit any local systems, where the local provider can either host a service from their own web-site or run the service direct from the service developer/provider's site. In this way, the service developer can provide high quality digital service components at a price at which even small local agencies can afford, and, importantly, tailored to the specific needs of the locality. Such an approach supports the general trend towards centralising the back-office and de-centralising the front-office, towards developing portals, and is also part of the tendency which sees programming of both the front and back-end of systems becoming much easier and cost-effective.

A relevant example of good practice in the exploitation of generic and modularised types of interaction between user and agency is the **Danish citizen portal, 'Net.citizen'**. This bundle of services utilises four generic types of interaction between a citizen and the public agency, modulated in a microsoft.net environment, each used as a template. When KMD, the national service developer, for example develops a service for Net.citizen, it usually does so in cooperation

with one or two municipalities (the local agencies that will deploy the services) which are considered to be at the leading edge in their approach to digital services. This cooperation allows KMD to conduct work studies and BPR projects in order to develop the systems and implementation plans optimally. When KMD subsequently markets its modularised service components and supporting services, it can therefore point quite specifically to the areas where these should lead to efficiency gains. KMD's experience is that any re-organisation and/or HR-oriented cost cutting measures must be made simultaneously with the implementation of the service. If the systems is introduced without such changes, it can be very hard to push for organisational changes and efficiency savings afterwards.

The Danish citizen portal also exemplifies how the constituent service modules can be developed by a public-private partnership. KMD is not part of a general government strategy of eGovernment. However, all municipalities in Denmark are partners in Net.citizen, and KMD is fully owned by the central umbrella organisation of the Danish municipalities. In this sense, therefore, Net.citizen can be considered as public-private partnership made to raise the effectiveness of the development and implementation of digital service solutions across Danish municipalities. However, the role of KMD is also typical (regardless of whether it is public or private) of an organisation which at national (or federal) level develops and promotes common templates, generic horizontal services (like payment and user authentification). KMD develops, markets and implements these modularised service components as part of the portal package, but also for other services which are not necessarily included portals or used as such. Thus, the development and use of generic or modular service components is not confined to portals but represents a wider and equally important strategy.

Other examples of the exploitation of generic and modularised types of interaction between user and agency include:

- **Citizens income tax in Finland**, as well as **business environmental services in Finland**. The TYVI platform is the backbone of both sets of services as well as others not covered in the present survey, for example by supporting standardised data transfer at the application to application level, as well as between large users, and is presently based mainly on the EDIFACT standard, although the use of XML is rapidly increasing. TYVI provides modularised low cost solutions which are easy to implement for other services and within other environments.

- **Citizens "HELP" portal in Austria**, is based on the development of pre-fabricated modules as learning and development models to help bring other services rapidly on-line. HELP is based around the development of modularised components which can inter-operate within any eGovernment procedure in Austria. The portal is currently integrating transaction services within each state within the federal structure, as well as down to municipality level, and will also provide transactions at the national level. The goal for 2005 is that the portal should deliver every administrative service in Austria on-line.

- **Business portals in Spain and Sweden**. In Spain, all 10 business services are built on one template consisting of submitting data, receiving notice of amount to pay, initiating payment through the portal using a digital signature, awaiting validation of the digital signature, connecting the user to the bank, and finally paying via the Internet portal using an NRC (complete reference number). In Sweden, the Swedish Tax Board is a pioneer in component-based development. The creation of modularised interfaces and functions has been prioritised, but in relation to specific services also tailored to particular user needs. All components are based on an Internet framework consisting of a web-client component and a Java-based server component. Constituent services include tax statements and tax collection (both citizen and business), national registration, eDemocracy (running general elections), etc. Both Spanish and Swedish business portals have built their constituent services around existing integrated infrastructures between different agencies and back-offices, thus making design and implementation much easier than if each new service had to be started from scratch.

In addition to the above, there are examples where standardised and modularised components are used purely between back-offices, i.e. not directly in support of a user front-office service. For instance, in **Denmark**, such enabling components ease interoperability between agencies (typically between the state and municipality levels), and are being used to create substantial reorganisation and rationalisation effects, even though there are no citizens or companies as visible end-users.

Another type of enabling service component is the horizontal (or auxiliary) service like payment or security (identity management), which can be used as a facility by other user services. In **Denmark**, a digital signature is about to be introduced to support secure transactions, as is a service called 'e-box', which is already in use within the Danish portals for all secure monetary transactions. These modularised developments could mean that the majority of public services in the foreseeable future will not develop or implement their own systems and standards for security and

payment, but instead use systems that have the critical mass of widespread national public and private use, and thus become de-facto standards in the market. Both the Danish 'e-box' and the digital signature are developed and managed by public-private partnerships. Such enabling service could ease back-office integration by creating standards for data transaction.

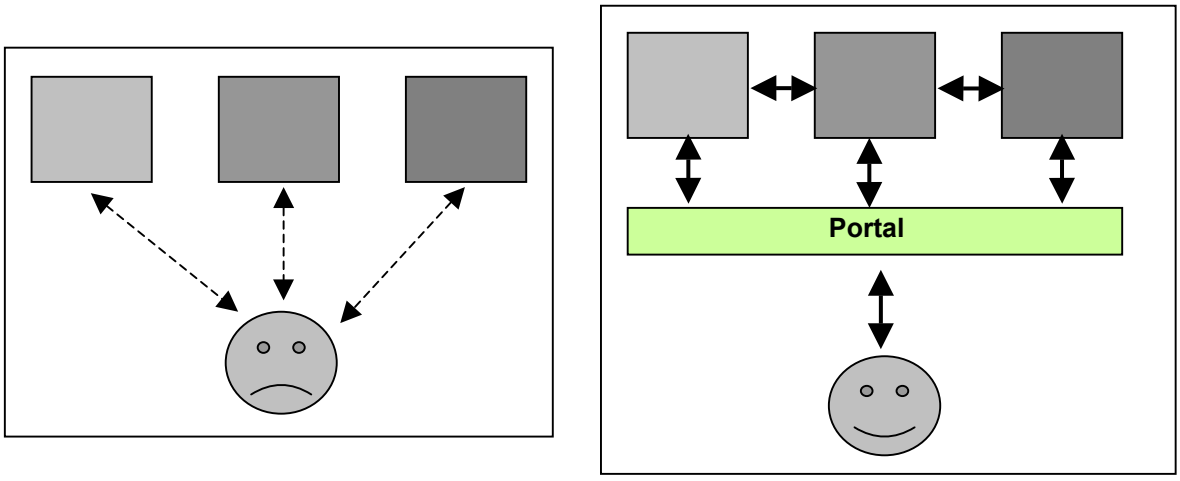
6.6 Portals

One of the major eGovernment trends of the last few years has been the development of portals. A portal, normally a web-site, provides users with an overview of, and access to, related services, typically as a one-stop-shop rather than the user having to visit a separate web-site for each service. Services in the portal are normally related to each other in some way, so that typically the user will need, or will wish, to use two or more of them to fulfil a particular requirement. An advantage of portals is often that what previously were separate services now appear as one service concept consisting of a number of steps or options. It is also more apparent to the user when his or her data, once given, are re-used in each of the steps without the necessity of keying them in again. A portal also enables horizontal services, like payment and security (authentification management), to be easily accessed from whichever service, or combination of services, are being used.

The distinctive feature of a portal is that its organising principle is not in relation to the back-offices providing them or the agency's own internal concerns and structure, but rather from the user's perspective. For example, a portal may be organised:

- for citizens, around life events, life episodes or the life cycle, such as birth, marriage, death, employment/ unemployment, education, living, home, working, sport and leisure, etc.
- for business, around business life events, e.g. starting a business, funding, legal and regulatory, business operations and trade, premises and environment, tax and finance, returns and other obligations, innovation, expanding your business, selling to government, closing or selling a business, etc.

Another, but overlapping, approach which appears to be more common in the good practice cases examined in the present study, is to organise a portal around the broader concept of large user targets groups, rather than life or business events, such as all citizens or all businesses, although this is sometimes also broken down, to give only several examples, into the elderly, youth, large businesses, small businesses, etc. For each of these target groups, an appropriate collection of services, or functional components, is assembled.



A relevant example of good practice in portal design, implementation and take up is the **Spanish business tax portal**. Here, the Agencia Tributaria (AEAT) is in charge of the effective tax and customs management at national level, for both citizens and business. A set of ten business services is made available as a specific business tax portal, including corporation tax, VAT, social contributions for employees, etc. Data submitted by business users is stored centrally so it can be re-used across all included services. The majority of services have been developed and implemented using a generic template, thus facilitating ease of use, interoperation and cost effectiveness. The portal takes the business tax

user through a series of steps and options. First, a company is requested to submit its data, and then it is informed of the amount it must pay. This can be done through the AEAT portal or by traditional means. If done via the portal, a digital signature provided by AEAT needs to be used for authentification. Once validated, , the service connects the user directly with the associated bank and the payment may take place using a uniquely generated NRC (complete reference number). Then the company submits a declaration, signed using a digital signature also provided by the Spanish identity management organisation (CERES) and associated trust centres, quoting the NRC. The digital signature is checked by CERES, and the NRC is checked with the bank. If the tax declaration results in a refund, information is sent to the standard refund system where an order to refund the money is generated. Before making payment effective, however, the system checks whether the company has any debts. If so, the refund is first used to settle these, and then the calculation is re-made to refund any difference or request payment by the user if the refund is less than the debt.

The Spanish business tax portal was first made available for large companies only in July 1998. Since January of 1999, it is obligatory for large companies to present their tax declarations using this portal. As result of the advantages presented by the portal, many SMEs (Small and Medium Enterprises) requested a similar service, which has been available since the third quarter of 1999. Significant publicity and information campaigns also take place. Overall take-up is thus very high, although no data are presently available.

Other examples of portals include:

- **Citizen portals in Austria (HELP) and Denmark (Net.Citizen)**, both of which offer, or have the goal of offering, all services relevant to citizens in their contact with the public sector. It is also quite clear that, even though such portals must be developed centrally, they can rarely become a success if the local agency offices see no benefit from integrating them into their local service portfolios. Development of portals and specific services must therefore pay special attention to a heterogeneous group of stakeholders in order to satisfy them all. It should also be noted that both cases are from countries with a very decentralised structure, which is why the issue of central development and local implementation is so important here. In the case of the Danish Net.Citizen, the ability of private companies to offer services directly related to the public services (for example, links to removal firms as part of the notification of address change function) , enhances the life event concept vis à vis the user. Also, user data is re-used between services (although there are still significant legislative issues related to this), thereby saving the user time.

- **Business tax portal in Sweden**, for company tax, VAT and social contributions, the major benefits of which for business users are the integration between reporting and payment, the 24/7 access and the fact that they get direct confirmation that the declaration has been processed. In many ways this is similar to the Spanish portal, except that use by large companies is not compulsory, which is one reason why at present there is only about 2% take-up, as is the fact that as yet little promotion of the Swedish portal has taken place.

- **Business corporation tax and VAT in Greece, Ireland and Portugal** are all part of one-stop-shop portals, or are planned to become part of one in the near future. In the Greek case, this is the so-called e-oikonomia tax portal for with both business and citizen interfaces. In Ireland, the portal is based on the Revenue On Line (ROL) concept which allows tax payers to make tax returns and payments and deal with other tax-related activities. In Portugal, a similar portal is under development as part of the Seg-Social concept, but taking a little longer than expected because of different institutional cultures and the initial lack of a strong vision and leadership, although now rectified.

- Similarly, the **Finnish TYVI system** is the platform for various portals, including those covering business environmental permits, business taxes, citizen income tax, etc. TYVI is the backbone of the Finnish data transfer system used for data authentification, data validation and storage of registration data about customers and service components. One of the best and strongest features of the TYVI service is that it can inter-operate with a high number of technical and organisational combinations, and can provide a low-cost and simple solution easy to implement in new contexts.

Generally speaking, the portals studied indicate that there are three different kinds of portal concept: specific, general and personal portals.

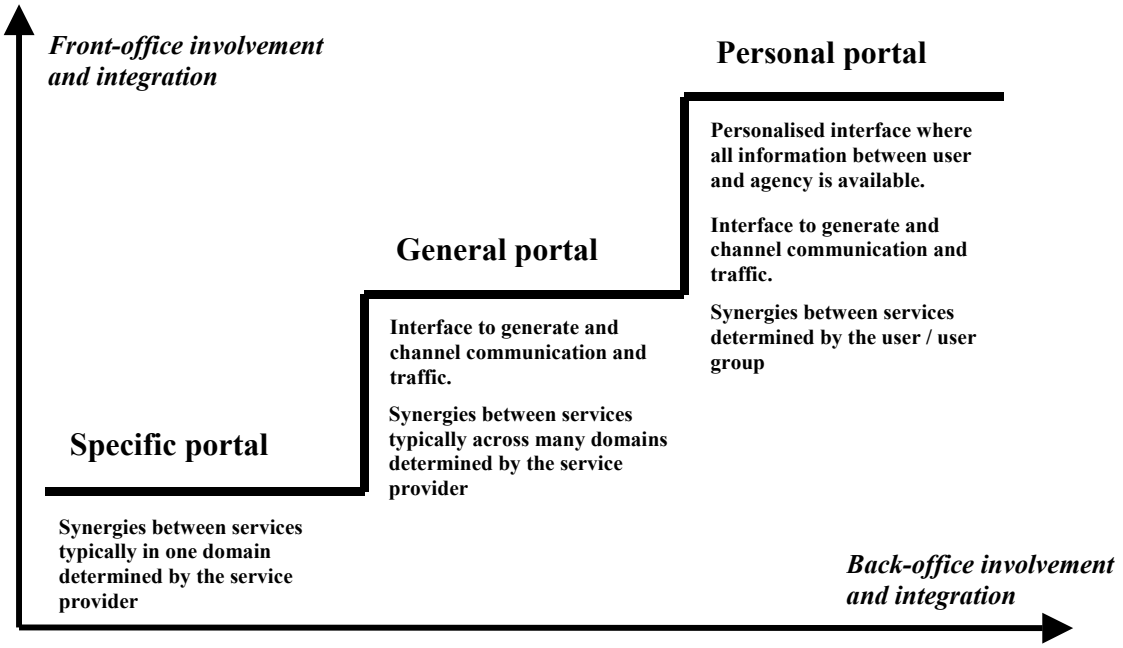
Specific portals are exemplified by the business portals in Spain, Sweden and Finland. These offer a limited number of services related within the same domain (such as income generating services for businesses). The portals are operated by the public agency which is most involved in the delivery of the service, and it is the goals and aims of this particular agency that drives the development of the portal. From a user perspective, the benefits are primarily that related services

can be accessed through the portal, and that relevant data may be re-used between services. The introduction of specific portals typically involves the back-end integration of systems (although this is in some cases something that has happened years before the portal is established) and a simple front-end interface.

Examples of general portals are the citizen portals in Austria and Denmark. These offer a variety of services, typically organised in a number of usage domains such as life event situations, and are created to be the overall digital interface between the public sector generally and citizens. Compared with the agencies offering specific portals, agencies and organisations operating general portals do not have a particularly interest in one administrative domain, but rather have a broader vision of the use of the portal. From a user perspective the added user benefits compared to a specific portal are the ease with which the totality of public services, and their inter-linkages, are made available. From an agency perspective the use of general portals increases the overall visibility of services, creates synergies between services in different domains, and is likely to increase the uptake of on-line services overall. The introduction of general portals typically requires front-end systems and services that are flexible and capable of being integrated.

Thirdly, the personal portal is seen more as an emerging trend and future goal, rather than currently widespread. The idea is that each citizen through his or her own personal portal can access just those public services he or she chooses to access. This could be set-up in the same way as is done in a general portal, but is instead determined by the user rather than the agency(ies). A personal portal will also be able to store and access all previous and on-going communication between the user and the agency(ies). The basic difference between the personal portal, on the one hand, and the specific and general portals, on the other, is that the former is designed and implemented by the user, whereas the latter are designed and implemented by the service provider. Personal portals could be designed and used by one individual or by a group of individuals having a common interest. Before such a vision can be fully realised, however, full integration of back-offices needs to be achieved, and, as the cases studied show, there are significant legislative and technical obstacles that must be overcome.

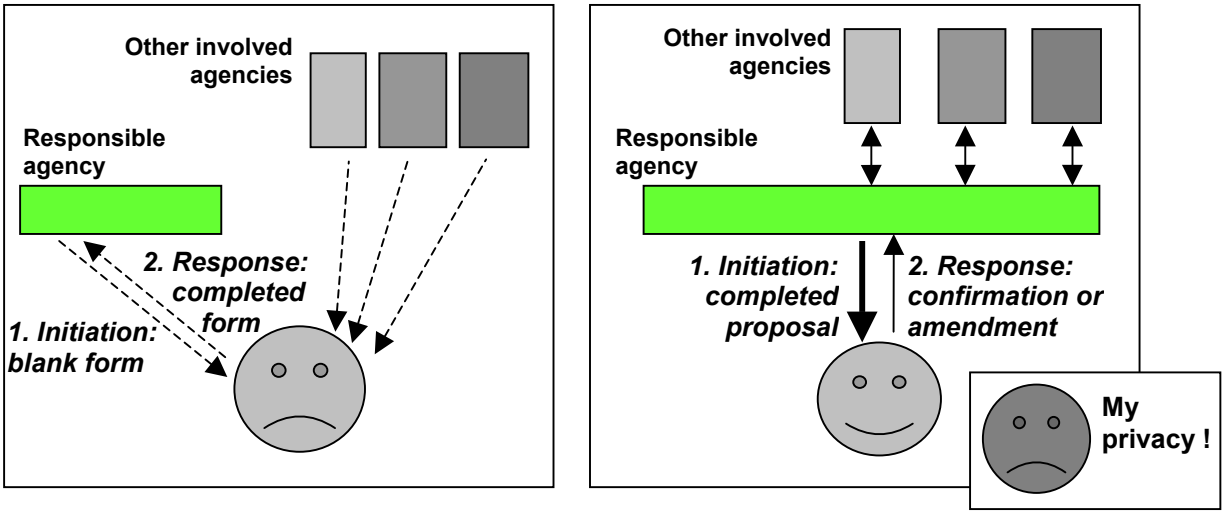
All cases clearly indicate that portals are an organising principle that benefits users as well as agencies. Portals may be used to generate more traffic, provide holistic services, initiate public-private partnerships, generate sufficient scale economies in development projects that need to be implemented locally, etc. The creators of service portals should therefore have a very clear vision of the portal, and the organisations behind the portal should also possess sufficient resources to ensure that the portal and its services becomes visible for the users, whether citizens or businesses.



6.7 Pro-active services

As back offices become more and more integrated and able to share data and resources, an interesting and growing strategy at the front-office is the ability to offer users a pro-active service. This is a service for which the relevant agency takes full responsibility to initiate, deliver and fulfil. Thus, the input and responsibility of the user is minimised and may even disappear altogether. Such services are therefore sometimes termed 'disappearing services'. This can be a huge advantage for the user, both because it removes the need to remember to identify when, where and how the service should be used, but also because it saves time and effort. It can also be an advantage for the user where services are based on, what for the lay-person, can appear complex legislation, multiple rules and difficult to understand procedures, requiring expertise rarely possessed by the average citizen.

For the agency, the ability to offer pro-active services can also brings important benefits. The agency can be assured that the service is activated at the right time and place, is efficiently and expertly fulfilled with no or few errors, and is not delayed by waiting for users to fulfil certain responsibilities or provide certain data. Typically, a pro-active service is one which requires data already possessed by the public sector, or which are easily and legally obtained from third sources (such as employers). These data are then combined as necessary within the context of governing legislation or rules to initiate the service, whether this be paying the user money, requesting money from the user, offering the user certain entitlements, imposing certain obligations on the user, etc. In most cases, the user is obliged to confirm the service initiated before it is implemented, although in some cases non-response is taken as affirmation. In the latter case, the service truly 'disappears' from sight as far as the user is concerned, even though it is fulfilled and thereby provides the user with benefits, or imposes obligations, which do of course affect the user.



A pro-active service is not relevant for all types of service, but tends to be restricted to services for which most if not all necessary data already exist within the public sector. The responsible agency is thereby able to shift as much responsibility and immediate control away from the user, by offering a more or less complete personal service without the need for initiation or action by the user. Most pro-active services are those for which typically:

- the agency is legally obligated to implement
- the agency itself already possesses most if not all necessary data (including personal user data), or which it can legally obtain from other agencies or organisations, to provide the service -- this also means that the need for users to obtain and retain receipts relating to various relevant transactions is also reduced or completely removed
- there is a high degree of integration and interoperability between back-offices
- there are no legal barriers to agencies using user data they already have, and that the user does not object to such use.

A relevant example of good practice in pro-active services is **family allowances in Ireland**. Here, three inter-linked developments have been central in enabling the new pro-active child benefit service to be provided. Firstly, on the DSFA (child benefit agency) side, new technology was introduced and a significant programme of organisational

change took place in 2001 and 2002. Apart from providing many improvements to the existing service from both user and service provider perspectives, this provided the capability to receive birth notifications electronically from the civil registration service. Secondly, in parallel with this, a major modernisation initiative was underway in the Irish civil registration service and processes. This system is responsible for the registration of major life events, births, deaths, marriages and so on. The modernisation included digitisation of records and computerisation of the registration process and of certificate production in the Irish General Register Office. Thirdly, Reach (a key national initiative in the coordination and development of eGovernment in Ireland) was developing an inter-agency messaging service that would provide for data interoperability, such as electronic notification of birth registrations, between agencies.

These developments mean that there will no longer be a requirement for most parents to get physical copies of birth certificates and submit these to the DSFA in order to apply for child benefit. The work of Deciding Officers in the DSFA will also be much reduced with the new system as authentication of claims is automatically provided through the link with the Irish General Register Office. In the case of a first child/claim, a partially filled out form will be issued automatically to the parent. This will reduce the amount of form-filling required as well as encouraging uptake of this service entitlement. In the case of subsequent children/claims there will be no need for form filling at all as commencement of payments will be pro-active and automatic without any action by parents (apart from child-bearing or adoption!). In a minority of new claims, the proactive/automatic service may not be possible, however, for example if the family have recently arrived in Ireland. In such cases, the online access to forms should be helpful for the user.

Other examples of pro-active services include:

- **Citizens income tax in Finland**. The Finnish taxation system is different from many others since here pro-active, pre-filled, tax proposals have been sent to all citizens by post for many years and thus is not reliant on a web interface, although it is of course reliant on the fact that the relevant back-offices are already highly integrated and digitised. In fact, most Finnish taxpayers do not use the electronic income tax system but continue accepting the paper forms, which can be explained by the very fact that this is a pro-active service requiring little or no action on the part of the citizen. The pre-filled (i.e. pro-active) tax proposal is sent to all eligible income tax payers on paper and by post. If the taxpayer does not react within one month, the form is considered to be accepted. Approximately 70% of the tax proposals are accepted in this way. In the 30% of cases where the citizen does react, most enter their corrections or comments by hand on the paper form, although it can also be done on-line. The tax administration then determines the final taxation level of every citizen, regardless of the way the tax declaration has been made (traditional tax declaration, tax proposal without changes, tax proposal with changes, on paper, on-line). The taxpayer receives the final tax notice, and, if too much tax has been paid, the tax administration credits the taxpayer's account, or, in the case of an underpayment of tax, the taxpayer is sent an invoice for the payment of due taxes. In view of the digitisation level of the whole process in Finland, 70% of all the invoices are paid electronically and 35% by Internet banking.

- **Citizens income tax in Spain**. Before the Spanish online tax service was implemented, taxpayers were obliged to obtain their tax information from several agencies involving many different channels and a lot of paper work, resulting in the high consumption of time and resources. The aim of the Spanish tax agency was thus to improve the efficiency of collecting taxes by simplifying the process for taxpayers as well as for staff by digitising work processes and ensuring data re-use and back-office interoperability. So, as with the Finnish tax system, the aim was that Spanish taxpayers should be provided with relevant information already possessed by the tax and other relevant agencies. Moreover, the completion of the declaration should be made easier, with paper work no longer necessary, the need for fewer documents and the integration of payment functions (paying in, as well as refund, of taxes), so that the whole declaration can be carried out within one single session. Further, mistakes and misinterpretations should be reduced by the new system. All this has to be done in an efficient way whilst achieving the maximum level of security.

- **Citizen family allowances, Spain**, where the pro-active on-line service is part of the wider tax regime and the associated on-line tax services as described above, which offers multi-channel access to women with children up to 3 years old, triggered by birth registration and labour market data. Whereas in Ireland, child benefit is offered purely on the basis of having children, in Spain it is now only available as a tax reduction, as the result of new legislation in January 2003 (back-dated to 2000), for mothers who wish to work. It is thus part of wider labour market policies encouraging women to work, or get back to work as soon as thought desirable, after childbirth. The data necessary to provide the Spanish child allowances service were previously scattered among other public institutions, such as INE (Spanish statistical agency), Seguridad Social and friendly societies. This was the greatest challenge for back-office reorganisation and interoperability, i.e. the need to centralise the various data sources in the AEAT (Spanish

tax agency), thereby making internal efficiencies as well as enabling AEAT to pro-actively contact eligible mothers with complete information and inviting them to confirm their status and then choose between a tax deduction or a direct payment into their bank account.

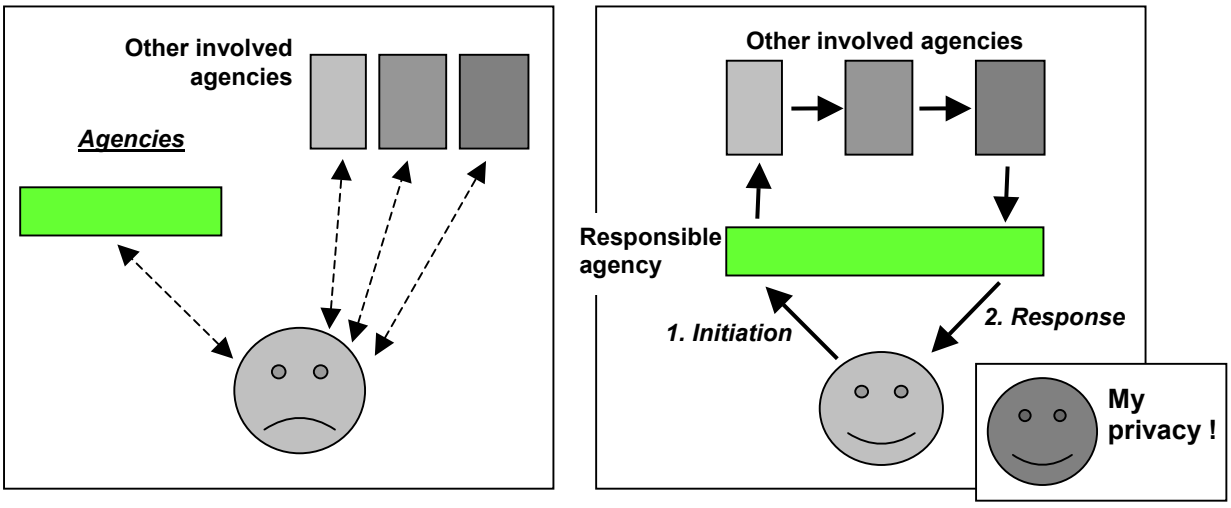
- **Business social contributions in Belgium**, in which the 'end user' of the system – the employee as an insured person – can be automatically entitled to benefits s/he should get in regard to the information entered by her/his employer (thus related to salary and working conditions/time). For instance, direct calculation of the employee's rights to a premature pension if s/he is unemployed or incapable of working. Similarly, work incapacity or unemployment benefits can be calculated by the institutions entitled to receive the information concerned on behalf of the National Office of Social Security and by means of the clearing house.

In each of the countries (Finland, Ireland and Spain) from which the above cases are taken, there have been few, if any, problems with data privacy, either because of legal restrictions or objections by the citizen. Such conditions do not obtain in all European countries, which makes the offer of pro-active services much more problematic there.

6.8 Greater user responsibility and control

As shown in section 6.7, as back offices become more and more integrated and able to share data and resources, it is possible to offer pro-active services which require little or no responsibility from, or action by, the user. Another important strategy resulting from these same developments shows how it is also possible to offer the user, not less but, greater responsibility and control over a given service. In the case of pro-active services, the digitisation and interoperability of data enables the relevant agency, rather than the user, to take most, if not all, responsibility and control for the service. However, the reverse is also a possibility, i.e. enabling transparency for users to have direct access to, and control over, certain data and service components, because these data are now electronically accessible wherever they are within the public sector, making it possible for users to access and use them on their own initiative. Thus shifting responsibility and control for a service either to the agency or to the user are both enabled by digitisation and interoperability, and whether one or the other takes place is now a policy, rather than a technical, decision within the prevailing legal, ethical and cultural framework.

Shifting responsibility and control to the user can provide significant advantages, both because doing so enables users to determine when, where and how the service should be used, and also because they can determine the precise features of the service they wish to exploit. It also enables users themselves to follow the progress of service implementation from initiation to fulfilment, for example by using transparent tracing and tracking functions. Further advantages include the ability to check for data inaccuracies or inappropriate information, faster updating of user data, and checking that the public sector possesses only data it is entitled to, and/or which the user wishes it to have. Finally, and perhaps of most significance in a modern democracy, shifting some responsibility and control for appropriate services to users can be seen as part of the ethos of open, transparent and accessible government, particularly if this helps to ensure that the legislation, rules and regulation governing a given service are sufficiently simple and understandable for most users to appreciate and exploit. A society governed fully or mainly by a legal and regulatory framework which is obtuse, hidden or can only be understood and wielded by experts, could be argued to be profoundly undemocratic.



For the agency, shifting more responsibility and control to users can also bring important benefits. These include the likelihood that some tasks, such as data input and checking, are significantly reduced, thereby saving staff and other resources, as well as, in certain pre-defined circumstances, relief from the obligation of having to supply the service at all, given that the onus for service initiation is on the user. Provided that relevant users are appropriately informed, equipped and skilled, this could also mean that the service is much better targeted than if it is provided across the board or if the agency itself takes all targeting decisions. It can also mean that users become more involved in service provision which, although perhaps an irritant in some contexts, can assist in fulfilling certain decision-making and democratic functions the agency may have.

Shifting some responsibility and control to users may not be relevant for all types of service, but seems to be most appropriate for services for which typically:

- the agency is not legally obligated to initiate
- the agency does not itself already possess most if not all necessary data (particularly personal user data), including those which are possessed by other agencies or organisations, to provide the service
- although there often needs to be a high degree of integration and interoperability between back-offices, so that their data are electronically accessible to the user wherever they are within the public sector, there may be legal restrictions placed on the different agencies in sharing personal user data with each other
- there are no legal, ethical or technical barriers to users taking more responsibility and control.

A relevant example of good practice in services which give greater user responsibility and control is **enrolment in higher education in Finland**. In this case the main administrative information system in the University of Helsinki consists of three parts, the first of which is information about the student and is largely controlled by the student him or herself. The other two are information about courses of study and information about study rules and regulations. When using the system, the student logs in using an ID and password which accesses his or her personal page, including user specific options in the form of a menu. The system includes intelligent on-line interfaces, including for example explanatory drop-down menus and self validating forms, all of which help to ensure fewer errors because of the greater control and responsibility given to users as compared with paper forms. This decentralisation of work and responsibility direct to the end user also saves significant staff time and resources.

Parts of the services are also available with the mobile phone (WAP, SMS). A student has a series of choices in the main menu, including checking and, if necessary, updating personal data, checking registrations, checking credits, checking his or her personal study plan, registering for teaching events, ordering transcripts, enrolling in the university, providing feedback on courses. All these features are initiated and controlled by the student. Overall, the devolved nature of the system to students themselves, enables them to manage their studies much better. In future, there will also be more study-oriented services, such as integration of the mentor system within the personal study plan. When a student wishes to change university, this is now much easier. In the future it will also be possible to take some of the exams in a university near to the student rather than having to travel to the responsible university.

One of the main drivers for an on-line, devolved Finnish enrolment service was pressure from students for more interactivity and control because they were experiencing delays, long queues and the need to visit different offices in the traditional system. Data security is extremely important in such an open system and is subject to the Finnish Personal Data Act which also requires the agencies to make a public declaration describing their own privacy practices. The external use of the student register information is mainly based on this legislation. For all other purposes (e.g. public contact information systems, other universities or recruiting information for employers), the student can approve or deny the transfer of his/her personal information.

Other examples of services which give greater user responsibility and control include:

- **Student grants in Denmark and the Netherlands**, both of which started out with pressure for change and more control from student users, although in the Danish case this was mainly for a faster, more efficient and delegated service rather than a fundamental change in the service itself, as was the case in the Netherlands. In both cases, one result has been significant savings in overall costs and particularly in staff time, as well as an upgrade in the quality of staff tasks from data input to more personal interaction with students in giving advice and support, and the acquisition of IT and related skills.
  - In the Danish case, the student users have clearly benefited from a 24/7/365 service and much better control over dealings with the student grant agency, as well as with the educational institute they are attending, by having

direct control over their own data input and being able to track the status of their grant applications or of payments and other issues.
  - In the Dutch case, the responsible agency decided to place more control in the hands of the user and enable him/her to control and adjust their personal data more easily. This meant that responsibility for accuracy of much of the data in the agency databases now lies with the users themselves. For the student users, controlling their own data entry meant that not only could they carry out this transaction online, but that the results of their action would be delivered more rapidly, for example an increase in the amount of loan payment. Placing so much control in the hands of the users meant that the agency should be able to verify changes in the data entered by the student. For this to be achieved, it was crucial that data be exchanged automatically between the participating institutions. New data entries need to be cross-referenced and checked with other organisations such as the municipalities, insurance companies, banks and the tax authorities, to prevent possible fraud from taking place (whether unintentional or otherwise).

- **Citizen enrolment in higher education in the UK**. Although the digitisation of the UK's enrolment system has been underway for many years, one of its main drivers in recent years has been the needs of applicants (the users) to have their own access to accurate up-to-date information, to be able themselves to apply for university places, and change these decisions in light of changing circumstances, and be rapidly informed of the results of their application. Advantages for the responsible agency include the lower costs associated with reducing the number of paper forms to be opened and the amount of data to be input manually by staff into the database, and the electronic forms completed by the user applicants themselves which save huge amounts of administrative labour involved in checking and correcting data. The users are a young population that is unused to filling out complicated forms. A common error on paper forms is to enter the date of application rather than the date of birth, or candidates may enter the wrong course code or course title. The use of self-validating forms with drop down menus prevents such mistakes on the electronic forms. An important motive for digitalisation was, then, significantly to enhance the quality of data reaching the agency by giving more control to users within the context of better on-line support, as well as a telephone helpline. For legal reasons a letter is sent to applicants confirming the receipt of their application, but this also issues them with a unique reference number and password that enables them to track the progress of their application on-line. From the 2004 entry, this also permits applicants to register to receive emails alerting them to correspondence deposited for them on the enquiry service website, in order to maintain data security.

- **Public libraries in Denmark and declaration to the police in Finland**:
  - In the Danish case, the on-line public library service enables registered library users to search all libraries in Denmark for books, sheet music, sound and video recordings, as well as other services, and order on-line. Users can also check the status of their orders, cancel and change, make enquiries by searching databases or sending queries by email for personal attention, always initiated and controlled by the user him or herself. This has become a huge success, mainly due to the fact that citizens can now order books that are not available at their local library and have them delivered to this library, with an electronic or postal notification sent to them. Reminders about overdue loans, as well as possible fines, can also be sent in the same way.
  - In Finland, all citizens can initiate a report via the Internet about any crime for which there is no need for immediate emergency services or investigations at the crime scene. This includes petty crimes such as stolen or lost property, non threatening damage, etc. Police benefit greatly by not themselves having to elicit and record statements, although there may be need for follow up questions and clarification, as well as being able to attend to such reports when they have time rather than being called to a front desk or the telephone at a time not chosen by themselves. However, users benefit most because they can make a declaration where and when they wish without having to visit a police station, which could be at a great distance, and then receive a response by email, fax or in person at the local police station at a time convenient to them. The interaction between the user and the service is highly digitised, so that no initial human processing by police officers is needed. In essence, the service saves both users and the police time. Before the system was implemented users often had to spend significant travel time to get to the police office, and then perhaps realise they did not have all relevant information, which meant that they had to come back again. On the web-form, full guidance is given and users are given time to access all the relevant information they need, whether this be insurance policy details or the IMEI-code of a stolen mobile phone.

- **Citizen portal in Denmark**, which is experimenting with a system to give almost total control and responsibility to the citizen user in circumstances where different public sector agencies each possess relevant but separate user-specific data but for legal reasons are not able to exchange these with other agencies. The user, however, to which these data refer, and whom of course owns the data, is legally entitled to pool and collate them. Thus a front-end is

being designed to enable users to access and combine their own data from different agencies, in the first instance, as part of the pensions eService on the Net.citizen portal. This development represents an interesting way forward where users are able to access and combine their own data for their own use, even though the administration cannot do the same because of data privacy restrictions.

7 Major good practice issues

Detailed analysis of the 29 good practice cases has revealed a number of major issues and sub-issues which seem to be critically related to good practice regardless of the type of strategy mix being pursued.

7.1 Meeting user needs and expectations

One of the main objectives of introducing ICT into government is to establish an electronic channel for public services. Previous research has shown how this can enable many services to be delivered around the clock, throughout the year and ubiquitously across space. It can put substantial power in the hands of the ICT-literate citizen or business so that the whole purpose, structure and mode of operation of government can begin to reflect the needs of at least some of those it serves. Thus, in addition to face-to-face and other traditional service delivery channels (such as paper and post), new service forms are becoming available which can either completely replace traditional channels or, as is more usual and probably desirable, complement them. These include the Internet and web-based services, phone and fax (e.g. by setting up government call centre services), mobile, digital TV, PIAPs[17], PDAs[18] kiosks, WAP, etc. Not only are the number and types of channels proliferating, so too is the organisation of the service delivery itself.

Each of the eight strategies described in section 6 demonstrates how users can enjoy improved services, more focused on their needs and on maximising fulfilment. The lessons articulated there will not be repeated here, but, in addition there are a number of issues, demonstrating aspects of good practice in meeting user needs and expectations, which affect them all.

7.1.1 Service design

User focus and stakeholder involvement

Ensuring that all involved stakeholders participate during service development and implementation, including users, can be important.

- The **citizens income tax service in Spain** was designed through the cooperation of all involved agencies/entities, including users. This was seen as necessary in order to develop an integrated service in which so many different interests are involved. So, for example, only through cooperation with the financial sector could payment be efficiently included. With the development of the 'complete reference number' (NRC), payment via the Internet became a reality and the citizens' tax declaration can be completed in only one single session.

- In the **public procurement service for business in Austria**, the initial project design stage took direct account of different user intentions and goals, based on their diverse backgrounds and activities. On the one hand, there are users mainly in the public sector who have a strong interest in improved financial monitoring options, whilst on the other there are private sector users whose interests are mainly profit maximisation. Other users have a more or less neutral role, such as the non-profit IT provider. All actors were aware that the common goal, the development of an electronic schoolbook order service, can only be achieved by consensus. Thus, the development phase involved intense discussions amongst all these user interests, and provided the basis for the integration and consideration of each one. Each actor was aware of his/her responsibilities and of the fact that data provision is decisive for establishing a fast, user-friendly and effective service. Therefore, users have to be involved in the service development from the very beginning and should become an integral part of the project cycle. This also helps to detect weaknesses in the system, and counter strategies can be implemented on time. Furthermore, the project team recommends saving a certain part of the project budget for later adjustments since the optimisation of service options often occurs at a later project stage.

[17] PIAPs are public internet access points, normally human-mediated or supported access points designed for citizens without independent access and/or the necessary skills.
[18] PDAs are personal digital assistants, normally small hand-held devices, the latest types of which are starting to converge with, and become indistinguishable from, mobile telephones and small computers.

The involvement of users in the pilot testing of on-line services before launch can also be important for overall success.

- In the **Danish on-line access to public libraries** case, a number of user groups were involved from the outset and contributed significantly to the successful implementation of the project. In addition to library staff, about 8,000 users across the country volunteered to give feedback during design and pilot testing, and enabled each library some say in the type of services that it wanted. In fact, most library staff were initially sceptical that citizens would want such a service, but soon realised this was not the case.

- The **on-line declaration to the police in Finland**, two police districts first piloted a full demonstration case in which both police officers and members of the public were involved. This meant that the final design was based on these pilots and user feedback and showed that the reporting of seven types of non serious crimes should be enabled by the system.

- Both the **Finnish and UK enrolment of students in higher education** were piloted before full release. In the UK formal market research was conducted during piloting, whilst in Finland, user groups were involved in testing the service both before release and as an on-going activity.

User-friendly features

Providing specific user friendly features can be important in service development. For example, maximising system transparency by providing tracing and tracking functions enables users to become involved, to be better informed and able to exercise some control for their own benefit.

- In the **citizen building permission services in Esslingen in Germany and Bologna in Italy**, both offer the possibility of tracing the application workflow to identify the status of the permission procedure. This allows the citizen to trace the status quo of the application, leads to more transparency within the planning process and enables relevant decisions to be taken at appropriate stages of the process. It also allows the planning agency to better organise their own workforce and resources regarding the necessary permission steps. Moreover, all involved participants can always see which participant is not living up to their responsibilities.

- The **enrolment in higher education services in both Finland and the UK** feature tracking facilities. In Finland the student can access his/her personal page and see the status of their registrations, credits and applications for courses and ordering of study materials. In the UK, the letter sent to applicants by the agency confirming the receipt of their application also issues them with a unique reference number and password that enables them to track the progress of their application online. From the 2004 entry, this also permits applicants to register to receive emails alerting them to correspondence deposited for them on the enquiry service website, so that no personal information is sent by relatively insecure emails.

- In the **public libraries on-line service in Denmark**, users can check the status of their book orders, cancel and change, make enquiries by searching databases or send queries by email for personal attention, always initiated and controlled by the user him or herself.

- The **new company registration service in Italy** provides businesses with the flexibility and speed to decide where and when to register, as well as the opportunity to follow the development of their application, thereby ensuring transparency and a sense of trust in the system.

Many of the other cases studied illustrate service openness and transparency, for example through real-time data access, including to data held by a range of different back-offices and agencies. These include:
- Business customs declaration service in Austria.
- Citizen family allowances in Spain.
- Student grants in Denmark and the Netherlands
- Business employers' social contributions for employees in Belgium.

Another important aspect can be putting user interests before those of the agency. For example, the **Irish business corporation tax and VAT** case indicated that the time scheduling of service releases is a very important aspect. For

some releases the scheduling was driven more by the internal considerations of the agency development team than by the external schedules of the targeted customers. For example, the ROS Corporation Tax system was implemented in November 2001 which was not at all an optimal time of the year since the annual return had been made by most companies a month before this. The result was that uptake was very slow initially, perhaps also due to the fact that the initial marketing took place a long time before potential customers were actually going to need to use the service.

Multi-channel access and services

An important issue emerging from many of the cases studied is the need to see electronic services as part, perhaps not the most important part, of a range of delivery mechanisms, each of course affecting the quality and experience of service delivery as well as how back-offices are organised and operate to provide the service. This implies that the integration, compatibility and complementarity between different delivery channels needs to be clearly considered, particularly in a context where many users in Europe still do not have easy Internet access, and where many lack skills and other necessary resources. The important issue of social inclusion is relevant here, particularly as many public services are needed most by the weakest and poorest members of society, precisely those who do not have Internet access. In very general terms the evidence shows that it is most appropriate to digitise and automate the more routine aspects of service design, production and delivery, particularly where large amounts of codified data are involved. On the other hand, the more knowledge-based, nuanced, judgemental and tacit approaches necessary for dialogue, discussion, examination and support directly between humans should be supported by electronic systems rather than replaced by them.

- In the case illustrating **citizen building permission in Bologna in Italy**, staff and end user input at the design stage resulted in the digitisation only of those service steps which could benefit from automation. Thus, the consultative processes, including giving individual advice to citizen applicants remains largely face-to-face, and can now be more effective given the informational support provided by the digitised aspects of the system.

- Both end-user and staff inputs and consultations during the development of all three **income tax services (Finland, France and Spain)**, studied showed how to relieve staff of an over-loaded work schedule and provide a better citizen service. This was achieved by the digitisation and automation of routine workflow tasks, leaving staff enabled to take on more personalised and direct user relations.

The above cases illustrates a salient point in eGovernment, i.e. ICT can support and enhance quality improvements to service delivered in traditional ways. It can be important that the technology does not replace frontline staff when this would lead to a more impersonal, lower quality service, but rather directly supports such staff by improving the quality of the services they deliver and by making them more responsive to citizen needs. Rather than a technology-driven approach, it is important to let people do what people do best, and the technology do what it does best.

In the **UK enrolment in higher education service**, both a traditional physical channel and a new Internet based user channel are used. However, given that most of the data being transmitted by the physical channel is suitable for digitisation, the responsible agency is taking active steps to manage the propensity of its users to use online services as opposed to physical services, through publicity, training and by restricting the distribution of some paper products.

There are also good examples of the successful adoption of different technology channels, for example **enrolment in higher education in Finland**, where in addition to web-site access, WAP and SMS are very important. Many cases also use SMS messaging for identity management, for instance student grants in the Netherlands.

7.1.2 User support

Given that for many users on-line services are still a relative novelty and may still be at an early development stage whereby bugs, failures and bad design can be commonplace, it can make sense to provide on-going support mechanisms. The cases studied illustrate a number of successful user support features.

Helpdesk facilities and user training

A range of services demonstrate successful use of user helpdesk facilities, training and so-called ‘user days’.

- The agency responsible for **enrolment in higher education in the UK** runs a telephone help-line service to help support users (candidates) through the admissions procedures. This is heavily used, with 2,000–2,500 calls a day during the admissions season. To try to control pressure on the help-line, the agency has made much more information available on the web, and has also instituted an online tracking and inquiry system.

- A help desk was made available by the **French income tax** service when it was first launched for online declaration in 2002.

- In the **business public procurement service in Austria**, a user hotline helps assure the high acceptance of the service. Hotline staff provide technical support and information about the functionality of the service, which is provided at no charge, and which can be judged as an important feature when introducing new online services. In addition, training and 'user days' are judged as preconditions of user acceptance. The success of the online service is also conditional upon the users' IT skills. Thus, when service users constitute a clear, focused and motivated group (as is the case here), training can be made available before a new service is provided. This can encompass both online training and training with experts face-to-face. In particular, online training is indispensable when hundreds of users are to be trained within a short period of time. However, this could fail if users lack basic IT and/or PC skills. During the introduction phase of the on-line service, the project leaders realised that only some of the users can be reached by online training. Many users instead addressed their enquiries to the hotline (as described above). Therefore, the project team suggests providing online training taking account of different levels of skills and knowledge. Classroom training has been very successful and a valuable complement to the online support. The involvement of highly motivated and experienced trainers is also important, so much so that the online service has also become widely known in the Austrian educational community for good training practice through its 'snowball effect'. Further, each year a 'user day' takes place and provides an excellent feedback platform. Users are invited to raise any service problems, to comment on (new) applications and to put forward new or alternative suggestions concerning the extension or optimisation of the on-line services and its various facilities. This ensures the maintenance of permanent communication between service providers and service users.

- For each of the **business corporation tax and VAT services in Greece, Ireland and Portugal**, an efficient help-desk service and continuous provision of precise and clear information aimed at users (without taking anything for granted) is judged as important as the service delivery itself. In-house end-user training has also been imperative in all cases in relation to service development and use of the new systems.

Direct user feedback

Providing mechanisms for direct and on-going user feedback can also be important.

- In the two **enrolment in higher education cases in Finland and the UK**, both services encourage users (both students and administrative staff) to monitor and provide on-going feedback on the services offered. In Finland, permanent user groups look after the interests of users and investigate reported bugs. In the UK, the responsible agency conducts regular surveys of applicants, careers advisers in schools, staff in higher educational institutions and staff in independent careers services. The latest results are published on the web and indicate a generally high level of satisfaction with all aspects of the agency's work.

- The **business social contributions for employees service in Belgium** has introduced a customer relationship management facility based upon a Contact Centre ('Eranova'), in order to deal with the complaints and questions from companies concerning their relationships with the public sector social security institutions as well as their problems with the use of the (sometimes mandatory) electronic communication methods. This contact/call centre can be reached 24/7 either by phone, fax, mail or a contact form

7.1.3 Marketing and take-up

Marketing and publicity

Timely, targeted and appropriate advertising and publicity to create awareness and provide information are sometimes forgotten but often extremely important. Indeed, marketing deserves to be considered as an integral part of the overall development and implementation process.

- An important part of the launch of the new **Spanish family allowance service** has been mailing and other publicity campaigns targeting those taxpayers who, according to the tax agency's information, fulfil eligibility requirements to obtain the child allowance. For example, pro-active personal letters are sent to eligible mothers, compiled from the tax agency's new system collating data from other agencies as part of the back-office reorganisation and data interoperability initiatives. There have also been publicity spots on radio and TV and in the newspapers.

- The service developer of the **citizen portal in Denmark**, 'Net.citizen', initially spent significant resources on marketing the portal as a portal. The effect of this was hard to document, so the strategy has been changed so that now specific services on the portal are marketed in a very focused way and when the timing is judged to be right. This is a change from a 'blunderbuss' to a 'sniper' approach. Marketing is not just to citizens but also to the municipalities since their staff have regular contact with citizens and can advise them to use the service. More often than not this is a new way of thinking for the municipalities and it often takes some time to implement.

- The **Irish business corporation tax and VAT** service adopted a successful marketing strategy outsourced to private specialised marketing consultants. The case showed that such projects need a marketing budget and need people with appropriate skills to do the marketing. Marketing consultants were employed to develop a service image and a marketing strategy and approach. Significant resources were allocated to an extensive and ongoing marketing programme targeted at the specific user group.

- In the **Spanish business portal**, user awareness is raised and help provided through regular informative publications on new possibilities and services. The number of copies during 2002 was 21,225,000. These publications are specifically sent to those taxpayers who are affected by specific services or measures. The responsible agency also provides instruction manuals. In 2002 570,600 manuals were printed and distributed.

Incentives and maximising take-up

Providing incentives for users to use the services can also be important. For example, sharing benefits with users so they can directly see and experience a benefit can be a successful strategy. This can be achieved by seeking out the 'win-win' advantages (for both the user and the agency) which are present in many services, including seeking 'quick wins', where these do not detract from longer term benefits, so that the launch and use of a service is directly related to visible benefits.

- The **citizens income tax service in France** offers incentives to taxpayers when using the online tax declaration. On the one hand, users benefit from a prolonged period of reply. While taxpayers have five weeks for returning their declaration by traditional paper-based procedures, this has been extended for those using the online-solution. On the other hand, taxpayers are no longer obliged to provide the appendix sheet to prove his/her status and activities (e.g. charity donations), which is obligatory with the traditional paper declaration. However, the user still has to keep all proof, in the form of receipts, in case of control. In future, further advantages for users will be introduced.

- From the start of the **business social contributions for employees in Belgium** case, services offered by the clearing house were not paid for individually (per message fee) but funded by a mandatory flat-rate tax directly taken at the source, i.e. from the social security contributions included in the salaries and collected by four public social security institutions which are obliged to finance the clearing house. This amount constitutes the operating costs of the clearing house. Thus, the more an institution uses the system, the better its return on investment is. This would probably not have been the case if a standard fee or price per message had been fixed. Another strategy to counter reluctance to use the service is by promoting competition between the user organisations. Once an organisation decides to use the system, its direct competitors cannot afford to neglect it any longer.

- Comparing the **business portals in Spain and Sweden**, in the former large companies are legally obliged to use the suite of services (of course, the services must be very good to enable this), so there is in principle 100% take-up amongst this group. There is also a large take up by Spanish SMEs due to marketing (see above) and the obvious benefits of use. On the other hand, the Swedish business portal, despite a set of excellent services, has to date achieved only about a 2% take-up, probably due to lack of marketing, no obligations placed on large companies to use it, and certain legal barriers (see section 7.4.1).

Use of 'multipliers' and intermediaries

Some services increase uptake by employing qualified or specialised intermediaries to 'multiply' the use of the service.

- The **citizens income tax service in Spain** allows for an intermediary to present the income tax declaration on behalf of the taxpayer and thus has helped to dramatically increase the number of declarations presented via the Internet. This has been particularly useful given the need to use a digital signature, which is a disincentive for many ordinary citizens. Thus, even though only 300,000 digital signatures have been enabled, more than 1.7 million declarations have been submitted, the difference being largely explained by each specialist income tax intermediary using his/her digital signature to make income tax declarations on behalf of a number of citizens. It seems that the digital signature is still an obstacle for many people using eServices. Without the use of such intermediaries, the number of online declarations would not have been so high. With this method, it is possible to reach a larger number of citizens.

- Although, the **citizen building permission services in Esslingen, Germany and Bologna, Italy**, are extremely beneficial to both citizens and responsible agencies, their use could be limited by the specialist nature of the activity, particularly in the Italian case. Users, however, also include specialists as important actors in the local economy: construction, architecture, engineering and design firms, which constitute a fairly small group of professionals who are able to use the system for all their planning procedures at the local level. These specialists can also act as intermediaries for multiplying use on behalf of ordinary citizens and thus achieve a higher take up than otherwise expected. The Bologna and Esslingen examples show, overall, quite low uptake of the online building permission service due to the small diffusion to date of the digital signature needed to use the service. However, as in the Spanish income tax example, professional users have already shown that the digital signature barrier is less of an issue for them than for ordinary citizens.

- The **citizens personal documents case in Bremen, Germany**, for birth and marriage certificates shows that, once again, the digital signature is an important barrier to service usage. However, shifting the focus of attention onto the development of online services that can be used by intermediaries, such as lawyers and other professionals, who are less put off by such barriers, can boost up-take. Such intermediaries are likely to use features like a digital signature much more often in their professional work than ordinary citizens and therefore benefit more from the use of the digital signature.

7.2 Managing change and human resources

The use of ICT in government is a profound challenge to existing forms of organisation and implies a 'modernisation' of management philosophies, often termed 'new public management', typically derived from the 'management of change' approaches adopted by the private sector. In fact, technical innovation to a large extent depends on organisational innovation in order to achieve real improvements in efficiency and quality of service. The effective translation and implementation of new modes of service provision into practice is always a serious challenge to established management approaches, and particularly to the 'silo' thinking of many departments and agencies. It requires appropriate solutions to tasks such as visioning, decision-making, coordination and control. In such projects, public bodies often work together with private sector firms and organisations as providers of equipment and know-how in the provision of the infrastructure for providing public services. Increasingly, cooperation among public and private sector organisations can include partnerships in service provision itself.

At the same time, the nurturing of skills and people (human capital) and the introduction of new ways of working have become key factors in the successful re-engineering of service suppliers as they transform into agencies for eGovernment. Changes to strategies, structures and methods of service delivery are dependent upon a creative and innovative workforce. This needs effective and visionary management to adapt its skills, competencies and, above all, mindsets and attitudes to new ways of organising and working which are more responsive to the needs of citizens and government overall.

Each of the eight strategies described in section 6 demonstrates how the introduction of ICT into public sector agencies and services can be very challenging to, but also immensely beneficial for, the changes needed to both the organisations

and the staff involved. The lessons articulated there will not be repeated here, but, in addition there are a number of issues, demonstrating aspects of good practice in managing change and human resources, which affect them all.

7.2.1 Management and decision-making

Change management and decision-making

Change management and coordination of multiple tasks across many agencies and back-offices is always the cornerstone of successful back-office reorganisation, which all cases in the present study illustrate to a greater or lesser extent.

- Both **family allowances in Ireland and Spain** cases illustrate successful change management and coordination with the wider eGovernment programmes of which they are part. This also ensures clear ownership of each of the main developments whilst ensuring effective coordination and progress towards common goals. Where cross-departmental projects are being set up, the roles and responsibilities of all parties should be set out and agreed at the outset and a structure put in place to resolve issues and difficulties. While this will not eliminate hiccups along the way it will ensure that the proper mechanisms are in place to resolve them. Both cases also gave high priority to change management issues as well as to technical matters. This included extensive consultation with all relevant parties, development of communication strategies and training. Management of multiple projects in particular needs experienced project managers and considerable coordination effort. The teams involved found that it takes longer to develop and test systems as the number of agencies involved increases. One specific issue in this context is that early adopters of the systems which will be used widely may perceive themselves to be at greater risk in terms of initial investment versus likely returns, and they became concerned that they would bear the burden of the development costs. A related key issue can be 'ownership' of the data being transferred between agencies, for example, at what point do the transferred data become the responsibility of the receiving agency and how should system failures, etc., be dealt with? While eGovernment is intended to present an integrated, border-less view of government to the user, government departments still often have to work within their own political, legal and accountability frameworks, unless these too can be made compatible at the same time, but this would often be too complex to resolve in the short term. In the Irish case special attention was also paid to the fact that requirements often change during the development and user testing phases. Accordingly, 'scope creep' needs to be managed very carefully to minimise impact on the 'go-live' date. In the Irish General Register Office, for example, a change control process was put in place whereby all changes had to be approved by the Programme Management Group. A clear distinction had to be made at various stages between changes that were deemed essential and those that were deemed 'nice to have'. Attention to these aspects was viewed as central to the success of the initiatives.

- The **enrolment in higher education services in Finland and the UK** both involve cooperation between many different interests and stakeholders. In the Finnish case, a large number of other public agencies are involved in providing the service, so clear leadership and allocation of roles and responsibilities is required. Also, a large number of different types of specialism are needed, including IT staff and user groups. A number of lessons were learnt in Finland. First, the stakeholder consortium started with too ambitious a task by attempting to renew the all main information systems at the same time. Second, a project group clearly in charge of the practical results was not defined at the beginning, which led to a situation in which nobody knew who was really in charge and leading the project. Third, cooperation takes time and there must be time for feedback and other comments as well as the possibility to prepare for sometimes slow development cycles. In the UK, the responsible agency can only digitise and exploit the benefits of this at the pace of all its partners (all UK schools, institutes of higher education and examination boards) but tries to encourage schools and colleges to go online. An important question confronting the agency is how much, and how fast, to force the pace of change amongst all stakeholders in proceeding with digitising and integrating the workflows of the different organisations. While integration may have significant benefits overall, the distribution of financial costs and business benefits may not be symmetrical. Thus the agency runs a number of regional groups, bringing staff from schools and universities together to discuss issues of mutual concern, and promotes the advantages of digitisation in relation to both strategic management and marketing needs. All these opportunities are used to increase awareness of the benefits of electronic admissions systems – a case of carrots rather than sticks. The success of this approach can be seen as the result of two important factors. First, the fact that there is a long history of relations between all the stakeholders involved (over 40 years), during which time the university admissions process has changed little in its essentials and the institutions involved are intimately familiar with the enrolment process and understand its logic and conventions. Second, the fact that there is clearly

only one leading and dominant stakeholder, i.e. the responsible agency itself which, within certain limits, is able to make the rules by which all other organisations in the 'supply chain' must also play the university admissions game.

Corporate commitment

- Both the **Irish and Portuguese business corporation tax and VAT cases** show that a strong commitment at corporate level is essential to be successful. In the Portuguese example, development and implementation was less than optimal in the first few years until a holistic vision for the project and 'top level' commitment was formulated and communicated throughout the responsible agency. In the Irish case, commitment was secured from the appropriate organisation at an early stage. A key feature was the appointment of a dedicated Strategy Manager from the outset. It was also important that the necessary best qualified personnel were made available as required. A project board of senior officials was established to advise, direct and oversee the development and implementation of the service. These actions cleared the way for a visionary and dynamic implementation and roll out of the services to customers.

- In the **citizens car registration service in the Netherlands**, because of the involvement of many different agencies and interests, it was important to ensure that the project has support at the highest level of each organisation in order to ensure that important decisions can be taken in a timely and effective manner and result in immediate and effective action.

Tools and teamwork

- The **citizens building permission service in Esslingen, Germany**, is supported by a project management process with on-line management tools, for example different virtual project rooms with different access levels for project management. A project room is accessed via Internet by a secure connection. There, documents can be saved in a structured manner, and information can be shared between the involved participants. The basic idea of the platform is a central information pool which can be accessed by all involved participants depending on their legal rights at any time. The advantages include consistent information, transparency in the management of each planning and implementation step, real-time availability of shared data, as well as improved communication amongst the involved participants.

- The **business portal in Spain** is being developed using a multi-disciplinary teamwork concept for the preparation and development of the services. This ensures that all involved actors have a say and a stake in the design and all decisions taken, which can also be important when hidden administrative, organisational, legislative or technical challenges are to be identified. One objective of the team is to suggest legislative changes that would improve service, usability and efficiency for all involved parties (including the end-users).

7.2.2 The locus of pressure for change

Because, potentially, there are so many different actors, interests and needs involved, how, when and from whence pressures for change manifest themselves can be decisive in influencing the design, implementation and success or otherwise of eGovernment projects. Thus, the locus of demand for change and how this expresses itself, needs to be understood. Who is pushing for change and who needs to change most? Does it comes from users, bottom-up from staff and/or top-down from central government and/or top decision-makers? Vision, resources and strategies are supplied by the top, the staff and managers actually putting plans and services into practice in the different agencies are in the middle, and users and their needs and interests are, metaphorically, at the bottom. A failure in any of these can be critical. In an ideal world, all three types of demand for change will be present and will work in harmony.

Pressure for change from users and staff

- In the **Dutch car registration service**, pressure for change came mainly from the motoring and travelling community. Before that, the many different agencies involved and sharing responsibilities often resulted in frustration and delays for the car owners and garages. The motoring and travelling community wanted to bring the secure registration of car ownership under their own control which required a change both in the front- and back-offices of the responsible agency.

- Both **student grants cases in Denmark and the Netherlands** started out with pressure for change from student users. In the Danish case this was mainly for a faster more efficient service rather than a fundamental change in the service itself. In the Dutch case, on the other hand, this was much more intense because of the very poor uncoordinated service which led to a serious crisis in the responsible agency. In the Danish case, internal pressure to ease staff workload was also important. The challenges being faced in the two cases were also different. In the Danish example, it was not seen as necessary to effect re-structuring of the back offices and agencies involved, especially given that their cooperation and respective roles was perceived as working well. In the Dutch example, on the other hand, the lack of coordination between back offices and agencies was one of the prime reasons for poor service and thus for change. Given that both cases have been very successful very quickly, this user and bottom-up push for, and commitment to, change seems very important.

- The **enrolment in higher education in Finland service** was pushed forward initially by students experiencing delays, long queues and the need to attend at different offices, as well as by university administrative staff having to undertake double and triple data-input work and servicing enrolment queues. The scale and history of the sector are important. Finland has a relatively small population and a corresponding low number of universities, so there has not been a pressing need for a centralised university admissions system, and thus pressure for change has come largely but not exclusively from users and staff. This contrasts with the UK where there has been a centralised admission service since the 1960s. Pressures for change to adopt digitised processes and services come largely from the admissions agency itself (see below).

Pressure from business

- The **Austrian business customs declaration** for out-of-EU trade arose from strong pressure from the Austrian business community. This was not because of an inherently poor service as traditional customs services go, but because better services were being provided by rivals in other EU countries for such trade which had put their services on-line, resulting in the threat by Austrian importers and exporters to move their business out of Austria.

- An important demand for an on-line service leading to the **business portal in Sweden** came from all businesses and their representatives who are legally required to fill in a form every month for VAT and social contribution on paper and send it to the Swedish National Tax Board. Even though present take up is still low, the major benefits achieved include the integration between reporting and payment, the 24/7 access and the fact that they get a direct confirmation that the declaration has been processed.

Pressure from the responsible agency

- The **UK enrolment in higher education service** is a relatively large and complicated system with a very large number of stakeholders, in contrast with the equivalent Finnish case in a small country with a relatively small number of higher education institutes where pressure for change came largely from students and staff. There has been a centralised admission service in the UK since the 1960s. Pressures for change to adopt digitised processes and services comes largely from the decision makers in admissions agency itself and the changing environment in which it finds itself. These include dramatic increases in the proportion of university age group persons attending higher education, a very uneven flow of work reflecting the academic year, the need for faster and more efficient publication and dissemination of information, a much more volatile and competitive markets for UK higher education, rapid changes in course portfolios, increasingly stringent financial regimes, and the need for more effective decision making. In particular, the agency is seeking to reduce costs and to increase the quality of services, as required by its charter determined by government and in cooperation with its partners (schools, exam boards and universities). In the UK, the integration of back office workflows with front office electronic service has been undertaken as part of a long-term strategic response to intrinsic business needs, not as a tactical, externally-imposed, eGovernment target. Indeed, the agency's initial forays into this process predate the publication of the British Government's first eGovernment targets by two or three years. The changes that have taken place, and the issues which have been identified for the future, are rooted in challenges and issues which are well understood and clearly owned by the management of the agency, rather than being perceived as a distraction from its core business, as sometimes is the case when pressure for change is applied from the government top, or from front line staff or users at the bottom.

7.2.3 Public-private partnerships

eGovernment often involves new relationships within the public sector, both horizontally between agencies at the same level (such as within a municipality) and vertically (such as between local, regional and national levels). However, a critical player can often also be the private sector. Today, questions are increasingly being posed about the extent to which government should behave like an ordinary business? Much recent debate has been focused upon the need for eGovernment to adopt the rigours of eBusiness, and, in relation to the reorganisation of government structures and processes, to follow down the path of Business-Process-Reengineering (BPR). However, many also see government as remaining distinctive from business for many reasons, including the fact that government cannot choose its customers and that users of government services take on a variety of roles, including as voters, tax payers as well as consumers. Despite the differences between the roles, ethos and operations of the public and private sectors, there is much to learn from each other (for instance, government can teach business much about social responsibility), and much to be gained from working together.

- As shown by the **citizens income tax service in France**, governments can learn and apply lessons learnt from the private sector in order to foster productivity and improve relationships to users. The aim must be to relieve employees of the most repetitive tasks in order to release resources to provide more personalised user relations. In addition, the web interface for the French payment services is a new product which does not rely on past examples from other public sector agencies or countries. In order to set up this technical infrastructure and develop the software, a call for tender was launched, and just as for the development of any other information system, contractors were found via open tender. Thus, know-how from the private sector was integrated into the public sector. Since the private sector usually works more efficiently, in strictly monetary and market terms, productivity in the public administration can be improved.

- The **Austrian certificate of residence** service involves outsourcing certain functions to various private partners, including Austria's largest mobile phone provider, Mobilkom, to authenticate users using this medium. Another certified private company has also been contracted to deliver official documents and notifications. This takes the load off the public administration which is usually responsible for carrying out the service. Moreover, the service is provided by a professional organisation with the necessary specialised know-how and infrastructure required for offering official certificates and notifications for download. Therefore, good prospects for service uptake are expected as soon as the required legal adaptations will have entered into force. All this adds up to a set of user-friendly solutions with positive effects on expected service uptake provided by beneficial public-private partnerships.

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- The **police declaration service in Finland** and the **public library service in Denmark** both outsource the running of ICT systems and infrastructures to the private sector in order that police and library staff can concentrate on their normal day-to-day activities. In Denmark both the user interface and the database have been outsourced very successfully, and in Finland the management of the overall ICT system has been outsourced. However, experiences with outsourcing have also been mixed. On the one hand, it is recognised that when very large development projects are undertaken the project leading organisation will often have to focus on core competencies and project management and hence should consider outsourcing assignments that do not fit one of these two categories. On the other hand, experiences in the Danish case indicates that giving away responsibility and influence over crucial components of the project can also turn out to create significant bottlenecks and extra work if contracts with the outsourcing partner are not specific enough.

- In the **Irish business corporation tax and VAT** service, the highly successful marketing strategy was outsourced to private marketing consultants

- The **Danish citizens portal**, Net.citizen, was developed and operated by a public-private partnership led by a company operating as an ordinary competitive private sector firm, but which is fully owned by the central organisation for the Danish municipalities. This arrangement combines the advantages of both public and private approaches, and has successfully raised the effectiveness of the development and implementation of digital service solutions in Danish municipalities.

- In the **business environmental permits service in Finland**, the so-called TYVI clearing house system has been developed and is operated by several private IT sector operators, which, when compared with alternatives like centralised public or public-private solutions, provides a very wide range of the expertise needed when merging thousands of different applications and organisations together. Another important aspect is that the IT companies,

working directly as TYVI operator or developing interfaces with TYVI, perhaps have a better feeling for the daily problems of the business customers of the service than does the public administration. Public funding has mainly been used in the TYVI concept only to develop and start the pilot phase and later for marketing. At least partially as a result of the private sector outsourcing process, the service is now financially almost independent.

7.2.4 A phased implementation process

A phased implementation process provides advantages in terms of planning, resource allocation and use, testing incremental steps before proceeding, allowing time to digest and fully work through the changes especially in terms of organisation and job functions and skills, ability to respond to change, etc.

- In the **Dutch student grant service** a phased approach has been adopted, within an overall planning framework which was fully laid out in advance. This was undoubtedly driven by the crisis situation the student grant service found itself in at that time, so that it was clear from the beginning that a fully comprehensive reform of the whole process and organisation was necessary.

- In the **family allowances service in Ireland** the opportunity for the initial testing of systems and services, including the parallel running of manual and electronic systems in a 'live' environment, as well as of the back-office systems and data interoperability aspects, were a central feature of the overall plan to test system functionality, validate process/procedures, run a training programme, obtain user and customer acceptance, etc. The Irish General Register Office, for example, instigated a four week period of parallel system running which gave invaluable feedback on issues that could then be resolved before going live. This proved extremely important and raised a number of issues that were resolved prior to full implementation.

- A phased implementation process with user involvement has been used in the **citizens income tax services in Finland and France.** In France, taxpayers were involved in two phases so that the special needs of the main target group could be considered. Similarly in Finland, the very successful approach was to test the tax proposal system with a limited number of people and limited number of local tax offices in the first instance. Technically, these kinds of big changes could be carried out quite quickly, but it takes time for organisations, staff and users to adopt change.

- The **business social contributions for employees service in Belgium** adopted a step-by-step approach, including analysis, computerisation, standardisation, and harmonisation of legal concepts. A global plan and vision was developed and validated by top decision makers. Workflows between back-offices were surveyed to estimate their added value. Databases run by the public social security institutes were then analysed, equipped with common identifiers, computerised where feasible, and then rendered interoperable with each other (in a first phase without changing the concepts in use) through standardised formats (Edifact and later XML). Similarly, dedicated forms were designed and harmonisation of the legal concepts undertaken. This enabled the computerisation of other workflows, and a start made on computerising relations between citizens/employers and the social security institutions.

- Both the **car registration cases in Italy and the Netherlands** adopted a phased implementation process in order to ensure time for error testing. As realised in the Dutch case, it is important to involve all stakeholders in the project from the beginning. In this particular case especially the close collaboration with the umbrella organisation of the industry paid off. The project was well received from the onset because it targeted a service for which a real demand already existed for years. On the other hand, the responsible agency did not move too fast but waited until it had enough experiences with technology to cater to the wishes of the industry. In the Italian case, service provision prior to the on-line service was very complex and confusing. After a planning phase of about seven months, the system was implemented. During the planning phase, representatives of the involved public agencies as well as from the private sector were integrated.

- In the **business public procurement service in Austria** project development and implementation were carried out in steps. At the outset, the project team decided to define extendable logical interfaces instead of focusing on the full integration of all relevant systems straightaway. This minimised the risks involved in the development of a new online service for the service providers, and enabled the users to get used to the reorganisation of services more readily. Good service performance is a pre-condition for high user acceptance rates. The different service options were tested several times in order to ensure failure-free service operation. The service providers recommend

carrying out several load tests during the development phase of a service in order to have enough time for hardware, software and network adaptations. Moreover, the paper-based operation of the procurement process was still operational when the on-line service was introduced. This helped to decrease initial scepticism since users were offered a second option at the beginning of the project. Today, this parallel operation is less and less important and will be soon be suspended, an option open because of the specialised nature of the business user group targeted.

- The **business customs declaration service**, also in **Austria**, has implemented an important phased strategy:
  - Evaluating routine tasks first, where the objective for the service itself was to significantly reduce the time between application and delivery of an export/import license. Processing an application by letter or fax took five days on average, resulting in additional storage costs that undermined the competitiveness of Austrian businesses in the European Single Market. The aim was to cut processing time by reducing the workload of officials. Routine tasks like error checking or transferring files to the EU Directorate General for Trade accounted for most of the processing time. These tasks first had to be automated and paper-based communication replaced by electronic workflows.
  - Handling of the less complex system first to learn for the more complex one. The on-line customs project is embedded in the more comprehensive strategy of creating an extensive platform for import and export. Information and transaction services are intended to support imports as well as export procedures. The import module is only the first component and a kind of learning model. It was implemented first because the export process is many times more complex. In its final stage, the system will provide paperless and fast administration of foreign trade as well as up-to-date information and support for businesses in foreign trade.
  - As a kind of pilot project for the much more complex task of administering export licenses, the electronic import license has thrown up important security considerations. In order to protect business data and, more important, to ensure 24 hour availability of the service, double 'demilitarised zones' around the server clusters, as well as secure connections between the clusters, were established. The result of this thorough planning is a system with a high level of availability and security. It is easily scalable and expected to be able to cope with the increasing traffic from importers and exporters in the next few years.

7.2.5 Human resources

Changing roles and skills of staff

- In the **citizen income tax services of Finland, France and Spain**, and the **car registration services in Italy and the Netherlands**, an important aim has been to digitise the most repetitive tasks of a service in order to enable staff take on more personalised user relations. Since the staff of all three tax administrations are traditionally overloaded with tax declaration tasks, many involving moving paper between desks, one of the basic ideas of their online declaration/proposal service is to relieve employees of the most repetitive tasks. This has been achieved by the digitisation of the workflow, where the most routine tasks have been automated and are now carried out by the system. Thus, responsible staff are enabled to take on more personalised and direct user relations, which both improves the quality of the work experience and provides much improved customer relationships. For example, in the French income tax case, civil servants are nowadays relieved from a lot of repetitive paper work, which has been largely replaced by more challenging and interesting work (direct contact with users, new technology-intensive work, etc.), so that tasks like sorting out paper forms, typing of information submitted hand written, etc., have been completely replaced.

- The **citizen personal documents, birth and marriage certificates case in Bremen, Germany** shows how, by digitising the process, the workflow of payment has been separated from the workflow of issuing the certificate, leading to the workload of the staff at the registry office regarding online payments being taken away, including the cash up at the end of year. Similarly, the staff at the cash desk no longer have anything to do with these payments since they are automatically processed by the SAP system used.

- The **student grant services in Denmark and the Netherlands** have both seen important changes to staff skills and work tasks due to reduction in the need for routine manual data input and the concomitant need for IT skills and more inter-personal communication skills useful in advising users on a one-to-one basis about detailed personal issues.

- In the **UK enrolment in higher education services** the responsible agency now makes much less use of casual, low grade labour and has shifted its skill base from one which is largely composed of clerical workers to one predominantly composed of technical staff and knowledge workers. There have been large reductions in data entry work, whilst, at the same time, the requirement for technical support staff has grown in order to support the network infrastructure and web site which are maintained in-house. The agency has chosen to deal with this changing staffing base, as far as possible, by re-skilling existing staff, on the grounds that they know the nature of its business best.

Staff flexibility

- In both the **declaration to the police service in Finland and the public library service in Denmark** the need for more flexibility in staff skills and roles has been necessary. There is less need for high specialisation in some tasks, such as in book searching in the library case, as all staff are now able to do this relatively easily. In the Finnish police case, as the service is only used for non-urgent crime, staff can now be much more flexible and handle the data when they have time and thus better balance their workload, given that they are not now so frequently called to the service desk or to the telephone for crime reporting.

Staff training

- In the **car registration service in Italy**, training of targeted staff is a prerequisite for qualified service delivery. In order to cope with the challenges of realising the service, which includes several public and private participants, training and the creation of awareness among the great number of system operators, including class training and assistance by a dedicated call centre, were undertaken. A critical factor is whether the car dealers are ready to invest in the new on-line service both by acquiring the relevant equipment and by supporting appropriate personnel training and redeployment.

- Both **family allowance services in Ireland and Spain** take account of the needs of staff to operate the new systems. In Ireland, a major training programme and a communication strategy were undertaken. In Spain, the new child allowance service required no special training of personnel, as the tax agency staff already had the required skills in computing obtained during the introduction of the on-line income tax service launched in 2000, as well as previous computing skills acquired through long experience of working with digital systems. But two short courses to learn how to use the specific application were necessary in this case.

- In both the **declaration to the police service in Finland and the public library service in Denmark** resources are spent on developing new competencies through formal and informal training programmes on an on-going basis.

7.3 Costs and efficiencies

One of the main drivers since the mid 1990s of eGovernment in Europe, as in other advanced economies, has been high expectations of significant cost savings. This has, however, often proved to be a mirage in practice. Although it is easy to see individual savings in paper, staff and shortened work processes, it has been hard to convert such reductions into clear overall savings given the investments also involved. In trying to quantify real cost benefits following from the introduction of ICT, governments inevitably run into the same set of issues that vex economists when examining the impact of ICT on the productivity of the economy as a whole, or even on individual companies, neatly termed the 'productivity paradox' by Robert Solow[19]. Most experts believe that productivity and other benefits of ICT do occur, but trying to quantify these and separate them out from all other factors proves elusive. On top of this, governments face the additional dilemma that, unlike banks or budget airlines, they cannot simply refuse to deal with expensive 'customers', especially when these are precisely those who rely most on public services and tend to use the more traditional channels to access those services, such as the elderly, disabled, sick, poor or deprived. Thus, electronic services often need to be added to existing services rather than replace them.

The mantra now, in the early years of the 21st Century, is that the real cost savings, and indeed real quality improvements, will come from re-engineering the internal structures and processes of government. For example, a

[19] For a thorough exploration of the issues and problems in attempting to measure the benefits of eGovernment see Kubicek, H, 2003, *Effect of ICT on public services – the state of the art*, paper presentation to the High-Level Expert Group in Socio-Economics with Commissioner Liikanen of the European Commission, Brussels, 19 March 2003.

recent European report concluded that "transformation comes not from moving services online, but from fundamentally restructuring the public administration's organisation and integrating work processes across agencies to put the citizen at the centre and simplify interaction, reduce costs and improve services."[20] Such strategies are reflected on the supply side through adopting common technology solutions across government departments and agencies, integrating work processes and sharing data and information.

There are, indeed, already savings and efficiencies to report from a number of countries, and many of the cases studied in this report are good illustrations of this. However, not many agencies have undertaken rigorous cost benefit analyses nor accurately examined the overall financial implications of eGovernment, because in addition to the problems mentioned above:

- it is often technically very difficult for agencies to do so, especially within and between large service and administrative organisations, perhaps complicated by public-private partnerships
- it tends not to be part of the way the public sector operates, especially because it is complex, politically sensitive, and often needs a longer term view to get beneficial results, and much politics is short term
- when agencies do closely examine the costs and benefits of specific activities, they may be loathe to publish the results, unless specifically required to do so by politically set targets, performance measurement initiatives, users' charters, etc.

Each of the eight strategies described in section 6 demonstrates particular aspects of changes in costs and efficiencies. The lessons articulated there will not be repeated here, but in the following are summarised across all types of case examined in the present study.

7.3.1 Cost-benefit analysis and impact measurement

- **Citizens income tax in France.** The success of the online service provision may depend upon whether a coherent study of the existing system is undertaken. As this French case illustrates, the project was built upon a solid cost-benefit analysis, as well as feasibility studies which examined both quantitative and qualitative benefits. The framework conditions for the development of the service could thus be established in advance. In addition, well conducted analyses and studies can prevent recurring debates about the actual use and necessity of investments. Results demonstrated major benefits for the French administration and its staff due to the decrease of data needed to be captured. This saves a lot of time and money. Furthermore, the process is paperless, which is on the one hand more cost-effective but also more environmentally friendly. Another result achieved by the service is the successful internalisation of payment since its former externalisation was not satisfactory. Moreover, regarding the payment option, mistakes during data entry are avoided and time for staff is saved while no treatment of cheques is required.

- The **car registration service in the Netherlands** was based upon a quantitative and qualitative cost benefit analysis as a prerequisite to ensure the usefulness of online delivery. Thus, the service was built on a solid business case that covered both quantitative and qualitative benefits. This prevented the ever-recurring debates about the actual use and necessity of investments.

- As part of the development of the **Danish citizens portal** estimates of possible rationalisation effects resulting from the services are made by the main service developer through business process analyses on all processes in the agencies that are implementing the services. This allows the specification of which benefits could be gained, the most common result being that the technology itself may give 20% of a given saving while the redesign of organisational processes provides the remaining 80% of the saving. Another important lesson is that efficiency gains are only generated when the organisation and human resources change immediately when the technology is implemented. If the systems are introduced without such changes it is very hard to push for organisational changes and efficiency savings afterwards. This drastic step is needed in order to push the organisation into utilising the new system in an optimal way. Furthermore, this tends to motivate personnel to do what they can to get citizens to use the new systems since it saves them effort every time this happens.

[20] eGovernment Workgroup of the Directors General, European Commission, 2002, *Survey on eGovernment services to enterprises*, IDA eGovernment Observatory, September 2002, page 7.

7.3.2 Costs and staff savings

- In both **student grant cases in Denmark and the Netherlands**, there have been important cost and staff savings. Although in the Danish case no structured cost-benefit analysis has been performed, the workflow has been substantially simplified by reducing the number of steps and making these automatic. An outsourcing arrangement to a data input bureau has also been eliminated thus saving considerable resources. In the Dutch case, there have already been great cost reductions across the agencies involved. The return on investments has already been reached. Because of a decrease in paper communication and more efficient management of telephone communication, fifty full time telephone agents have become redundant. The estimated cost reduction as of August 2003 is over € 2,000,000 annually. This figure is expected to grow.

- Both **enrolment in higher education cases in Finland and the UK** have experienced very significant cost and staff savings. In the Finnish case, self-service by students accessing the on-line service has decreased the work of administrative staff, especially in the enrolment process. Alone in the University of Helsinki, this means about 16,000 fewer desk visitors per annum. Together with preparatory work, this saving is at least equivalent to the same amount of fewer working hours. No staff have been made redundant, but the saving has led to a much reduced need for temporary staff to be appointed. Because of the partnership of stakeholders involved, there have also been lower development costs. In the UK, the move to a web-based system away from the existing CD-ROM system has led to a significant reduction in data capture and of maintenance costs. In addition, the increasing use of web technology is capable of leading to significant reductions in postal costs. The responsible agency currently spends about £1.8m a year in postal communications with applicants: it estimates that it can reduce this to about £0.5m. In the UK, reductions in labour costs mean fewer jobs. Where the agency has employed about forty temporary clerks to cope with handling forms and keying in data at peak periods, it now typically uses about four. In general, the agency now makes much less use of casual, low grade labour and has shifted its skill base from one which is largely composed of clerical workers to one predominantly composed of technical staff and knowledge workers. Savings in labour could be even greater, however, if the agency could reduce the work involved in reconciling discrepancies with examinations board entries. More dramatic savings in its staff have recently been achieved from reductions in data entry work, and the number of permanent staff in this section has been reduced from twelve to four.

- In both the **declaration to the police case in Finland** and the **public libraries case in Denmark** there have been cost savings. In Denmark, less staff time is used for searching for books on behalf of users, and there is more efficient searching when staff do search. In both Denmark and Finland, there are important efficiency gains as users enter data themselves and workloads have decreased as both manning enquiry desks and the telephone have been reduced even though there has been a substantial increase in total book ordering by citizens themselves. The latter has, however, led also to some additional costs because of the increased physical transport of books ordered between the different libraries.

- In the **Greek business corporation tax and VAT case**, there have been reductions in time and cost necessary for tax declarations by reducing the former congestion at local tax offices and by facilitating fiscal controls.

- The **new company business registration case in Italy** has achieved time and cost savings amongst the 4,000 agency staff previously involved by limiting the need for paper documents as well as significantly rationalising and reducing routine work.

- In the **business portal case in Spain**, savings are considered to be high as large companies are obligated to use the service, even though no data are yet available to substantiate this. The **Swedish business portal** has shown that for every tax declaration submitted via the portal, administrative costs are reduced by about 60%. The problem is that there is only at present about 2% take up of the portal service, though this is probably due to some legal barriers which it is hoped will shortly be removed (see section 7.4.1).

7.3.3 Assessment, quality control and measuring impact

- Both **Danish and Dutch student grant cases** are measuring impact and success on an on-going basis. Even though they have only recently been launched, it has been important in each case to register both user take-up and satisfaction, as well as benefits to the agencies involved, from the beginning. Continued progress depends upon on-going pressure and support from both users and suppliers if the necessary and difficult decisions are to be taken. In

the case of agency benefits, cost savings are particularly important, as are improvements to staff working conditions, workload and job content, coupled with overall staff satisfaction.

- The **Belgian business social contributions for employees case** employs on-going assessment and quality control. Continuous assessments and evaluations of the back-office relations managed by the clearing house take place through indicators allowing measurements of message integrity, content appropriateness, exchange speed and performance, service availability, reliability and security of operations. The figures are collected on a data warehouse system in the form of 136 indicators. Moreover, the resources of the clearing house are allocated following a precise task distribution evaluated by task time recording, analytical accountancy and demand management. Task distribution also determines the functioning of data exchanges between the social security institutions themselves and with the clearing house. This is based on mutual agreements between the institutions and its acceptance and adequacy is controlled by the clearing house advisory board, of which the institutions are members. Further, a skills management system has been progressively implemented into the clearing house structure since 1998. Since then, every back-office task has been analysed and divided into minimum and coherent units of time-human-logistical resources. This makes it possible to define measurable work objectives for employees, to calculate the effective workforce costs, and so to be able to precisely evaluate financial needs.

7.4 Institutional and legal structures

One of the clearest conclusions emerging from the present study is that state structures, and institutional, legal, regulatory and cultural factors, can be extremely important in determining the nature, cost and success of eGovernment. As has been demonstrated earlier in this report (for example in sections 6.1 and 6.2), progress often depends on whether or not there is a history of back office integration and cooperation, but not necessarily through centralised structures. If there is, then it may be relatively easier and quicker to achieve significant digitisation, rationalisation, and the benefits of eGovernment. If there is no such clear tradition for cooperation, there could be a relatively long and complicated process to manage and coordinate change. However, the latter also provides the opportunity to completely re-think the whole process and the reorganisation of the whole service supply chain.

In some countries special issues may arise, such as the federal structure in Germany which means there is an extra government level which is difficult to 'integrate', especially given the fact that the Länder are fiercely independent both of each other and the national government. However, Austria also has a federal structure but has demonstrated significant innovation in eGovernment at municipal, federal and state levels. Other barriers may also arise from legal restrictions, for example on data sharing between agencies. Again, however, as Austria, Spain and Denmark, to give just three examples, have shown in many of the cases examined in this study, these can be overcome if there is a need and sufficient will to do so.

However it remains generally the case that eGovernment progress requires careful consideration of the existing organisational and technology conditions, which often themselves reflect national and/or regional regulatory and institutional regimes and cultures. Further, it is important to consider the different roles that can and should be played by the different policy levels (European Union, national, regional, local). The national level can have a key impact in identifying current needs (e.g. where integration is most necessary). Regional and local authorities, on the other hand, play a strong part in communicating with stakeholders and citizens, whilst the European level should arguably lead the way in standardisation and harmonisation initiatives.

It is clear that in many countries, strong central leadership, consisting of an overall vision, strategies, roadmaps, resources and the specification of standard solutions and frameworks, can be important for ensuring success in eGovernment. However, this needs to be pro-actively complemented by local and regional initiatives, close to their social and business communities, driven forward by local champions who are able to find the appropriate balance between, on the one hand, undermining special vested interests and undemocratic fiefdoms ('breaking down silos'), and, on the other, the need to preserve local autonomy and freedom to act in response to specific local needs. A difficult balancing act indeed, but an essential one and not confined to eGovernment initiatives alone. Different countries across Europe need to develop their own paths as each has unique identities, cultures, legal systems and institutional structures, but all can undoubtedly learn from the experiences of others.

Many of the eight strategies described in section 6 demonstrate how state and institutional structures, and legal and regulatory frameworks, are important. The lessons articulated there will not be repeated here, but, in addition there are a number of issues, demonstrating aspects of good practice in taking account of this fact, which affect them all.

7.4.1 Legal and regulatory conditions

- In the **Bremen personal documents case in Germany for birth and marriage certificates**, close cooperation was necessary and successful between the city itself and the Bremen federal authorities. In the German federal context, such legal changes and cooperation are perhaps easier in a small 'city-state' like Bremen (only the cities of Bremen and Hamburg have federal level status in the German system) because of its small size. Experience shows that this is much more difficult in other parts of Germany where the federal Länder are much larger.

- In both the **Finnish and UK enrolment in higher education cases**, legislation imposes certain constraints and obligations on services and data security, whether or not they are electronic, which may affect the type of service and how it is delivered. In the UK case, for legal reasons, the responsible agency will continue to send by post all correspondence involving the formation of the contract between the candidate and the university. Also, in both cases, data protection legislation determines how students' personal information is used and to which third parties it can be divulged. For example, in Finland, data security is subject to the Finnish Personal Data Act which also requires the agencies to make a public declaration describing their own privacy practices.

- The **citizen portal in Denmark**, and the development of the Net.citizen services, has put the focus on the fact that laws and legislation relating to interaction between the public and citizens can be a major obstacle for services that are feasible and logical from an organisational, citizens' and technical perspective. Typically, such obstacles either relate to the legal validity of the interaction between the citizen and agency (an example of this is the current law relating to applications for building permission that stipulates that "even a digital signature is not valid"). Or they are related to the amount of information on a citizen that a public office is allowed to integrate in their dealing with the citizen. In effect this means that strict laws which prevent different administrative levels from sharing or pooling information on citizens are becoming a problem when digital services aim to create administrative savings through the re-use of data. The citizen portal in Denmark is, however, experimenting with a system to enable the citizen to directly access and combine his/her own data located in different public sector agencies, even though the agencies themselves are legally barred from doing so because of data privacy restrictions.

- All three **business corporation tax and VAT cases in Greece, Ireland and Portugal**, show that existing legislation may hinder change both in the agencies involved and in the companies using the services. Often, existing laws may prove to be barriers to greater service integration, since rules related to data protection and data exchange can be inappropriate. Thus, existing laws should always be examined closely when contemplating the development of digital public services.

- In both **business portal cases, in Spain and Sweden**, the role of the legislative framework is important to understand uptake and success of the services. In the Spanish case preparatory work has been made to harmonise laws that would prevent the portal implementing its full services, and new laws were created to oblige large companies to use the service. A clear objective has been to suggest legislative changes that would improve service usability and efficiency for all involved parties (including the end-users). In the Swedish case the preparatory work was primarily organisational, which meant that some legislative issues proved to be an obstacle to success. For example, the law that restricts only one person in signing for a company, usually the managing director or the CEO. All companies and organisations are obliged to submit monthly tax declarations, but many have either an economic department or an outsourced consultancy that handles the declaration. In such cases, the manager/CEO needs to sign the declaration prepared by others which is a major disadvantage, especially when the declaration is prepared electronically. Efforts are being made to change the law, but this may be one reason why the Swedish portal is, to date, not highly used.

7.4.2 Pressure from legal changes

There are several examples where legal changes have opened the opportunity for online services and associated changes.

- In the **Spanish citizens income tax case**, legal changes opened the possibility for on-line services, initiated by problems regarding identification, authentication, privacy, etc.. These legal changes went hand in hand with the development of the service and led to the actual tax declaration system. A main legal barrier even now, however, is the necessary authorisation of the payment of tax refund while there is no technical demand for this human intervention. Another legal change took place to provide the possibility of a representative presenting the declaration on behalf of the taxpayer. This enabled the achievement of an impressive number of declarations filed via the Internet. With only 300,000 digital signatures, more than 1.7 million declarations were delivered.

- In the **Spanish family allowances case** the on-line service arises directly out of, and accompanies, legislative changes enabling for the first time women paying tax to receive a child allowance as part of a wider labour market reform to encourage women to start or return to work as soon as possible after childbirth.

- In the **Esslingen building permission case in Germany** a change in the regional law was required to carry out legally binding building plans on-line without at the same time requiring equivalent paper documentation.

- The **Italian car registration case** was prompted by a change in the law which aimed at the simplification of administrative procedures: the Bassanini Law. This also allowed the service to be provided without the territorial restrictions previously existing, so that the on-line service can now be used from anywhere in the country regardless of where the citizen actually lives. Since the Bassanini law concerns the provision of all public services, many other Italian online services are also being encouraged, for example **application for building permission** and **registration of a new company**.

7.4.3 Cultural and institutional dependencies

The differences between all cases are to some extent contingent upon the specific cultural and institutional context of each. One example is used to illustrate this.

- As the three different **citizen income tax services in Finland, France and Spain** show, the income tax system has grown over decades in each country and under the influence of different cultural and institutional norms and practices, especially regarding the content of tax declaration and privacy aspects. Thus, often the main limits are less linked to technical obstacles than to cultural and institutional frameworks. In other words, human and cultural factors are still extremely important in determining the success or failure of a project. Against this framework, it is interesting that in Finland personal income and the amount of taxes every citizen pays, is information in the public domain. Only some details are protected by privacy legislation. It is clear that cultural preconditions and institutional histories, e.g. regarding privacy, need to be considered when reorganising service provision. The Finnish example also shows the importance of embedding services in the everyday lives of citizens, businesses and agencies. Many practical problems have been solved because they are of topical interest and directly involve the people most concerned. Clearly, this kind of working method has a great impact on commitment and creates a spirit of ownership by, and the self development of, an organisation and its staff. It also encourages innovativeness and motivation.

7.5 Technology issues

eGovernment is not primarily about the technology, but technology is, of course, the enabler, and technological changes constitute an important driver and opener of new opportunities. Emerging technology trends and challenges include convergence, liberalisation and standardisation. On the supply side, this encompasses the need for interoperability, open standards, scalability and data security. On the demand (user) side there is the need for multi-channel choice, and fast, simple and secure access which actually fulfils user need, e.g. by providing services from a user life or business event perspective rather than an administrative/departmental perspective, and enabling the individualisation of services, or 'Me-Government'. The latter allows citizens or their electronic agents to actively self personalise the eGovernment service, which can 'learn' (e.g. through neural processing) how the citizen uses the service and adapt accordingly.

The successful management of technology is one of the most challenging issues. A 2002 report into big public sector IT projects in the UK (and, given the nature of the public sector, most IT projects are big) concluded that most fail and

waste millions, if not billions, of pounds. The culture of the public sector is not suited to large IT projects, it is said. When things go wrong, and they invariably do, no one individual (or even department) is prepared to take responsibility and accept the consequences, and neither does management take action to ensure accountability. The public sector tends to accept whatever systems, quality and price the suppliers throw at them, so there is no incentive on suppliers to perform better. (A corrective comparison is perhaps needed here with the success and failure of private sector IT projects).

Technical issues also need to be seen in the context of the speed and complexity of technological advance. This often makes it difficult for agencies to keep pace and adapt their organisational structures, the skills of their staff and the actual on-line services offered, in a timely, effective and financially responsible manner. General European good experience shows that a balance needs to be struck between customised large scale turnkey solutions, on the one hand, and outsourcing and standardised solutions on the other. The former enables agencies to retain control and ensure maximum benefit through specialised functionality, but has the disadvantage of large scale and thus large expense, as well as the heightened risk that failure or shortfall will have serious consequences. The latter gives agencies less control, but also tends to be cheaper, less risky and smaller scale, as well as enhancing interoperability with both legacy systems and implementations elsewhere, as long as an open technology platform is adopted. An important long term strategy is to aim to customise standard products and systems, rather than build a bespoke solution. In other words, ensure interoperability and open platforms, but also that solutions are tailored to local needs.

Each of the eight strategies described in section 6 demonstrates particular technology-related issues. The lessons articulated there will not be repeated here, but in the following are summarised across all types of case examined in the present study.

7.5.1 Standards and interoperability

Technical platforms built upon open standards can greatly ease progress towards eGovernment by ensuring the necessary levels of integration and interoperability are in place for truly 'joined-up' and cross-border (or 'borderless') government. Much evidence shows that many resources are being wasted reinventing systems and developing 'silo' technologies which are not interoperable between agencies or with private sector partners. Much of the evidence from the case studies examined in this report show that interoperability is easiest to achieve where there is a tradition of inter-organisational cooperation, and shared legacy technology. Where there is no such tradition, interoperability can be built using open standards (preferably modular and open source), retaining flexibility and knitting together the new work flows and organisational units, so that the technology and the organisation are changed at same time. As described in section 6.4, there are also 'back-doors' to interoperabilty which allow different back-offices and agencies to continue to use their legacy systems, so that legacy technology is not 'opened up' but 'wrapped around'[21]. There is no reason why this should not be a longer term solution, where appropriate, at least until there are other pressing reasons to change the technology.

Standards for interoperability

- Both **family allowances cases in Ireland and Spain** show the importance of the use of common standards especially when interoperability between different agencies and back offices is important. In the Irish case, one of the agencies was mandated to 'own' the standards and ensure that they are adhered to. In this initiative, the Irish Reach initiative was mandated to agree, set and own the data using XML message standards and this proved very successful in the development and implementation of the various strands/projects involved.

- **The citizen building permission case in Esslingen, Germany**, shows the importance of standards and the lack of them. Since building permission is the responsibility of the large number of municipalities rather than states or national governments, the use of standards is becoming more and more a priority. Particularly in Germany, different municipalities often use different software which leads to incompatibilities even between adjacent municipalities. As planning procedures often concern other municipalities as well, standards are a precondition for the integration of other services. For example, to connect the application for building permission with related services like real estate taxation or the population register, which are often the responsibility of the state or national governments, standards

[21] Waggemaar, R,, 2003, *From legacy to modularity*, Proceedings of Second International Conference EGOV2003, Prague, Czech Republic, September 2003, Springer, 2003: discusses technical modularity ('plug and play') which provides built-in interoperability and standardisation, and the concomitant degrees of freedom and tailorability in an open platform context.

are necessary. Moreover, standardised solutions are also a precondition for transferability. As the Esslingen case illustrates, the use of the planning platform is to date handicapped by the lack of standardisation within Germany. This means that different building permission software and legal rules across the German municipalities prevent diffusion of one platform technology, since common standards are lacking. Similarly, Esslingen architects who wish to use the platform when they are outside Esslingen can not do so since the platform solely exists in Esslingen. Esslingen can be seen as a driver of the standardisation process regarding the application for building permissions in Germany. A working group with representatives from all German states (Länder) has been set up in order to develop the common data exchange standard XBau.

Interoperability and transferability

- The **citizen income tax case in Finland** is mainly based on interoperability between the organisations formed by the TYVI-service concept. This platform is the backbone of the Finnish data transfer system that takes place mainly at the application to application level, as this provides many more benefits to the companies than e.g. Internet-forms for data exchange.. The platform is described in the Finnish case studies in Annex 6. TYVI is the basic Finnish backbone which covers all important B2G and G2B information transfers as well as many G2G processes.

- In the **car registration service in Italy** interoperability between different systems is made possible by the introduction of a standard web-based interface and ISDN connections with protocol TCP IP providing the link with agencies that are equipped with Windows 2000 or XP. This creates the possibility for a dialogue, based on XML, between the on-line system and the previous system existing in some of the agencies. The services are delivered via Intranet and protected via SSL v.3 protocol. Communication between agencies is managed via a dedicated line on the model web services. The system regulates the permanent balance according to variations of workload

- In the **citizen personal document case in Austria for residential permits** the use of standardised technology is necessary to guarantee interoperability and transferability. The Austrian case uses standardised eGovernment modules, an advantage of which is that if there are technical or regulatory changes, modules for sub-processes can easily be changed and upgraded. This offers more flexibility in service improvement and connectivity to other agencies. Due to the decentralised processing of files, faster communication via email and a higher degree of unification is necessary and is reflected in workflow standards.

- The both **family allowance cases in Ireland and Spain** the ability to provide pro-active services depends upon data interoperability between different agencies and back offices. In Ireland, the government-wide Reach programme is providing an inter-agency messaging service for all eGovernment initiatives, in the child benefit case between the child benefit agency and the civil registration and statistical agencies, such as electronic notification of birth registrations. In the Spanish case, data interoperability takes place between the tax agency, the social security agency and the Spanish statistical agency, as part of the wider on-line tax programme. In both Irish and Spanish cases, one key issue is thus 'ownership' of the data being transferred between agencies, for example, at what point do the transferred data become the responsibility of the receiving agency and how should system failures, etc., be dealt with. Further, there are the issues of data conversion, clean-up, migration and conversion of historical data, all of which is often a major task. In the case of Irish General Register Office, for example, this took up more time and resources than originally envisaged. This was mainly due to the fact that the data were originally indexed to support paper based retrieval and the data format was not consistent across all years. Ideally, more time should have been given to analysing the paper-based data prior to the commencement of the electronic data capture process. Similarly, encryption processing and error handling in the Irish case proved to be a more complex task than originally envisaged and was more difficult to do than the actual application development. It is important that sufficient time and resources be assigned to each to ensure successful development and implementation.

- In the **declaration to the police case in Finland** standard solutions to ensure success were employed. When a citizen user has filled out and sent a crime report form, it will first be processed by the lomake.fi portal[22] and after that sent to the XML-server of the Finnish Police. After having recognised the location of the crime, the information will be sent to the electronic crime declaration box of the local police office in question. Local police can transfer some parts of the information to their own operational system, but full integration of the investigation system is still under preparation. The information received by police is used for other services, e.g. in case of a stolen mobile

[22] The lomake.fi service enables electronic transactions between citizens, companies and organisations and central government and local authorities, their agencies and other relevant organisations. Today lomake.fi includes 800 different electronic forms of 20 public sector organisations. Monthly number of transmitted forms is roughly 5,000.

phone, the police inform the operators to prevent the use of this phone with other SIM-cards. Technical standards, which enable the solution, include TCP/IP networks, HTML presentation standard, HTTP and SSL protocols, VPN standard for secure transfer and XML in data recording.

- Both **enrolment in higher education cases, in Finland and the UK**, make use of data standards and conversions, and are going-over to a web-based system. In both cases, very large amounts of data need to be collated, for example, about students, their results, wishes, universities, types of courses, etc., and various legacy systems need to be incorporated. This is one of the major technical challenges, and has been successfully achieved through the use of data standards and conversions, and by ensuring scalable, flexible, resilient and secure systems, including the centralisation of relevant data by the agencies concerned. For example, in the UK case, the internal network infrastructure uses multiple web servers, application servers, databases and file servers which are controlled automatically to increase and reduce capacity according to traffic levels. This architecture also ensures that back up is available should any element fail. The UK also introduced a CD-ROM based system in the mid 1990s as the first fully digitised system. However, this approach has several drawbacks: it is expensive for the responsible agency to develop and maintain, it requires schools to install special software and, once issued each year, cannot be updated. In contrast, the new web-based services can be accessed from any PC, the information on the web can be updated frequently and the software can be constantly improved. It also allows universities to update information about courses during the course of the admissions season.

Legacy technology

- Both **student grant cases, in Denmark and the Netherlands** have successfully built on existing legacy technology, although in the Dutch case a lot of additional communication software between the back-offices of the different agencies involved has also been added given that this case (unlike the Danish) involved significant back-office re-organisation in order to correct the previous malfunctioning system and organisation. The Danish case was able to simply add a web-based front-end to an existing legacy mainframe system as a very cost effective solution, but could only do this because there were no significant changes to organisational set-ups or cooperation between the different agencies involved.

- The new system in **public libraries in Denmark** had to be highly flexible and compatible as it needed to be laid on top of existing legacy software which is different across many libraries. The use of the existing software infrastructure, and the development of very flexible central systems to ensure integration with different local systems, was thus a key factor. This minimised development costs and enabled very rapid implementation at the local level. A 'one step at a time' approach was also adopted and had several positive effects. First of all it allowed for a rapid development and implementation period, and the effect of this on citizens and administrative workers should not be underestimated. Secondly, it ensured that the long run flexibility of the system is optimal since it is being developed in modules.

- For the **citizens portals in Austria and Denmark** the major challenges have been to integrate a front-end web system with a variety of existing local back-end systems. In the case of the Austrian 'HELP' service portal, for example, many transaction services, especially at the local level, are stand-alone services which have been implemented by initiatives of states or municipalities in a bottom-up approach. Therefore, seamless integration into the portal is not always ensured in the top-down process of building a common national transaction platform.

- For the **Swedish business portal** the major challenge was to develop an interface for the users as well as routines that could handle the information that was registered on the website. In other words, that it was possible to transform the 'new' data into compatible strings that worked with the already existing systems.

7.5.2 Identity management

Some of the main conclusions from the cases regarding identity management are that digital signatures often create new barriers for users and keep traffic volumes low, although in some situations, like use by specialist and professional user groups, they can be successful, or when, for example, they constitute a standard horizontal function across many different services. In many cases passwords are considered sufficient for the time being and for the kind of risks related to the service in question. Take-up tends to be higher where simple solutions build on existing authentification systems (for example mobile phone service providers in Austria, SMS messaging in the Netherlands). If a pro-active service

mode is adopted (see section 6.7), password based procedures become more secure, because the agency knows to whom the initiative is directed.

Digital signature and PKI

- The **Finnish, French and Spanish income tax cases** all make use of a digital signature. In Finland, this is used across a large number of services as part of the TYVI-platform as the backbone of the Finnish data transfer system, so the digital signature is also used by many other services including citizen and business portals, the environmental permit service, etc. The French agency responsible is testing the use of the digital signature in the income tax declaration service as the major innovative feature of the income tax tele-declaration. The digital signature is, however, more than a signature as it is also an authentication through the declaration of the previous year. The Spanish declaration of income tax is the first public service in Spain using the digital signature and is thus also a test for other online services. Therefore, an organisation in charge of providing digital signatures and relevant trust centres has been integrated into the process to guarantee the identification of the taxpayer and to interact with the tax agency in a secure way.

- The **citizen car registration case in the Netherlands** initially paid too little attention to the impact of using PKI technology that requires a considerable amount of pioneering. The current PKI solution uses certificates that are linked to a specific in-house register and therefore the system is not yet exportable to other applications. An official national PKI standard had already been developed, but it was too elaborate to be of practical use. Despite the cautious strategy of waiting to introduce the new service until the responsible agency had enough in-house experience with the technology involved, the use of PKI still turned out to be a serious challenge to the organisation.

- The **citizen personal documents, birth and marriage certificates case in Bremen, Germany**, offers the use of a digital signature as part of the payment process. However, uptake is very low with two requests per month with the digital signature and about 18 per day without digital signature. (See below under 'Alternative forms of identity management')

- In the **Danish student grant case** PKI technology has been adopted for user identification and authentification, available from the centralised Danish agency responsible for developing software for the public sector. The fact that this does not yet enable full digital signature or access to users' tax data will shortly be rectified by system upgrade.

- Both **citizen building permission cases in Esslingen, Germany and Bologna, Italy** offer the applicant the possibility of legally binding decisions by using a digital signature. Similarly, legally binding official decisions by the agencies involved are also enabled. However, as long as the general demand for eServices is not articulated more clearly, and as long as further applications for which there is real demand for digital signatures are not present, the critical mass for a smartcard digital signature is lacking, even though the advantages are clear and improve service provision for customers as well as for the agencies.

- The **business social contributions for employees case in Belgium** is secured by a digital signature enabled by smart card technology which may be used in relation to a variety of other public services. This is very successful, also because the user group is relatively professional and specialist.

- In the **business registration of new company case in Italy** a key success factor is the development of a secure system that is easy to operate via digital signature, which is itself part of the 'Fedra' facility using a smart card. The digital signature may also be used for other eServices and this means that the probability for high uptake of the digital signature is quite good. The interrelationship between generic services such as online payment and digital signature and the specific services provided for Italian businesses is a key to the success of both types of initiatives.

- In the **Spanish business portal** a digital signature and on-line payment facility must be used for many of the business services, both provided by the Spanish tax agency. Once the signature is validated, the service connects the user directly with the associated bank and the payment may take place using a NRC (complete reference number). When this step is finished, the company submits the declaration signed with the digital signature and including the NRC. The digital signature is checked with the agency responsible for digital certificates and trust centres and the NRC is checked by the bank.

Alternative forms of identity management

The use of mobile phones is becoming a useful channel to support user authentification

- In the **citizen personal documents, residence registration case in Austria** citizens have the choice of a digital signature smart card or by mobile phone ('Citizen Card Light'). The country's largest mobile phone provider (Mobilkom) provides a service to identify/authenticate users using mobile access, thus enabling the exploitation of an already existing and widely used system. Citizens do not need to authenticate themselves by other means which would require further effort (whether this be PKI, digital signature smartcard, card reader, or whatever). This alternative mobile option results in only slightly less secure identification/authentication ('Citizen Card Light') than a full electronic signature. The procedure makes use of the fact that the mobile phone provider already identifies the user when a subscription is taken out. Therefore this mobile digital signature can safely be linked to a person's identity. The service is not limited to customers of Mobilkom. Customers of other providers or prepaid phone users who register personally with an identity card for an A1.net account are also being integrated into the service. Because of the widespread use of mobile phones, most citizens are able to access this service.

- Both the **Austrian and Bremen, Germany, personal document cases** are now offer alternative ways of identification/authentication than the use of the digital signature smart card. A critical barrier to the development of advanced eGovernment services in both countries is the low diffusion of signature cards amongst citizens. The lesson to be learned is that utility for users and ease of use stimulate demand. As long as there are no more than a few services, which are also available offline, citizens will refrain from purchasing the necessary equipment to use eGovernment services. Further, if users have to pay hefty charges for such services, this will impede uptake. Transaction costs for obtaining and mastering hardware and software for eGovernment services add to the unwillingness to invest time and money. Intermediate solutions with lower barriers of entry like the 'Citizen Card Light' via a mobile phone in Austria, could make an increasing number of people adopt a new service, thus building a user base for on-line services. Similarly, Bremen now also offers on-line services with lower demands on security regarding identification/authentication for certain services. In addition, the new company founded as a public-private-partnership (which sells eGovernment products to other municipalities as well), now offers its products with lower security levels. Following this strategy, the use of digital signature smart cards for any interaction with public administrations can be avoided by a more differentiated approach, with positive effects on uptake.

- In the **student grant case in the Netherlands**, PKI technology has been adopted for user identification and authentification, but a unique and very successful solution is used based on GSM/SMS technology, enabling users to access the system by mobile phone anytime anywhere.

Other alternative ways of identification/authentication are based on lower, but still appropriate security levels, in order to reduce usage barriers.

- The **Spanish family allowance case** offers a choice between digital signature and a personal reference number, i.e. a user ID. This is an interesting approach to tackling the difficult but necessary user authentification requirement. A choice is given to users: a digital signature facility already developed and used as part of its on-line income tax service, or the use of a unique reference number (as a user ID) given to eligible taxpayers in the pro-active letter sent to them inviting application for child allowance. The relative use of the two methods during the first week of August 2003 was two thirds using digital signature and one third using the reference number. In the Spanish case there do not appear to be any data security failures or barriers to usage as a result, which is a significant achievement (although it is too early to make definitive judgements), and thus probably demonstrates the value of having alternative authentification methods to support use of the service, and particularly the facility enabling users to interrogate the status of their allowance and payments on-line. In Ireland, a digital signature is being implemented as part of the birth registration process but is not yet fully implemented. The child benefit process is not subject to electronic user authentification as users do not yet have an on-line facility to check their entitlement and payments, although this is planned in the longer term.

- The **Danish public libraries service** demonstrates the first use of the publically known person-number to order books on-line. This is not very secure, but when the book is collected in person the user must use a standard library card which, of course, has the same level of security as the traditional system.

- To use the **Swedish business portal** and the electronic tax return, the individual has to obtain an electronic identification document. Posten AB (The postal service) or one of the seven major banks in Sweden can provide this, provided that the person concerned has a personal identity number.

- The two **citizens portal cases in Austria and Denmark** both indicate that event portals may not be attractive enough for citizens on their own to drive the uptake of digital signatures, but this problem has been partially helped in Austria by offering a type of digital citizen using a mobile phone, as described above for the residence permit. In Denmark, the service provider, KMD, developed its own user code system based on the personal number of Danish citizens, as in the library case above, in order that citizens should be able to use the portal with as little time as possible spent on obtaining codes and/or digital signatures.

7.5.3 On-line payments

On-line payments are invariably linked to identity management and are typically, though not always, part of the same functional package, depending upon whether or not the service in question involves financial transactions.

- The **citizens income tax services in France and Spain** both integrate on-line payment functions. In France, the payment solution was developed by private partners who were chosen through public tender, thus does not rely on past examples from other agencies or countries. One condition in the tender was the transferability to other French public services requiring payment (e.g. the payment of fines). So, for future services and with regard to the common platform 'www.service-public.fr' offering several payable services, the payment solution is to be standard for other services as well. In Spain a solution was found as a result of close cooperation with the finance sector (National Bank of Spain and other major banks), to integrate the payment procedures (either refund or payment of taxes) in the service provision independently from classical credit card systems. With the common development of the 'complete reference number' (NRC), payment via Internet became a reality and the declaration can be finished in only one session. The NRC allows a more flexible system, where the taxpayer can pay using his/her bank account number. The NRC is generated by the bank when payment is effected. The Spanish income tax service provider, AEAT, checks this code when the declaration is presented. It is the key for the whole payment process.

- The **citizen personal documents, birth and marriage certificates case in Bremen, Germany** offers users three different possibilities to pay fees. Apart the traditional method of payment, the user can choose between payment by direct debiting or electronic purse. The latter shows an efficient integration of payment in the cash system. While the registry office receives the order to issue the certificate, simultaneously a debit side entry at the cash desk's local enterprise resource planning software (SAP) is generated. Both workflows are labelled by a special ID and carried out via OSCI. When the customer carries out the online-payment by a standard order form or prepaid card, the cash data – labelled with the same ID again – settles the debit side entry. Therefore, the workflow of payment is separate from the workflow of issuing of the certificate. The workload of the staff at the registry office regarding online payments is taken away including the cash up at the end of year. Similarly, the staff at the cash desk no longer have anything to do with these payments since they are automatically processed by the SAP. Because of the use of common standards, this solution is highly transferable to other public administrations using the widespread software SAP.

- The **citizen personal documents, residence registration case in Austria** shows how to offer alternative ways of payment which customers are more likely to use. The 'Paybox' system integrated as part of the on-line certificate of residence, currently being implemented, has the disadvantage that it is not a very popular method. Although it is relatively fast and safe, it also charges the user extra transaction fees. The mobile access solution described above (under 'Alternative forms of identity management' in section 7.5.2) also allows payment of fees. Thus, a commonly used medium can be used to carry out payment with no other infrastructure needed by the user. This adds up to a user-friendly solution with positive effects on expected service uptake. Other payment systems are currently not available but a transaction database is being developed which will make credit card payment and bank transfer possible. In addition, banks are adopting EPS2 that will further facilitate payment by on-line bank transfer. Thus, different kinds of payment will be offered to give a variety of choice to the users, so that individuals can select according to his or her own needs.

- The **family allowance cases in Ireland and Spain** both illustrate the use of standardised services for the payment of the benefit/allowance into the user's bank account, in the Irish case as part of the wider eGovernment programme and in the Spanish case the horizontal service developed as part of the wider on-line tax programme.

- Both **enrolment in higher education cases, in Finland and the UK**, employ on-line payment methods. In the Finnish case, use is made of the standardised ePayment-interface of the Finnish Banking Association, as well as standardised PKI and digital signature services. In the UK, student applicants using the web-based application channel may pay fees online at the point of application by keying a valid credit or debit card number. This is the standard service, supported in the usual way by the commercial banks.

- The **business registration of new company case in Italy**, as described above in section 7.5.2 (under 'Digital signature and PKI') uses an integrated on-line payment system as part of the Fedra' digital signature tool using a smart card.

- In the **business portal case in Spain**, paying business taxes can take place via the Internet portal using an NRC (complete reference number) system. See section 7.5.2, under 'Digital signature and PKI'.

7.5.4 Data security

Data security is, of course, an integral part and objective of all identity management and on-line payment systems, but the following example is highlighted in order to illustrate this aspect.

- Both **enrolment in higher education cases (Finland and the UK)** operate successful data protection strategies. In the Finnish case, when paying fees, some of the banks provide the possibility to use PKI in login. A more common way is to use an ID, a fixed password and a changing password together. PKI/digital signature is also available in the web services of the banks. In the UK, the responsible agency achieves a high level of security in two main ways. First by multiplying its databases and file servers, and second by protecting the network with a series of firewalls. The agency does not make use of digital signatures or certificates. They have a very limited market in the UK and tend to deter customers from using electronic services. User access to the enquiry service is controlled by a PIN, in the form of the applicant's unique reference number, and password, and involves additional authentication checks in cases of lost passwords. For additional security, electronic correspondence will not be sent as email. Rather, an email will alert the applicant to the fact that correspondence has been placed in the enquiry service, to be accessed via PIN and password.

8 Good practice by service cluster

As described in section 4.2.3, the 29 European good practice cases were selected, not only on a country basis, but also to balance the different services represented in the eEurope common list of basic public services (see section 2.1.2). Services are also grouped into 16 clusters representing the two main target users (citizens and businesses) as well as in relation to the purpose(s) of the service. Good practice in each of these is examined in detail in this section.

Citizens eService clusters:	**Business eService clusters:**
Income tax (Finland, France, Spain)	Social contributions for employees (Belgium)
Car registration (Italy, the Netherlands)	Corporation tax and VAT (Ireland, Portugal, Greece)
Certificates (Austria, Germany)	Customs declarations (Austria)
Family allowances (Ireland, Spain)	New company (Italy)
Student grants (Denmark, Netherlands)	Public procurement (Austria)
Declaration to police (Finland) and public libraries (Denmark)	Environment-related permits (Finland)
Building permission (Germany, Italy)	Business portals (Spain, Sweden)
Enrolment in higher education (Finland, UK)	
Citizen portals (Austria, Denmark)	

The following provides an explanation of case overview tables.

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues

Column 3: user experience, on-line service score

1. An official application form can be downloaded, filled in by the user and sent electronically (an individually paper-signed version and/or attachments may have to be sent separately) (1 point);
2. The user receives online an individualised answer that her/his application form is accepted (evidence e.g. by registration number) (2 points),
3. The administration replies electronically (where legally possible) with the required document or a substitute (e.g. an announcement that the product can be collected). (3 points)
4. Data re-use takes place, so that the electronic service either:

- if a single service, re-uses data previously given by the user when returning at a later date, so that the user does not have to re-enter data previously given
- if the service is embedded as one of a 'bundle' of services (e.g. in a multi-service context such as a user life or business event), or is linked to other databases (where legally possible), between which there is data re-use and sharing, so that the user does not have to re-enter data previously given to another service and/or database.

Two additional points (+1+1) can be given, one for each:

- Some form of authentification, such as electronic signatures, PKI, etc (1 point extra)
- Electronic payment function. The term 'payment' in this context covers both a charge for a service (e.g. to obtain a birth certificate) or the service itself (e.g. unemployment benefits or child allowance). 'Electronic' means online banking, credit card, direct debiting, call centre. (1 point extra)

Column 4: back-office digitisation score

1 – in the BO: human interface (media break) keying-in data submitted by user
2 – in the BO: human interface checking of data
3 – in the BO: completely automatic (human interface only in exceptional circumstances for control).

Column 5: model (see section 4.1.5)

A – one service, one stage
B – multi service, one stage
C – one service, multi stage
D – multi service, multi stage

Column 6: Number of stages and agencies at each stage
Actual or estimates of number of stages and agencies/ back-offices at each stage

Column 7: Performance: on-line proportion of total service use (incl. raw data)
Take-up and other measures where these are available.

8.1 Citizen income tax

8.1.1 Background goals and drivers

In comparison with the other online services analysed in this study, the online income tax declaration is the most rolled-out service provided across Europe. Of seventeen countries involved in the evaluation, ten recommended income tax service as one of their most advanced examples. In general, the income taxation process is characterised by the need to:

- handle very sensitive data
- integrate data from many different offices
- possibly integrate income data from several employers per employee.

Regarding electronic service delivery, income tax declaration faces problems of:

- handling documentation (e.g. tax deducted by employers, invoices, etc.)
- authentication of taxpayers
- secure transmission of sensitive data
- in some countries, legal restrictions on fully digitised processes, though, from a technical point of view, digitisation would be feasible.

These needs and problems are the main challenges of putting income the tax declaration process online, in addition to the fact that citizens want to save taxes while the administration's aim is to maximise tax collection receipts.

Until now the overall take up of online declaration services is low to very low, with the exceptions of the Finnish and the Dutch examples. The Finnish taxation system is different from the others since here pro-active, pre-filled, tax proposals are sent to all citizens by post and thus is not reliant on a web interface. Thus, the relevant back-offices in the Finnish taxation system are already highly integrated and digitised. Thus, not least because of its user friendliness, the Finnish tax proposal represents European good practice. Apart from the Finnish case, the Spanish and French tax declaration services were selected for in-depth analysis. The Spanish service is characterised by the facility to undertake both declaration and payment (refund or paying in) in just one session with highly digitised workflows, whereas the French uses two separate workflows (which are also highly digitised). But this does not mean that other European declaration examples are not valuable. Rather, it is quite difficult to choose between the top service providers; for example also worthy of study are the Dutch and Austrian systems provide advanced income tax declaration services to their citizens with highly digitised back-offices. As mentioned above, the Dutch system has very high uptake with advanced electronic processing and no need for paper work, whilst the Austrian system has strengths in automation and the calculation of estimated refunds.

The common aim of the national finance ministries is to simplify the service both for their customers (citizens/businesses) as well as for their administrative staff. This is done by collecting the relevant data electronically and by a prioritised digitisation of repetitive working steps. However, it is clear that governments prefer service digitisation without the need for large scale reorganisation involving back-offices.

Before the Spanish online tax service was implemented, taxpayers were obliged to obtain their tax information from several agencies involving many different channels and a lot of paper work, resulting in high consumption of time and resources. The aim of the Spanish tax agency was thus to improve the efficiency of collecting taxes by simplifying the process for taxpayers as well as for staff by using new ICT. So, as with the Finnish tax online service, the aim was that Spanish taxpayers should be provided with relevant information already possessed by the tax agency. Moreover, the completion of the declaration should be made easier, with paper work no longer necessary and fewer required documents. Further, mistakes and misinterpretations should be reduced by the new system. All this had to be done in an

efficient way whilst achieving the maximum level of security. Other overall aims of the Spanish administration were the testing of their digital signature in a concrete service context, and the provision of a quality service leading to an increased demand for electronic services by the taxpayers. All in all, the online tax declaration service is an important component of overall progress toward an Information Society in Spain.

The traditional French tax declaration process suffers from three major disadvantages. First, the need for a high number of civil servants since the declaration period is only about 5 weeks a year. Second, a relatively large number of mistakes occur both in data collection and during data entry. Third, the use of the postal system to send tax forms is cost-intensive and not environmentally friendly. A direct web data entry service for the taxpayer should abolish all these disadvantages. In order to develop a system to improve service delivery by electronic means, an initial cost-benefit analysis was carried out so that the new tax declaration service could also be an economically valuable product for the citizen. In addition, the French Ministry of Economics, Finances and Industry (MINEFI) - which is responsible for tax declaration - is testing the use of a digital signature for this service, which will also be useful for the transferability of online services requiring an unambiguous identification of the user to other areas. All in all, the current government of France has set clear priorities: to offer online services for its citizens and to improve these services in the long run.

In contrast to most other European income tax declaration systems, the Scandinavian countries provide a special proactive tax proposal, with most data already included, direct to their citizens. In the Finnish case, taxpayers receive a pre-filled-in tax proposal generally including the relevant personal tax information. Even if communication between the taxpayer and the public agency is not web-based, the back-office situation is already characterised by high levels of integration and digitalisation. Before the back-offices were connected electronically, the taxpayer received only partially pre-filled-in forms, and had to fill in missing information before sending the form back to the agency. The form requested data from the citizen many of which were already held by the tax administration (like income and tax withholding certificates from employers) as well as some new information (from banks). These data were mainly used at the last step of the process to check the information given by the citizen in the tax declaration. Because most of the information was not received electronically, it was not possible to incorporate it at the beginning of the process. Thus, a specific objective of the service was the reorganisation and digitisation of certain processes and back-offices to receive this information at the beginning of the process. Once this was done, the data could be included in the tax proposal to be sent to the citizen, thereby relieving the need for the citizen to independently gather the same information. Other objectives were the retaining of service accessibility, even with fewer local offices, and an improved service for external customers in the public administration.

8.1.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4 +1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
AEAT (Agencia Estatal de Adminstración Tributaria = Spanish Tax Agency)	Spain[23]	4+1+1	3 (if result is paying in by citizen) 2 (if result is refund by the agency. 3 is possible but prohibited by law)	D	5 stages: • 1 national tax agency • ca. 200,000 public and private entities • 1 office for digital signatures • 1 National Bank of Spain • Several banks	2003: 1.7 million users, 12.2% of potential	• declaration in one session by using the digital signature • 'pro-active' tax declaration • tax calculation in real time • download of personal tax information • integrated payment • complete reference number (NRC) allows real time payment • bundling e.g. with family allowances like the deduction for maternity • tax declaration can be done by a representative • no paper work required
Impot.gouv.	France [24]	4+1+1	3 (declaration workflow) 3 (payment workflow)	D	• 1 national tax agency • 1 national accounting • ca. 4,000 local tax agencies • 1 National Bank of France • several banks	2003: ca. 300,000 users, 1% of potential	• declaration and payment are separate workflows • users were involved in development • integrated in a tax-account • bundling with inhabited house duty • payment is included • extended time frames by online handling • fewer documents required
Tax proposal	Finland [25]	No web application	3 within the involved databases and BOs (not to the users)	D	• 130 local tax offices • 9 regional tax offices • 5 ministries and central agencies • 20 banks and other financial institutions • 20 social insurance agencies and pension foundations • 100 000 stable employers • 100 000 occasional employers • 10 trade unions • 150 foundations, universities, research institutes etc. • limited companies and other organisations	2003: 3 million tax proposals were sent to 70% of all taxpayers and is the highest possible rate. The other 30% receive only declarations -- because they are mainly full or part time entrepreneurs, a tax proposal is not feasible. About 70% of the proposals were accepted by taxpayers without changes.	• pro active service for users • no web application • bundling with other taxation-, registration and other services by commonly used databases by several offices • police can check income information by SMS to define the level of fines on the road • easy and user friendly • highly digitised network • no reaction by the taxpayer required if proposal is OK • about 205,000 organisations involved providing data electronically • high take up

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

[23] Case report by Telefónica Investigación y Desarrollo, SAU, Spain
[24] Case report by Services Trading European Partners (STEP), France
[25] Case report by Association of Finnish Local and Regional Authorities, Finland

8.1.3 Implementation

User service provision

The Spanish taxpayers file their income tax declaration via a special assistance programme for income tax declaration (PADRE). This PADRE programme is available both online and offline (via the website of the Spanish tax agency or on CD). The user files his/her declaration by downloading personal tax-related information from the AEAT-website (Spanish Tax Agency) and/or by filling in the necessary data in the (PADRE) programme. The information for download is provided by several public and private entities and is also used to validate information provided by users. While filing, the tax amount (refund or paying in) is automatically calculated and shown in real time. Moreover, payment can be undertaken if all necessary steps are carried out and a digital signature is used. Through close interaction between the public organisation responsible for certificates (CERES), trust centres, banks and the AEAT, authentication and payment is possible via the AEAT web using the payment service. Once completed, a NRC number is provided to validate the declaration when it is presented. This last step can be done directly from the application or via the AEAT virtual office. The declaration can thus be completed within one session. Users without digital signature or offline-users generate and print a PDF form with a special point code. This code is similar to a bar code (with much more information) and can be read by a laser at the local tax office where the declaration needs to be presented.

The declaration of taxes in France is initiated by an online-form, filled in by the users. Citizens, who have filed their income tax declaration in the past, can file and pay them online on the websites of the French government. When filing the declaration online, no further paper-based cooperation is required. Moreover, the users benefit from a further time period to file their income tax declaration. The tax form is treated mainly electronically by an interface, an application and local tax agencies. After filing the form, the user receives a personalised number electronically, with which he/she can consult the status of his/her declaration at any time. On the basis of the submitted information, which is registered automatically, the agents working at the DGI calculate the sum of the tax to be paid, and send (by traditional post) the notification of assessment to the user. Once the tax amount is calculated, payment can be handled by the taxpayer in another session through an interface. These workflows are completely separate but of course interrelated. Each one is managed by a different authority. The implementation of the electronic payment was realised by a programme inside the Ministry. With regard to the two sessions, two notifications of assessment will be sent by traditional post to the taxpayers.

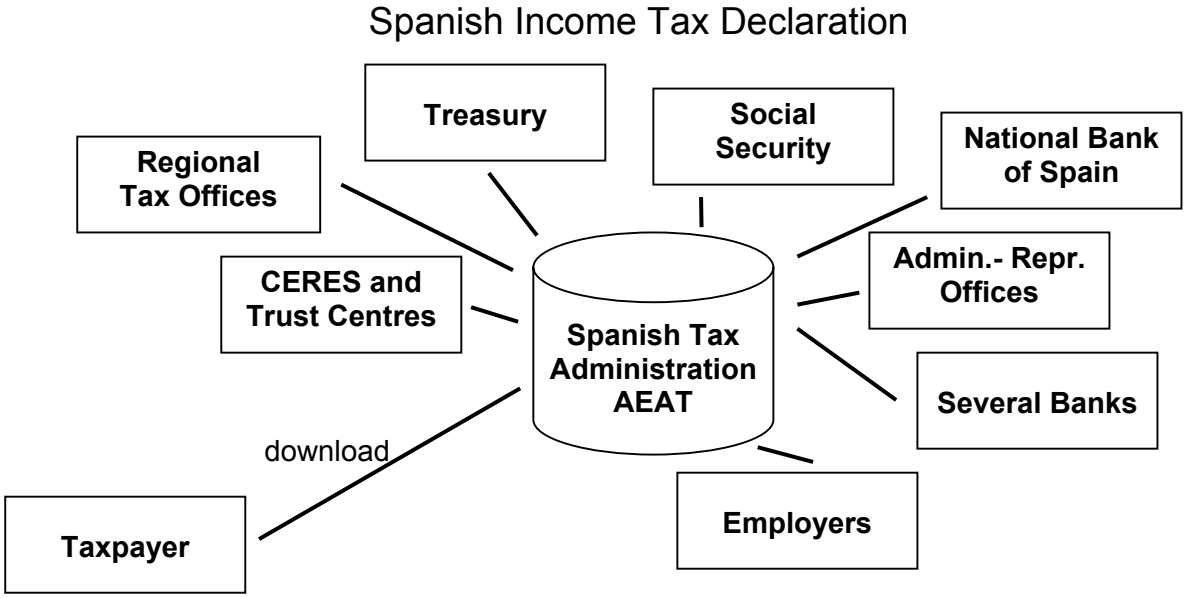
The pre-filled (i.e. pro-active) tax proposal of the Finnish tax authority is sent to about 70% of the taxpayers. Since the front end to the user is not digitised, the tax proposal is sent to the taxpayer paper-based by post[26]. The taxpayer has roughly one month in which to react. If the taxpayer does not correct or adjust any data or make any additions to the information, the tax proposal documents need not be returned. This means, if no changes are required, the taxpayers have nothing more to do with the filing of their income tax return. Approximately 70% of the tax proposals are accepted without the need for changes. In the case of changes, these are entered by hand on the tax proposal form and sent to the local tax office before the deadline in June. The tax administration determines the final taxation level of every citizen at the same time in autumn, regardless of the way the tax declaration has been made (traditional tax declaration, tax proposal without changes, tax proposal with changes). The taxpayer receives the final tax notice before the end of October. After this, if too much tax has been paid, the tax administration credits the taxpayer's account, or, in the case of an underpayment of tax, the taxpayer is sent an invoice for the payment of the due taxes. In view of the digitisation level of the whole process in Finland, 70% of all the invoices are paid electronically and 35% on the Internet.

Back office reorganisation

The Spanish declaration of income tax is the first public service in Spain using the digital signature and is thus also a test for other online services. Therefore, an organisation in charge of providing digital signatures (CERES) and relevant trust centres has been integrated into the process to guarantee the identification of the taxpayer and to interact with the tax agency in a secure way. The income tax service is provided by the AEAT which has reorganised the workflow in different phases. The AEAT has set up an electronic layer over a previous working application. Years ago, this application itself automated the internal management of tax declarations. Relevant taxation information comes from many public organisations, as well as other public and private institutions, and is transmitted by EDITRAN or Internet. The number of entities presenting information to the AEAT is around 200,000. Today, citizens communicate directly with the programme (called PADRE), making human intervention unnecessary. In order to offer real-time refund or 'paying in', a special feature, implemented between the National Bank of Spain, banks and the AEAT was integrated.

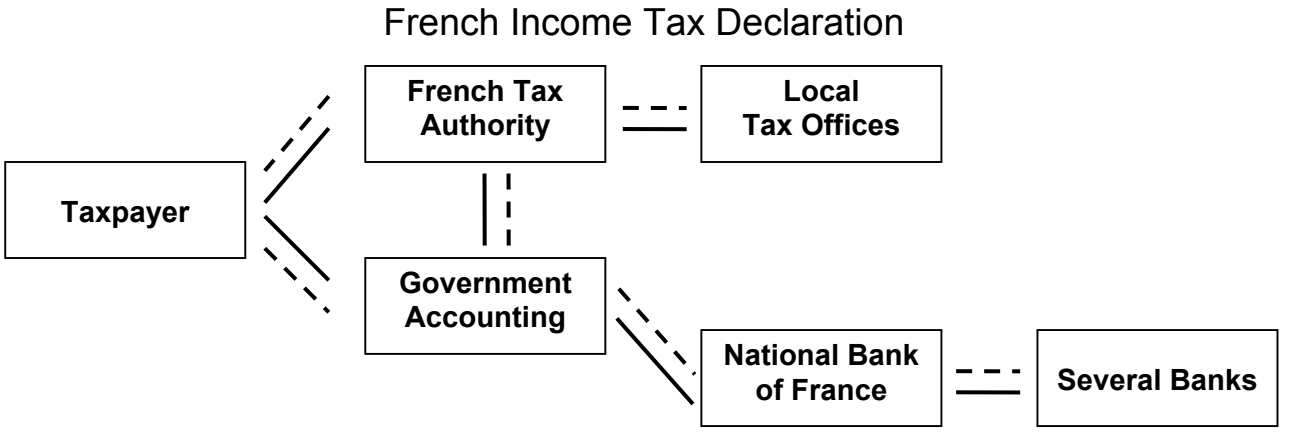
[26] The remaining taxpayers are mainly full or part time entrepreneurs, who file the ordinary tax declaration.

Hence, back office organisation has enabled a change in the way in which the service is offered to the citizen to take place. The system deals with all parts involved in the process. All processes are digitised, but because of legal obligations, an administrative act is mandatory for refunds.



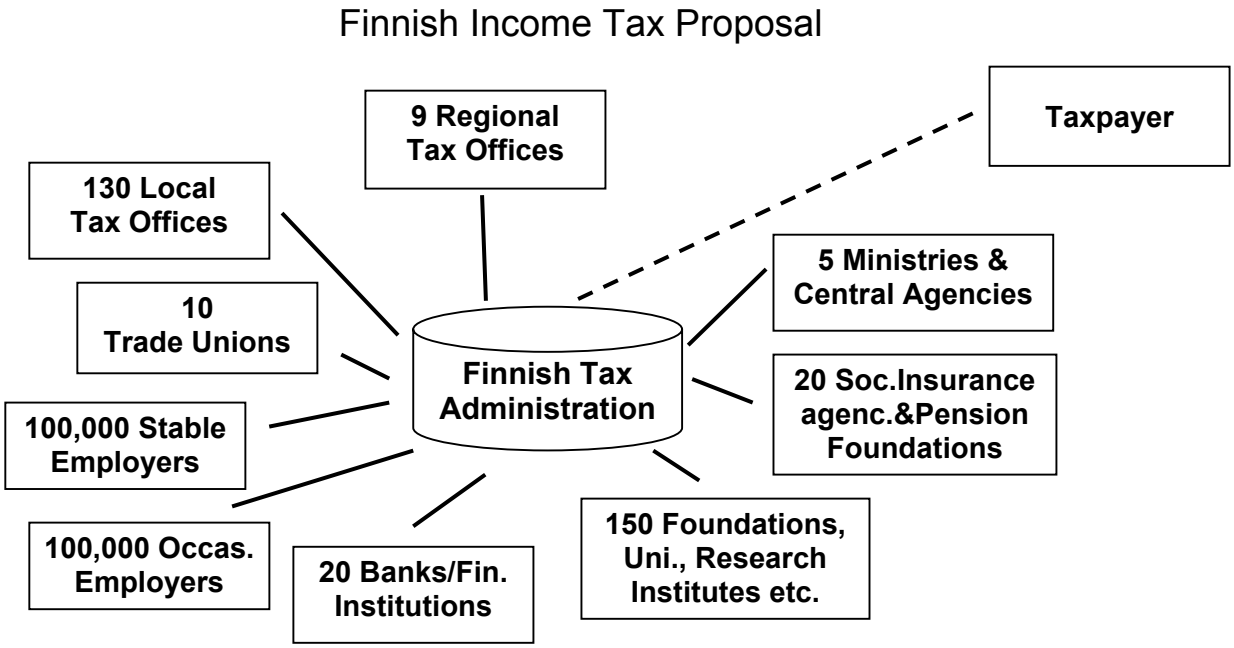
Similar to the approach taken by the Spanish government, the French MINEFI is testing the use of the digital signature in the income tax declaration service. This signature/certificate is the major innovative feature of the income tax tele-declaration. The digital signature is, however, more than a signature; it is an authentication through the declaration of the previous year. While putting the service online, the basic principle of income tax declarations did, however, not change as a result of digitisation. The same information has to be provided in basically the same period. What was done in the past via post and traditional payment can nowadays be done via the Internet. The taxpayers have to fulfil two major tasks: the tax declaration itself and undertaking the payment. This is done in two separate sessions. Both sessions are provided by two different directorates which belong to the Ministry (MINEFI). Data exchange is guaranteed through close interaction of the two directorates. The payment procedure is carried out electronically.

In the same way that the basic principle of income tax declarations did not change as a result of digitisation, neither did the back office situation change drastically. Civil servants were trained with respect to the new information systems. Today, a lot of data capture work is simplified due to the online service. However, the same back offices remain involved and no significant staff turnover was noticed.



———	Indicates transactions fully operated via the French Online service
– – –	Indicates transactions fully operated via the traditional (off line) service

In spite of the big changes in the Finnish service itself, the process in the administration – similar to the other online income tax declarations in Europe – is quite similar to the activities of the traditional service. Basic data used in the Finnish income tax declaration process comes from the Finnish National Basic Register System, which covers the main databases. These databases are fed by different authorities and connected in a network. So, for example, the change of a citizen's address will also be visible almost immediately in the taxation client register. The most important workflow in the whole tax proposal process is the information received from employers. Employers provide information on wages or salaries, other benefits and taxes withheld from every employee. The Social Insurance Institution of Finland supplies information on unemployment benefits, sickness and maternity allowances, pensions, etc. Banks and other institutions/ companies must also give their information to the register. At present, an average of 92% of all data received by the national register is electronic. The highest rates with almost fully digitised workflows are reached by information sources like pensions, income from forestry, trade union fees, unemployment benefits, dividend incomes, loans and interests, while the lowest level of electronic data transfer concerns the salaries (65%) and all kinds of research and artist grants (57%). All in all, the estimated number of organisations providing data for the back-office process for the tax proposal is 205,000.



8.1.4 Results and benefits

User benefits

Benefits enjoyed by Spanish taxpayers are the possibility of completing the income tax declaration without having to go to any public or private office. All procedures can be completed remotely, saving both time and money. Even if the taxpayer does not, for some reason, present the declaration online, the PADRE software also serves as a support programme, fills in the forms, and makes the correct calculations. Then it produces a PDF file that can be printed and presented to the tax agency by post or by going to the office. To obtain information about user satisfaction, the agency provides a questionnaire, which shows that more than 80% of responding users are satisfied or very satisfied with the new online tax declaration. In relation to the degree of difficulty of the system, about 80% assess the tax declaration as of 'low' or 'medium' difficult. A further benefit is also that tax declarations can be presented on behalf of third persons. These declarations are then presented by the administrative representative's offices on behalf of their clients or by using public Internet access points installed by municipalities and regions. The big advantage for users lies in the calculation of the tax amount (whether tax refund or tax payment) in real time, and the completion of the declaration in one single session. On average, refunds to taxpayers have been shortened from approximately 90 days to 25 (around 70% less).

The benefits of online declaration and payment for French taxpayers are seen in terms of reduced time as well as in the saving of money and paper, since the declaration-forms no longer have to be sent by post. One of the additional advantages for the user is that, with the new online declaration, s/he is no longer obliged to provide the appendix sheet to prove his status and activities (e.g.: charity donations), which was obligatory with the previous paper declarations. However, the user has to keep all proof in case of control. In order to assist citizens making tax declaration, the Ministry installed a help desk for questions for the first online declaration in 2002. Furthermore, the online taxpayer benefits from an additional time period in which to reply. In future, further advantages will accrue to the user. The tele-declaration of taxes is one of the first steps towards a unique platform, which will, in the long run, be able to absorb the complexity of the French public administration.

In the Finnish system, the main advantage of the pre-completed tax proposal sent to the citizen is its user friendliness and the fact that most, if not all, required data is already entered. Since about 70% of citizens subject to taxation do not react to their proposal, they are deemed to be satisfied with the taxation system. Certainly, there is also a danger that some Finnish tax payers may be too easy going or lazy to react, so that some people may not make necessary changes to their tax proposal even if this would give them some tax deductions. Thus, the administration is working to optimise their workflows in order to reduce this possibility. Since taxation is carried out in a pro-active way, taxpayers do not need to keep many receipts nor employers' income declarations during the taxation year. On the assumption that in the old system it took an average of four hours to find the receipts, make the calculations, fill in the declaration and send it to the tax administration, and that the checking of the tax proposal takes half an hour, savings in time and effort for Finns are tremendous. In addition, the tax legislation and the system it supports are easier to understand because their transparency enables citizens to see everything listed in the tax proposal.

Agency benefits

With respect to the comfortable new features of the Spanish tax declaration system, about 12.2% of the Spanish taxpayers used the released version of the 2003 declaration campaign. This means an average increase of 50%. This is an important statistic in a country with a low Internet penetration rate. Benefits for the agency are that the information filed by the taxpayer is transmitted in real time, even before this information is transmitted previously by other agencies or institutions. The quality of information has also been improved, as it is validated during the process, helping to present declarations with fewer errors or gaps. In addition, the payment transaction itself is carried out with no further delay and the average time for refunds has been reduced from 90 to 25 days. Thus, digitisation has effectively shortened both payments and refunds.

The major benefit for the French administration and its staff is the decrease of data needed to be captured. This saves a lot of time and money. Furthermore, the process is paperless, which is on the one hand more cost-effective but also more environmentally friendly. With regard to the content of staff jobs, civil servants are nowadays relieved from a lot of repetitive paper work, which has been largely replaced by more challenging and interesting work (direct contact with clients, that is users; new technology-intensive work, etc.). For instance, tasks like sorting out of paper forms, typing of information submitted hand written, etc., have been completely replaced. Another result achieved by the service is the

successful internalisation of payment since its former externalisation was not satisfactory. Moreover, regarding the payment option, mistakes during data entry are avoided and time for the administration is saved while no treatment of cheques is required.

Since 2,100,000 Finnish tax payers (equals about 100% of total citizen income tax payers, excluding entrepreneurs) do not react to the pre-completed tax proposal sent to them (which means that for them the proposal is also the final taxation calculation), a huge workload is removed from the tax authority staff. This saves roughly 500 man-years in tax administration. In addition, there was a centralisation of tax back offices from a situation where almost all municipalities had their own tax offices (446), to the current system, where the offices are mainly sub-regional (130). Further, instead of routine tasks, the limited human resources can now concentrate on more complicated services. Since the paper-based workflows have become more and more digitised, fewer mistakes in data-transfer occur and there are fewer appeals against taxation demands. The increase of electronic data transfer has also brought savings to information providers. For example, more than 3,000,000 annual notifications from employers are sent electronically every year almost directly from the local pay-roll systems to the tax database. Compared to manually filled-in forms, the savings are remarkable. Further advantages are the easier and faster use of tax information which helps to improve public services, and even provide new pro-active services, because in many public services data on personal income play an important role.

8.1.5 Lessons and good practice

Centralisation of data sources allows service provision in real time and reduces the need for receipts of evidence
The Spanish tax agency as well as the Finnish one obtain information from a large number of entities, including public organisations and different kinds of associations and private companies. It also centralises all fiscal data in the system, thereby simplifying information provision by responsible organisations. Even where it is not possible to obtain all information electronically, the attempt to capture it this way has been important. Tax agencies in both Finland and Spain provide as much flexibility as the current systems allow. For electronic transmission, the Spanish entities can use EDITRAN (information transfer protocol) or the Internet. The latter still has some limitations depending on the size of the files. If a certain number of registries are exceeded, the Spanish income tax service provider (AEAT) requires use of EDITRAN. AEAT is dynamically changing these limitations as its Internet servers now allow broadband connection. The Internet does not need a large infrastructure, so it is ideal for small organisations. Data-flow in the Finnish tax proposal is managed by the TYVI-platform[27] and the messages between the applications, and especially between the big users, are mainly based on the EDIFACT-standard (although the use of XML is increasing). The Spanish agency is trying to increase the amount of information (registries) that can be sent via Internet to facilitate the electronic collection of information. The amount of information both tax authorities manage is immense. Therefore, the more information obtained electronically, the more efficient its management will be. Since the relevant tax information is kept online at the tax agency, the declaration system is able to calculate the tax amount in real time. Moreover, since the tax agency already has the relevant tax data, no further receipts of evidence by the taxpayer are required. A paperless tax declaration and tax proposal is possible. In addition, another important element in the background of the Finnish tax proposal is that the centralised national basic register system is utilised in almost all services and functions of the Finnish public administration. So the database of each citizen is generally known throughout the whole Finnish administration, a situation which is not legally possible in all countries.

Offering pro-active service to meet users' needs
The Spanish tax agency collects all possible information relevant to income tax and, at the same time, to validate any information introduced by citizen themselves. Centralisation and digitisation of data and workflows in the Spanish income tax declaration system makes it possible to provide the taxpayer with the relevant tax information by download from the tax authority (AEAT) website. Therefore, taxpayers do not need to collect data from the different entities involved in order to present these at the tax office, even though the citizen is still obliged to provide relevant information which AEAT does not have. Thus, the workload is shifted from the taxpayer to the online taxation system which processes the relevant taxation data. A similar shift in workload is evidenced by the Finnish tax-system, which moreover makes a pre-filled tax proposal to its citizens, so that the majority do not have to do anything to progress their income tax declaration since the tax authority undertakes this using data it already possesses or can obtain from the actual data sources. Only in the case of corrections or adjustments will the tax proposal documents need to be returned in altered state by the citizen to the tax authority. To realise such a service, the Finnish government started to change the

[27] The TYVI-platform is the backbone of the Finnish data transfer that is made mainly on the application-application level. The platform is described in the Finnish case studies in the annex.

taxation system in the early nineties, aiming to simplify the tax declaration system itself. Several changes were made in tax deductions in order to implement this goal. The basic idea behind the tax proposal was to change the use of information, formerly collected and presented by the citizen to the tax agency and then checked by the tax agency against their own data during the last stage of the process, to the use of the agency's own data right from the beginning thus relieving the citizen of the need to collect any data at all. This helped to increase the quality of the service as well as the effectiveness of the public administration.

The back offices must be highly integrated to offer a pro-active service
As especially the Finnish and Spanish examples show, back office integration is of high importance since many public and private organisations are integrated in the taxation workflow. Much emphasis was (and still is) placed upon the connection of the back offices to the national tax authorities. The digitisation of processes between each back office involved is a pre-condition of a successful pro-active service being offered to citizens. Otherwise, the citizens will need to consult any relevant back offices not integrated in order to access the paper-based workflow data.

Cultural and institutional dependencies influence the organisation of the service provision
The income tax declaration/proposal is a service grown over decades in each country and under the influence of different cultural and institutional norms and practices, especially regarding the content of tax declaration and privacy aspects. Thus, often the main limits are less linked to technical obstacles than to cultural and institutional frameworks. In other words, the human factor still determines the success or failure of a project such as the income tax declaration in Finland, France or Spain. Against this framework, it is interesting that in Finland personal income in taxation as well the amount of taxes of every citizen is public information. Only the details are protected by the privacy legislation. Cultural preconditions and institutional histories, e.g. regarding privacy, need to be considered when reorganising service provision.

Integration of payment functions by the finance sector to guarantee a one-stop procedure in one single session
As the Spanish case shows, a solution was found -- under tight cooperation with the finance sector (National Bank of Spain and Banks) -- to integrate the payment procedures (either refund or payment of taxes) in the service provision independent from classical credit card systems. With the common development of the 'complete reference number' (NRC), payment via Internet became a reality and the declaration can be finished in only one session. The NRC allows a more flexible system, where the taxpayer can pay using his/her bank account number. The NRC is generated by the bank when payment is effected. The Spanish income tax service provider, AEAT, checks this code when the declaration is presented. It is the key for the whole payment process.

Realise payment as a secondary service to guarantee centralisation and standardisation of payment and thus transferability to other services
The French payment solution was developed by private partners that were chosen through public tender. Therefore, the payment solution does not rely on past examples from other agencies or countries. One condition in the tender was the transferability to other French public services requiring payment (e.g. the payment of fines). So, for future services and with regard to the common platform 'www.service-public.fr', offering several payable services, the payment solution is to be standard other services as well.

Taking advantage of existing systems to avoid developments from scratch
The Spanish online income tax system takes advantage of existing systems (e.g. the existing tax system, payment, and digital signature), so it is not necessary to develop the service from scratch. The new layer on the Internet allowed taxpayers to interact directly with the income tax service provider's (AEAT) computing system and therefore to complete the declaration processes electronically, avoiding human intervention of the agency staff. Additionally, existing systems for companies have been used to develop income tax declaration via the Internet. The system is very similar to those previously implemented, thereby taking advantage of existing solutions for necessary tasks. Electronic payment, developed as a horizontal service, allows easy integration with other services which need to use it. Thus, time and money are saved, and compatibility of features across services is achieved.

Emulate the existing service on the Internet to improve service delivery without huge reorganising tasks
The provision of the French tax declaration service is mainly based on the digitisation of the existing working steps since the basic principle of income tax declaration has not changed. The same information has to be provided in basically the same period. What was done in the past via post and traditional payment can now be done via the Internet. Neither did the back office situation change drastically. Civil servants were trained with respect to the new information systems. Today, much data capture work is simplified due to automation of the online service. However, the same back offices remain involved and no significant staff turnover has occurred. However, the service delivery has been

improved by digitising the workflow since the processes were simplified for users as much as possible. Also, the online forms and their completion have been maintained in a very straightforward way and are easily understood by the entire population.

Offer incentives for using the system to increase uptake
The French tax authority offers incentives to taxpayers when using the online tax declaration. On the one hand, the users benefit from a prolonged period of reply. While taxpayers have five weeks for returning their declaration by traditional paper-based procedures, this has been extended for those using the online-solution. On the other hand, taxpayers are no longer obliged to provide the appendix sheet to prove his/her status and activities (e.g. charity donations), which is obligatory with the traditional paper declaration. However, the user has to keep all proof, in the form of receipts, in case of control. In future, further advantages for users will be introduced. The tele-declaration of taxes is one of the first steps towards a unique platform, which will, in the long run, be able to absorb the complexity of the French public administration. This will help to increase the uptake of online-services as part of a more efficient and streamlined income tax declaration workflow.

Digitise the most repetitive tasks of a service in order to enable staff take on more personalised user relations
Since the staff of all three tax administrations studied (Finnish, French and Spanish) are overloaded with tax declaration tasks, one of the basic ideas of their online declaration/proposal service is to relieve employees of the most repetitive tasks. This has been achieved by the digitisation of the workflow, where the most routine tasks have been automated and are now carried out by the system. Therefore, responsible staff are enable to take on more personalised and direct user relations, which both improves the quality of the work experience and provides much improved customer relationships.

Apply lessons learnt from the private sector to foster productivity
As in France, governments can and should apply lessons learnt from the private sector in order to foster productivity and improve relationships to users. The aim must be to relieve employees of the most repetitive tasks in order to release resources to provide more personalised user relations. In addition, the web interface for the French payment services (SATELIT) is a new product. This product does not rely on past examples from other agencies or countries. For setting up this technical infrastructure and the development of the software, a call for tender was launched (just as for the development of any other information system contractors were found via open tender). So, know-how from the private sector was integrated into the public sector. Since the private sector usually works more efficiently, productivity in the public administration can be improved.

Data transfer at the application-to-application level provides efficient data transmission
The income taxation process in Finland is mainly based on interoperability between the organisations formed by the TYVI-service concept[28]. This service can be considered as the Finnish Portal which covers all important Finnish B2G and G2B information transfers as well as many G2G processes. Data transfer is undertaken mainly at the application-to-application level as this provides many more benefits to the companies than e.g. Internet-forms for data exchange.

Speed up final taxation declarations and payments for more solid financial planning by municipalities
One aim of the Finnish tax authority is to speed up final taxation declarations and payments. The tax authority is in charge of income taxation for the local governments. For a successful financial planning, the municipalities are interested in final tax information at an early stage. Because many manual tasks still exist in the whole taxation process, this objective has not yet been fully achieved.

Increase use of service by enabling specialised representatives ('multipliers') to file for many taxpayers
The possibility in Spain of a representative presenting the income tax declaration on behalf of the taxpayer has allowed the achievement of an impressive number of declarations presented via the Internet. With 300,000 digital signatures, more than 1.7 million declarations have been submitted. This facility enabled many people who do not have the digital signature to file the income tax declaration electronically, thereby achieving the benefits this presents. It seems that the digital signature is still an obstacle for many people using eServices. Without the use of representatives, the number of online declarations would not have been so high. With this method, it is possible to reach a larger number of citizens.

To increase uptake, offer users a service with user-friendly features

[28] The TYVI-platform is the backbone of the Finnish data transfer that is made mainly on the application-application level. The platform is described in the Finnish case studies in the annex.

The automation of the Spanish tax-service simplifies the declaration for the taxpayer. At the same time, it is used as an information service where the taxpayer can consult his/her personal income details and other kinds of personal fiscal information. Users who are not familiar with new technologies and associated procedures are supported by the service provider (AEAT) to finish the process satisfactorily. The pro-active service of the Finnish tax authority has implemented the most user-friendly solution of all, since in most cases the citizens do not have to do anything about their income tax. Also, with regard to possible changes to the proposal, the citizens only have to write the required changes on the tax proposal form and send it back to the local tax office. In the tax proposal process there are, in fact, several services for citizens as well as for the administration back offices and some services for companies. Similar to the Spanish declaration process, the Finnish tax proposal can also be seen as an information service from the administration for the citizen about tax-related information.

Legal changes may be needed as the basis for an on-line service
To develop and allow the Spanish online tax declaration, several laws and orders had to be changed and issued, since problems regarding identification, authentication, privacy, etc., arose. These legal changes went hand in hand with the development of the service and led to the actual tax declaration system. A main legal barrier until now is still the necessary authorisation of the payment of tax refund while there is no technical demand for this human intervention. Another legal change took place to provide the possibility of a representative presenting the declaration on behalf of the taxpayer. This enabled the achievement of an impressive number of declarations filed via Internet. With 300,000 digital signatures, more than 1.7 million declarations were delivered.

Accomplish cost-benefit analyses and feasibility studies as a factor of success
The success of the online service provision may depend upon whether a coherent study of the existing system is undertaken. As the French case illustrates, the project was built upon a solid cost benefit analysis as well as feasibility studies that covered both quantitative and qualitative benefits. The framework conditions for the development of the service could thus be established. In addition, well conducted analyses and studies can prevent recurring debates about the actual use and necessity of investments.

Close cooperation with all involved entities is a precondition for success
Centralisation and digitisation of information in the Spanish case made it possible to provide the income tax declaration online. Therefore, and with respect to the interests of all involved agencies/entities, it was seen as necessary to cooperate with each other to develop an integrated service. So, for example, only because of cooperation with the financial sector could payment be efficiently included. With the development of the 'complete reference number' (NRC), payment via the Internet became a reality and the declaration can be finished in only one single session. Electronic payment can be easily implemented in other services needing cash functions that do not only involve the credit card systems used on the Internet.

To implement a complex and sensitive online service, a phased implementation process with user participation is recommended
In France, as in other countries, legal changes were and still are necessary to provide such a complex and sensitive online service. Such changes will influence the step-by-step development of the income tax declaration service, as well as the overall aim to integrate most governmental services in a common platform (www.service-public.fr) providing high value for citizens. In addition, to increase this value, users need to be involved in the overall development process. In France, taxpayers were involved in two phases so that the special needs of the main target group could be considered. Similarly in Finland, the very successful approach was to test the tax proposal system with a limited number of people and limited number of local tax offices in the first instance. Technically, these kind of big changes could be carried out quite quickly, but it takes time for organisations, staff and users to adopt change.

Development as a part of everyday life
The Finnish tax proposal system has never been a special project with its own resources and reports, so it is impossible to find out afterwards what its costs have been. This does not mean that the change has not been controlled or that something has happened by accident. The next reform planned, Taxation2005, has parts that have been prepared using normal project methodology. The feeling of an outside evaluator is that many practical problems are solved if they are of topical interest and involve people. It is obvious that this kind of working method has a great impact on the commitment and creates some kind of 'spirit' of ownership by and development of the organisation and its staff. It also encourages innovativeness and motivation.

Overall conclusions

Within the cluster for income generating services to citizens, only one single service is covered, i.e. the declaration/proposal of income taxes. However, this service is the most rolled-out online service in Europe and involves important elements of back office reorganisation and digitalisation. Income tax declaration across European countries is organised differently in relation to national legal conditions, as well as cultural and institutional frameworks and histories. Thus, any transferability of on-line income tax services needs to be treated with utmost caution. However, some elements like payment solutions, authentication or ideas regarding prepared tax proposals or declarations, are important elements which can impact the way other countries plan and implement their systems.

A common feature of the income tax service is the high number of tax declarations in every country each year. This means that authorities need large resources to cope with this financial service which is important for citizens and public administrations alike. In times of chronically tight public funds the finance ministries try to reduce personnel costs by service automation. But, also citizen-centred models which allow simpler procedures are important. Both demands can be served by providing an online tax declaration service. The best European solutions aim to collect income data from the original sources, such as employers, social insurance, etc., at the beginning of the taxation process rather than at the end by collecting data from the taxpayers themselves. This is done in Spain and France by providing these data direct to the individuals concerned, and in Finland by using the data to pre-complete the income tax declaration and sending this pro-actively to the taxpayer. To do this, the back offices providing the data for the taxation process have been connected to the tax agency and each working step has been digitised. Therefore, the user no longer needs to prepare and file the relevant data himself/herself. Further, receipts or statements, such as tax withheld or invoices, are no longer necessary. To simplify the process, governments generally move to income taxation processes with less demand for such receipts or statements. To connect all relevant back offices, great efforts regarding standardisation and interfaces processes are required. These technical challenges have to be faced in an iterative process and are still not finished even in the best income taxation examples. This is mainly due to lots of involved small and medium-sized companies.

Further common upcoming problems are the demands for security and privacy, beginning with the identification of the users in case of the web based tax declarations. Today this is solved by individual solutions for this specific service, mostly by different kinds of electronic signatures with certificates and transaction numbers like the NRC in Spain, the tax and declaration numbers in France or the tax and social security numbers in Austria. These tend also, however, to provide a burgeoning national standard for other eServices requiring financial transactions. An exception is the German income tax declaration procedure which can be accessed by a qualified signature on a smart card. This electronic signature is equal to the written signature and serves to authenticate the user for any service at any time. However, the use of digital signature smart cards is not very common, neither in Germany nor in other European countries.

In fact, in the security context the service application is, in general, more advanced than its legal basis. This means that human control functions preconditioned by law have to take place through human authentication (mainly in case of tax refund or identification of users), even though the application could technically enable automatic processing. In addition, national behaviour often determines service flow. So most of the time, the main limits are not so much the technical barriers mentioned above, but are rather linked to cultural handicaps and to institutional factors. In other words, the human factor still determines the success or failure of a project such as income tax declaration in France and Spain, as well as the Finnish system. Similar pro-active elements of taxation used in Finland also exist in some other Nordic countries but are very different from the rest of the European states. It is not only a question of technical differences like PIN-codes and central basic register databases or electronic data exchange between organisations. More important are cultural, institutional and political differences in the privacy area, as well as differences concerning the balance between the centralisation and decentralisation of certain tasks or sectors of the public administration.

8.2 Citizen car registration

8.2.1 Background goals and drivers

The car registration services online which have been short-listed in Europe as good practice are from Iceland, Ireland, Italy, The Netherlands and Sweden. The service provision in these countries shows many similarities and all in all is very advanced not only in regards to other online registration services in the evaluated European countries.
Various well designed service parts characterise these services. While the Irish offer a special service integration in the national revenue system with personalised tax account, the Icelanders use the security functions of the banks to authenticate themselves in the same way like home banking. The Swedes, furthermore, offer fully electronically registration and de-registration with an automatic report to the concerned agencies like the Police, insurance companies, car testing authority, car agents and others.

However, not least because of the special feature of involving the private car dealers in the process as certified registrars, the Dutch 'in-situ registration' service and the 'e-counter car registration' in Italy are chosen for an in-depth introduction.

The Dutch RDW[29] case is a result of the efforts by the Dutch motoring and travelling community during the 1990's which persistently campaigned for a reorganisation of the car registration procedure. In the old system, the car owners had to register their car at three different registers[30] separately while the data integrity was low. So, while the actual total number of cars in the Netherlands was less than 6 millions, about 9 million cars were registered in these three databases. This led to a significant negative effect on the operations of each of the individual agencies. Besides, the responsibility for car registration solely rested with the RDW. However, the main certification steps had (and still have) to be done by the car dealers. So customers and car dealers had to fulfil several demands which were considerably time and effort consuming. So in detail, with the new in-situ registration it is aimed to reduce the total operation costs as well as the work load at the car dealers[31], to improve the customer service in the car sales process and to keep up or preferably improve the levels of reliability of the registration process.

The Italian Auto e-counter car registration is a project resulting from a special law which aims at the simplification of administrative procedures (Bassanini Law). This is not just a law for car registration but for all public services and was passed in the beginning of 1999. The car registration procedure prior to the auto e-counter was characterised by numerous steps to be done especially by the users, e.g. the car owner had to make several visits to different offices to register the vehicle and to notify officials of any related change of ownership or of prerequisites for circulation. The main challenge of the e-counter car registration was therefore to bypass this huge bureaucracy and time-consuming procedures by moving toward a unified e-gateway. Simultaneously, a solution had to be found for a linkage of the two responsible public administrations for car registration: the Automobile Club Italy (ACI)[32] and the Department for Transportation of the Ministry of Infrastructure and Transport[33]

Both the Dutch and the Italian case were driven by a special pressure for change; the Dutch by users who were very dissatisfied by the traditional registration procedure and the Italians who were forced by law to simplify public service provision. The characterising feature which is special for car registration services is the fact that registration has to take place after purchasing a car and that it has to be done mostly by the car dealers. So the special challenge of car registration is to involve the private car dealers in the overall registration procedure in a better way, for the car dealers itself as well as for the customers.

[29] RDW: Netherland Road Transport Department.
[30] Formerly, the car owners had to register their car at the Police, the Ministry of Finance and the RDW.
[31] The car dealers are responsible for carrying out the registration at the public administration. So the customers are not 'really' involved in the registration process at the public agency.
[32] The ACI is responsible for the Public Registry to certify the legal ownership of the vehicle.
[33] The Department of Land Transportation regulates prerequisites and technical specifications for automobile circulation.

8.2.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4 +1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
In situ registration of RDW (Netherlands Road Transport Department)	The Netherlands[34]	3+1+1	3	C	RDW Police / Justice Chamber of commerce Population register all Postal Agencies several insurance companies several car dealers	June 2003: ca. 1650 users (garage companies) ~ 14% with ca. 25% increasing rate per year. Ca. 140.000 transactions ~ ca. 7%	No web interface for customers (in situ registration) Authorisation of private companies as certified registrars Postal Agency is still also responsible for registration Integrated central database + one-stop procedure (purchasing and registration) + high cost savings + data re-use by several back offices
Auto e-counter of ACI (Automobile Club Italy)	Italy[35]	3+1+1	3	C	ACI (nat. level) Ministry of Transport & Infrastructure (nat. level) 3.552 e-counters diffused in 194 offices of: - ACI - Ministry of Transport & Infrastructure - Car dealers	April 2003: 400.000 car registrations ~ 100%	Car registration has to take place at the e-counter offices Authorisation of private companies as certified registrars Two integrated central databases + one-stop procedure (purchasing and registration) + integrated in a service portal for car related services + re-deployment of staff as e-counter agents

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.2.3 Implementation

User service provision

Since the pressure for change in case of the Dutch car registration procedure has led to a reorganisation of the service, the responsibility to register cars is now shared between the motoring and travelling community (car agencies, dealers, garages etc), postal offices and the RDW.

Today, the customers can register their cars directly at the car dealer where they have bought them. For registering, only the driving licence[36] and a signed advanced directive[37] are required by the user. The staff at the garage are in charge to check the legitimating of the car owner by consulting the databases of the RDW (central driver's licence register and central vehicle certificate register). If legitimating is successful, a registration certificate will be printed and given to the customer as well as the 'letter of indemnity' to the former car owner. Also the car plates will be handed out during the registration process. The customer has nothing more to do. On the other side, because of the authorisation, the staff at

[34] Case report by ICTU, the Netherlands
[35] Case report by Nomisma S.p.A., Italy
[36] Since the RDW maintains the central driver's licence register (and is not in charge of the population register), legitimating is only possible with a driving licence. Formerly, the customers were also allowed to authenticate themselves by passport.
[37] The 'advanced directive' is a written declaration that the customer agrees to the fact that the garage company – as a non-neutral party – performs the registration.

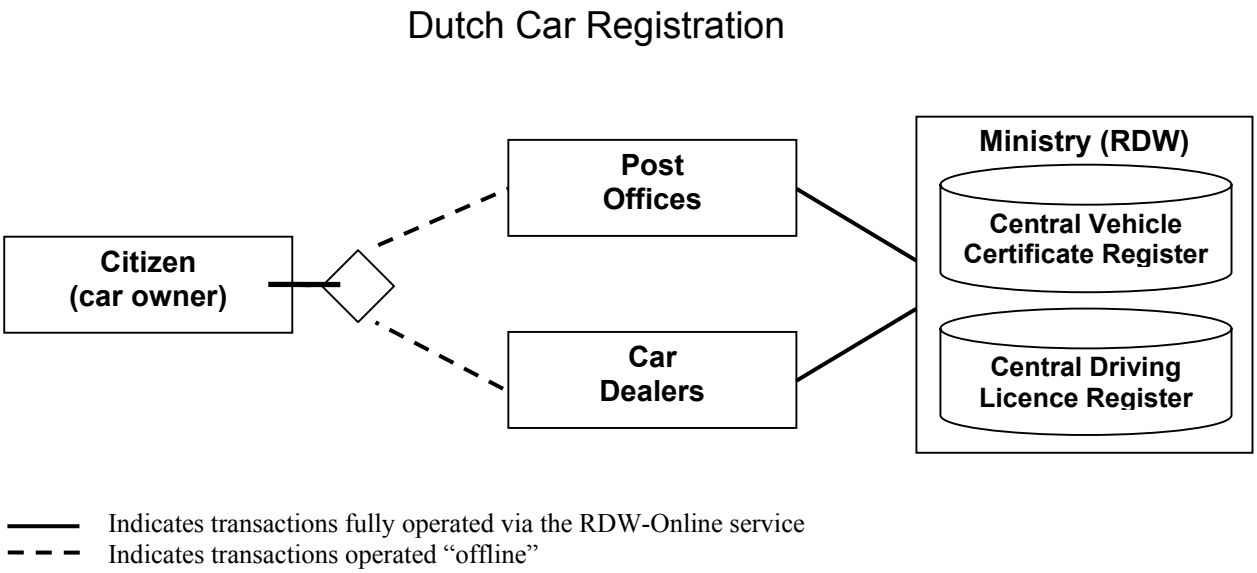
the garage can register on their own without getting in direct contact with the public administration. The former procedure (registering at the post office) is also still available. So the customers have the choice to register at the car dealer or at the postal office.[38]

Customers of the Italian e-counter have to present first two documents to the e-counter which are relevant for registration[39]. This includes the car circulation card and the certificate of ownership. Then, via the web service the user can register the car[40] either via the ACI or the Ministry domain. The databases of the two Ministries are connected with each other and both will continuously be updated with entered user data[41]. At the moment the data is entered, the back offices verify the validity and coherence of the data with respect to the current law. The users also get an ID and password for further operations. After validation the document will be issued and sent by traditional post to the customer. The car plates will be taken directly at the e-counter while the registration is carried out. Also, the fees have to be paid at the e-counter; but online payment is available for the payment of annual car property taxes. In contrast to the previous system where the customers had to go about five times to several agencies, now the customers have to go only once to one e-counter. However, the 'letter of indemnity' is not part of the service and has to be ordered separately.

Back office reorganisation

The reorganisation regarding the Dutch RDW case took place in two phases: To face the problems arising from the three vehicle databases owned by different parties, these three databases were first integrated in one commonly used register of authentic vehicle licence registration. This register, maintained by the RDW, is fed by several organisations[42] and is also the legal reference basis for tax, social security, municipalities, insurance companies and police. Due to the great number of parties involved, the construction of the reliable and trustworthy registration system took more than a decade. This phase was accompanied by legal changes especially regarding the RDW which became an administrative body on its own, now independent from the ministry.

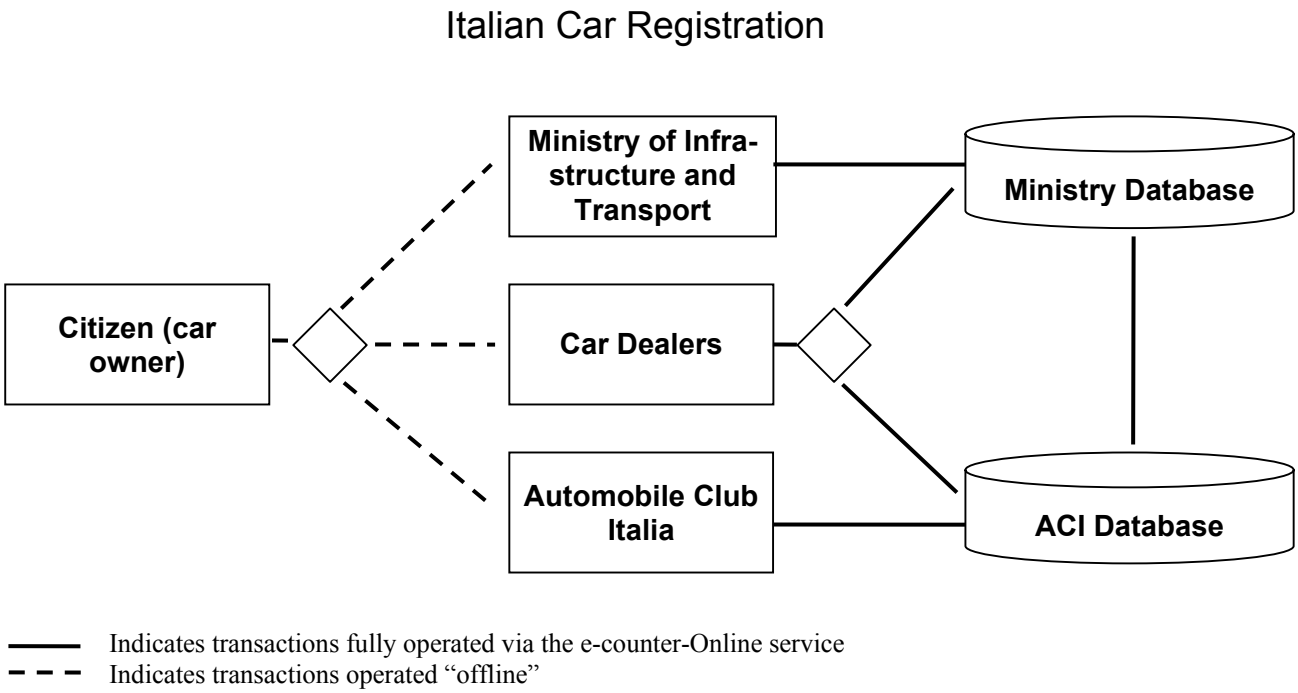
The second phase is the implementation phase of the actual registration case. Therefore the car dealers were authorised by the RDW as certified registrars to do the car registration beside the post offices. So the customers can purchase the car and arrange the registration in a one-stop procedure with instant service. Also the actual provision of the certificates of car ownership is now shared between the car dealers and the Postal Agency. For this particular service, all post offices in The Netherlands therefore function as RDW's front office. The insurance companies were also involved in the reorganisation to serve the customers with the necessary indemnity.



[38] The post offices are considered as a reliable and trustworthy channel for many public services in the Netherlands.
[39] The issuing of two paper-based documents is still necessary since the Italian e-counter only represents an intermediate step toward the long-term objective to harmonise the legal and administrative system for certification and registration of ownership of vehicles with a scope to further simplification of such a system.
[40] Besides car registration, customers can also obtain the certificate of car ownership, survey the Public Register Automobile database or pay the vehicle tax via the web service.
[41] The databases are connected but not interactive.
[42] The main participating organisations are the post offices, police/justice, car importers/garages, chamber of commerce, population register and the insurance companies.

The Italian e-counter was implemented within one phase by a mixed project team from the involved administrations and the private sector. With regard to reorganisation efforts, the car registration in Italy is now available at any time at any place. Before the e-counter, the access to the services was limited at the provincial level and the operation was limited to the opening hours of counters of the relevant local offices of the ACI and the Ministry of Transport and Infrastructure. Now the customers are served not only by the public offices of ACI and the Ministry but also at the car dealers spread throughout the country.

The formerly separated databases of ACI and the Ministry which both were fed by the customers with the same data are now linked with each other. So the customers have to enter their data only once. The co-operating system between the two entities concerned is now characterised in a way that any 'imbalance' occurring in one of them is immediately reflected in the other. Also, such a connection allows the immediate processing of any request and the delivery in real time of the relevant final certificates.



8.2.4 Results and benefits

User benefits

The benefits of Dutch in situ registration for the actual users (the car dealers) are seen to be tremendous: A conservative estimation (based on 3.000 participating companies and 800.000 registrations) arrives at total annual savings of 10,3 million Euros – an average 3.250 Euros saving per company. Total annual savings for the entire markets (12.000 companies and 2 million registrations) are estimated at 22, 6 million (average 1.884 Euros per company). The savings will ultimately be passed on to the customers.

In qualitative terms for the customers: they do no longer have to hand over their official documents or wait another day for the completion of the registration process (one-stop procedure).
An interesting side effect is that the competition between the car dealers and the post offices has led to an improved service performance of the latter and to lower prices per unit[43].

The benefits to users of the Italian e-counter project are mainly seen in the advanced service delivery which results in efficient time savings. From the initial request and data entering to the actual printing out of the registration certificate,

[43] Prior to the in-situ registration, only the Postal Agency was entitled to issue the registration, now the car dealers are as well allowed to do so. Therefore both are competitors in serving the registration of cars.

a maximum of 15 minutes is required. In contrast: the customers had to make an average of five visits to the related public administration offices before. So savings in working days were estimated by 1.25 million according to the estimated time of every single access of 1 hour. These savings are not only for car registration but also for other transactions and operations of e-counter. Concrete financial benefits are not known until now since the service is relatively new and will continuously be improved and expanded.
Through the diffusion of nation-wide access points[44], the service delivery has been decentralised and the service delivered in real time. The e-counter now offers the possibility to request automobile-related files without territorial barriers.

Agency benefits

Before the Dutch RDW case was started, a cost-benefit analysis was carried out. Benefits for the agency mainly resulted from the investments in the new central registration, surrounding organisation and information systems and eventually amounted to 27, 3 million Euros. Initial estimations amounted to 32, 76 million Euros – hence this is a rare example of an IT project that actually did not overrun its budget. Estimations of annual financial benefits according to the RDW are about 90, 9 million Euros – which means the investment would be recouped in only four months.

Moreover, the RDW financed the project of its own budget, but to recoup the prior investments, the garage companies have to pay fees. This is considered appropriate since the garage companies benefit tremendously from the new system. Once the amortisation of the project costs is completed (3-4 years), the fees will be lowered.
The introduction of the central register including the new role of the RDW had been accompanied from the beginning by a long-term internal quality management program, focused both on improvement of internal processes (quality of data, no human errors, more cross checks) and (faster and easier) service delivery.

The benefits for the public administration in case of the Italian e-counter are seen in the greater availability of reliable and updated information regarding motoring that can be used for monitoring trends and for making policy recommendations. Also, there is a reduced risk related to cash transactions, as these are replaced by e-payments through Car Dealers which increases security for provincial offices. Moreover, the possibility to carry out simultaneously the file processing function by the ACI and Ministry systems has generated immediate benefits for the Public Administration.

A further benefit is the creation of advantages for car dealers and driving schools in terms of redeployment of staff trained as e-agents by the PA's training programme.

8.2.5 Lessons and good practice

A number of common and alternative learning points arise from the introduced cases from The Netherlands and Italy. Each of them can be considered for transfer elsewhere provided that unique local conditions are taken into account.

Outsourcing of responsibilities to private companies to use their geographical distribution and to reduce the workload of the public agencies
A major feature of the Dutch in-situ registration and of the Italian e-counter is the shifting of responsibilities for registering cars to private companies (car dealers). This takes into account that, from the viewpoint of the users (people who purchases a car), the service is done where it occurs – at the car dealer while purchasing a car. So the legal acts that have to be done by the customers when purchasing something (in case of car registration - a car) can carried out without further delay. This saves time and efforts for the customers and car dealers.

Moreover, by involving the private sector in public administration tasks, the distribution of the private companies (car dealers) over the whole country can be used. In addition, in case of the Dutch car registration, the Postal Agency was and is still also responsible for the registering of cars. So the geographical distribution of the Postal Agency was and is still used for service provision. Therefore, the network of private car dealers, post offices (only in The Netherlands) together with public offices is used to improve the service delivery by decentralisation (closer to the customers) and longer opening hours. Besides, the public administration, usually responsible for registering cars, will thus be supported.

[44] Due to the possibility to choose among the e-service suppliers (ACI counters, Ministry counters and the car dealer counters).

Centralisation of data sources allows service provision in real time by simultaneously reducing the error rates
Once a database is used by different parties for different purposes, a centralised database under one responsible authority could lead to a better performance for all participants. As the Dutch RDW case shows: A single central database which contains all vehicle owners in a single database saves resources in comparison to the former situation when the Ministry of Finance, the Police and the RDW operated with three different databases which had more or less the same content (vehicle owners). This leads to a service provision in real time since only one single database is accessed (and therefore no other back offices or databases are involved which would interrupt the dataflow). Furthermore, faults or misinterpretations in data entry and converting will be avoided because of the direct access to the single register. This is also the case in the Italian e-counter system; even though there are two registers, these are linked with each other and will continuously be updated. So just as in the Dutch case, there is no interruption between access point and central register, and the advantages of service delivery are the same.

Online-emulation of traditional service steps could save resources by simultaneous improvement of service provision (instead of investments in new workflows)
Dutch RDW case: Apart from the realisation of the central vehicle register (which has actually not an active role in the service provision for the customer itself), the workflow of registering cars has only been copied from one authority (Postal Agency) to another (car dealers). Even if the service provision has advanced much for customers as well as for the staff, the workflow now introduced to the car dealers has been emulated to the traditional procedure at the post offices as much as possible. So existing working steps which had been proved practical can also be suitable for other tasks by using the same infrastructure. Therefore wasteful developments could be avoided.
The same in Italy, though the service delivery of the e-counter has drastically been improved, the main changes have taken place by transferring the traditional workflow into an electronic one. However, the competencies of the single local dealers have been extended to allow a territorially independent registration procedure.

Integration of the Postal Agency as a trustworthy organisation for issuing certificates
In the Dutch RDW case, the Postal Agency (beside the car dealers in case of the car registration) is in charge of printing certificates. The Dutch Postal Agency is in charge of printing any official certificates of the public administration. So an organisation, which the Dutch public considers trustworthy, has been chosen to print certificates (though the Postal Agency has been privatised by now) i.e., an original task of the public administration has been outsourced not only to any private firm but to a well-known institution. This strengthens the trust in the online provision of services containing sensible data in the sense of security and privacy.

Service provision without territorial barriers allows broader service diffusion
Before there was the Italian e-counter, the customers had to register their car at their local agencies within the district borders they lived in. With the new e-counter the service provision was reorganised so that the service could be used elsewhere in the country without taking care of territorial responsibilities. So one advantage of the Internet technology – service access from elsewhere – was included in the service provision itself: accessing the service from elsewhere in the country.

Putting a service online where all participants are known, a high uptake could be forecast
The car dealers in The Netherlands as well as the e-counters in Italy are more or less statistically recorded. In Italy, the registration of cars is only possible via the e-counters, so the e-counters are all known by the public administration. The Dutch authority has statistics about the potential car dealers which could serve as certification agencies. This means, the amount of potential users is either known, as in the Italian case, or can easily be estimated, as in the Dutch case. Therefore, to develop and implement a service which relates to such a closed (known) user group, the uptake can be influenced more efficiently as if the potential users are not known. Besides, in these cases the uptake can be increased by showing the users the benefits or by giving advice to use the system (e.g. by law). As the Italian example demonstrates, 100 % of the registrations will be done via the e-counters. However, the Dutch went another path and still additionally provide the traditional solution via the post offices. Until now, the uptake is quite low with about 7%, but it will increase since 30-40 car dealers per month let themselves be certified as official registrars.

Training of targeted staff are a prerequisite for qualified service delivery
In order to cope with the challenges of realising the Italian e-counter project which includes several public and private participants, training and the creation of awareness among the great number of system operators including class training and assistance by a dedicated call centre were undertaken. A critical factor is whether the car dealers are ready to invest in the new e-solution both by acquiring the relevant equipment and by supporting the personnel training and redeployment.

Based on standards to be prepared for interoperability
The inter-operability between different systems in case of the Italian e-counter is made possible by the introduction of modern technology. Web-based interface and ISDN connections with protocol TCP IP provide the link with agencies that are equipped with Windows 2000 or XP. This creates the possibility of a dialogue, on XML, between the e-counter and the previous system existing in some of the agencies. The services are delivered via Intranet and protected via SSL v.3 protocol. The communication between the ACI domain and Ministry domain is managed via a dedicated line on the model Web Services. The system regulates the permanent balance according to variations of workload

Pressure for change leads to renewals
The Dutch in-situ car registration was started by a pressure for change mainly coming from the motoring and travelling community. By that time, the RDW managed the registration system in conjunction with a network of automobile garages, but delegated actual provision of the certificates of ownership to the Postal Agency. This shared responsibilities often resulted in frustration and delays for the car owners and garages. The motoring and travelling community wanted to bring the secure registration of car ownership under their own control which required a change both in the front- and back offices of the RDW. In contrast to the Dutch case, no special pressure by the users was the main reason to renew the Italian car registration system; rather the change of the law which aimed at the simplification of administrative procedures (Bassanini Law) was the starting point of the service renewal. Since this law concerns the service provision of all public services, the other Italian online services are also driven by this rule (application for a building permission and registration of a new company).

A phased implementation process guarantees time for error testing
As realised in the Dutch RDW case, it is important to involve all stakeholders in the project from the beginning. In this particular case especially the close collaboration with the umbrella organisation of the industry paid off. The project was well received from the onset because it targeted a service for which a real demand already existed for years. On the other hand, RDW did not move too fast but waited until it had enough experiences with technology to cater to the wishes of the industry. Nevertheless still too little attention had been paid to the impact of using a technology that requires a considerable amount of pioneering (esp. PKI)[45]. The service provision prior to the Italian e-counter was very complex and confusing. Based on the Law (Bassanini Law) the service provision could have been reorganised. After a planning phase of about seven months, the system was implemented. During the planning phase, representatives of the involved public agencies as well as from the private sector were integrated. However, there were no special phases of implementation.

Root the project to decision makers on the top to do decisions immediately
The success of the Dutch RDW case is also to be put down to the fact, that the project was firmly rooted at the highest decision making levels. This permitted the project management to make important decisions immediately, without further delay.

A quantitative and qualitative cost benefit analysis as a prerequisite to ensure the usefulness of online delivery
As the Dutch RDW case illustrates, the project was built on a solid business case that covered both quantitative and qualitative benefits. This legitimating prevented ever-recurring debates about the actual use and necessity of investments.

Digitising of highly repetitive services to realise quick results in savings and benefits
As the Dutch RDW case demonstrates, the most significant short-term reductions in administrative costs can be achieved by aiming at existing high-frequency procedures. In this case, the project aimed at the migration from an existing front office channel to an improved electronic one. Total number of registration is over 2 million per year – already a small reduction in costs per registration adds up to a significant amount. Car-related services in Italy are one of the highly repetitive services. The two involved administrations have to manage more than 20 million car-related files annually. Moreover, beside the PA's lots of car dealers and authorised demolition centres are involved in car-related services. Therefore and also with regard to the Bassanini Law (s.a.), this service was considered as a very useful service to streamline and effectuate its provision with real benefits to staff and customers.

[45] The current PKI solution uses certificates that are linked to a specific in-house register and therefore the system is not yet exportable to other applications. An official national PKI standard had already been developed, but it was too elaborate to be of practical use. Despite the cautious strategy, to wait deliberately with the introduction of a new service until RDW had enough in-house experience with the technology involved, the use of PKI still turned out to be a serious challenge to the organisation.

8.3 Citizen certificates

8.3.1 Background goals and drivers

Various countries in Europe offer the possibility to request certificates of birth and marriage online. The responsibility for service provision differs between countries. While in some cases the municipalities are in charge of the online certificate service, in others a more central organisation is in place (e.g. central electronic register and delivery service).

However, the maturity of service provision among these countries could hardly be considered as much advanced. Most cases suffer from problems regarding authentication and concern the delivery of the certificates. So there are only two cases in Europe that have been short-listed as good practice and which will be introduced in depth: The request for 'Certificate of Residence' from Austria and of the 'Birth and Marriage Certificates' from Bremen, Germany. These two cases meet best the service challenges and provide authentication online as well as solutions for the delivery of the certificates. The Austrian service is similar to the request for certificates of birth and marriage although it concerns a different type of certificate which had not been explicitly mentioned in the original list of basic public services in Europe. The disadvantage of the Bremen case is the low uptake since digital smartcards are required but rarely used by citizens. Similar the Austrian case, but Austria offers alternative access and authentication modes. Therefore, the move from pilot users to wider uptake depends on legal requirements entering into force at the beginning of 2004.

The Austrian Certificate of Residence (CoR) is a brand-new model application under Austria's national Web-portal (www.help.gv.at). Since the certificate service was designed as a transaction that can be carried out fully online including the download of the certificate, the delivery has to be foolproof so that no changes of the certificate can take place. To guarantee the legal rules regarding identification/authentication but to avoid the use of the digital signature as the only option[46], a suitable alternative solution had to be found. This was accomplished by offering a modified version of the digital signature ("Citizen Card Light") involving a private mobile phone provider. Also for the online delivery of certificates, a suitable solution had to be found. The development of the certificate service has been driven by the aim to utilise a technology with high penetration and consequently low access barriers in order to pilot a project that can be accessed at an Austria-wide level. The service is also designed as a model application to demonstrate the transaction functionality of the national HELP.gv portal. Moreover, it should be shown that the newly established central register of residence (population register) and other components work together effectively within an e-government procedure.

Bremen, Germany, offers the possibility to request for certificates of birth and marriage in the framework of its activities concerning the provision of electronic services by use of qualified digital signatures. Since the City of Bremen is one of the three final winners of the federal e-government competition MEDIA@Komm, Bremen is aiming to offer various online services for citizens and businesses under inclusion of digital signatures. This competition was introduced by the Federal Government of Germany in 1998 to push the development of e-government technologies and applications in the public administrations. Due to this competition Bremen was awarded matching funds to develop an online-transaction platform and specific applications for various user groups including the request of certificates (beside other online services).

In this context, the modules and workflows that were and will be developed have to be transferable to other applications and proceedings. So the use of open standards on the technical side as well as the creation of workflows which can be implemented in other services as well is paramount. A big part of the reorganisation efforts is given to the implementation of a new software system. The public administration of the whole City of Bremen has put the local enterprise resource planning software SAP in operation. Therefore the administrative proceedings, especially the payment proceedings, should be integrated in this system as far as possible. The integration of payment proceedings are of high priority because all agencies are conducted to the cash desk to do their payment transactions or for reckoning up.

Both, the Austrian and the German cases were driven by a special pressure from the authorities to implement a service that can be provided and carried out fully online. The service is accompanied by strict rules regarding security and privacy. On the other hand, legal adaptations were necessary to provide the service online to the full extent and in an attractive form.

[46] Since digital signature smart cards in Austria are far from being broadly available up to now, an additional channel for identification/authentication was deemed necessary. However, identification/authentication by qualified digital signature is also possible.

8.3.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
Certificate of Residence*	Austria[47]	4+1+1	3	C	Register of Residence All local registry offices Private mobile phone providers Private certificate delivery company (w-deliver. itsolution.at) Private payment provider (paybox)	November 2003: only a few pilot users, therefore towards zero percent (no push of this service before the entering into force of required legal and technical adaptations)	Based on centralised database Integration of private company for delivering certificates Authentication by digital signature smart card or via mobile phone By Nov. 2003, existing online payment by mobile phone via private Paybox service needs technical adaptation; new online solution in preparation. + fully digitised incl. online delivery of certificate + integrated service of a portal
Bremen	Germany[48]	4+1+1	3 in case of payment 2 in case of the delivery of the certificate	C	1 Registry Office 1 Cash desk 1 Intermediary to process forms all Trust centres to check signatures	July 2003: 2 per month ~ 0,2%	use of qualified digital signatures + payment integration in SAP + payment by electronic purse and debiting + part of a transaction platform - low uptake - Whole service could not be recommended because of legal conditions
*) Originally, this service was not on the list but chosen as good practice because it is another kind of certificate.							

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.3.3 Implementation

User service provision

The Austrian Certificate of Residence is a certificate which is required by many institutions like social insurance, schools, universities, insurance companies etc., as a proof of permanent residence. The service offers choice between user identification/authentication via electronic signature on smartcard and via a mobile phone-based option; it requires access to the central register of residence and includes online payment of charges and secure online delivery. The citizen can order the certificate via the HELP.gv-portal where his/her data will be checked, then the payment procedure is carried out via a private company, and at the end the user has to access a certified private delivery service where he/she can download the ordered certificate (the delivery service is one of the key modules of the electronic service delivery process which is physically represented by a service provider who forwards official notifications/documents to citizens or businesses). However, up to now the electronic signature is hardly used. Therefore the alternative option builds on a much more popular technology: access and identification/authentication via mobile phone[49]. The required visits to the registry office are no longer necessary with the new certificate service that can be accessed and carried out fully online.

Although the overall performance of Bremen's (Germany) application for requesting certificates suffers from national conditions regarding the population registry procedure[50] or on Bremen's mode to authenticate only by signature smart card, the transaction platform that serves also for other services and the payment part of the service will be introduced as good practice.

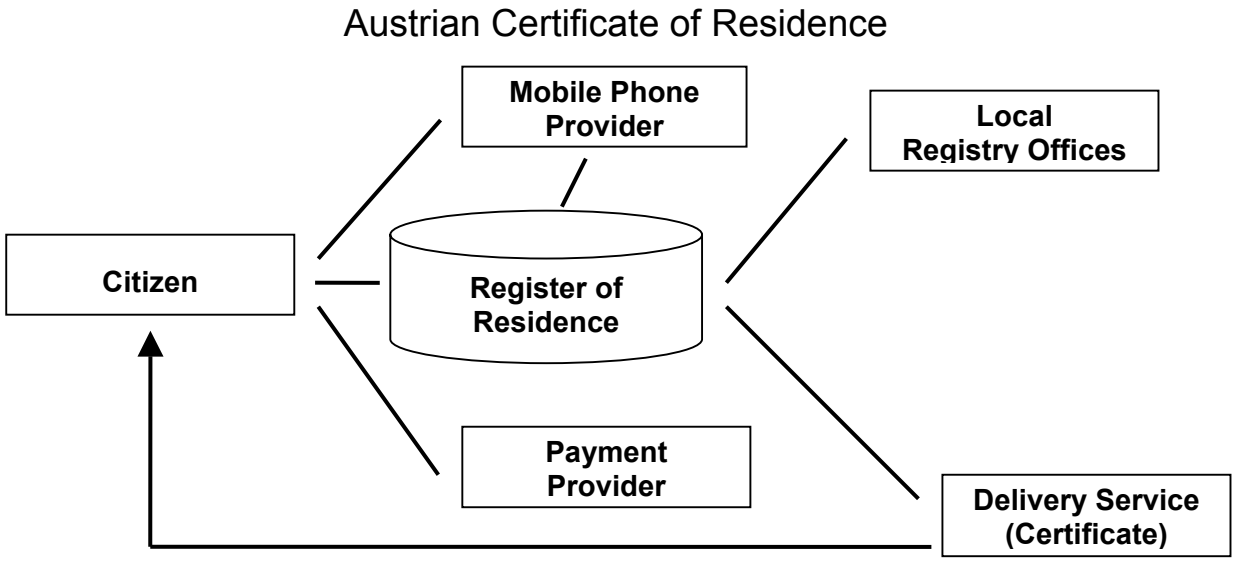
[47] Case report by The Institute of Technology Assessment, Austria
[48] Case report by Institut für Informationsmanagement, Bremen, Germany
[49] The procedure makes use of the fact that the mobile phone provider already identified the user when subscribing him to the network. Therefore a digital signature can be safely linked to a person's identity. Identification/authentication is required three times during the procedure: to access the system for checking the legitimating to receive such a certificate, to enact the payment and to download the certificate. This option does not meet all criteria of a qualified electronic signature, but it should increase user-friendliness at a high level of security.
[50] The population registry procedure is influenced by several rules regarding the keeping of electronic personal data.

The service to request certificates is an integral part of Bremen's online transaction platform. The citizen requests the certificate by filling in the online form and sending it, digitally signed, to the office via an intermediary institution. This intermediary institution checks the validity of the signature in cooperation with the relevant trust centre. Besides, it generates a cash desk-registration number (ID) with which the form is labelled and the date is also added. If the signature is valid, the form including ID and date will be sent securely by using the OSCI-Standard (Online Service Computer Interface-Standard) to the registry office. Moreover, a debit-side related to the ID will be sent to the cash desk via OSCI and there a (debit-side) entry in the SAP will be generated. Now, the applicant can choose between three options to pay the fee: by bill, debit or electronic purse. Each payment workflow is different from each other. The issuing of the certificate by the registry office is independent from the payment, and both processes (issuing of certificate and payment) will be carried out simultaneously. Because of the law, the certificates have to be in paper form and therefore to be sent to the applicant by traditional post.

Back-office re-organisation

Austria's new registration system required a digitisation of workflows on national and on local levels. A key component was the establishment of a central electronic register of residence by 1st of March 2002. Before that, residence information was kept on paper forms and on standalone computer systems. A copy of the registration form, which had the status of an official document, was handed to the citizen upon registration. Citizens had to produce this form in various instances whenever their place of residence had to be verified. Today, programming interfaces are provided to allow agencies and privileged private organisations to query information on citizens directly from the registry.

Whenever citizens had to prove their residence e.g. to social security or employment services, they had to show the registration form which was legally attested by the police. Every citizen was in possession of such a document. With the reorganisation of the registration, this document is no longer needed. When registering, the citizen receives a printout of the data entered into the central register of residence. This printout is stamped by an official and usable as a proof of residence without having the status of an official document like the old certificate.

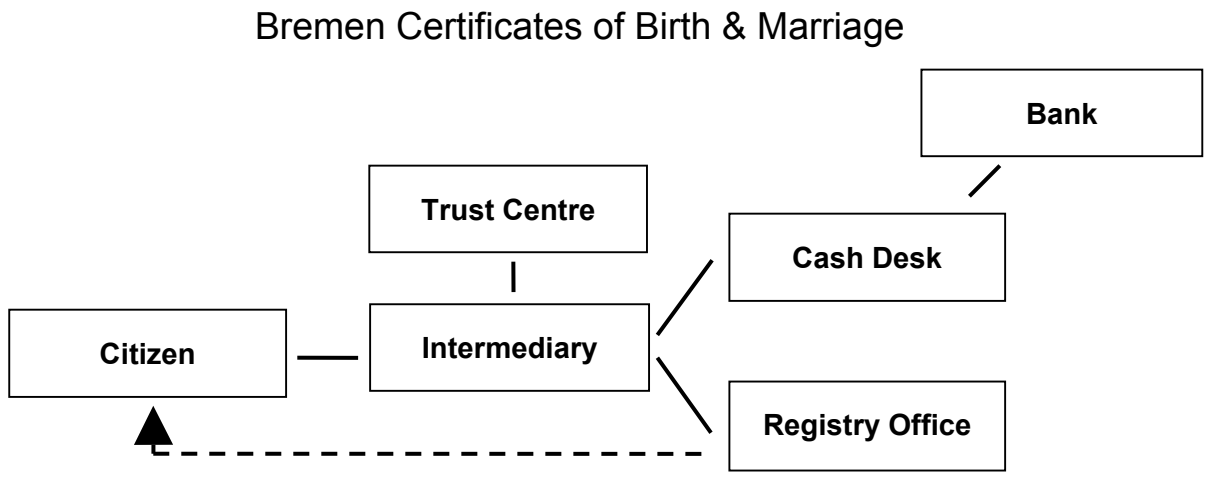


——	Indicates transactions fully operated via the Certificate of Residence-Online service

The main back office reorganisation in Bremen was carried out by integrating the online transaction platform including the public private partnership with an intermediary institution that processes the online forms in connection with the digital signature. The transaction platform was developed in public-private partnership between the City of Bremen and a newly founded company (Bremen Online Services). All online services in Bremen are to be delivered via this common online transaction platform, encapsulating transmission, signature verification, encryption and payment. This platform is implemented using open standards, to achieve platform and application independence. It also answers to the

specific needs of government such as data privacy and different types of transactions (synchronous, such as online-changes and calls in company registers, and asynchronous, such as bids on public tenders).

Another big part of the reorganisation efforts is given to the implementation of a new software system. As mentioned above, the whole City of Bremen has put the local enterprise resource planning software SAP in operation. This made it possible to separate the payment processes from the service delivery procedures. Therefore, the offices responsible for payable public services, like the registry office, are relieved from the payment workflows. So, the workload regarding payment procedures is taken off the staff.



———	Indicates transactions fully operated via the online transaction platform
– – –	Indicates transactions operated "offline" (media break)

Both services are characterised by a comprehensive reorganisation of the service provision. While Austria's solution is characterised by a strong integration of front-office and back-office with a sophisticated service provision which can be accessed fully online, the main emphasis of Bremen's solution lies on the integration of the back offices responsible for service delivery with the back office of the cash desk responsible for all payable transactions within the public administration.

8.3.4 Results and benefits

User benefits

From the user's perspective, the digitisation has changed the Austrian certificate service mainly in so far as the citizen saves time and does not have to go to his local registry office within limited office hours and is not facing a break of media. The online service is available around the clock independent of office hours. However, the reorganisation of the registration has brought higher costs in some cases. In the old system, every citizen was in possession of a certified document which was free of charge. Today, a certificate of residence is free of charge only in some cases (depending on purpose). Usually it costs € 3. The fee of € 13.- for an application in written form[51] will be avoided in future by treating online applications like oral applications which are free of charge.

The benefits for users of the Bremen certificate service are that they can request and receive the certificate fully online without going personally to the registry office. Therefore, the users save a lot of time and expense when requesting online. However, these benefits only occur if the citizens are owners of the digital signature smartcard and the card-reader.

[51] For certificates for personal use, € 13 is charged. Because of existing regulations, the application via WWW is considered as an application in written form. For this an extra € 13 are charged. Since this would significantly raise the costs of e-government for citizens, the draft e-government law specifies applications per WWW as not requiring extra charges.

On the other side, a special benefit for users of the transaction platform occurs for so-called 'multipliers' – persons or companies who act for citizens or businesses. So each multiplier carries out several transactions for his/her customers. This means that benefits resulting from the reduced workload are of higher value than the expenses for getting a digital signature smart card including card-reader. These multipliers are defined as a special target group within Bremen's e-government actions. Because of economic benefits due to power-users, the return on investment can be reached earlier.

Agency benefits

For the Austrian administration, the service provides an application running entirely without human intervention. The system of keeping records of residence has changed from decentralised data repositories stored in paper files or standalone computers on local level to a centralised online database integrated on national level.
Cost savings on behalf of Austrian government are expected to be realised by electronic delivery of certificates instead of physical ones. A "RSa" letter, which is only handed out to the authentic receiver and returns a signed advice of delivery to the sender, costs about € 7.- per piece. The Ministry of Finance and the Ministry of Justice together post about 30 million documents per year. The future costs of a delivery will lie between the costs for digital and conventional delivery or even below the latter. In any case costs below the current level are seen as realistic. No further financial or other statements could be made until now since the service is relatively new and no special evaluations have taken place.

In relation to back office reorganisation, changes were brought about by the establishment of the central register of residence. Moreover, responsibility for residence matters (keeping residence data and recording changes of address) was shifted from the police posts to municipal offices, together with a switch to computer-based data entry. The new system facilitates the task of updating the citizens' addresses without keeping copies of the forms of residence.

Benefits for Bremen's public administration are seen in the reduction of the working steps regarding the accounting entry of the fees. However, up to now the service uptake is low, but in future, the workload of the concerned offices will be reduced since the payment workflow was shifted directly to the cash desk. In addition, each request will automatically be marked with an ID, so all transactions are quickly traceable. In case of mistakes, the relevant data can therefore be found very easily and efficiently. A further benefit is the trustworthy transaction with the highest level of security in case of online payment in comparison to other kinds of payment in the Internet.

Because of the very low uptake (two requests per month with the digital signature and about 18 per day without digital signature), statements about time and cost savings within the public administration are not possible until now. Therefore, the cost-benefit effects are considered very low. However, the results have to be seen under the unsteady conditions of the rules until now. So in the long term, when digital signatures are accepted by users and the infrastructure in public offices is widely spread, the acceptance will of course increase.

8.3.5 Lessons and good practice

The introduced cases show a number of common and alternative learning points, each of which can be considered for transfer elsewhere provided that unique local conditions are taken into account.

New workflow organisation to create comfortable new ways of service provision
The Austrian certificate of residence service has been fully renewed from scratch since several changes have taken place. This is mainly due to the introduction of a central population register and the sharing of responsibilities with a mobile phone provider for identification/authentication and a private company as delivery service of official certificates. This offers new ways to provide other and more comfortable and flexible ways of service delivery. The solution of Bremen is different where an online transaction platform for various public services has been implemented. The certificate service is one of many online services. No tailor-made solution for the certificate service had to be found. However, the service delivery via this platform has reorganised the service provision by the platform integration. This allows the request of certificates fully online with no need to go to the public office.

Outsourcing of responsibilities to private companies to use their infrastructure and know-how for a better service provision to customers simultaneously reducing the workload of the public administration
The Austrian certificate of residence involves various private partners. Austria's largest mobile phone provider (Mobilkom), to identify/authenticate users in the mobile access version. This enables the identification/authentication of

customers via an already existing and widely used system. Citizens do not need to authenticate themselves by other means which would require further efforts (e.g. PKI, digital signature smartcard, card reader) to do so. This avoids the necessity to use digital signature smartcards as the only option since these are not very common until now. The alternative mobile option means only a slightly less secure identification/authentication mode ("Citizen Card Light") than the fully qualified electronic signature. Users do not necessarily need to be customers of Mobilkom; other mobile phone providers are being integrated into the service as well since a free registering at the Mobilkom Webpage in connection with any mobile phone provider is preconditioned. Because of the widespread use of mobile phones, most citizens are able to access this service. Therefore good prospects for service uptake are expected as soon as the required legal adaptations will have entered into force. This procedure includes a payment solution that allows payment of fees via mobile phone. So, similar to the previous point, a commonly used instrument (mobile phone) is used to carry out the payment; no other infrastructure is needed on the user side. This adds to a user-friendly solution with positive effects on expectable service uptake. A certified private company is allowed to deliver official documents and notifications. This takes load off the public administration which is usually responsible for carrying out the service. Moreover, the service is provided by a professional organisation with the specialised know-how and infrastructure required for offering official certificates and notifications for download.

Centralisation of data sources allows service provision in real time by simultaneously reducing the error rates
Austria's central register of residence was introduced in the beginning of 2002 and is the backbone of the certificate of residence, moreover, even of any further online service. So the old decentralised registration system dispersed over offices throughout the country was replaced by a consistent, central database which allows the correct identification of a person in an administrative procedure. Therefore the centralisation aspect has played an important role in the realisation of providing fast and straight processing of requests in real time. However, it also creates greater challenges to guarantee privacy protection. As a response, a strategy based on two pillars has been implemented: *firstly*, out of the personal identity code of the centralised population register ("ZMR Zahl") a TripleDES encrypted hashed stem code ("Stammzahl") is created; *secondly*, only the latter is then used for creating so-called "area-specific identifiers", which are again hashed codes depending on application area.

Identification/authentication by private companies who are already in charge of systems/modes to do so while these system/modes are also used by the customers (e.g. mobile phone provider - mobile phones)
Since the uptake of the Austrian signature card is very low at the moment, but users have to identify/authenticate themselves, an alternative user-friendly solution had to be found. Therefore a digital signature is being generated requiring a mobile phone and a free user account at Mobilkom's A1.net webpage, without necessitating a personal signature card. The procedure makes use of the fact that the mobile phone provider already identified the user when subscribing him to the network. Therefore a digital signature can be safely linked to a person's identity. The service is not limited to customers of Mobilkom. Customers of other providers or prepaid phone users who register personally with identity card for an A1.net account are also being integrated into this service.

Use standardised technology to guarantee interoperability and transferability
As the Austrian certificate of residence demonstrates – which uses standardised e-government modules, the interoperability between different modules with regard to the integration in other services could be improved. Moreover, an advantage of modular services is that in case of changes in technology or regulation, modules for sub-processes can easily be changed and upgraded. This offers more flexibility in service improvement and connectivity to other agencies. Due to the decentralised processing of files, faster communication via email and a higher degree of unification is necessary. This is reflected in standards for workflows, the appearance of the authority and the length of processes.

Reduce the workload of the issuing/relevant public agency from the treatment of payments by an automatic integration of payment directly to cash-desk
The Bremen example shows an efficient integration of payment in the cash system. While the registry office gets order to issue the certificate, simultaneously a debit side entry at the cash desk's local enterprise resource planning software (SAP) is generated. Both workflows are labelled by a special ID and carried out via OSCI. When the customer carried out the online-payment by a standard order form or prepaid card, the cash data – labelled with the same ID again – settle the debit side entry. Therefore, the workflow of payment is separate from the workflow of issuing of the certificate. The workload of the staff at the registry office regarding online payments is taken away including the cash up at the end of year. On the other side, the staff at the cash desk has also nothing to do with these payments since the payment is automatically effected by the SAP. Because of the use of common standards, this solution is highly transferable to other public administrations using the widespread software SAP.

Offer alternative ways of identification/authentication for the use of the digital signature smart card
A critical factor for the development of advanced e-government services in Austria and Germany is the low diffusion of signature cards in the public. The lesson to be learned is that utility for users and ease of use stimulate demand. As long as there are no more than a few services, which are also available offline, citizens will refrain from purchasing the necessary equipment to participate in e-government. Additionally, if users have to pay hefty charges for e-government services, this will impede uptake. Transaction costs for obtaining and mastering hardware and software for e-government add to the unwillingness to invest time and money. Intermediate solutions with lower barriers of entry like the "Citizen Card Light" via mobile phone in Austria could make an increasing number of people adopt a new service, thus building a user base for e-government services. Similar to this, Bremen now also offers online services with lower demands on security regarding identification/authentication for certain services. In addition, the new company founded as a public private partnership (which sells e-government products to other municipalities as well), now offers its products with lower security levels. Going this way, the use of digital signature smart cards for any interaction with public administrations can be avoided by a more differentiated approach, with positive effects on uptake.

Offer alternative ways of payment which customers are likely to use
The Paybox system of the online certificate of residence currently being implemented in Austria has the disadvantage that it is not a very popular method. Although it is relatively fast and safe, it also charges the user extra transaction fees. Alternative payment systems are currently not available but a transaction database is being developed which will make credit card payment and bank transfer possible. In addition, banks are adopting EPS2 that will further facilitate payment by online bank transfer. So different kinds of payment will be offered to give a variety of choices to the users; everybody can select according to his needs. Bremen offers its users three different possibilities to pay the fees. Beside the common method to pay by bill, the user has the choice between payment by direct debiting or electronic purse. So the user is offered different kinds of payment and can choose the most comfortable one depending on his/her demands.

Reduce the workload of the concerned public offices by shifting the payment directly to the cash desk
As the Bremen case shows, the workload of the payment workflow for requesting certificates has been shifted directly to the cash desk. Since the online request is split up and forwarded to the registry office as well as to the cash desk simultaneously, the registry office is no longer involved in the collecting of fees or, in case of delayed payment, with collection proceedings. On the other side, the workload of the cash desk will not increase since the cash desk is in charge of the payment accounting anyway. Rather the opposite is the case; the accounting procedure at the cash desk will be streamlined.

Increase efficiency of service provision by developing online services that can be used by 'multipliers'
Because of the low acceptance of digital signatures by citizens – Bremen has shifted the attention to the development of online services that can be used by multipliers such as lawyers or traders. These multipliers have to use special services much more often than common citizens and therefore benefit more from the use of the digital signature.

8.4 Citizen family allowances

8.4.1 Background goals and drivers

The main challenges faced by on-line family allowance services are the need:

- to satisfy the relatively specific needs of parents (who, as a group, have a relatively highly variable usage of ICT) for fast, high quality services and information about their child allowance/benefit entitlements and situation
- to ensure high levels of integration and interoperability between the often large number of public and private sector actors
- for effective user authentification in order both to match data across various actors and users as well as to ensure protection of potentially sensitive data.

Three European good practice cases supporting family allowance services were short listed. In the UK, the child benefit on-line service was examined and although this has a relatively high level of digitisation, claimants still have to submit the child's birth certificate by post and no data on uptake were forthcoming. Thus the two cases selected for in-depth study are from Ireland and Spain.

This Irish case focuses on eGovernment developments that have enabled the process of claiming child benefit[52] payments in Ireland to be changed quite radically. The relevant developments include a major re-organisation and development of the back end child benefit system and, most significantly, developments in the civil registration process in Ireland that support automatic and proactive triggering of the initiation of the child benefit claim after the birth of a child. This eliminates the need for customers to furnish a birth certificate to authenticate their claim and, for many, eliminates entirely the need to complete an application form as well. The specific case of e-enablement of the Child Benefit service is part of a wider Irish programme to e-enable Life Event Data in Ireland more generally. The fundamental objectives in relation to this are:

- the introduction of a modern civil registration service
- the sharing of life event data electronically between agencies
- automatic allocation, by the DSFA (the child benefit agency), of a Personal Public Service Number (PPSN) to a child on receipt of electronic notification of a birth
- automated processing of Child Benefit claims following allocation of the PPSN
- delivery of integrated and e-enabled services for customers
- re-engineering of back-office and legacy systems.

From the perspective of Child Benefit services in Ireland, the combined goal of the three related initiatives - redesign of the Child Benefit (CB) system, modernisation of civil registration (GRO) and inter-agency linkage and messaging system (IAMS) - was to e-enable the process of initiation of Child Benefit claims. This required back-office and IT system developments in both the Child Benefit and civil registration services, as well as the development and implementation of a conduit for electronic notification of birth registrations from the civil registration service to the child benefit service. In relation to this overall goal, the specific objectives were to:

- automatically and proactively initiate the process of claiming for Child Benefit for all new births in Ireland
- eliminate the need for customers to submit a physical birth certificate when making a claim for Child Benefit for a new baby.

In January 2003 (back-dated to 2000) legal changes enabled the Spanish tax agency (AEAT, Agencia Tributaria) to start offering tax deduction to mothers who both work (registered in the Seguridad Social or a benefit society) and who have children up to 3 years old, whenever children live with them. Adopted children can also receive this benefit in the three years following adoption. The amount that can be deducted is up to 1,200 Euros/child/year, i.e. 100 Euros/month. As indicated, this tax deduction is a new allowance offered at national level, and the resulting Internet-based service has been planned and implemented as part of a package of necessary changes in the legal system. The eService has also built upon the parallel technical and organisational changes across the AEAT more generally as part of the on-line tax services being implemented, including the income tax service launched in 2000.

The data necessary to provide the Spanish child allowances service were scattered among other public institutions, such as INE (Spanish statistical agency), Seguridad Social and friendly societies. This was the greatest challenge for back office re-organisation and interoperability, i.e. the need to centralise the various data sources in the AEAT, thereby making internal efficiencies as well as enabling AEAT to pro-actively contact eligible parents with complete information and inviting them to confirm their status and then choose between a tax deduction or a direct payment into their bank account. Both Irish and Spanish eServices are therefore pro-active on the basis of data already held by the public sector and both provide automatic benefits for eligible parents. Both also offer parallel electronic and physical services to parents, and both took advantage of the functionalities of ICT to redesign organisational, work flow and information formats to achieve internal as well as user benefits.

The overall goal of the Spanish child allowance service is to support the inclusion of women into the labour market and to compensate for social and labour costs resulting from child-bearing. The implementation of the service aims to enable the taxpayer the possibility to apply for child benefit in the most flexible way possible by providing several methods to complete the procedure. The ultimate aim is to reach all eligible applicants. The operational objectives of the service include:

- Collating all necessary information from existing data held by the public sector, only requiring input from the taxpayer in rare cases where data is missing.
- Enabling taxpayers to use different methods to apply for the allowance, including paper, telephone and the Internet. In the latter case, the service is available either with a digital signature facility or by using a unique reference number included in the personal letter sent by AEAT to all eligible taxpayers.

[52] Child benefit payment is a universal entitlement in respect of all children living in Ireland

- Mailing campaigns targeting those taxpayers who, according to AEAT's information, fulfil eligibility requirements to obtain the child allowance.
- Payment by the AEAT to applicants who fulfil the requirements.
- Ensuring that the child allowance process takes into account the legal right of appeal by taxpayers who are not deemed eligible for payment.

8.4.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
eEnabled Child Benefit Service	Ireland [53]	Pro-active service	3	D	5 stages and large number of agencies	2003: Piloted in Cork area only (195,400 inhabitants, just under 5% of total Irish population). Roll out to the rest of the population will take place within one year of August 2003.	Pro-active on-line service as part of wider Life Event Data programme offering multi-channel access to parents triggered by birth registration data initiated by the hospital or doctor/midwife.
Family allowance	Spain[54]	Pro-active service 4+1+1	3	D	5 stages and large number of agencies	First week in August 2003 (8 months after service launch) 6.2% of total child allowance applications took place on-line, two thirds using digital signature and one third an allocated reference number.	Pro-active on-line service as part of wider on-line tax services offering multi-channel access to women with children up to 3 years old triggered by birth registration and labour market data.

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.4.3 Implementation

User service provision

In the Irish case, the user experience depends on whether it is a first claim for child benefit by the parent (usually when the new baby is the first child) or the parent is claiming benefit already for another child (usually when the new baby is a second or subsequent child). If it is a first application then the Child Benefit system automatically sends a partially completed child benefit application form to the parent. If the parent is already claiming child benefit for another child then the system automatically arranges for child benefit payments for the new baby to commence. Physical birth certificates are not required in either case and completion of the application form is only required in the case of a first claim. The system is thus designed to be highly proactive, minimising the need for parents to take action and/or supply information, and re-using data government agencies already possess. It is also multi-channel providing parents with the traditional postal and face-to-face channels as well as the on-line option.

As of mid-September 2003, the Irish on-line child benefit service has only been piloted in the Cork area, which with 195,400 inhabitants represents just under 5% of total Irish population. Roll out to the rest of the population will take place within one year of September 2003.

In the Spanish case, the service has been implemented using a multi-channel approach, i.e. paper, telephone or Internet. The AEAT tax agency obtains once a month all relevant data about women who are eligible for the child allowance from Instituto Nacional de Estadística (INE, National Institute of Statistic) and from Seguridad Social and friendly societies. On this basis, the agency generates letters to send to eligible women by post inviting them to confirm whether by post, telephone or the Internet. The women need the NIF (Número de Identificación Fiscal, Fiscal Identification Number) allocated to them. If users avail of the Internet service, they can choose whether to use a digital signature to

[53] Case report by Work Research Centre, Ireland
[54] Case report by Telefónica Investigación y Desarrollo, SAU, Spain

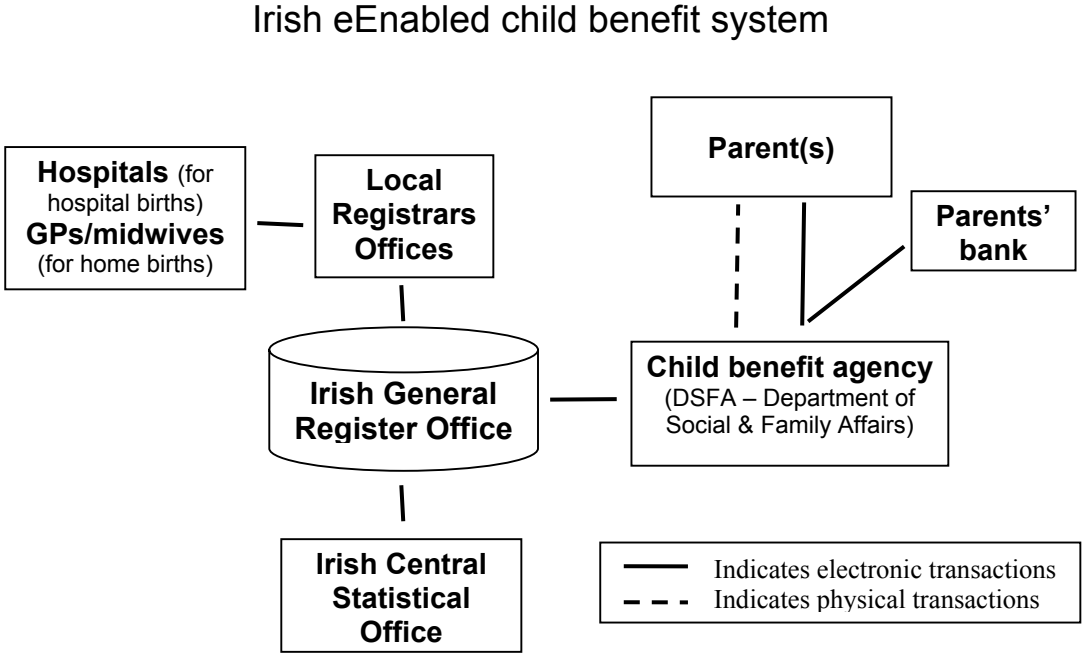
authenticate their identity or use a unique reference number included in the personal letter sent by AEAT. Therefore, the procedure is started pro-actively by the AEAT taking advantage of the back office organisation and the centralisation of data sources which has taken place. It is possible for the user to change the information, such as the bank account, address, etc., during this process. Any new data provided by the user are updated for use by other services.

Using the digital signature or reference number, the taxpayer accesses the relevant on-line form and completes the required cells, including a bank account to receive the monthly payments. AEAT validates any new information submitted, if necessary checking it with the information it already has. The user can consult her application status, including payments by Internet at any time, thus providing a highly transparent and efficient service. As a routine, the AEAT checks and validates all information each month, including updates input by the user and new data. received from the NIF, the Seguridad Social or the friendly societies.

Back-office re-organisation

In the Irish case, three inter-linked developments have been central in enabling the new automatic/pro-active child benefit service to be provided. Firstly, on the DSFA (child benefit agency) side, new technology was introduced and a significant programme of Organisational Change took place in 2001 and 2002. Apart from providing many improvements to the existing service from both client and service provider perspectives, this provided the capability to receive birth notifications electronically from the civil registration service. Secondly, in parallel with this a major modernisation initiative was underway in the Irish civil registration service and processes. This system is responsible for registration of major life events, births, deaths, marriages and so on. The modernisation included digitisation of records and computerisation of the registration process and of certificate production. Thirdly, Reach (a key national initiative in the co-ordination and development of eGovernment in Ireland) was developing an inter-agency messaging service that would provide for data interoperability, such as electronic notification of birth registrations, between agencies.

In Ireland, a variety of separate and linked back-office and inter-agency developments provide the background to the specific service developments that have made possible the new e-enabled Child benefit service. These include developments within the child benefit agency (Department of Social and Family Affairs, DSFA) and within the civil registration service (Department of Health and Children) at local and central levels (GRO), as well as overarching eGovernment developments to link agencies (Inter Agency Messaging Service – IAMS) and to provide secure shared access to relevant client information (Public Service Broker).



The Irish Child Benefit (CB) system is concerned with the administration and payment of child income support. The new system went live in November 2002. Data migration took four days, involving information on more than one million children, 500,000 customers and 40 million payment records. An extensive change management and support programme was implemented to facilitate the associated re-engineering of procedures. This included an overall re-design of structures, functions and working environments, a major training programme and a communication strategy. The redesign of the child benefit service encompassed the implementation of a new service delivery framework that involved the re-engineering of back office systems - business (processes / procedures) and technology (architecture, tools, development platform, redesign of legacy systems) - around customer access channels and the adoption of a pro-active/automated approach to delivering customer services.

In the Spanish case, the tax agency (AEAT) centralises all relevant data in order automatically to either generate personal letters to post to eligible women inviting them to confirm (or correct) their data and apply for the child allowance, or to update the status of women already deemed eligible and receiving the allowance. If the application is rejected or the payment is not longer effective because some requirements are not fulfilled, the user has the right to appeal. This is taken automatically into account by the system, which waits for resolution of the appeal. Data is obtained from the following public agencies:

- CERES, the public agency in charge of certificates, dependent on the Fábrica Nacional de Moneda y Timbre. Digital signatures (Certificado CA-2), if used, are checked with the CERES and trust centres.
- Instituto Nacional de Estadística (INE), the main public body in charge of Spanish statistical surveys and studies, social indicators, census, etc. The INE provides the AEAT with information about births and deaths (which come from the Register Office, dependant on the Ministry of Justice).
- Seguridad Social and friendly societies, providing information about women working and their contributions. The most important friendly societies are:
  - ISFAS (Instituto Social de las Fuerzas Armandas)
  - ISM (Instituto Social de Marina)
  - MUGEJU (Mutualidad General Judicial)
  - MUFACE (Mutualidad General de Funcionarios Civiles del Estado).

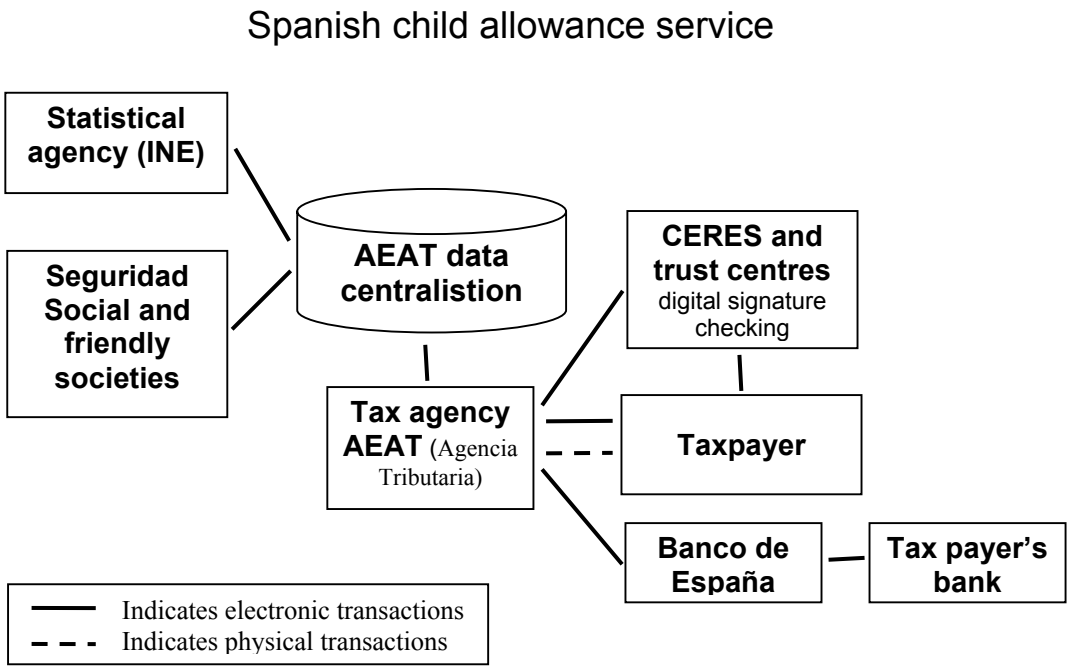
Other institutions involved are the Banco de España (Spanish Central Bank), which is in charge of making child allowance payments, as well as the users' own private banks into which the payments are made.

Before any payment is effected, the system automatically checks for taxpayer debts. If any debt is found, the amount is used to clear or reduce the debt and this fact is communicated to the user. If there is no debt the system automatically performs the payment by instructing the Banco de España to make the necessary financial transfer to the taxpayer's own bank account.

All back-office workflows and procedures have been automated. However, there is a legal obligation on the AEAT to execute a human administrative act in order to make payment effective. This administrative act is carried out by a responsible official who must authorise the payment before it takes place. Once payment is authorised by administrative act the first time, it subsequently continues automatically without needing further authorisation. The payment process could be completely automatic, but the current law mandates this human intervention. The AEAT is attempting to change this legal requirement in order to automate the whole process.

The back-office reorganisation and data centralisation for introducing the new child allowance service requires no special training of personnel, as the AEAT staff already had the required skills in computing obtained during the introduction of on-line income tax service launched in 2000, as well as previous computing skills acquired through long experience of working with digital systems. Only two short courses to learn how to use the specific application were carried out. Roles, responsibilities and organisational structures have not varied to implement and run this service, given that these were adapted earlier in conjunction with the on-line income tax service.

This case is innovative because it was able to build directly upon and exploit the earlier back office re-organisation, introduction of ICT, work flow automation and new information formats (including digital signature) brought about as part of AEAT's introduction of the on-line income tax service in 2000. What is also completely new in Spain is that this has enabled the establishment of a pro-active service requiring minimal action and input by the user.



8.4.4 Results and benefits

User benefits

Until the process of e-enabling life event data began in Ireland, both the civil registration and child benefit processes required manual intervention, either by staff or users, at most stages of the process. This included PPSN (Personal Public Service Number) allocation, certificate request/production, completion of the Child Benefit application form, set-up and award of the Child Benefit claim and so on. The development and implementation of the new e-enabled civil registration processes/procedures and computer systems, and the linking of these to the systems in the child benefit agency (Department of Social and Family Affairs, DSFA), is radically transforming the way business is carried out both within the Civil Registration Service and within DSFA. From the customer's point of view, birth certificates will no longer be required for certain services and, when required, can be acquired much more quickly and conveniently.

In relation to the Irish Child Benefit service specifically, the nation-wide rollout of the new civil registration computer system will mean that there will no longer be a requirement for most parents to get physical copies of birth certificates and submit these to the DSFA in order to apply for child benefit. The work of Deciding Officers in the DSFA will also be much reduced with the new system as authentication of claims is automatically provided through the link with the Irish General Register Office. In the case of a first child/claim, a partially filled out form will be issued automatically to the parent. This will reduce the amount of form-filling required as well as encouraging uptake of this service entitlement. In the case of subsequent children/claims there will be no need for form filling at all as commencement of payments will be pro-active and automatic. In a minority of new claims the proactive/automatic service may not be possible (for example if the family have recently arrived in Ireland). In such cases, the online access to forms may be helpful for the user.

In Spain, the child allowance system was launched by the tax agency (AEAT) in January 2003 so there has not yet been a full evaluation. During the first week of August 2003, the total number of applications for child allowance was 655,098, of which 40,098 (or 6.2 % of the total) took place on-line, a quite impressive start after only 8 months. This compares with 15.4% using the telephone and 78.4 % using purely physical means. From August of 2003, the number of payments has stabilised around 450.000 per month.

An important part of the launch of the new service has been mailing and other publicity campaigns targeting those taxpayers who, according to AEAT's information, fulfil eligibility requirements to obtain the child allowance. In

relation to pro-active letters sent to eligible mothers, compiled from AEAT's new system collating data from other agencies as part of the back-office reorganisation and data interoperability initiatives, an additional 83.913 applications have been generated, 12,8% of the total number of applications. This statistic is important because it indicates the part already played by the centralisation of data sources relevant to child allowance undertaken by AEAT. There have also been publicity spots on radio and TV and in the newspapers.

In relation to user authentification, two methods are available: a digital signature facility already developed and offered by AEAT as part of its on-line income tax service, and the use of a unique reference number (as a user ID) given to eligible taxpayers in the pro-active letter sent to them inviting application for child allowance. The relative use of the two methods during the first week of August 2003 are as follows:
provided with the letter, we find the following results:

- digital signature: 26,743. (66.7%)
- reference number: 13,355 (33.3%)

This indicates that two thirds of the applications presented via the Internet already use digital signature, but that a considerable number still require the less demanding reference number, showing the value of having alternative methods in support use of the service.

Agency benefits

In the Irish General Register Office, there are benefits of a reduced requirement for physical birth certificates as more than 50,000 will now not be required for Child Benefit purposes. This figure will increase as data sharing is expanded across the public service. For example, there are about 200,000 passport applications annually, each of which currently requires a birth certificate. More generally, the system enables faster retrieval of event data and certificate production for new and historical records – 5 minutes now compared with 20 minutes previously – with attendant benefits for both users and the service provider.

More generally, the allocation of the Irish Personal Public Service Number as part of the birth registration process and consequent updating of the civil registration record will in future the linking of life events and the production of life certificates using this unique personal identifier. The Irish Central Statistical Office will receive life event data electronically in respect of all registered events. This will reduce postage costs for the registration service, eliminate transcription errors and ensure more timely receipt of better quality registration data.

In the longer term in the Irish case, when the Public Service Broker provides all public agencies with online access to customer registration data, most of the current requirements on users to furnish physical certificates to access public services will be eliminated and consequently the need to produce paper certificates will be much reduced. In the future it will also be possible to carry out more rigorous statistical analysis of registration data, e.g. trend analysis, year on year comparisons by region, local district, etc.

Also in the longer term, the Irish General Register Office technical architecture/software solution has been designed to enable the development of an Internet solution providing online access, by the public, genealogists, emigrants and so on to registration data for both family research purposes and certificate requests. It is expected that this will have a significant impact on the service and will generate large volumes of business. Apart from births, the General Register Office is currently working in partnership with Reach and the child benefit agency (DSFA) to develop a service which will communicate in a timely manner the details of death registrations via the IAMS (inter-agency linkage and messaging system) for relevant Government Agencies. This will be useful for various reasons, for example, timely cessation of public pensions and reducing overpayments to General Practitioners because of lack of updating of patient registers.

In Spain, the tax agency responsible for the child allowance system (AEAT) has managed to integrate all information dispersed among different institutions in order to deliver the service pro-actively to users. The on-line child allowance service was able to build directly upon and exploit the earlier back office re-organisation, introduction of ICT, work flow automation and new information formats (including digital signature) brought about as part of AEAT's introduction of the on-line income tax service in 2000.

The re-organisation within AEAT and the automation of work processes both within the agency and with the other agencies with which it cooperates to obtain data has resulted in a reduction of work tasks, removing the need for human intervention except when invalid data or errors are identified. Such mistakes are, anyway, reduced because of the

automation of work processes. The only obvious problem is a possible small increase in the black economy. The AEAT has detected a slight increase in the percentage of enrolments in the Seguridad Social since the new measures came into force in January 2003, as mothers who wish to qualify for the child allowance have to enrol here in order to obtain the 100 Euros/month.

8.4.5 Lessons and good practice

A number of common learning points arise from the family allowance and benefit cases, each of which can be considered for transfer elsewhere provided that unique local conditions are taken into account.

Building on, and exploiting, wider eGovernment programmes
Both child allowance cases are good examples of on-line services which are part, or natural extensions, of wider eGovernment developments, thus exploiting and building on existing, or parallel developments of, back-office re-organisation, interoperability and integration initiatives or programmes. Thus, in Ireland the child benefit service is part of the wider e-enabled Life Event Data programme, and in Spain the child allowance system is a natural extension of the wider on-line tax services being developed by the Spanish tax authorities. Developing new on-line services in this way both builds economies of scale and scope and itself supports the wider integration and interoperability of government using ICT.

Proactive service
Both Irish and Spanish eServices offer pro-active on-line services on the basis of data already held by the public sector and both provide automatic benefits for eligible parents. The philosophy is to minimise the need for action and/or data input by parents.

Multi-channel services
Both Irish and Spanish eServices offer parallel electronic and physical services to parents. In the Spanish case this also includes a telephone service. This is seen as essential given that the target groups in both cases are ordinary families which have very different levels of digital skills and access to ICT. The continuation of such multi-channel services is likely to be an important feature of child allowance/benefit services for a long time to come.

Data interoperability between agencies
In both cases, the ability to provide pro-active services depends upon data interoperability between different agencies and back offices. In Ireland, the government-wide Reach programme is providing an inter-agency messaging service for all eGovernment initiatives, in the child benefit case between the child benefit agency and the civil registration and statistical agencies, such as electronic notification of birth registrations. In the Spanish case, data interoperability takes place between the tax agency, the social security agency and the Spanish statistical agency, as part of the wider on-line tax programme. In both Irish and Spanish cases, one key issue is thus 'ownership' of the data being transferred between agencies, for example, at what point do the transferred data become the responsibility of the receiving agency and how should system failures, etc., be dealt with. Further, there are the issues of data conversion, clean-up, migration and conversion of historical data, all of which is often a major task. In the case of Irish General Register Office, for example, this took up more time and resources than originally envisaged. This was mainly due to the fact that the data was originally indexed to support paper based retrieval and the data format was not consistent across all years. Ideally, more time should have been given to analysing the paper-based data prior to the commencement of the electronic data capture process. Similarly, encryption processing and error handling in the Irish case proved to be a more complex task than originally envisaged and was more difficult to do than the actual application development. It is important that sufficient time and resources be assigned to each to ensure successful development and implementation.

Centralisation of data sources
Based upon data interoperability, the Spanish case has centralised relevant data sources necessary to provide the proactive child allowance service within the tax agency (as part of the wider on-line tax programme). The Irish case has not centralised relevant child benefit data within the child benefit agency as such, but rather draws exclusively upon the data collected by the Irish General Register Office. Both cases, therefore, exhibit interoperable data centralisation and data re-use in relation to the specific data needs of the service. The Irish case differs from the Spanish case in that child benefit is always made as a payment in relation only to births and does not take account of whether or not the mothers are working and paying income. It has, therefore, no labour market objectives. The Spanish case needs data both on births and on income tax paid by mothers so that the benefit in this case is seen as a tax allowance to encourage mothers to work, paid either by reducing the tax burden or by a corresponding payment to compensate for tax paid.

Standards
Both cases show the importance of the use of common standards especially when interoperability between different agencies and back offices is important. In the Irish case, one of the agencies was mandated to 'own' the standards and ensure that they are adhered to. In this initiative, the Irish Reach initiative was mandated to agree, set and own the data, and envelope and XML message standards and this proved very successful in the development and implementation of the various strands/projects involved.

Single Vendor Technology
In the Irish case, single vendor technology was seen as an advantage as opposed to multiple best of breed products. In the Irish General Register Office strong vendor support was received throughout the development making it cheaper, easier and faster to resolve issues.

User authentification
The Spanish case represents an interesting approach to tackling the difficult but necessary user authentification requirement. A choice is given to users: a digital signature facility already developed and used as part of its on-line income tax service, or the use of a unique reference number (as a user ID) given to eligible taxpayers in the pro-active letter sent to them inviting application for child allowance. The relative use of the two methods during the first week of August 2003 was two thirds using digital signature and one third using the reference number. In the Spanish case there do not appear to be any data security failures or barriers to usage as a result, which is a significant achievement (although it is too early to make definitive judgements), and thus probably demonstrates the value of having alternative authentification methods to support use of the service, and particularly the facility enabling users to interrogate the status of their allowance and payments on-line. In Ireland, a digital signature is being implemented as part of the birth registration process but is not yet fully implemented. The child benefit process is not subject to electronic user authentification as
users do not yet have an on-line facility to check their entitlement and payments, although this is planned in the longer term.

Transparency
In the Spanish case, the user can consult her application status, including payments by Internet at any time, thus providing a highly transparent and efficient service. This is also linked to the successful user authentification systems adopted.

On-line payments to users
Both cases illustrate the use of standardised services for the payment of the benefit/allowance into the user's bank account, in the Irish case as part of the wider eGovernment programme and in the Spanish case the horizontal service developed as part of the wider on-line tax programme.

Staff training programme
Both cases take account of the needs of staff to operate the new systems. In Ireland, a major training programme and a communication strategy were undertaken. In Spain, the new child allowance service required no special training of personnel, as the tax agency staff already had the required skills in computing obtained during the introduction of on-line income tax service launched in 2000, as well as previous computing skills acquired through long experience of working with digital systems. Only two short courses to learn how to use the specific application were necessary in this case.

Advertising and publicity
An important part of the launch of the new Spanish child allowance service has been mailing and other publicity campaigns targeting those taxpayers who, according to the tax agency's information, fulfil eligibility requirements to obtain the child allowance. For example, pro-active personal letters are sent to eligible mothers, compiled from the tax agency's new system collating data from other agencies as part of the back-office reorganisation and data interoperability initiatives. There have also been publicity spots on radio and TV and in the newspapers.

Legislation
In both cases, close monitoring of legal changes has been essential to ensure relevant and successful on-line services. In the Irish case, this is in the area of changes to civil registration requirements, and in the Spanish case the on-line service arose directly out of, and accompanies, the legislative changes enabling for the first time women paying tax to receive a child allowance.

Management and decision-making
Both cases illustrate successful change management and coordination with the wider eGovernment programmes of which they are part. This also ensures clear ownership of each of the main developments whilst ensuring effective co-ordination and progress towards common goals. Where cross-departmental projects are being set up, the roles and responsibilities of all parties should be set out and agreed at the outset and a structure put in place to resolve issues and difficulties. While this will not eliminate hiccups along the way it will ensure that the proper mechanisms are in place to resolve them. Both cases also gave high priority to change management issues as well as to technical matters. This included extensive consultation with all relevant parties, development of communication strategies and training. Management of multiple projects in particular needs experienced project managers and considerable co-ordination effort. The teams found that it takes longer to develop and test systems as the number of agencies involved increases. One specific issue in this context is that early adopters of the systems which will be used widely may perceive themselves to be at greater risk in terms of initial investment versus likely returns as they were concerned that they would bear the burden of the development costs. A related key issue can be 'ownership' of the data being transferred between agencies, for example, at what point do the transferred data become the responsibility of the receiving agency and how should system failures, etc., be dealt with. While eGovernment is intended to present an integrated, border-less view of Government to the user, government departments still often have to work within their own political, legal and accountability frameworks, unless these too can be made compatible at the same time, but this would often be too complex to resolve in the short term. In the Irish case special attention was also paid to the fact that requirements often change during the development and user testing phases. Accordingly, 'scope creep' needed to be managed very carefully to minimise impact on the 'go-live' date. In the Irish General Register Office, for example, a change control process was put in place whereby all changes had to be approved by the Programme Management Group. A clear distinction had to be made at various stages between changes that were deemed essential and those that were deemed 'nice to have'. Attention to these aspects was viewed as central to the success of the initiatives.

Phased implementation approach
The opportunity for testing systems and services, including the parallel running of manual and electronic systems in a 'live' environment, as well as of the back-office systems and data interoperability aspects, was a central feature of the Irish case to test system functionality, validate process/procedures, training programme, user and customer acceptance, etc. The Irish General Register Office, for example, instigated a four week period of parallel system running which gave invaluable feedback on issues that could then be resolved before going live. As of mid-September 2003, the Irish case has also only been available in respect of all births in the Cork area of Ireland (just under 5% of the total Irish population), full national roll-out being expected to be completed within 6-months to a year. Both are these proved invaluable and raised a number of issues that were resolved prior to full implementation. A phased implementation approach was less necessary in the Spanish case as it was part of an already successfully tested and functioning on-line tax service programme. However, also in this case new features are planned for testing and implementation, and present features are being monitored on an on-going basis.

Business requirements as a driver
In the Irish case, a decision was taken at an early stage that the business requirements would assist in driving the technology project rather than the other way round. The General Register Office technical architecture/software solution has been designed to enable the development of an Internet solution providing online access by the public, genealogists, emigrants, and so on, to registration data for both family research purposes and certificate requests, many of which could be income-generation services for government. It is expected that this will have a significant impact on the service and will generate large volumes of business in the longer term. Overall, this ensures that the business requirements would be taken into account and that the most appropriate technology would be used to implement them.

8.5 Citizen student grants

8.5.1 Background goals and drivers

The main challenges faced by on-line student grant and loan services are the need:

- to satisfy the relatively specific needs of student users (who, as a group, have a relatively high usage of ICT) for fast, high quality services and information about their financial entitlements and situation
- to ensure high levels of integration and interoperability between the often large number of public and private sector actors
- for effective user authentification in order both to match data across various actors and users as well as to ensure protection of potentially sensitive data.

Four European good practice cases supporting student grant and loan services were short listed. First, a case in Germany at the federal level providing payback services of student grants is often quoted as one of the first and perhaps the only German eService to date which has achieved high cost savings. About 4.5 million Euro a year has been saved since the service went online in November 2000. Second, the Icelandic student loan fund into which in November of each year all students input data concerning income earned in order to calculate appropriate loans for the coming semester. Neither of these services have, however, been selected for in-depth study because of the low level of digitisation of the workflow in the German case, and the fact that only one back office is involved in the Icelandic case. The two cases selected for in-depth study are from Denmark and the Netherlands.

The Danish "My-SU" case is not a direct part of any eGovernment strategy in Denmark, even though it is indirectly linked to the general move to eGovernment in the country. It started out by giving educational institutions electronic access to the existing legacy mainframe system of the student grant agency responsible for administering student grants and loans in Denmark This then enabled these institutions to directly key in data instead of only being a physical staging post for paper applications on the way forwards and backwards between students and the agency. This was very beneficial seen from the perspective of the agency which thereby avoided all data capture activities and was able to drastically reduce its reliance on an external data-input bureau.

However, these changes resulted in many complaints of overwork from the educational institutions. Furthermore, some students were not satisfied with the restricted opening hours of the educational institutions and the still relatively slow speed of response, especially if they were interested in only basic information. These two arguments were the main objectives for implementing "My SU", i.e. to ease the administrative workload posed on the educational institutions and to give student applicants access to instant information and a better service more generally.

The main objective of the Dutch "My-IB-Group" case was to improve customer services and customer relations, which would in turn lead to improved public perception of the IB-group, responsible for administering student loans and other student services. The IB-Group had an extremely negative image and reputation resulting from very poor performance over the past years, and it understood that relationships with its customers would only improve if it improved its performance overall. The only way to achieve this was to initiate changes at both ends of the organisation. Improvement in customer services generally would lead to more efficiency in the front-office, and indirectly to improvements in the back-office.

One of the main complaints levied by customers against the existing system was that their data was often incorrect, for example their address or chosen course of study. To remedy this, the IB-Group decided to place more control in the hands of the customer and enable him/her to control and adjust their personal data more easily. For the IB-Group, this meant that responsibility for accuracy of much of the data in their databases now lies with the customers themselves. For the students, controlling their own data entry meant that not only could they carry out this transaction online, but that the results of their action would be more immediately delivered, for example an increase in the amount of loan payment.

Placing so much control in the hands of the customers meant that another important objective also had to be reached: the IB-Group should be able to verify every change in the data entered by the student. For this to be achieved, it was crucial that data be exchanged automatically between the participating institutions. New entries needed to be cross-

referenced and checked with other organisations such as the municipalities (who have very tight controls on their residents' personal data), insurance companies, banks and the tax authorities, to prevent possible fraud from taking place (whether unintentional or otherwise). Thus, establishing automated overnight data exchange with these third party organisations also became an important objective. In the Dutch "My-IB-Group" case the ultimate aim of these changes was to effect significant improvements in customer services and relations over a broader range of communication channels.

Both Danish and Dutch cases started out with pressure for change from student users. In the Danish case this was mainly for a faster more efficient service rather than a fundamental change in the service itself. In the Dutch case, on the other hand, this was much more intense because of a very poor uncoordinated service and led to a serious crisis in the IB-Group. In the Danish case, internal pressure to ease staff workload was also important. The challenges being faced in the two cases were also different. In the Danish example, it was not seen as necessary to effect re-structuring of the back offices and agencies involved, especially given that their cooperation and respective roles was perceived as working well. In the Dutch example, on the other hand, the lack of coordination between back offices and agencies was one of the prime reasons for poor service and thus a strong driver of change.

8.5.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
"My Student Fund"	Denmark[55]	3+1+1	3	C	5 stages and large number of agencies	20% of all users in 2003 (from zero in 2002)	Cost savings, cutting out one agency, building on existing legacy technology and cooperation, tasks and responsibilities delegated out to user, quicker more responsive user services, new less routine job functions and greater job satisfaction for staff.
"My-IB-Group"	The Netherlands[56]	3+1+1	3	D	6 stages and large number of agencies	2000-2003: • 25% less telephone traffic • 34% fewer visits to physical desk 2003, user pop 650.000: • 219,000 emails • 2.100.000 web visits • 75,000 portal users (12% of all users)	Adding to and extending existing technology, wholesale organisational change (both within and between back offices), cost savings, staff redundancy, tasks and responsibilities delegated out to user, quicker more responsive user services, new less routine job functions and greater job satisfaction for staff.

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.5.3 Implementation

User service provision

The Danish "My-SU" case was partially driven by a demand from users for a higher quality, more responsive and quicker service, and this was achieved by delegating many tasks and responsibilities out to user who can input all his/her data direct to the student grant system via a web system running on Java applets. A PKI system is used for identification and authentification, though this is not yet a true digital signature so the taking out of a loan, as opposed to a grant, still requires a physical signature. The web-based system provides a direct link into the existing legacy mainframe system and enables the user to input new grant/loan applications, make changes to his/her data and

[55] Case report by Danish Technological Institute
[56] Case report by ICTU, the Netherlands

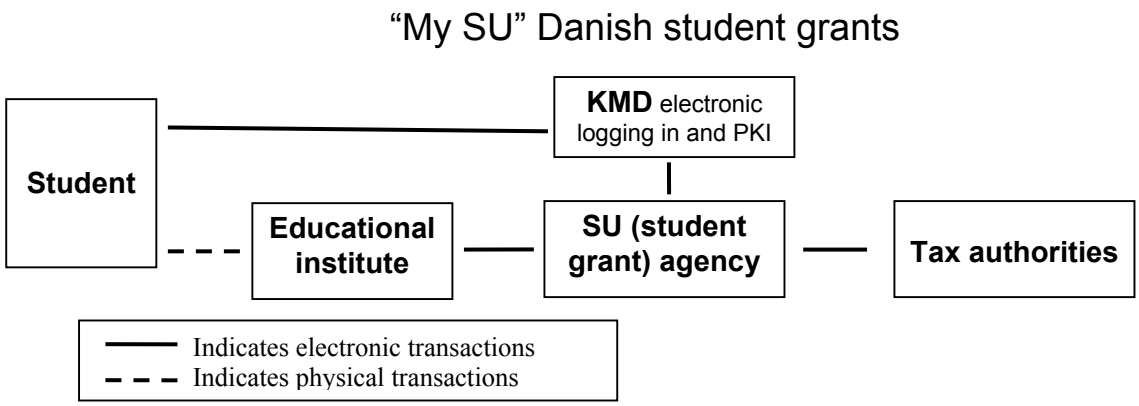
instructions, send queries and see his/her status in real time. The only exception is data subject to checking with the tax authorities (tax rate and income records) which is subject to a 24 hour response time. Previously, the user filled in a paper form and sent this to his/her educational institution which was responsible for the application together with the student grant authority. Changes or queries typically took many days to be executed. Student users need appropriate web-access, plus skills and motivation to use the system. The physical channels (post, in-person and telephone) are still open to the user.

The Dutch "My-IB-Group" case was strongly driven by a demand from users for a proper functioning service because of very poor performance, and this was achieved by delegating many data input and query tasks and responsibilities out to the user, as well as by extending the number of access channels to include a web-portal and by reorganising the back offices (see below). Four user channels are now available: the web portal including email, SMS, telephone, and physical (post and in-person). The main challenge was the need for authentication technology and secure communications. The IB-Group first considered using PKI, for which a national standard was in development. However, at the time when the decision had to be taken, the technology did not have the critical mass following that was needed to make the project a success. In addition to that, PKI was rather an expensive solution, especially given the finances and abilities of the target group. The group thus invested in developing a system of SMS authentication. This product was custom built when it was first launched but it is now available as open source software.

Both Danish and Dutch cases effected improved user services by extending the number of channels to include web services and email, and, in the Dutch case, also SMS access. Student users are now given much more control over their data and queries, and are largely responsible for these. The results have included quicker, faster more accurate services in both cases. Multi-channel choice is still important, so that the legacy physical channels are still available but draw upon the same back-office databases.

Back-office re-organisation

The Danish "My-SU" case was implemented through two sets of changes to existing procedures, each time changing workflows, job functions and task responsibilities of staff. With each set of changes the level of digitisation of the workflow has increased but has also left existing procedures in place. The first change enabled individual educational institutions to enter data into, and interrogate, the student grant agency's mainframe system, rather than sending paper forms and requests as previously. This meant that the agency's previous use of a data input bureau has now been virtually discontinued. The agency continues to use the existing mainframe system to communicate electronically with the Danish tax authorities concerning student tax rates and income in order to assess their qualification for a grant or loan. The student's educational institution can access these facilities via the mainframe, but still has to dialogue with students physically.

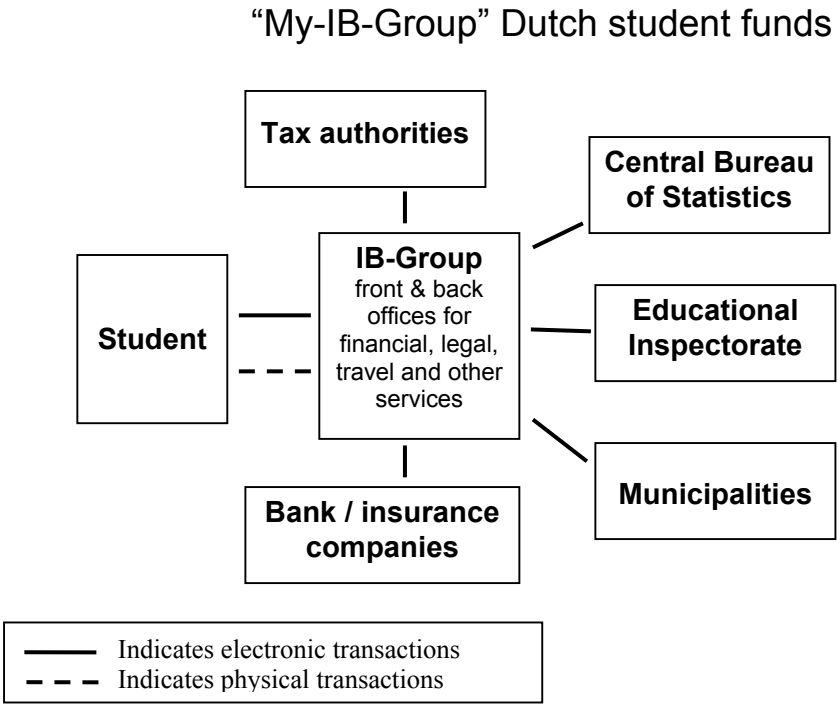


In the "My-SU" case, the opening up of access to the student agency mainframe system has meant that a lot of work has been decentralised, firstly, to the individual educational institutions, and then to students themselves. Thus, employees at the central agency no longer have the responsibility of collecting all applications from each educational institution and then physically sending these back and forth to the data-input bureau. Initially this meant an increase in the work of staff in the educational institutions which had to key in student data themselves, and this increase in work pressure was one of the drivers giving students themselves direct web-access to the mainframe. Staff in the agency and the

educational institutions now have a lot less routine keying-in and data query work, with the former for example now focusing on electronic communication with the educational institutions, plus education, training and ICT-support.

The Dutch "My-IB-Group" case made use of both customised turnkey- and commercial-off-the-shelf software. The back office did not require any major software changes as their system and procedures, (once started) already performed sufficiently and catered for the relevant work processes and other procedures. The majority of this software was available off-the shelf, such as the MQ-series as middleware, NT platforms and some legacy software from IBM. More demanding was the connective software for communicating between the back-office of the IB-Group and third party organisations such as banks and local government. The IB-Group targeted much of its in-house capacity towards developing and improving these connections. Such data exchanges are now completely digital and almost completely automated.

In the "My-IB-Group" case a compete overhaul of the back-office organisational structures was undertaken. Up until 2001, there were four columns which operated rather autonomously and which were organised on the principal of a particular aspect of the law, the implementation of which they were responsible for. In 2001 these columns were 'cut' and the specialists were forced to cooperate with other disciplines in 13 units that were regionally oriented. This action had two immediate results: employees were forced to cooperate and therefore learn from each other; and the customer became more identified by the employees as someone from their region. In addition, the user was no longer someone from a mob of 600,000 but also belonged to the employee's 'own group' of approximately 50,000 people also living in his own region. Finally, the notion of front office and back office was thrown away. A unit became both front and back office. Instead of primary and secondary helpdesks, there was now the concept of integrated customer services (IKA). Implementation took place in four phases, starting in early 2001 over 2½ years, using a 'think big, start small' approach: first, email enablement, followed by dynamic FAQ, then web-forms, and finally the full "My-IB-Group" portal.



Both Danish and Dutch cases have successfully built on existing legacy technology, although in the Dutch case a lot of additional software communication between the back-offices of the different agencies involved has also been added given that this case (unlike the Danish) involved significant back-office re-organisation in order to correct the previous malfunctioning system and organisation. Also, both cases have adopted a phased approach, which has obvious advantages in terms of planning, resource allocation and use, testing incremental steps before proceeding, allowing time to digest and fully work through the changes especially in terms of organisation and job functions and skills, ability to respond to change, etc.

Surprisingly few problems were experienced during the implementation phases of both the Danish "My-SU" and the Dutch "My-IB-Group" systems. In the Danish case the technical solution was simply to add a web-based front-end to an existing legacy system. This also meant that costs were kept very low. The Dutch case is more complicated because of the need for a complete back-office re-organisation. However, this proceeded relatively smoothly because there was no disagreement about the need for dramatic change, given the chaos and failure which previously existed.

The success of both cases depends on the assumptions that student users have access and the necessary skills and motivation, and that back-office staff are prepared to be flexible in terms of the tasks they undertake and adopt new ways of working. In both Danish and Dutch cases these assumptions are largely fulfilled, mainly because it was the students and the staff themselves who drove forward the demand for the changes leading to the present system, and who clearly benefit from this.

8.5.4 Results and benefits

User benefits

In the Danish "My-SU" case the student users have clearly benefited from a 24/7/365 service and better control over dealings with the student grant agency. If their applications or queries need to be checked with the tax authorities (e.g. concerning tax rates and income levels), a 24 hour delay is introduced, but this is still much better than the previous situation. After only one year of operation, already 20% of students use the web-based system, the remaining 80% still fill in paper forms and make paper based or telephonic queries, but this is expected to change significantly in the future. Students still cannot yet use a true digital signature to apply for a loan or directly interrogate the tax authorities online regarding their tax rates and income status, but, again, further improvements are planned to the "My-SU" system which will soon also facilitate these via the web-interface.

The Dutch "My-IB-Group" also shows strong user benefits, measured for example in increased levels of customer satisfaction, which are even higher with the new digital channels than the legacy physical and telephone channels. The push from unstructured to structured customer services, from offline to online, is evident from data showing decreasing telephone calls, decreasing telephone on-hold time for users, decreasing visits to physical desks, and dramatic increases in the use of the web-portal, email communication and web-forms. The costs of communication have been reduced for both the customer and organisation.

Both the Danish and the Dutch cases have only recently been fully launched, but already the online services are being well used and feedback on user satisfaction is very encouraging in both cases. Developments are on-going in both countries, however, so that a better analysis of the impact of online service on student grants will be forthcoming only after another 1-2 years.

Agency benefits

In the Danish "My-SU" case it is quite difficult to provide information on specific results as no structured cost-benefit analysis has been performed – neither prior to nor after implementation. Implementation was mainly driven forward by a wish to improve customer service as well as to minimise the burden on the educational institutions, which itself arose from the earlier step of distributing the work from the student grant agency out to the formers' administrative staff. As the system has only been up and running for one year, it is not possible to say whether or not this had a long term effect. The agency has received feedback from the educational institutions, as well as from student applicants, that the system is highly appreciated and that it is considered a success now that 20% of all applications are made using "My-SU" after only one year. The original procedure whereby students' paper forms were sent, after checking by their educational institution, to the agency, which, in turn, passed these forms to a data input bureau, has now virtually disappeared. The agency is itself of the opinion that the implementation of "My SU" system has been successful given the rapid take-up in only one year, and satisfaction among student users as well as the educational institutions themselves has improved significantly.

The "My-SU" case has shown how the workflow can be substantially simplified by reducing the number of steps and making these automatic. One stage, i.e. the data input bureau has also been eliminated thus saving resources. Back-office staff job functions and tasks have improved considerably without the need to change formal organisational structures or cooperation partners. All this has been achieved at relatively low cost by enabling the educational

institutions to access and interrogate the student grant agency's existing legacy mainframe system, and by doing the same for student users via the addition of a web-based front-end.

The back-offices and agencies in the Dutch "My-IB-Group" case have undergone dramatic changes, particularly between back and front offices, in management and in cooperation with supporting units. The back offices used to be anonymous 'columns' organised on the basis of the specific law that they serviced. Each column communicated with customers only on the subject of that specific law. The front office in this situation often became involved at the end of the process, when things went wrong because of prior miscommunication. In the new situation front office employees work together with representatives of all former back office units. This results in much better coordination between the offices. A recent survey within the organisation showed that all of the interviewed employees are satisfied with the new structure and do not wish to return to the 'old situation'. These results would not have been possible without the concept of integrated customer services. The approach is for the specialists to also do more general tasks, such as answering e-mails and phone calls with simple questions. This means that all employees can answer simple and frequently asked questions. Questions that require deeper knowledge are transferred to the specialists when necessary. This way the organisation has become much more flexible. The ICT units saw a change primarily in their work processes and workflow. Schedules are now much tighter, and the ICT departments have more responsibility when it comes to bringing their products to market. This is especially the case within R&D (research and development) departments.

There have already been great cost reductions across the organisation in the "My-IB-Group" case. The return on investments has already been reached. Because of a decrease in paper communication and more efficient management of telephone communication, fifty full time telephone agents have become redundant. The estimated cost reduction as of August 2003 is over € 2,000,000 annually. This figure is expected to grow.

Both Danish and Dutch cases demonstrate significant agency benefits in terms of cost savings, which have been particularly well demonstrated in the Dutch situation. Improvements to staff working conditions, workload and job content have also improved in both cases with strong feedback from staff testifying to their satisfaction.

The only potential longer term issue in the Danish and Dutch cases appears to be that, even if online usage climbs very high, there is likely to be a long period during which a residual cohort of users will not have access, skills or motivation to use the web-interface, so that the physical channels of contact between students and the student grant services will need to remain in place for some time. In the Danish case, however, maintaining this alternative physical channel is not inordinately expensive (as its cost is purely to be measured in terms of extra administrative staff time in the existing educational institutions) and is thus in direct proportion to the expected dwindling number of users who will use this channel, and does not involve, as is the situation in many other cases, maintaining expensive alternative infrastructures.

In the Dutch case, just such an alternative physical infrastructure does exist in the form of thirteen regional front-offices which do represent a considerable resource. These are justified as they ensure that staff remain as close as possible to student users, thus providing a more personal and higher quality service. In the longer term, it may be that pressures to remove or rationalise these may start to appear unless they can continue to justify their presence in strict cost-benefit analysis terms.

8.5.5 Lessons and good practice

A number of common learning points arise from the student grant cases, each of which can be considered for transfer elsewhere provided that unique local conditions are taken into account.

Pressure for change

Both Danish and Dutch cases started out with pressure for change from student users. In the Danish case this was mainly for a faster more efficient service rather than a fundamental change in the service itself. In the Dutch case, on the other hand, this was much more intense because of the very poor uncoordinated service which led to a serious crisis in the IB-Group. In the Danish case, internal pressure to ease staff workload was also important. The challenges being faced in the two cases were also different. In the Danish example, it was not seen as necessary to effect re-structuring of the back offices and agencies involved, especially given that their cooperation and respective roles was perceived as working well. In the Dutch example, on the other hand, the lack of coordination between back offices and agencies was one of the prime reasons for poor service and thus for change. Given that both cases have been very successful very quickly, this user and bottom-up push for, and commitment to, change is very important.

Measuring impact and success

Both the Danish and the Dutch cases have only recently been launched, but it has been important in each case to register both user take-up and satisfaction, as well as benefits to the agencies involved, from the beginning. Continued progress depends upon on-going pressure and support from both users and suppliers if the necessary and difficult decisions are to be taken. In the case of agency benefits, cost savings are particularly important, as are improvements to staff working conditions, workload and job content, coupled with overall staff satisfaction.

In both cases, successful implementation rests upon the assumptions that student users have access and the necessary skills and motivation, and that back-office staff are prepared to be flexible in terms of the tasks they undertake and adopt new ways of working. In both Danish and Dutch cases these assumptions are largely fulfilled, mainly because it was the students and the staff themselves who drove forward the demand for the changes leading to the present system, and who clearly benefit from this.

Technology

Both Danish and Dutch cases have successfully built on existing legacy technology, although in the Dutch case a lot of additional communication software between the back-offices of the different agencies involved has also been added given that this case (unlike the Danish) involved significant back-office re-organisation in order to correct the previous malfunctioning system and organisation. The Danish case was able to simply add a web-based front-end to an existing legacy mainframe system as a very cost effective solution, but could only do this because there were no significant changes to organisational set-ups or cooperation between the different agencies involved.

Both cases have also adopted specific solutions for user identification and authentification from those available to them. The Danish case adopted a form of PKI available from the centralised Danish agency responsible for developing software for the public sector. The fact that this does not yet enable full digital signature or access to users' tax data will shortly be rectified by system upgrade. In the Netherlands a unique and very successful solution has been adopted based on GSM/SMS technology, enabling users to access the system by mobile phone anytime anywhere.

A phased implementation process

Both Danish and Dutch cases have adopted a phased implementation approach, which has obvious advantages in terms of planning, resource allocation and use, testing incremental steps before proceeding, allowing time to digest and fully work through the changes especially in terms of organisation and job functions and skills, ability to respond to change, etc.

In the Danish case this was not planned as such from the beginning given that the drive for change, in addition to the demand from students for a better service, came exclusively from, in the first phase, central student grant agency staff who wished to rid themselves of the need to organise the manual data input of application forms. When this resulted in the data input task being decentralised to staff at the educational institutions, the next phase was instigated by the desire of these staff to see this extra workload reduced, thus the further decentralisation of the task to the students themselves.

In the Dutch case, on the other hand, the phased approach, within an overall planning framework, was fully laid out in advance. This was undoubtedly driven by the crisis situation the student grant service found itself in at that time, so that it was clear from the beginning that a fully comprehensive reform of the whole process and organisation was necessary. The Danish situation was never characterised by any sense of crisis, but rather by a more gradual, though undoubtedly strong, pressure for improvement from first one staff group and then another.

Multi-channel access

Both Danish and Dutch cases effected improved user services by extending the number of channels to include web services and email, and, in the Dutch case, also SMS access. Student users are now given much more control over their data and queries, and are largely responsible for these. The results have included quicker, faster more accurate services in both cases. Multi-channel choice is still important, so that the legacy physical channels are still available but draw upon common back-office databases.

Maintaining existing physical channels once online channels are launched is often essential given that, even with students who are a forerunner group when it come to having the necessary access, skills and motivation to use ICT, there is likely to be a long period during which some individual users will still prefer to use traditional methods. Indeed, sometimes such traditional, especially face-to-face channels, will continue to provide a higher quality service especially in the context of highly personalised services.

The Danish and Dutch student grant cases illustrate these issues well. The Danish case rests upon the traditional network of the educational institutions themselves as the primary physical contact point between the student grant system and the student, albeit coordinated one step back by the student grant agency. The fact that this network is more or less here to stay means that the physical channel can be maintained at marginal cost. The Dutch case, on the other hand, rests upon a student grant tradition not based upon a network of educational institutions but upon the direct provision of the student grant service through the responsible agency (in this case the IB-Group). When this system failed, it needed to be reorganised, and this involved replacing an existing network of physical front-offices with a new network of 13 regional physical front-offices. In the longer term, it may be that pressures to remove or rationalise these may start to appear unless they can continue to justify their presence in strict cost-benefit analysis terms.

Both cases show, therefore, that implementing online services needs to take account of the historical context and the organisational infrastructures and cultures already in place. In some respects the Danish solution can be said to be preferable being cheaper, but this is only because the legacy context was more favourable to rapid, relative cheap and successful implementation. The Dutch solution is without doubt more suitable for the context in which it finds itself.

Back-office reorganisation and human resource changes

The Danish and Dutch student grant cases illustrate contrasting approaches to the issue of whether back-office re-organisation is necessary to improve front-office service quality. In the Danish case, the existing organisational set-ups and cooperation were relatively simple and working well and it was not necessary to make any significant organisational changes. The system was not in crisis and the pressure for change, although important, was easily manageable within the existing framework. In the Danish case, the introduction of online services was done to incrementally improve services for the users and save resources for the agencies as well as improve the working conditions of agency staff. The system could undoubtedly have continued for some time without the use of additional ICT, as it was in many respects functioning relatively well.

The Dutch case, on the other hand, illustrates an alternative scenario. Here, the existing system and organisational framework was in crisis. Pressure for change was coming from all quarters (including questions in Parliament) and this was not manageable within the existing system as this plainly was not functioning. In the Dutch case, the introduction of online services was, in fact, the saviour of a failing system. The need for change existed independently of any role ICT could play. Undoubtedly, a solution other than ICT could have been found to address the system's shortcomings, but also undoubtedly the introduction of eServices did provide the best solution and also made it easier to address the organisational problems. ICT was the right solution at the right time, which not only provided better services but also was the means of rescuing the system from collapse.

These two contrasting situations well illustrate many scenarios across a range of public services (not just student grants):

1. **Service inherently needing reform (maybe in crisis), independently of any role ICT could play** -- ICT can be an excellent means to assist in reforming the system as well as providing an upgrade of services:
   - The organisational arrangements are relatively complex and not well integrated. Comprehensive back-office and inter-agency re-organisation is necessary with or without ICT. This could meet resistance from lower level or departmental managers, but has not been a problem in the Dutch case because, as described above, the drive for change has also come from these staff themselves, and they have experienced less routine and more interesting work as a result.
   - The technology solution is likely to be more than simply adding a web front-end to legacy systems – as the legacy systems reflect the existing organisational set-ups, changes to the latter also require changes to the former (in the Dutch case, new communications software was needed to provide cooperation between previously un-cooperating back-offices and agencies).
   - Changing the job functions, tasks and skills of staff.
   - The decentralisation of responsibility and control direct to the users themselves -- this is what happens in many eProcesses where the end user achieves simultaneously more control but also takes on more responsibility.

2. **Service not needing important reform** -- ICT can nevertheless improve service quality for users and save costs for the agencies, as well as improve the working conditions of agency staff:
   - The organisational arrangements are relatively simple and well integrated. Little or no re-organisation is necessary, as the system is typically quite simple and well integrated and, on many measures, presently functions reasonably well, although some adjustments may be desirable.
   - The technology solution is likely to simply be adding a web-based front-end to the existing legacy architectures.
   - Changing the job functions, tasks and skills of staff.
   - The decentralisation of responsibility and control direct to the users themselves -- this is what happens in many eProcesses where the end user achieves simultaneously more control but also takes on more responsibility.

In both scenarios the common elements are changing staff job functions and some decentralisation of responsibility and control as far as to the user as possible. This is because the data needed do not, by and large, previously exist as the user is the source, so it makes sense to shift control and responsibility to the user, thereby at the same time relieving agency staff of a lot of work and some (though perhaps not ultimate) responsibility. This really is a win-win situation by simultaneously removing routine work from back-office staff, who can thus engage in more rewarding tasks, and achieving more instant control for users. This often also results in quite significant cost savings. The only downside is that some staff may be made redundant, if redeployment to other duties cannot can be achieved. This happened in both cases -- the external data input bureau was cut-out in the Danish case, and 50 full-time telephone agents were sacked in the Dutch case. The other proviso as described above is, of course, that the alternative physical channels be kept open (which can be a significant on-going cost) in order to cater for users not able or willing to use ICT. This is important in terms of tackling the digital divide.

Historical organisational legacy

It is clear from the above that what happens when public eServices are offered depends partly on the historical organisational legacy in terms of agencies, their back-offices and their cooperation with each other

If this is functioning well, and relatively cost-effectively within an existing simple and well integrated system, ICT is in any event likely to be able to add considerable improvements both to the quality of services, by extending channels, as well as to the functioning of back-offices and the working conditions of staff. This can often take place relatively easily and without huge costs, simply by adding web-technology on top of legacy architectures and existing organisational arrangements. It is also likely to reduce overall costs.

If, on the other hand, the existing organisational set-up is not well integrated and functioning well in terms of delivering the type and quality of services being demanded (and this demand is likely to be constantly changing, increasing and becoming more differentiated), then changes are needed regardless of whether ICT will be part of the solution. In many cases, the introduction of eServices can constitute the basis for system change, thus both providing improved services and facilitating necessary organisational change at the same time. In such cases, given that the legacy technology reflects existing organisational arrangements, there is likely to be a need for more comprehensive technology investment over and above adding a web-based front-end.

Good practice transferability thus depends upon understanding:
- the existing organisational and technology conditions, which often reflect national and/or regional regulatory and institutional regimes and cultures
- the overall need for changes to these in order to better respond to present and futures demands on public services and the public finance framework
- the locus of demand for change. Is the latter from users, bottom-up from staff and/or top-down from central government and/or top decision-makers? In an ideal world, all three types of demand for change will be present. Certainly, however, the two student grant cases presented here have shown that success has arisen directly out of user and bottom-up pressure for change.

8.6 Citizen social benefits – public libraries and declaration to police

8.6.1 Background goals and drivers

According to the Finnish Act on Electronic Services in the Public Administration, public authorities are required to provide online services as far as they are able. This prompted the Finnish police to formulate a strategy was based on the vision for the year 2010, when all the web services should be integrated with the operational systems. Customers should be able follow up their case electronically and they should be able to check their own data in the administrative system of police (with certain limitations) and services are given on the 24/7 base.

The first step in the way to the realisation of this vision was to develop a system where the main common objective was to provide the citizens with an easy way to make a crime declaration in cases, which didn't require a strong identification or an immediate action. Furthermore the 24/7 access and independence of "place" was important seen in the context of the very sparsely populated areas of Finland which made it very expensive to have police offices covering the whole geographical area of the country. With new services and structures it will be possible to have more equal situation by having 24/7 services in Internet and having a local one stop shop together with the other authorities.

Another objective from the administrative perspective was to increase the quality of the declarations. By electronic guidance it is ensured that data is entered in the correct fields so police officers wont have to spend time doing this task. But the main internal objective for the police itself, was to use the project as a first step towards a future with better integration with operative systems, more focused services and better Cupertino on the back office level.

There were several factors that prompted the start of the Danish case, Bibliotek.dk. Denmark had for a long time had a central register (called DanBib) for all library books available in all libraries in the country. A private company, Danish Library Centre (DBC) operated this database, but all libraries didn't have the opportunity to use this database in their work. In 1998 there had been discussion for some time that the database should be made available for all libraries. In the autumn of 1998 the minister of culture gave a speech where she promised to start at project that would allow not only the libraries to use the database but also all Danish citizens. The rationale behind this decision was that citizens should have the opportunity to access the entire "population" of books in Denmark regardless of their geographical location. Furthermore the opportunity for the citizens to conduct the search for books himself, was considered as a service lift (from a citizen perspective) that could result in productivity gains as more and more citizens identified the books they needed without the help of librarians.

On the other hand part of the system is also targeted employees at the libraries: this services enables them to identify books and their availability status very quick and efficiently in other libraries. This service and its effect has been a significant part of the organisational changes that some libraries have gone through and other libraries will go through in the future. Libraries (especially research libraries) have had a rather high degree of functional and practical specialisation, which meant that organisational flexibility and service orientation was contingent on very good planning on a day to day basis. One of these functions was the responsibility for the identification of books on other libraries when the library itself didn't have the book. The new system means that all librarians can perform this function very quickly and thereby existing organisational routines are challenged and being reconfigured. In a longer perspectives the fact that personal can be less specialised and perform the same results should led to greater organisational flexibility and better service.

Both the Danish and the Finnish case started out as high level political visions for an enhanced citizen's service. All though citizens themselves didn't formulate their specific needs they were given voice in relation to the projects since both projects used "user" involvement and pilot projects as part of their development phases. Even though the goals in both cases were enhanced citizen's services, politicians and administrative units has been very aware that projects offered opportunities for efficiency gains. In both cases the gains are high due to the fact that customers enters relevant information themselves and the systems allows for validity check of the information entered.

8.6.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
www.bibliotek.dk	Denmark	3+1 Library service	3 vertical bundling and personalisation of the interface	C	1 stage two libraries Libraries involved +300	NA	All Danish libraries are involved, but no other kinds of back offices.
Declaration to the police http://www.poliisi.fi	Finland	3+0+0	2	C	1 national portal 280 police stations	NA	24/7 declaration of petty theft

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.6.3 Implementation

User service provision

In the Finnish case, two police districts first piloted a full demonstration case and the final solution was based on the results of these pilots and the feedback from users. In the final solution there are seven crime types that can be recorded in the system:

- Stolen property in general
- Stolen bicycle
- Stolen mobile phone
- Damages (for private persons)
- Damages (for organisations)
- Stolen or lost weapon
- Stolen or lost document approved by police

When a user has filled out and sent a form, it will first be processed by the lomake.fi portal[57] and after that sent to the XML-server of the Finnish Police. After having recognised the location of the crime, the information will be sent to the electronic crime declaration box of the local police office in question. Local police can transfer some parts of the information to the own operational system but fully integration of the investigation system is still under preparation. The information received by police is used for other services, e.g. in case of a stolen mobile phone police informs the operators to prevent the use of this phone with other SIM-cards. Technical standards, which enable the solution, are TCP/IP networks, HTML presentation standard, HTTP and SSL protocols, VPN standard for secure transfer and XML in data recording.

The Danish service, Bibliotek.dk, enables the user to access the total amount of books in Denmark. If the user identifies a book that he wishes to lend he may specify the library that he wants it to be delivered to. The user may use his personnel number to identify himself and secure that he is the one he claims to be. Once the book is collected at the library the user will have to use his library card, or health insurance certificate to lend the book. The back office procedures related to this will be described further in the following chapters. Today the service has approximately 24.500 unique user pr. week and the users orders a total of 21.000 books pr. week.

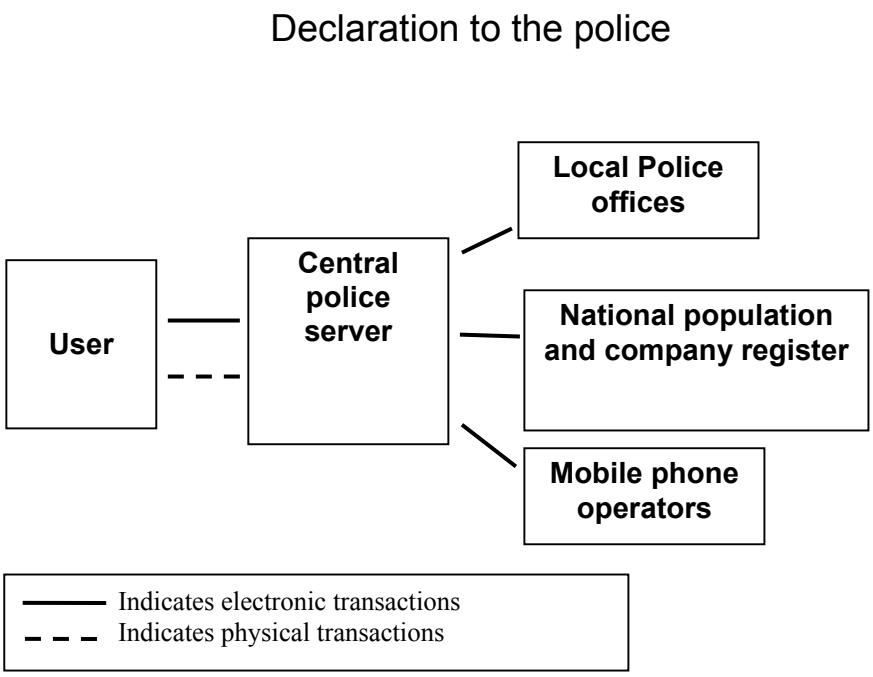
Both initiatives improved the citizens service by addressing the issues of time and place. The service are 24/7 services which gives the citizens the flexibility to use them whenever it is convenient for them, and both initiatives overcome service obstacles induced by geographical distance.

[57] The lomake.fi service enables electronic transactions between citizens, companies and organisations and central government and local authorities, their agencies and other relevant organisations. Today lomake.fi includes 800 different electronic forms of 20 public sector organisations. Monthly number of transmitted forms is roughly 5.000.

Back-office reorganisation

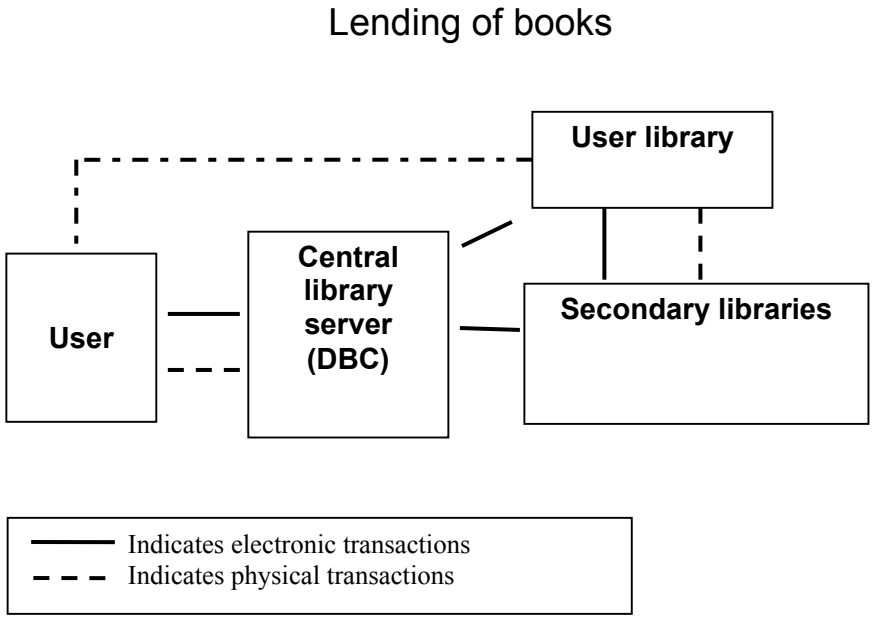
In the Finnish case, the project has not changed the police organisations working processes much. The main reason for this is that the lomake.fi system has been used as the citizen's interface and data entered there has been XML-converted to fit the existing systems of the police organisations. A positive effect of this is that there has been a very fast dissemination of the new service. Today, all police districts use the same system and it is part of daily work of the officers.

There has been no need to train personnel for the new web-form system and general guidance was done by sending instructions to all service points. The only truly new task for duty officers is to regularly check the new common crime declaration email box. Because declarations are not urgency cases it makes possible to do this, when other tasks allow it and the information transfer to the police case system can be done outside the rush time. Management of ICT is not something the personnel have to deal with since most new tasks were done by an external private operator. An important enabler in this case was data confidently managed by the private operator during the transfer from citizen to police data centre.



In the Danish case traffic and lending generated by the system has meant that many of the employees have had to develop new ICT competencies. In an organisational perspective the introduction of the system has accentuated a trend towards a de-specialisation of librarians as means to improve flexibility and customer service, and this has been well received by most libraries and most librarians.

In both cases the actual back office re-organisations has not been massive but this may be due to the fact that the services has been implemented in less than a year. In both cases it is recognised that there are significant efficiency gains, but the organisations has not yet found out if these gains should be leveraged by actual organisational changes. Both cases have successfully utilised existing software and spend a great deal of time to ensure that the new systems developed could be easily integrated with a the variety of systems that may be on a local level.



Very few problems have been recorded in relation to the development and implementation of the two projects. On reason for this could be that the pilot project effectively identified the majority of potential problems and dealt with them before the system was implemented on a larger scale.

In relation to important issues, one of the dominating success criteria's in the Danish case was that the system should be developed and implemented in all Danish libraries fast. This posed several technical and managerial challenges. In the technical domain, it was apparent that the need for fast implementation in +200 local libraries with different IT systems meant that the new system should be extremely flexible and readily compatible with all the different IT systems in the libraries. In the beginning the local libraries weren't that involved in the process, but as the success of bibliotek.dk has increased, the library organisations have become more and more interested in the shaping of the future functionality's of the system.

In the development process, the contractor (DBC) chose to focus on its core competencies and outsource parts of the development project to subcontractors. This was done with varied success. The design and development of the interface was outsourced to a web-development company and the result of their work is considered to be very successful by DBC. User responds to the interface has been good, and the usability of the services has been rated high in different evaluations that has been performed. The problems arose when the hardware component of the system was delivered. It turned out that the hardware provider hadn't tested and certified the hardware and its basic programmes, and this created a wide variety of problems for a period of a couple of months. In this period DBC had to focus very strongly on this issue and do a lot of the test and changes them selves in order to ensure that the quality of the implementation was in top.

8.6.4 Results and benefits

User benefits

The crime declaration on Internet is meant to use in the situation, where there is no need for immediate emergency services or investigations on the place of the crime. It can also not be used if the location (municipality) of the crime is unknown or the crime has been made abroad. Users benefits from most of the services because they can make declaration where and when ever they want and get the response by mail, fax or pick up it personally at the local police office. Police can balance workload of their officers and has got better quality in the declarations. The interaction between the user and the service is digitised to a greater extend. In the service itself no human processing is needed, but

checking and response initiation still need to be undertaken by an employee. In essence the service saves users and the police time. Before the system was implemented users often had to spend significant travel time to get to the police office, and often they didn't bring all relevant information (like the IMEI-code of the mobile phone) which meant that they had to come back again. On the web-form there is a place for all needed codes and other information. In the most cases the customer has this information better at hand when making the online declaration than at the Police station.

In the Danish case the service has become a huge success, and this is mainly due to the fact that citizens can order books that are not available at their local library and have them delivered at the library. This makes ordering and delivery very convenient for the citizen.

Agency benefits

In the Finnish case the police offices has benefited from the service in several ways. Seen from a qualitative perspective the police are receiving more exact information e.g. on the stolen property, which helps to solve the crimes. Also the growth of the number of declarations provides the possibility to have better comprehension on the criminality. In many cases, small crimes can be part of bigger cases and this kind of flow of small hints can help the investigation. It is presumable that the new system will increase the criminality in the statistics.

Seen from an efficiency perspective the working time needed to handle the crime declaration decreases when the desk service disappears. Furthermore the customer now does the main part of the recording work.

Another important result is that the local offices can work with the relative small crimes reported in the service, when there is nothing going on with higher priorities. This gives an increased flexibility, which is very important for the overall performance of the police work in Finland. The following numbers should underline this point. The number of police stations with a service desk open 24 hours is 75. Police receives 800.000 crime declarations every year. It has been calculated that 150.000 of them are suitable for this new seven months old service. In the autumn 2003 police received 10% of these suitable declarations through Internet.

In the Danish case, there is no doubt, that work related to the identification and ordering of books located at other libraries, has become much more efficient. As indicated earlier the Bibliotek.dk has lead to significant rises in the amount of lending between libraries[58] and this means that the search and identification of books no longer is handled by a few specialist at each library. Naturally this have meant that a significant amount resources have been spent at competencies development and organisation development at all libraries.

Consequently it would seem fair to say that the system had had positive results, and contributed to a change in the distributions of competencies between library personnel and organisation of work that will enhance the flexibility and service levels of libraries without inducing more cost for the specific library. Having said this, there are still significant gains to be expected from a further integration of BackOffice systems which will allow a fully automated search and ordering facility for the users of the Danish libraries.

In long term perspective many of the existing routines carried out by librarians are expected to be automated. The main challenge in relation to this is develop middleware that can integrate information and search strings between the different back-end systems. There are currently 10 types of back-end systems that are dominant in the Danish libraries and DBC are primarily targeting these systems in their strategies for future development. Another important result of Bibliotek.dk is that the transportation system between the libraries has to be renewed, since the current system is geared to a much lower activity level between the libraries.

There has been no significant problems or issue reported in relation to results and benefit in the two cases.

[58] Some libraries have witnessed a 400% increases in loans between libraries

8.6.5 Lessons and good practice

Development of a fully integrated back office system is a huge task that in Finnish case may take 5-10 years to do. This period is too long to be predictable especially concerning the technology, and the structure and tasks of the public administration. Therefore it seems wise that the Finnish police has not attempted to make one integrated development project covering all parts of the process and service. Instead they have created a structure that allows for a step by step development, with separated front and back offices. Another important lesson is the fact that existing infrastructure has been used to leverage the service and minimise cost. This is good from a user perspective as well as an administrative perspective since the service can be implemented and operational quite fast.

In relation to transferability, one would expect that the organisational models of the police are quite similar in many countries and probably also the daily problem in the local police stations of how to prioritise the use of human resources. This indicates that the Finnish electronic crime declaration may be transferable to a significant amount of European countries. On the other hand the opinions of the actual citizens and administrative needs may vary from country to country. The system deals with sensitive information and the context may be quite emotional and some countries may think that humans are better to handle such situations than technology.

Legislative frameworks
In the Danish case, the importance of the legislation and existing infrastructure as fundamental drivers of success cannot be overstated. The positive alignment of these factors allowed DBC to develop and implement the system very quick, and the fact that libraries all ready were lending each other materials meant the concept of the service all ready was accepted by all libraries.

User involvement
User involvement from different user groups has also contributed significantly to the successful implementation of the project. The fact that DBC has 8000 users who volunteers to give feedback shows that DBC has been very successful in managing this relation and this is promising in for the future development of the service. The flexible approach that allowed each library some say in the relation the level of participation in the services that it wanted has also proved to be a success. Most of the libraries that were sceptical from the beginning are now choosing to participate more fully in the project.

Systems design and development strategies
Both cases have had success with a centrally developed solution for very decentralised and localised services, and this is important since there are significant efficiency gains connected with this approach in relation to a decentralised development approach. Several common reasons for the success of the two development strategies may be suggested. Citizens involvement and “agency” involvement in the actual development process has enabled the developers to develop the service right from the beginning, and to foster a climate positive towards the changes connected with the implementation of the new services.

On a technical level, the use of existing software infrastructure, and the development of very flexible central systems to ensure integration with different local systems has also been a key factor. This minimised development costs and enabled a very quick implementation on a local level.

The “one step at a time” approach of the two cases have had several positive effects. First of all it has allowed for a fast development and implementation period and the effect of this on citizens and administrative workers should not be underestimated. Secondly it has ensured that the long run flexibility of the system is optimal since it is being developed in modules. All these points seem to be transferable to other countries and systems.

Administrative savings
Both cases illustrate how administrative savings can be made while service levels are improved for the users. The dominant driver for these saving are in both cases the fat that users take on some of the work of the administrative personnel in order to utilise the flexibility that ICT facilitated services offers.

Flexibility in organisational structures and competency profiles of administrative personnel
Especially the Danish case shows that service improvements for citizens may mean organisational changes and changes in job profiles. Identifying and ordering books in other libraries used to be a specialist task with a fixed amount of

resources dedicated to it. The pressure from the new services and the ease of use that new a new system interface has given has meant that all librarians now undertakes this task from time to time in order to cope with user demands. This also ensures that internal resources are used in an optimal manner.

Outsourcing development tasks
Experiences with outsourcing has been mixed. On the one hand it is recognised that when very large development projects are undertaken the project leading organisation will often have to focus on core competencies and project management in hence should outsource the assignments that does not fit one of these two categories. On the other hand experiences in the Danish case indicates that giving away responsibility and influence over crucial components of the project may turn out to create significant bottle necks and extra work if contracts with the outsourcing partner are not very specific.

8.7 Citizen building permission

8.7.1 Background goals and drivers

The services regarding the application for a building permission online which have been short-listed in Europe as good practice are from Finland, Germany, Italy and the United Kingdom. However, the service provision in order to take the load off the citizens/customers is somewhat lacking. This is mainly due to the complex character of the permission procedure, the need for discussions and advises with and to customers and other involved participants as well as the unwieldy construction plans. To face these challenges in order to streamline the procedure by putting the service online, the various countries went with exception of the German case almost similar ways; the emulation of a traditional service to an online one. The German example, represented by MediaKomm Esslingen has chosen another way, by organising the service on a common platform with certain access rights of the involved participants. Besides high efforts on digitisation, Bologna, Italy reorganised the offices associated with the building permission procedure and situated them at a single address. This leads to short ways within the administration and the customers only have to go to one single office. A special feature of the British case is the facility to apply through a national portal; the application is then transmitted to one of over 400 local authorities, all in different buildings and geographical areas throughout the UK. The Finns have the service combined with other housing related databases like e.g. real estate taxation services or the population register.

Not at least because of Bolognas leadership in Italian's e-government applications and of providing the building application as a service accessed by professionals through a digital signature, the Italian example is chosen for an in depth introduction below. Besides and as alternative plan, while organising the service provision another way and also including the digital signature, the application for a building permission at Esslingen will also be introduced in depth.

The Italian building permit service at Bologna started out as a pilot initiative to test the use of the digital signature as part of the overall Italian government interest in the use of digital signatures following the passage of the Bassanini Law in 1997. The Bassanini Law states that documents, acts and contracts created with information technologies and transmitted electronically are valid and legally binding: this essentially paved the way for the development of online transactions and the digital signature in Italy. Another important law affecting the building permit process is the Regional Law 31/2002, which went into effect on 1 July 2003 and changed the procedures and requirements, associated with construction activities. The objective behind the digitisation of the building permit process was to break down barriers between citizens and the public administration and to rationalise, simplify and speed up the process to initiate building activities. The service is designed for experts only, since in Italy only professionals from construction industry can apply for a building permission.

Esslingen, Germany, offers an online application for a building permission in the framework of its ambitious activities concerning the provision of electronic services not only by the use of qualified digital signatures. Since the City of Esslingen is one of the three final winners of the federal e-government competition MEDIA@Komm, Esslingen is aiming to offer various online services for citizens and businesses. This competition was introduced by the Federal Government of Germany in 1998 to push the development of e-government technologies and applications in the public administrations. Due to this competition Esslingen was awarded matching funds to develop an online-transaction platform and specific applications for various user groups including the application for a building permission (beside other online services). The developments at Esslingen could be divided into five modules each with different contents

('Local Services', 'Education', 'Culture', 'Social Services' and 'Electronic Business'), and a module called 'cross-section' which is in charge of developing the (signature) technology and providing it to the other modules.

The construction platform is part of the 'Local Services' module. The reproduction of the building-permission process on an online-medium is seen at Esslingen as the most difficult process when putting public services online. This means, if the online application for a building permission could be made available to the users, the other public services could be developed for online use as well

Both the Italian and the German case are aiming a service provision which is characterized by high degree on digitalisation. This should mainly lead to a better service provision for users since there is a lower demand for office visits and for the administration since the application data and documents can be hold digitally and therefore kept at a central place for immediate access.
Moreover, since the application for a building permission is a very complex service with many varying involved offices, the implementation of the service takes time and need a long testing phase. So in both cases, the service development has not reached its end; above all, when we take into consideration, that the Cities test the use of the digital signature also at that service.

8.7.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
Bologna	Italy[59]	4+1+1	2	C	Construction and Enterprise desk Sector territory and urban requalification Planning dependent: internal concerned offices external concerned offices other offices outside municipality	2002: 50 from over 6.000 applications have been done online ~ <1% 64 professionals are registered and therefore in charge to use the online application	Application only for professional and registered users (architects, engineers, planners, designers, draftsmen etc.) + locates offices associated with building permission in one single building + includes a common address which provides geographic data sources and other cartographic plans + several attachments are possible online + legally binding acts are done by use of digital signatures - the 'only one' system for facilitating building permissions is still missing - low uptake
construction platform - Esslingen	Germany [60]	4+0+0	2	C	Planning department Planning dependent up to 40 entities or even more: Local concerned authorities General concerned authorities Private organisations concerned neighbours	From June 2002 to June 2003: 3 applications have been done online ~ 2%	+ Reorganising the service provision by a common platform - Because of the law, double procedure on paper is necessary until the beginning of 2004 + Change of law to avoid the double procedure on paper has been started + standardisation process in building permission applications within Germany has been started + legally binding acts are possible by use of digital signatures + all data sources are digital + architects can use the platform for several purposes - low uptake

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

[59] Case report by Nomisma S.p.A., Italy
[60] Case report by Institut für Informationsmanagement, Bremen, Germany

8.7.3 Implementation

User service provision

There are two requisites in Bologna for applying for a building permit online: The user must have a digital signature and must be a professional, responsible for managing the project as well as a member of the relevant professional register.[61]. The digital signature has a dual function: to identify the user and to sign documents. The professional user begins the application online by using his/her digital signature to enter the system and inserts the relevant data regarding personal data, the characteristics and location of the proposed construction project. Then, an "electronic application" is generated. The data entered will be archived; therefore, repeat users do not have to fill in their personal information again. The "electronic application" is received by the Construction Desk, which functions as the "single interface point" for users. Then an e-mail message is automatically sent to the user that the data was received and that an appointment has been set up with the technical staff of the Construction Desk in order to review relevant documents to be presented (even if the documents were sent as file attachment). The user may confirm or reschedule the appointment via e-mail and go to the Construction Desk at the scheduled appointment time. There he/she present the documents and answer any outstanding questions. Upon satisfaction of the documentary and other requirements, the application that was started electronically is "formally" activated.

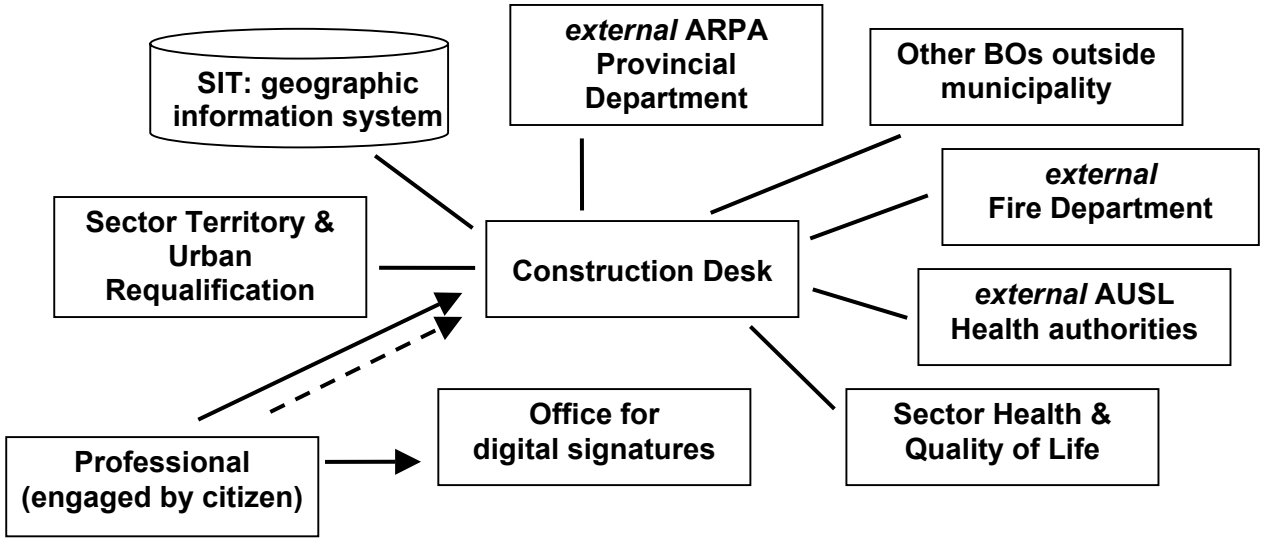
Applicants for an online building permit at Esslingen need – similar to the Bolognese case – a digital signature to file the application legally binding. The user of the application can be an individual or a professional. However, in general, applications for a building permit will be filed by professionals (architects) who were commissioned by customers. Users of the application can chose to rent a virtual workspace at construction platform to prepare their planning online. This is not a prerequisite to use of the platform, but this provides comfortable features to the users and supports the application procedure since the planning documents can be optimal prepared for the further application steps. With or without using this virtual workspace, the users have to file and upload the documents that are necessary for the application to the platform. The planning department, which is in charge of the platform carries out the application while informing and giving access to the offices and other involved participants which are concerned by the planning. These offices and participants can now rework the planning documents at the platform. No further documents have to be sent around among them. Also the user, he/she only has to sent further documents or go to the office in exceptional cases: After the application is reworked by the offices and participants the planning department will carry out the application and sent it electronically to the user.

Back-office re-organisation

The entire structure of Bologna's municipal public administration was reorganised at the beginning of 2002 to be more citizen-oriented and thus "cross-sectoral". Now the back offices that handle the contacts with citizens and represent the primary interface for the online applications are all situated under one strategic direction: "communication and relations with the citizenry". With regard to building permit applications, the most important change brought on by the reorganisation was to integrate two formerly separate back offices under two different departments into a single back office: the unified Desk for Construction and Enterprises. This desk is designed to serve as a joint interface shared by building and business activities and subordinated to the above-mentioned area[62]. In the past, applying for a building permit involved presenting numerous paper documents and compiling various forms in different offices, some not within the municipality's administration. The 2002 municipal reorganisation has led to a streamlining of the paper-based process, so that there is now only one direct interface point with the user (*single point of access*), the Construction Desk (which comprises several sub-entities).

[61] While private citizens may receive a digital signature certificate, only those with the relevant requisites may now apply for a building permit. This change ensures that the applications received comply with a certain level of quality.
[62] "communication and relations with the citizenry"

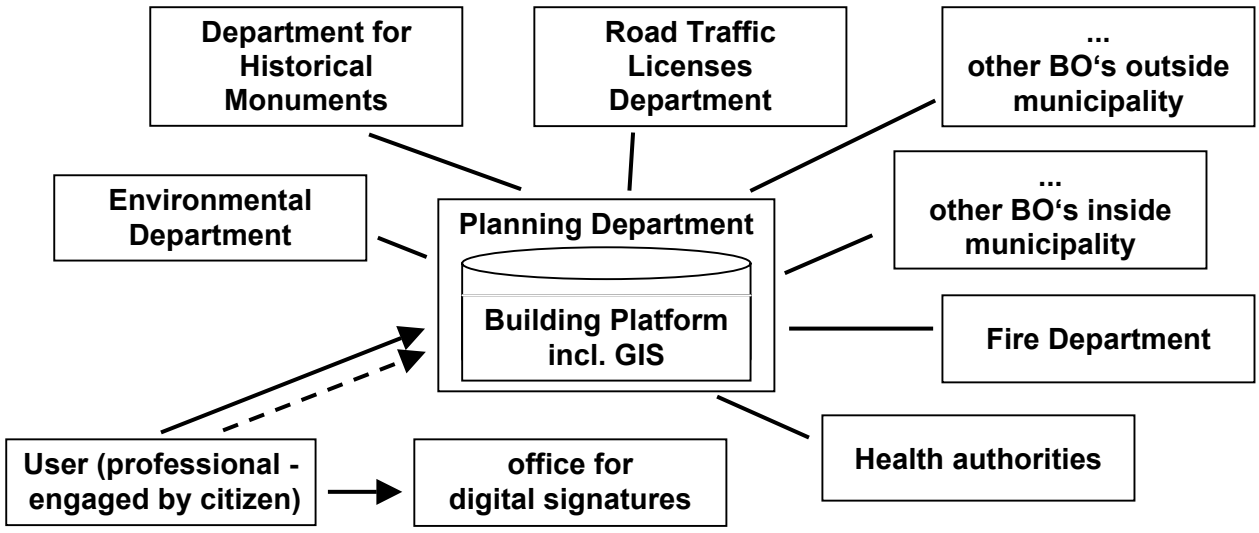
Bologna, Italy, Building Permission



———	Indicates transactions operated (mainly) via the online building permit service
– – –	Indicates transactions operated "offline" (media break)

Esslingen has and is still reorganising the complete public administration by the integration of electronic transaction services with the auxiliary function digital signature. However, the back office organisation of the application for a building permission has not changed drastically. Rather the service organisation has changed, since the service is provided on a central platform which can be accessed by the several involved offices and participants.

Esslingen, Germany, Building Permission



———	Indicates transactions operated (mainly) via the online building permit service
– – –	Indicates transactions operated "offline" (media break)

This means, the planning department manages the building permission process by coordinating the workflow on this platform while giving access to each involved office/participant. A file and document management system is one of the

main features of the platform to support the permission workflow. It functions as archive of the files and documents as well as assistant for the communication with the involved offices/participants. So, e.g., the planning department gets an automatic notification if a statement of an office/participant was received by the directory. Moreover, not all offices or participants are allowed to have access to all files, so access will be routed via this special directory by the responsible planning department. Before the construction platform was online, the offices and participants had to be contacted by in-house post or traditional post stepwise and the documents had to be sent to them. So the workflow for the planning department was characterized by manual steps which had to be carry out one after another, while now the involved offices and participants can more or less simultaneously rework the planning and the planning department will automatically be informed about these changes.

8.7.4 Results and benefits

User benefits

The main benefits for users of the Italian case are seen in the saving of time and the avoided need for often frustrating and fruitless phone calls and office visits to the compartmentalised administrations that can only provide part of the answers to the questions. Now, users have to enter the relevant data into an electronic application and have to visit one single office (unified Desk for Construction and Enterprises) only once. Professionals that regularly apply for building permits benefit in a special way that for simple projects, the procedure could take place almost completely online (necessitating only one appointment). Not at least because of the reduced need for travel in an already crowded city, this could be seen as a remarkable time saver. Besides, efficiency is improved by the fact that once information is presented, it does not have to be presented again (archived by municipality).
In addition, with the application of the Regional Law on Construction 31/2002, the time limits have changed for the "silent assent" related to the DIA[63]: previously the limit was 20 days, now it is 30 days. For the actual building permit, the time limit for the "silent assent" is 135 days from the time of the submission of the application; however, the municipality may request missing documents only once within 30 days of the presentation of the application. In any case, the average time for the release of a building permit in Bologna is 45 days, well within the time limit for the "silent assent."[64]

The customers of the building platform at Esslingen mainly benefit by saving time and costs that would occur if they had to visit the public offices to file the application. By applying for a building permit online, not only the routine visits at the offices are no longer required. Certainly, in complex planning procedures, visits at the offices can hardly be avoided. However, the customers are no longer restricted to the opening hours of the public agency for the communication and cooperation with the planning department. Moreover, by using workspace I for the preparation of the planning, the customers (architects) are provided with the most appropriate tools to prepare the planning documents for the building permission. This saves resources at the customer's and at the same time improves the planning process by using the comfortable tools provided by the platform infrastructure. In addition, the planning procedure is transparent, since the involved offices and participants can track and trace the process by a special history. The building and construction trade estimates the savings for architects at about 2,000.- Euros per planning procedure. Nevertheless, a cost-model for renting workspace I is not fixed until now.

Agency benefits

The important benefit of the Bologna case is seen that instead of the user filling out a paper form with data, which then had to be input in the municipal system by BO staff (leaving room for transcription errors), the user directly generates an electronic application, checking the data before sending it to the municipality. This saves time and contributes to accuracy by removing the risk of faulty transcription. Also, the user announces a planned activity, thus informing the Construction Desk ahead of time of the appointment at which the user must present relevant documents. The option for users to communicate with the Construction Desk via e-mail is also seen as a substantial improvement, given the fact that the Construction Office phones are invariably busy. This also gives municipal staff time to respond to e-mail messages when the office is closed to the public. Thus, the real improvements were brought on by a change in the Regional Construction Law that eliminated some procedures from municipal control and simplified others (DIA[65]). This

[63] DIA: declaration of the initiation of activity – a building permission "light"
[64] The "silent assent" means that if an applicant hears nothing from the municipality within the time limits for the DIA or the building permit, it is the same as a green light to go ahead with the construction project.
[65] See footnote no. 63.

law streamlined and increased transparency and has also contributed to a reduction in the amount of paperwork, as citizens were no longer required to carry documents from one office to another. Moreover, there was reduction in the number of certificates and documents required to undertake certain administrative procedures

The main advantages of Esslingen's building permission platform are seen in the recognition of the added values that cannot be expressed in a quantified manner. So the digitisation itself brings several benefits for the working steps: The data can be stored digitally and easily used for further planning procedures or simplify the storage of planning procedures in the archives. Moreover, the planning process can be sped up since the documents can be reworked simultaneously and do not have to be printed out and sent by in-house post or traditional post. The estimated savings for the public administration regarding the latter points (prints and postage) are about 300. - Euros per building permission procedure processed online (subdivided to 5-8 offices that are mainly involved in the planning process). However, because of the very low uptake to date, impressive statements about savings of time and costs for the public administrations are not possible yet. Other benefits resulting are that the workload of professional advice from the information desk will be reduced, since basic and qualified information are on the net. Also, fewer mistakes in processing occur since there are checks on plausibility in the system. Another benefit is the advantages arising from the standardisation process regarding the common interface with a standard data description (XBau) that will allow the compatibility of planning related data across the borders.

8.7.5 Lessons and good practice

A number of common and alternative learning points arise from the introduced cases from Germany and Italy. Each of them can be considered for transfer elsewhere provided that unique local conditions are taken into account.

Centralisation of planning data sources allows faster service delivery by giving the various involved participants access to this data in one place
The path followed by the planning department of Esslingen is that all the planning-related documents like construction plans and information, expert witness reports, application forms, laws etc. are provided on a special planning platform on the Internet. All entities and persons involved in a certain planning are given access to this planning platform - depending on their legal rights. Therefore the plans and other planning documents which are often unwieldy do not need to be printed out and sent to the relevant offices, which is very time-consuming and cost-intensive. Instead, the relevant offices are given access rights to the platform by the planning department, which coordinates the procedure. The various offices are now able to download the documents, rework them and upload them back to the platform. This allows a more or less simultaneous reworking of the planning documents. So the former queuing system by sending the planning documents from one office to the next has been abandoned by a more efficient star-shaped system around a central platform. This leads to a faster and cheaper procedure for the customer as well as for the other involved entities.
In contrast, the City of Bologna prefers another service provision which is also based on the centralisation of data sources. Regarding reorganisation aspects, Bologna has situated the relevant offices for planning procedures at a 'single point of access' within a single building and also unified the functions under a joint desk for enterprise and construction. So customers only have to go to one place in order to deal with planning-related services, and on the other side the various relevant public offices can use the geographic closeness for a better cooperation also allowing other than electronic communication.

Respect the advice- and discussion-intensive working steps within the service provision by digitising of only the really useful steps
Within the whole planning procedure, the City of Bologna takes into account that huge or complex planning procedures are all more or less accompanied by tasks of giving advice to the users and discussions with various involved entities and persons on the way to the final building permission. Moreover, often construction and other plans of huge scale are part of the planning and permission process which can be better watched or interpreted when they are in paper form instead of a small-sized monitor. Therefore the involved entities and persons have to come to the office if advice or discussions are needed or the unwieldy planning documents have to be consulted. All the other steps of the planning and permission procedure are digitised. This means the working steps the digitization of which have been identified as useful were digitised, the others not. Besides, most projects do not require advice from the offices since the task is only renovation or restructuring. Therefore, the city only approves or denies permission and the practice of "silent assent" for many types of building interventions is usual practice. Moreover, as mentioned above66, the relevant public offices of

[66] under 'lesson and good practice': 'Centralisation of planning data sources allows faster service delivery by giving the various involved participants access to this data in one place'

the planning procedure have been situated in a single building in the city centre. So there are short ways between these offices with comfortable possibilities for common and frequent meetings.

Use or develop solutions based on standards to guarantee the connectivity and transferability especially for services in charge of the municipalities
Since the permission of building applications is generally in charge of the municipalities, the use of standards is getting more and more priority. This is because various municipalities often use various software systems which could lead to incompatibilities even between municipalities in the neighbourhood. As planning procedures often concern other municipalities as well, standards are a precondition to provide the possibility of integration of other services organised another way. So, for example, to connect the application for a building permission with related services like real estate taxation or the population register which are often in charge of offices on national level, standards are necessary. Moreover, standardized solutions are also a precondition for transferability. As the Esslingen case illustrates, the use of the planning platform is to date handicapped by the lack of standardisation within Germany. This means that the various building permission software and legal rules in the German municipalities prevent a diffusion of the platform technology, since common standards are lacking. On the other side, Esslingen architects who would use the platform also outside Esslingen can't use it since the platform solely exists in Esslingen. Therefore Esslingen is a driver of the standardisation process regarding the application for building permissions. A working group with representatives from the German states (Länder) has been set up in order to develop the common data exchange standard XBau.

Providing tracing (tracking) functions as improved service provision for customers and as an internal controlling function
Esslingen as well as Bologna offer the possibility of tracing the application workflow to identify the status of the permission procedure. This allows the customers to trace the status quo of the application. This leads to more transparency within the planning procedure and allows more in-time decisions by the users for relating actions. Besides, the involved entities can also trace the status of the process in order to organize their own workforce and resources regarding necessary permission steps. Moreover, the involved participants can always see which participant has not done his part to date and therefore a 'natural' pressure – being in time – prevents delays respectively enforces the service provision.

Providing a service by using the digital signature allows legally binding service provision but prevents a higher uptake until now (because the digital signature is lacking acceptance)
Both, Esslingen and Bologna offer the application for a building permission online with the possibility of legally binding acts by using the digital signature. On the one hand the digital signature allows official acts which are legally binding, but as long as the general demand for e-services is not articulated more clearly and as long as further applications for which there is a real demand potential will yet have to be created, the critical mass or an interest to obtain a digital signature on smartcard is lacking. However, the advantages of such a signature are clear and improve the service provision for customers as well as for the agencies.

Offer services which can be used by multipliers to increase the uptake
While the digital signature and online public administration services have great potential for saving time, increasing efficiency, eliminating paperwork and improving direct communication with citizens, the benefits derived from the online building permit service are especially useful, respectively remain limited (in the Bologna case), to a specific (though quite important) sector of the local economy: construction, architecture, engineering and design firms. These constitute a fairly small group of professionals that may use the system, but they may use it for all their planning procedures on the local level. This means they serve as multipliers in the way that a small group of users may lead to a high uptake while doing several applications. The Bologna and Esslingen example show low uptakes of the online building permission service due to the small diffusion of the digital signature. However, it has to be mentioned that the process of the service implementation with regard to the service complexity in both cases is still going on, and the services will become more sophisticated step by step. Though, both applications, respectively the application for building permission in general, is a service mostly used by professionals and therefore could be considered as a suitable service for online use.

Providing a better service performance by using existing networks and digitising the workflow
Both, Bologna and Esslingen used the existing network of relevant entities and connected them by electronic means. While Esslingen has reorganised the workflow by centralising the workflow around a central planning platform, Bologna has reorganised the locations of the planning-related offices with a central building. But the network of the participants of the whole planning procedure is still the same; only the working steps were put online (to the greatest possible extent, if it is useful).

Providing virtual project rooms with different access levels for project management
The basis of the Esslingen planning platform is a market-proof Internet-based project management platform (IBPM). Such platforms provide project rooms. A project room is accessed via Internet by a secured connection. There, documents can be saved in a structured manner, and information can be shared between the involved participants. The basic idea of the platform is a central information pool which can be accessed by all involved participants depending on their legal rights at every time. The advantages are mainly consistent information, transparency of the management of various versions of the planning steps, current availability of uniform and current information and data as well as the improved communication within the involved participants.

8.8 Citizen enrolment in higher education

8.8.1 Background goals and drivers

The main challenges faced by on-line enrolment in higher education services are the need:
- to satisfy the relatively specific needs of students or intending students (who, as a group, have a relatively high usage of ICT) for fast, high quality services and information about courses, institutes of higher education, admission conditions and procedures, and related information about their financial requirements, status of application, etc.
- to ensure high levels of integration and interoperability between the often large number of public and private sector actors
- for effective user authentification in order both to match data across various actors and users as well as to ensure protection of potentially sensitive data.

Seven European good practice cases supporting enrolment in higher education services were short listed:
- Finland – enrolment in the University of Helsinki: There is full automation and interaction between the user and the service is fully digitised, so the only need for human agent intervention is in exceptional circumstances, i.e. there is full automatic data input, checking and response.
- Ireland – application to third level educational institutions: This site provides full online facility to complete transactions, changing courses of study and college selection up to a cut off date, enquire about offers of places and accept them online. There is online payment but no digital signatures and all of the applicants' choices are available to the third level institutions via the HEA network; interagency links involving public-private partnerships.
- Italy -- University of Bologna 'Immatricola': Digital signature for professors, but not for students; possibility to sign up for admissions test, verify result of payment and ranking of admissions, etc.; However, just one service, i.e. no bundling.
- the Netherlands – IB-Group student services: Already analysed as part of the student grant service cluster.
- Norway -- Enrolment in Higher Education (Samordna opptak): A good example of back-office integration, i.e. between the universities and the university level colleges. The on-line service creates a rational, single stop system for the users, providing an excellent overview of all courses available. The service is relatively mature in terms of back-office re-organisation, which has a long history, but there is still room for improvement in the user interface. The necessity of 'real-ink' signatures reflects the lack of a generalised system of user authentication in Norway.
- Sweden -- National Agency for Higher Education (VHS): The user of the service can apply to the university by submitting an on-line form. No paperwork is required, as the service is completely electronic. The user can log-in to a personal page on the web site to monitor his/her application. Applications can only be made for university educational programmes and not single courses. Information about future studies can be submitted to the National Board of Student Aid which will send the necessary forms together with information about a student's existing studies included to facilitate the application for student grants and/or loans.
- the UK -- Universities and Colleges Admissions Service (UCAS): Fully automated workflow between applicants, schools, UCAS and the universities, except that human selectors make decisions.

In order to best illustrate the range of good practices available, two cases have been selected for in-depth study from Finland and the UK.

In the Finnish case, the main administrative information system in the university of Helsinki is called Oodi, the core of which consists of three parts:

- information on students, including their personal rights to study, study attainments and on enrolment
- information on the scope of degrees, lectures and seminars provided by the university
- study information system, includes the administration of courses, registration of the study attainments, credits, credit transfers and study plans.

The users of Oodi/WebOodi are the students, administrative staff and the whole teaching staff. Updating of information is decentralised to faculties and departments. WebOodi is the browser-interface of Oodi, which for students provides facilities to:

- enter for an examination
- register for teaching events
- update own personal information
- enrol at the university and pay the students union fee
- manage their personal study plan
- obtain feedback from the system.

The starting point of the service was the need to renew the study and student register systems as well as the need to decentralise the work done with those registers. Because many universities had similar needs, a group of five (later six) universities commenced development as a consortium in the year 1995. The founding members were University of Helsinki, University of Oulu, Helsinki School of Economics, Sibelius Academy and Helsinki University of Technology. Later the consortium enlarged to cover 12 Finnish universities. The current consortium covers 56% of Finnish university students.

In the Finnish case, drivers of changes away from the traditional system included pressure from students experiencing delays, long queues and the need to attend at different offices, from university administrative staff having to undertake double and triple data-input work and servicing enrolment queues, and because of a change in the role of universities which meant that state funding is now based upon university results so that easy marshalling of data and their strategic use has become much more important. It was also very important to develop an on-line system that is flexible enough to be implemented in every Finnish university, as well as to support the co-operation of the universities in the student and study administration.

The UK has had a central admissions and clearing system for entry to higher education (HE) since the 1960s. It was established in its present form in 1993 as a result of the merger of the former University and Polytechnic HE sectors. Today, all applications to study full time for a bachelor's degree (BA or BSc), HND or DipHE at any university (other than the Open University) in Great Britain and Northern Ireland must be made through UCAS. In addition, UCAS deals with admissions to higher education programmes offered by most colleges of higher education and some colleges of further education, and it also administers the central admissions systems of various vocational training programmes. For this market, UCAS provides a number of services.

UCAS acts as the intermediary between nearly half a million applicants for university places and over 330 HE institutions yearly, and collects large amounts of data on applications and placements. Many data sets and analytical services are designed to enable individual HE institutions to make decisions about the shape of their provision and to forge effective marketing and recruitment strategies, but they also enable effective resource planning to be undertaken for the HE sector as a whole. The increasing richness and flexibility of these statistical and analytical services is an important product of the digitalisation of the admissions process.

There has been some degree of vertical integration in place between the back-offices of UCAS and the HE institutions since the 1960s. More recently, a process has been set in motion by which UCAS is increasing the intensity of digitalisation among back office processes associated with university admissions and beginning to digitise the front office arrangements which serve nearly half a million applicants and thousands of schools and colleges. Digitalisation is partial, but is expected to continue much further, must faster over the next few years, and there are facilities for online payment. No other services are bundled into the process, but the electronic transfer of examination results directly from some ten examination boards to UCAS means that there is a degree of horizontal integration.

The main drivers of the UK UCAS system going on-line and digitising its processes include dramatic increases in the proportion of university age group persons attending HE, from less than 4% in the 1960s to a over 40% today (with a predicted rise to 50%); a very uneven flow of business reflecting the academic year and possible future changes to this; the need for faster and more efficient publication and dissemination of information; much more volatile and competitive

markets for UK HE, particularly in light of the large number of foreign (especially non-EU) applicants; rapid changes in course portfolios; increasingly stringent financial regimes; the need for more effective decision making; and of course the need of applicants (the users) to have access to accurate up-to-date information and to be able to apply for university places, and change these decisions in light of changing circumstances, and be rapidly informed of the results of their application. Specifically, the objectives of the digitisation process in UCAS are:

- to reduce costs, particularly those associated with the employment of large numbers of clerical staff
- to increase the quality of service, as measured by the time taken to undertake various tasks, including processing application forms, responding to offers from universities and confirmations by applicants, and dealing with inquiries
- to increase the value derived for individual institutions and the sector as a whole from the data captured by UCAS from the admissions process
- strategically, to future proof the university admissions process against major policy shifts, such as a decision to delay university applications until after the publication of the A Level (university qualification) results.

8.8.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
Enrolment in the University of Helsinki	Finland [67]	4+1+1	3	D	9 stages and large number of agencies	Of Helsinki's 37,685 students in 2002, 40% used the on-line service for enrolment and payment.	Full automation and interaction between the user and the service is fully digitised, so the only need for human agent intervention is in exceptional circumstances, i.e. there is full automatic data input, checking and response. Significant cost and staff savings made.
Universities and Colleges Admissions Service (UCAS)	UK[68]	4+0+1	3	C/D	4 stages and a very large number of agencies (thousands of schools, over 330 HE institutions, and 10 exam boards)	2002-2003 entry cycle: 139,903 applicants (33% of the total) used a CD-ROM based system, and 28,655 (7% of the total) used the web-based system in its first year of availability. Use of the web-based system is expected to rise dramatically over the next few years, whilst the CD-ROM system will be phased out.	Fully automated workflow between applicants, schools, exam boards, the universities, and UCAS, except that human selectors make decisions. Significant cost and staff savings made.

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.8.3 Implementation

User service provision

In the Finnish case, the students logs in using the same ID and password as in the network of the university. After logging in the personal page will be shown, and the user specific options will appear in the menu. Parts of the services are also available with the mobile phone (WAP, SMS). The students has the following choice in the main menu (text in italic is from the English user manual):

- check your personal data
- register for teaching events
- check your registrations
- check your credits
- study plan

[67] Case report by Association of Finnish Local and Regional Authorities, Finland
[68] Case report by The Nottingham Trent University, UK

- order transcript
- enrol in university
- give feedback on courses

In the enrolment process the first task of the student is to check his/her personal information, including desired status (present/absent) of the studies during the relevant semesters. Then the student must choose the fees he or she is going to pay. The membership fee of the students union is compulsory, but many student unions have also some voluntary fees (e.g. for work in the developing countries). After making these choices, WebOodi provides on screen the total sum as a normal giro transfer. The student starts the payment phase by approving the sum and choosing his/her own bank. The interface between WebOodi and the bank is based on the standardised ePayment-interface of the Finnish Banking Association. Some of the banks providing this service have also the possibility to use PKI in login. A more common way is to use an ID, a fixed password and a changing password together. PKI/digital signature is also available in the web services of the banks.

The change from WebOodi to the student's bank is automatic, and payment is undertaken as a telebanking process. After successful payment the user is guided back to WebOodi, where a receipt can be printed. If the student does not have a telebanking agreement or does not want to use the integrated service, he or she can use the traditional channels or other electronic services (mobile phone, phone, Internet). The information on payment is transferred automatically from the student's bank to the university. This period varies from some hours to three days. The transfer is faster if the student and university use the same banking group.

After receiving confirmation of payment, the university approves the student's enrolment and the status of the student in the personal information of Oodi is changed. The university ensures the transfer of the payment to the final destination, i.e. the students union. Part of the fee is also transferred to the Finnish Student Health Service.

In the UK UCAS case, in addition to enhancing user friendliness and the quality of service experienced by the user, there are sound business reasons for digitising the admissions process. As well as the costs associated with reducing the number of paper forms to be opened and the amount of data to be input manually into UCAS's computer systems, electronic forms completed by the user applicants themselves can save huge amounts of administrative labour involved in checking and correcting data. UCAS deals with a young population, that is unused to filling out complicated forms. A common error on paper forms, for example (present in about 7% of cases) is to enter the date of application rather than the date of birth, or candidates may enter the wrong course code or course title. The use of self-validating forms with drop down menus prevents such mistakes. An important motive for digitalisation was, then, significantly to enhance the quality of data reaching UCAS.

UCAS's first attempt at digitalising the applications process came in 1995 with the introduction of a CD-ROM based system known as EAS, the *Electronic Application Service*. Like all UCAS's technological innovations, the design of EAS was based on market research and piloted before release. In the first year, EAS attracted 7,000 users; by 2003 take-up appeared to have plateaud at around 100,000 users. EAS requires schools or colleges to purchase special software from UCAS; this software contains an 'applicant suite' of pages, including the part of the application form completed by the student, and an 'administrative suite' that permits staff to complete their parts of the form and submit them into the school's UCAS account. From the 2002-3 entry, the forms have also been available on a web-based service known as *Apply*, which requires no special software and enables forms to be submitted online. UCAS has also developed a special version for the international market. This version is known as *International Apply* and permits overseas candidates to take full charge of the application process without any reference to their school.

To help support users (candidates) through the admissions procedure, UCAS runs a telephone helpline service. This is heavily used, with 2,000–2,500 calls a day during the admissions season. To try to control pressure on the helpline, UCAS has made much more information available on the web, and has also instituted an online tracking and inquiry system, *the Applicant Enquiry Service.* The letter sent to applicants confirming the receipt of their application also issues them with a unique reference number and password that enables them to track the progress of their application online. From the 2004 entry, this also permits applicants to register to receive emails alerting them to correspondence deposited for them on the enquiry service website.

Universities notify their decisions to UCAS electronically, but for legal reasons, UCAS will continue to send by post all correspondence involving the formation of the contract between the candidate and the university, including the acknowledgement of receipt of an application, the confirmation of offers held by the candidate and confirmation of the

place the applicant chooses to accept. Other correspondence between the UCAS and applicants is planned to take place increasingly via the enquiry service.

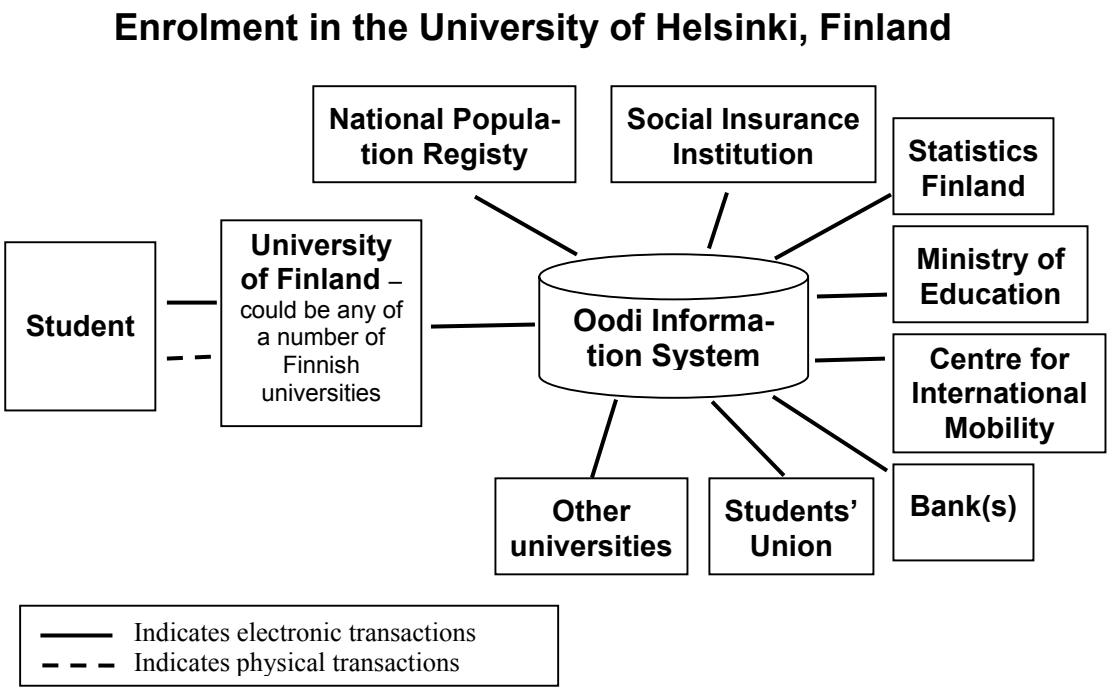
Back-office re-organisation

Before 1995 in Finland, the universities now participating in the Oodi-consortium already had information systems for students and for some of their studies. The main problems were the tenuous integration between the different applications, delays in the registration of examinations, the validity of much of the information, and often the double work needed to be undertaken by administrative staff. Some technical issues were also important, like Y2K and the character based interface. In addition, the existing information systems mainly supported only administrative processes and not studies and teaching.

In addition to delays and long queues for students, double work for staff, another driving force was the change in the role of the universities which meant that state funding is now based upon university results so that easy marshalling of data and their strategic use has become much more important. It was also very important to develop an on-line system that is flexible enough to be implemented in every Finnish university, as well as to support the co-operation of the universities in the student and study administration. The main external back offices incorporated into the digitised process have been:

- student unions and other student associations
- other universities
- banks
- Central Population Register
- Statistics Finland
- Social Insurance Institution
- Ministry of Education

In the old system the students were able to enrol only in-person at the office in the university. This was difficult especially for students living at a long distance. Enrolment also took several days and resulted in long queues. Because of limited back office integration, students were forced to physically prepare many copies of all their certifications and other papers. In some cases, there were also long delays in obtaining financial aid and grants. The need for administrative staff to manually update the same information also caused double and triple work, requiring at peak periods extra resources to help service the enrolment queues.



The Oodi system developed has multiple access interfaces, WebOodi being mainly for the students whereas the administration has its own interfaces. The system has already shown that is scalable. It is used in many universities each differing by size and function. The application also runs in many different technical environments.

For user authentication, users must have a user account and be registered in the network of the university. This means that first year students cannot enrol using this service, but anyway their enrolment process is considerably different from that of existing students. Data security is subject to the Finnish Personal Data Act which also requires the agencies to make a public declaration describing their own privacy practices. The external use of the student register information is mainly based on this legislation. For all other purposes (e.g. public contact information systems, other universities or recruiting information for employers), the student can approve or deny the transfer of his/her personal information.

The Student Union is one of the back office winners. As a return service the union is taking care of the delivery of the printed study guides, which were in the previous process given to the students at enrolment. Other back office relations have not changed very much because of the new systems, because most of the interactions were already digitised or because digitalisation was not dependent on system renewal.

The Oodi-project group consists of the IT-staff of the universities, as well as different subgroups in charge of the different aspects of the development and maintenance periods. A user group handles the needs of the users and investigates reported bugs. The web group develops the student interface. The DW-group works on DataWarehouse-reporting, and technical development is coordinated by the technology group. The whole consortium is coordinated by the University of Helsinki. This task includes project management, enlargement of the consortium and operational services for some users. During the last four years, the total development and operation costs of the Oodi-consortium have been 750,000 Euro, one third of which has been funded by the Ministry of Education and the rest by the participating universities themselves. Overall, the WebOodi is highly innovative in terms of:

- the wide range of available student services
- back office integration
- reducing work in the administration
- implementing electronic payment in the public administration
- consortium membership and management.

In the UK, UCAS has long made heavy use of mainframe computer power to store and process large quantities of personal data about university applicants. Indeed, its core back office business has been computerised for over forty years in a system called *Marvin.* It has also possessed the ability to exchange data with universities in the form of flat data files (using standard record layouts) since the 1980s. But, until recently, UCAS and its predecessor organisations received all applications through the medium of paper forms, and still today over 50% of candidates for university entrance in 2003 used a paper form. As we have seen, UCAS expects this proportion to drop steeply over the next year to two, but market research suggests that there will continue to be a significant minority of candidates - perhaps 30% or so - who prefer, or whose school teachers prefer, to use paper forms. If UCAS is right about this, it will prevent it from realising the full benefits of digitalisation. First, its staff will have to continue to key in basic personal data contained in the form. Second, UCAS will have to decide how to deal with the remaining data, especially personal statements and references. The alternatives facing UCAS are as follows. The most obvious solution is that UCAS staff will continue to copy paper forms and post them to institutions, so that selectors have access to this information. Or UCAS will have to pay to have it keyed-in, perhaps by contracting it out to bureaux elsewhere. Or UCAS will withdraw the option of applying by post. Or the university admissions process will cease to make use of personal statements and references. There is also the danger that restricting the use of paper forms will penalise overseas applicants, which represent a considerable sourcre of revenue for British higher education.

At present, about 10% of UK higher educational institutions, mostly small colleges with few degree-level courses, use a system known as *Hercules* to access UCAS's databases direct via their own PCs, rather than create a separate institutional database. In this case, the institution's special UCAS code is used to restrict access to their own staff. However, most HE institutions still use the hard data transferred to them by UCAS electronically and then deposited into their own databases. In the medium term, however, UCAS sees great advantage in establishing *Hercules* as the main electronic link with institutions. This system would give universities remote, interactive access to UCAS's own database of applications data and allow them to upload data electronically. It would also allow them interactive access to UCAS's increasingly rich store of statistical data about the changing student population and the nature of student choices in the competitive global market for higher education. The increasing use of *Hercules,* and the associated discontinuance of dispatching paper forms, would, however, make it necessary to find a solution to the problem of how

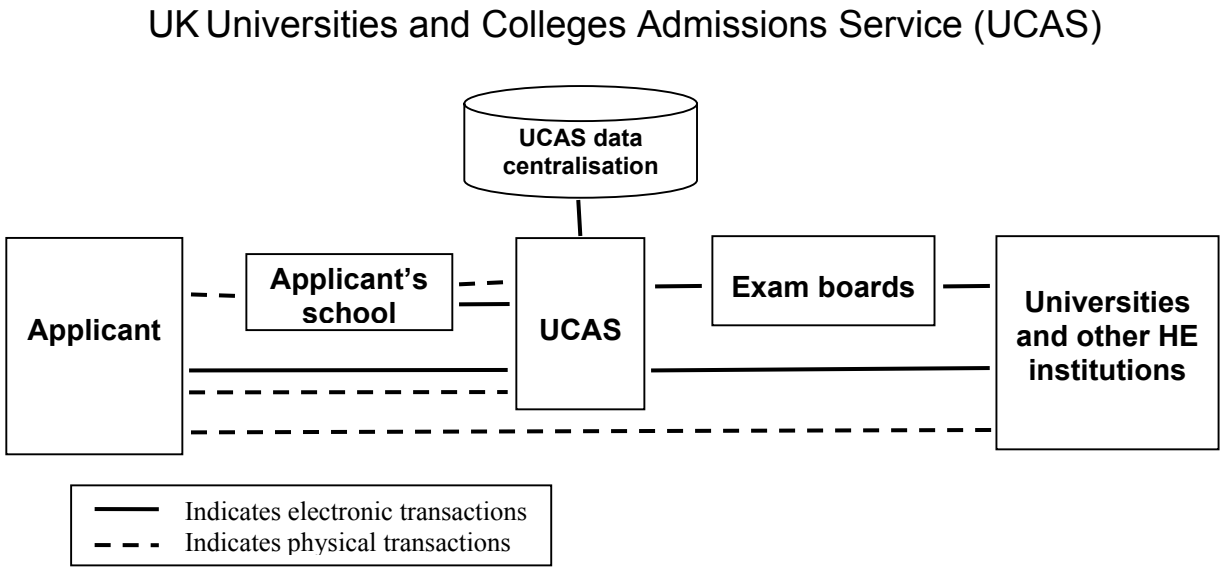
to deal with the personal statements and references used by the human selectors which are, of course, the most subjective and perhaps the least useful information contained on application forms.

The offer of a place at a UK university is often conditional on the candidate achieving certain grades in his or her examinations. In order to validate examination results, UCAS undertakes major data matching exercises in which it cross matches applications data with results data received in the form of flat data files from all the major examinations boards in the UK. It also receives results from the boards that administer the major English-language school leaving examinations overseas and from the International Baccalauriate. In order to prepare well in advance for these exercises, which must be completed in a very short space of time, UCAS's staff match electronically all the data about examination entries supplied in its application forms with the entry data held by the examination boards. A successful match is achieved in about 95% of cases. The remaining 5% or so involve intensive human intervention, as UCAS staff seek to reconcile as many discrepancies as possible well before the results data are transferred to UCAS. Through such means, UCAS matched 98.4% of Scottish and English applicants with their A level results in 2001-2.

In terms of technology, UCAS has solved the technical problems associated with e-government, in that it can maintain systems which are scalable, flexible, resilient and secure. It has achieved this objective in a number of ways. First, the internal network infrastructure uses multiple web servers, application servers, databases and file servers which are controlled automatically to increase and reduce capacity according to traffic levels. This architecture also ensures that back up is available should any element fail.

UCAS also achieves a high level of security in two main ways: first by multiplying its databases and file servers, and second by protecting the network with a series of firewalls. UCAS does not make use of digital signatures or certificates. They have a very limited market in the UK and tend to deter customers from using electronic services. User access to the enquiry service is controlled by a PIN, in the form of the applicant's unique reference number, and password, and involves additional authentication checks in cases of lost passwords. For additional security, electronic correspondence will not be sent as email. Rather, an email will alert the applicant to the fact that correspondence has been placed in the enquiry service, to be accessed via PIN and password. UCAS operates on the principle that its legal relationship is with the applicant, not their school, parent or adviser. In consequence, it refuses to divulge information about the progress of an application to a person other than the applicant, despite frequent requests to do so.

Applicants using *Apply* (the web-based application channel) may pay fees online at the point of application by keying a valid credit or debit card number. This service is supported in the usual way, by a commercial bank.



UCAS can only digitise at the pace of all its partners (all UK schools, institutes of HE and examination boards) but tries to encourage schools and colleges to go online, through a number of means. First, it lays great emphasis on ensuring that the technology is both robust and easy to use. Second, it devotes considerable effort to liaison and educational work

with schools. It not only undertakes regular mailings and publicity work, but its staff also run conferences on the admissions and HE systems. UCAS also sponsors a number of regional groups, bringing staff from schools and universities together to discuss issues of mutual concern. All these opportunities are used to increase awareness of the benefits of electronic admissions systems. An important question confronting UCAS is how much, and how fast, to force the pace of change. In order to encourage use of the web site, and to make sure all schools use up to date course information, it has recently restricted the availability of its printed directory of university courses, an action that caused dismay in some schools. There is also the question, mentioned above, of whether UCAS should continue to accept paper forms.

8.8.4 Results and benefits

User benefits

In the Finnish case, student can enrol anytime, anywhere without the need to travel to the university. This is a huge benefit in Finland where such large distances are involved, and especially for the students that enrol to be absent and maybe living abroad. Back office integration has also provided students with a much faster service, particularly in relation to student grants obtained from the Social Insurance Institution. The health care services provided by the Finnish Student Health Service Foundation are also more easily available. Further, WebOodi enables the student to manage his/her studies much better. In future, there will also be more study-oriented services, such as integration of the mentor system within the personal study plan. When a student wishes to change university, this is now much easier. In the future it will also be possible to take some of the exams in a university near to the student rather than having to travel to the responsible university.

In the Finnish case, back-office integration has demonstrably led to much better front office services. In the old system it was not only question of queuing in just one place, the student was forced to stand in queues in several places and to present the same papers in each. The feedback received on the enrolment service has been very positive, both from the students as well from administrative staff.

In terms of take up, of Helsinki's 37,685 students in 2002, 40% used the on-line service for enrolment and payment. The on-line service started in 2000.

In the UK UCAS case, for the 2002-2003 entry cycle, 168,558 applicants (nearly 40% of the total) used either the CD-ROM or the web-based system, and UCAS expects this proportion to rise rapidly in the next year or two. 83% of these applicants used the CD ROM version. Nevertheless, UCAS is hoping to phase out the CD-ROM system by 2005 or 2006, for a number of reasons. First, its market research suggests that the web service will rapidly increase in popularity, reaching up to 70% of all applications within two years; the web-based applicant enquiry service already reaches over 50,000 hits a day during peak periods. Secondly, the CD ROM version has several drawbacks: it is expensive for UCAS to develop and maintain, it requires schools to install special software and, once issued each year, cannot be updated. In contrast, a web service can be accessed from any PC, the information on the web can be updated frequently and the software can be constantly improved. It also allows universities to update information about courses during the course of the admissions season.

In the UK UCAS case, there is also plenty of evidence that digitisation of work processes and the web-based system offered to users have proved to be compatible with the maintenance and enhancement of the quality of service provided both to applicants and universities. Indeed, the quality of UCAS's customer service has been recognised by the award of a Charter Mark, the accolade bestowed on high quality, customer focused public services in the UK. UCAS's service is monitored annually against clear and ambitious throughput and business clearance targets. Data relating to the last full year, 2001-2, shows, for example, that UCAS staff turned round offer letters and confirmation letters within a working day of receiving a decision from universities. They successfully processed all application forms by the mid January deadline, and they provided a full reply to letter, fax and email inquiries from applicants within five working days in 95% of cases. What cannot be known from high level numbers such as these, is how well or quickly the remaining, exceptional cases are dealt with.

To gain subjective assessments of service quality experienced by users, UCAS also conducts regular customer surveys amongst applicants, careers advisers in schools, staff in HE institutions and staff in independent careers services. The latest results are published on the web and indicate a generally high level of satisfaction with all aspects of UCAS's work. Among these data is the statement that 83% of applicants are satisfied with the admissions experience and 82% of

university staff are pleased with UCAS's information technology. The lowest level of satisfaction among applicants related to the value for money for the application fee.

Agency benefits

In the Finnish case, self-service by students accessing the on-line service has decreased the work of administrative staff, especially in the enrolment process. Alone in the University of Helsinki, this means about 16,000 fewer desk visitors per annum. Together with preparatory work, this saving is at least equivalent to the same amount of fewer working hours.

In terms of the changing role of the universities, information needed for strategic planning and which has significant effects on financial decision-making, is now more accurate and updated more rapidly. This also facilitates improved planning of resource use. It is difficult to estimate, but probably the savings in the information technology costs have not been notable.

The main benefits of the partnership of agencies and actors responsible for the service have been:
- lower development costs in general
- the pooling and use of joint experience
- better integration of future activities and developments.

One of the winners in the partnership has been the Students Union. More than half of its fees are now secured without any effort. This means less work with pre-printed invoices and in other administrative tasks. Another winner is the banking sector, where telebanking is the most profitable service channel for the private persons. Even in Finland the pricing of the banking services is mainly based on the channel used. Future benefits include greater cooperation between universities and greater student mobility.

In the UK, UCAS's own analysis suggests that *Apply* (the web-based application channel) yields much better value for money than the earlier CD-ROM system, EAS. This is because the CD-ROM approach has high up front development and maintenance costs. The cost savings associated with using the CD-ROM derive mainly from better data quality, but, since most forms are printed out and sent by post, data still have to be keyed into computer systems. In contrast, *Apply* can be continually updated and its introduction has already led to significant reduction in data capture costs. In addition, the increasing use of web technology is capable of leading to significant reductions in postal costs. UCAS currently spends about £1.8m a year in postal communications with applicants: it estimates that it can reduce this to about £0.5m.

Reductions in labour costs mean fewer jobs. Where UCAS has employed about forty temporary clerks to cope with handling forms and keying in data at peak periods, especially in the initial applications period from October to January, it now typically uses about four. In general, UCAS now makes much less use of casual, low grade labour and has shifted its skill base from one which is largely composed of clerical workers to one predominantly composed of technical staff and knowledge workers. Savings in labour could be even greater, however, if UCAS could reduce the work involved in reconciling discrepancies with examinations board entries. More dramatic savings in its staff have recently been achieved from reductions in data entry work, and the number of permanent staff in this section has been reduced from twelve to four. At the same time, UCAS's requirement for technical support staff has grown, in order to support the network infrastructure and web site, which are maintained in-house. Technical staff are organised into two groups, those concerned with maintaining the infrastructure and those concerned with the constant development and testing of UCAS's systems. UCAS has chosen to deal with this changing staffing base, as far as possible, by re-skilling existing staff, on the grounds that they know the nature of its business best.

Clearly, UCAS has increased its dependency on ICT, but without suffering any of the computer project failures and service interruptions that have plagued many other e-government initiatives in British public services. Published performance data, cited in the sections above, indicate that UCAS's systems are robust and resilient, and internal testimony suggests that they are also secure.

One problem in the UK is that to fully use *Hercules*, the necessary technology costs each HE institution about £450k, and only one major university has adopted it fully to date. It is thought to be unlikely that this cost will be defrayed centrally by the Government. The problem is, of course, that the cost of investment will be borne by the institutions, while the business benefits will accrue mainly to UCAS. However, there are considerable business benefits which the institutions can also exploit by using *Hercules*, not least the ability to track and analyse data both to achieve financial

rewards from government for admitting disadvantaged students and in developing relations with the private sector and maximising overseas income, and these are now being explored in cooperation with UCAS.

8.8.5 Lessons and good practice

A number of common learning points arise from the enrolment in higher education cases, each of which can be considered for transfer elsewhere provided that unique local conditions are taken into account.

The locus of pressure for change
In the Finnish case, the drivers of changes away from the traditional system included pressure from students experiencing delays, long queues and the need to attend at different offices, from university administrative staff having to undertake double and triple data-input work and servicing enrolment queues, and because of a change in the role of universities which meant that state funding is now based upon university results so that easy marshalling of data and their strategic use has become much more important. It was also very important to develop an on-line system that is flexible enough to be implemented in every Finnish university, as well as to support the co-operation of the universities in the student and study administration. The scale and history of the sector are important. Finland has a relatively small population and a corresponding low number of universities, so there has not been a pressing need for a centralised university admissions system, and thus pressure for change has come largely but not exclusively from users and staff. This contrasts with the UK where there has been a centralised admission service since the 1960s. Pressures for change to adopt digitised processes and services come largely from the admissions agency (UCAS) itself and the changing environment in which it finds itself. These include dramatic increases in the proportion of university age group persons attending higher education, a very uneven flow of business reflecting the academic year, the need for faster and more efficient publication and dissemination of information, a much more volatile and competitive markets for UK higher education, rapid changes in course portfolios, increasingly stringent financial regimes, and the need for more effective decision making. In particular, UCAS is seeking to reduce costs and to increase the quality of services, as required by its charter determined by government and in cooperation with its partners (schools, exam boards and universities). In the UK, the integration of back office workflows with front office electronic service has been undertaken as a long-term, strategic response to intrinsic business needs, not as a tactical, externally-imposed, eGovernment target. Indeed, UCAS's initial forays into this process predate the publication of the British Government's first eGovernment targets by two or three years. The changes that have taken place, and the issues which have been identified for the future, are rooted in challenges and issues which are well understood and clearly owned by the management of UCAS, rather than being perceived as a distraction from the core business.

Horizontal functions provided by generic, cross-service solutions
On-line payment
In the Finnish case use is made of the standardised ePayment-interface of the Finnish Banking Association, as well as standardised PKI and digital signature services. In the UK, student applicants using the web-based application channel may pay fees online at the point of application by keying a valid credit or debit card number. This is the standard service, supported in the usual way by the commercial banks.

The decentralisation of work and responsibility to end users
Intelligent on-line interfaces, including for example explanatory drop-down menus and self validating forms, tend to lead to fewer errors because of the greater control and responsibility given to users as compared with paper forms. This decentralisation of work and responsibility direct to the end user also saves significant staff time and resources.

Piloting new services before release
The design and need for new electronic services in the UK case is based on market research and piloted before full release. In Finland, user groups are involved in testing the service both before release and as an on-going activity.

Telephone help-line service
To help support users (candidates) through the admissions procedure, the UK agency UCAS runs a telephone help-line service. This is heavily used, with 2,000–2,500 calls a day during the admissions season. To try to control pressure on the help-line, UCAS has made much more information available on the web, and has also instituted an online tracking and inquiry system.

Tracking progress of application on-line

In the UK, the letter sent to applicants by UCAS confirming the receipt of their application also issues them with a unique reference number and password that enables them to track the progress of their application online. From the 2004 entry this also permits applicants to register to receive emails alerting them to correspondence deposited for them on the enquiry service website, so that no personal information is sent by relatively insecure emails.

Managing stakeholders and digitisation benefits

Both cases involve cooperation between many different interests and stakeholders. In the Finnish case, a large number of other public agencies are involved in providing the service, so clear leadership and allocation of roles and responsibilities is required. Also, a large number of different types of specialism are needed, including IT staff and user groups. A number of lessons were learnt in Finland. First, the stakeholder consortium started with too ambitious a task by attempting to renew the all main information systems at the same time. Second, a project group clearly in charge of the practical results was not defined at the beginning, which led to a situation in which nobody knew who was really in charge and leading the project. Third, cooperation takes time and there must be time for feedback and other comments as well as the possibility to prepare for sometimes slow development cycles. In the UK, UCAS can only digitise and exploit the benefits of this at the pace of all its partners (all UK schools, institutes of HE and examination boards) but tries to encourage schools and colleges to go online, through a number of means. First, it lays great emphasis on ensuring that the technology is both robust and easy to use. Second, it devotes considerable effort to liaison and educational work with schools. It not only undertakes regular mailings and publicity work, but its staff also run conferences on the admissions and HE systems. An important question confronting UCAS is how much, and how fast, to force the pace of change amongst all stakeholders in proceeding with digitising and integrating the workflows of the different organisations. While integration may have significant benefits overall, the distribution of financial costs and business benefits may not be symmetrical. Thus UCAS also sponsors a number of regional groups, bringing staff from schools and universities together to discuss issues of mutual concern. All these opportunities are used to increase awareness of the benefits of electronic admissions systems – a case of carrots rather than sticks. For example, the 'informatisation' of the system and the greatly enhanced possibilities for capturing and analysing data providing important management and market intelligence, as well as having important business and policy value, and which not only secures efficiencies and service enhancements but also yields added value in the form of access to much richer data and significant enhancements in facilities for interrogating and analysing them. The success UCAS has had can be seen as the result of two important factors. First, the fact that there is a long history of relations between all the stakeholders involved (over 40 years), during which time the university admissions process has changed little in its essentials and the institutions involved are intimately familiar with the UCAS process and understand its logic and conventions. Second, the fact that there is clearly only one leading and dominant stakeholder, i.e. UCAS which, within certain limits, is able to make the rules by which all other organisations in the 'supply chain' must also play the university admissions game.

Ownership and outsourcing of technology

In contrast to many other public services in the UK, UCAS has developed its systems and maintains them in-house, rather than contracting them out to one of the major information services suppliers. However, UCAS's telecommunications services are outsourced, and it procures its hardware from external suppliers, but the computer network, databases and web site are managed by UCAS's own staff.

Technology robustness and testing
Attention to marketing
Multi-channel services

In the UK case, great attention is given to both the robustness and the acceptance by users of the technology employed. Indeed, these two issues are closely related, given that users soon loose confidence in technology that is difficult to use or proves unreliable. These issues are particularly important to UCAS, since, as is common in eGovernment, it is a monopolistic service provider, the ICT skills of its user base are highly variable, and its work is often in the public eye and politically sensitive. For these reasons, a major systems breakdown could be politically costly, and the impact on the university admissions potentially huge. All these factors combine together to make it particularly important that the technology is resilient and scalable, loadings are constantly tested and that new innovations are thoroughly piloted and publicised. They also mean that the issue of if, when and how to withdraw a paper-based admissions service must be treated as a sensitive one. In the meantime, UCAS is taking active steps to manage the propensity of its customers to use online services, by restricting the distribution of other sources of information about university courses (namely, the *UCAS Directory*), while at the same time enriching the information available online. This illustrates how, with the judicious use of appropriate incentives, both negative and positive, an organisation can try to influence the market for e-government services, although, in this case, the power to do so derives largely from its monopolistic market position.

Multi-channel services

Given that enrolment in higher education services serve a relatively large and diverse user group of applicant students as well as the staff of the various cooperating agencies, and must be easily accessible to all, web-based services run in parallel both with traditional physical channels (including telephone), as well as in the Finnish case, WAP and SMS. The continuation of such multi-channel services is likely to be an important feature of such services for a long time to come and it is important that the different channels are properly managed as complementary services.

Data interoperability
Data centralisation
In the both cases, very large amounts of data need to be collated, for example, about students, their results, wishes, universities, types of courses, etc., and various legacy systems need to be incorporated. This is one of the major technical challenges, and has been successfully achieved through the use of data standards and conversions, and by ensuring scalable, flexible, resilient and secure systems, including the centralisation of relevant data by the agencies concerned. For example, in the UK case, the internal network infrastructure uses multiple web servers, application servers, databases and file servers which are controlled automatically to increase and reduce capacity according to traffic levels. This architecture also ensures that back up is available should any element fail. The UK also introduced a CD-ROM based system in the mid 1990s as the first fully digitised system. However, this approach has several drawbacks: it is expensive for UCAS to develop and maintain, it requires schools to install special software and, once issued each year, cannot be updated. In contrast, the new web-based services can be accessed from any PC, the information on the web can be updated frequently and the software can be constantly improved. It also allows universities to update information about courses during the course of the admissions season.

Legislation
In both cases, legislation imposes certain constraints and obligations on services and data security, whether or not they are electronic, which may affect the type of service and how it is delivered. For example, in the UK case, for legal reasons, UCAS will continue to send by post all correspondence involving the formation of the contract between the candidate and the university, including the acknowledgement of receipt of an application, the confirmation of offers held by the candidate and confirmation of the place the applicant chooses to accept. Also, in both cases, data protection legislation determines how students' personal information is used and to which third parties it can be divulged. For example, in Finland, data security is subject to the Finnish Personal Data Act which also requires the agencies to make a public declaration describing their own privacy practices. The external use of the student register information is mainly based on this legislation. For all other purposes (e.g. public contact information systems, other universities or recruiting information for employers), the student can approve or deny the transfer of his/her personal information. In the UK UCAS operates on the principle that its legal relationship is with the applicant student, not their school, parent or adviser. In consequence, it refuses to divulge information about the progress of an application to a person other than the applicant, despite frequent requests to do so.

Data security
Both cases operate successful data protection strategies. In Finland, when paying fees, some of the banks provide the possibility to use PKI in login. A more common way is to use an ID, a fixed password and a changing password together. PKI/digital signature is also available in the web services of the banks. In the UK, UCAS achieves a high level of security in two main ways: first by multiplying its databases and file servers, and second by protecting the network with a series of firewalls. UCAS does not make use of digital signatures or certificates. They have a very limited market in the UK and tend to deter customers from using electronic services. User access to the enquiry service is controlled by a PIN, in the form of the applicant's unique reference number, and password, and involves additional authentication checks in cases of lost passwords. For additional security, electronic correspondence will not be sent as email. Rather, an email will alert the applicant to the fact that correspondence has been placed in the enquiry service, to be accessed via PIN and password.

User feedback
Both cases involve users (both students and administrative staff) in monitoring and providing feedback on the services offered. In Finland, permanent user groups look after the interests of users and investigates reported bugs. In the UK, UCAS conducts regular surveys of applicants, careers advisers in schools, staff in higher educational institutions and staff in independent careers services. The latest results are published on the web and indicate a generally high level of satisfaction with all aspects of UCAS's work.

Cost and staff savings
Changing roles and skills of staff
Both cases have experienced very significant cost and staff savings. In the Finnish case, self-service by students accessing the on-line service has decreased the work of administrative staff, especially in the enrolment process. Alone in the University of Helsinki, this means about 16,000 fewer desk visitors per annum. Together with preparatory work, this saving is at least equivalent to the same amount of fewer working hours. No staff have been made redundant, but the saving has led to a much reduced need for temporary staff to be appointed. Because of the partnership of stakeholders involved, there have also been lower development costs. In the UK, the move to a web-staff system away from the existing CD-ROM system has led to a significant reduction in data capture and of maintenance costs. In addition, the increasing use of web technology is capable of leading to significant reductions in postal costs. UCAS currently spends about £1.8m a year in postal communications with applicants: it estimates that it can reduce this to about £0.5m. In the UK, reductions in labour costs mean fewer jobs. Where UCAS has employed about forty temporary clerks to cope with handling forms and keying in data at peak periods, it now typically uses about four. In general, UCAS now makes much less use of casual, low grade labour and has shifted its skill base from one which is largely composed of clerical workers to one predominantly composed of technical staff and knowledge workers. Savings in labour could be even greater, however, if UCAS could reduce the work involved in reconciling discrepancies with examinations board entries. More dramatic savings in its staff have recently been achieved from reductions in data entry work, and the number of permanent staff in this section has been reduced from twelve to four. At the same time, UCAS's requirement for technical support staff has grown, in order to support the network infrastructure and web site, which are maintained in-house. UCAS has chosen to deal with this changing staffing base, as far as possible, by re-skilling existing staff, on the grounds that they know the nature of its business best.

8.9 Citizen portals

8.9.1 Background goals and drivers

The Austrian portal, HELP, was created in 1997 as an aid for official administrative or governmental contacts. Another objective was to show that and how the central registration database and other components work together within an e-government procedure. In 2004, according to existing plans, Austria should show significant improvements in its position in e-government benchmarking. The medium to long term purpose of this pilot project therefore can be seen in the transformation from information to transaction services at national level. In the course of this, the portal HELP will integrate transaction services from the states and communities as well as provide transactions at national level on its own. The goal for 2005 is that the portal should deliver every administrative service online.

The Danish portal, Netborger (Netcitizen) was created in 1998 when the public discourse in Denmark was very focussed on the possibilities that digital citizen services offered. Netcitizen is a portal that offers digital services and information in 8 different subject areas. Netcitizen was developed and operated by a private company (KMD), and is therefore not part of a general government strategy of e-government. On the other hand all municipalities in Denmark are partners in Netcitizen, and KMD is fully owned by the central organisation for the Danish municipalities. In this sense Netcitizen can therefore be considered as public private partnership made to raise the effectiveness of the development and implementation of digital service solutions in Danish municipalities.

8.9.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
www.netborger.dk	Denmark [69]	4 (+1) (+1)	C(3). It is a portal of different services.	D	Depending on the service provided. But typically 2-3 Stages and 2-3 back offices.	NA	Up till 256 municipalities may be using the same service but there is no integration between the municipalities. Generally between two and three back offices will be involved. It is an interesting example of public-private partnerships since the company delivering the service is private.
Certificate of residence (Elektronische Meldebestätigung) http://www.help.gv.at/cgi-bin/system.pl?label=MeldebestaetigungWien	Austria[70]	4+1+1	c) 3	C	4 x central citizen register (integrates all local residence offices) x 3 (providers of signature, payment, e-notification delivery services)	NA	Most recent, but most advanced mass citizen service regarding integrated service modules (e-signature, e-payment, XML-notification, e-delivery); represents a model for all future egovservices; based on central citizen register, public access by 5 June via HELP.gv.

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.9.3 Implementation

User service provision

The ambitions of HELP and Netcitizen are to become their respective countries digital interface between public administrations and civil society. Both portals embraces a variety of services, the major difference between them being that Netcitizen is more focussed on citizen services where HELP entails both citizen and business services. Another important difference is that private companies also are allowed to offer their services via Netcitizen, if their particular services can create synergies with the public services offered. As such, both portals can be viewed as traffic and communication hubs, that channels users to the right services and aims to offer a full service experience for the users. Users will not have to look and search through a variety of sites to find the right service, and when services from different administrations units are related, they are presented together on the portals thereby increasing the service value for the user, and maximising the use of digital service.

But the organisations behind the two portals also develop and implement digital services that are made available on the portals. In both cases the development approach is very well documented and modularised in order to increase effectiveness, re-use of data and speedy implementation. Netcitizen for example, has through analysis and accumulated development experience identified four generic types of interaction between a citizen and public office. Each of these generic types has been modulated in a microsoft.net environment as templates, and this enables KMD to develop consistent services very fast and cost efficient. This is the culmination of a trend where the programming of the front end of the systems has become easier and easier. The challenge and time consuming part of development these days is to access data in the old back-end systems in a secure, efficient and consistent manner.

[69] Case report by Danish Technological Institute, Denmark
[70] Case report by The Institute of Technology Assessment, Austria

Back office reorganisation

There has been no notice of backoffice re-organisations as results of the citizen's portals per se, but systems integration and re-organisations are taking place when the specific service modules are introduced. The major challenges in relation to the portals are therefore to integrate a front-end web system, with a variety of local back-end systems. In the case of HELP for example, many transaction services, especially on local level, are standalone services which have been implemented by initiatives of states or municipalities in a bottom-up approach. Therefore, seamless integration into the portal is not always ensured in the top-down process of building a common national transaction platform. The design of the confirmation of residence according to official specifications and standards serves as a learning model how to facilitate the integration of a service and intends to help bringing other services online. It also demonstrates the efficient usage of prefabricated server modules and encourages further implementations.

In relation to development and implementation of new service modules both organisations spend a significant amount of time with representatives from the organisations to understand the technical, legislatory and organisational challenges related to the development of the services. When KMD for example develops a service for Netcitizen they usually do so in co-operation with on or two municipalities that are considered to be at the leading edge in their approach to digital services. The co-operation allows KMD to conduct work-studies and BPR projects in order to develop the systems and implementation plans optimally. When KMD are selling their services, they can therefore point quite specifically to the areas where the services should lead to efficiency gains. KMD's experience is that any re-organisations and/or HR-oriented cost cutting measures must be made simultaneously with the implementation of the service. If the systems is introduced and without changes it is very hard to push for organisational changes and efficiency savings afterwards.

8.9.4 Results and benefits

User benefits

The user benefits of the two portals is first and foremost that they get an overview of services, and the services are organised in life event and "service communities", rather than in relation to the back-offices handling them. In the case of Netcitizen the possibility for private companies to offer services related to the public services also enhance the "life event" service orientation for the user. In many cases user data may be re-used between services (although there are still significant legislative issues related to this), thereby saving the user time.

Agency benefits

As noted above very few organisational changes are being made as an effect of the portals per se. But the portals raises the possibility of a high uptake of the services available and in this indirect way they may lead to benefits in the form of efficiency gains for the agencies involved. Other important agency benefits are related to the fact that the organisations behind the portals has the size and resources to developed standard services systems in a modular approach and that these systems can be purchased at low price and customised locally to fit any local systems. In this way the organisations behind the portals are driving a high quality locally oriented development of digital services at a price where even small municipalities may purchase the services.

In the case of KMD for example, municipalities may use service modules in two different ways. They may link to the service on Netcitizen from their own homepage, or they may run the service directly on their own homepage. Once the service has been implemented, KMD typically spends one day with the back-office personnel in order to teach the functionality of the system and discuss what kind of effects the service may/should have on their internal organisation and external communication. In relation to the internal organisation, the implementation of this particular system rarely leads to fundamental organisational changes since caseworkers still have to check all data before the system is updated. Productivity/efficiency gains are often reached but this is rarely converted to organisational changes.

In order to estimate possible rationalisation effects of the services that are designed and offered KMD conducts business process analysis on all processes in the administration that are implementing the services. This has allowed KMD to specify what benefits that could be gained. The most common result of these analyses is that the technology in itself may give 20% of a given saving while the redesign of organisational processes gives the remaining 80% of the saving. Another important lesson that was learned from these analyses was that the efficiency gains were only generated when

the organisation was changed immediately when the technology was implemented. This drastic step is needed in order to push the organisation to utilise the new system in the optimal way. Furthermore, this will motivate personnel to do what they can to get citizens to use the new systems since it saves them time every time a citizen uses the system.

8.9.5 Lessons and good practice

Specific lessons

Both cases indicate that it takes time and resources to build a successful portal. It is therefore imperative that it is strong organisations with resources, development competencies and persistence that undertake this kind of task. It is also quite clear that even though portals must developed centrally they can never become a success if the local administrative offices sees no benefit from use and integration towards them. Development of portals and specific services must therefore pay special attention to the heterogeneous group of stakeholders in order to satisfy all. It should be noted that both cases are from countries with a very decentralised structure, which is why the issue of the central development and local implementation is so important.

The primary success criteria for portals like this are to generate a maximum amount of traffic that is then channelled to the right services. This requires that there is a significant amount of services available and some sort of marketing effort. In relation the first issue the lesson to be learned is that utility for users and ease of use stimulate demand. As long as there are no more than a few services, which are also available offline, citizens will refrain from purchasing the necessary equipment to participate in e-government. Additionally, if users have to pay hefty charges for e-government services, this will impede uptake. In relation to the second issue the organisations behind the portals have had various experiences with this. In relation to Netcitizen KMD initially spend a significant amount of resources on marketing the portal per se. The effect of this was hard to document so the strategy has been changed. KMD now aim to market the particular service on the portal to the citizens when they experience the need. This often includes the municipalities, since their workers have the contact with the citizens and can advise them to use the services. More often than not this is a new way of thinking for the municipalities and it often takes some time to implement.

General conclusions

The issue of security and digital signature is also very relevant in relation to the portals. In the Danish case, KMD developed their own user code system based on the individuals personal number[71]. The reason for this is that KMD believed users should be able to use the portal with as little as possible time spend on obtaining codes and or digital signatures. In the case of HELP, a common digital signature is required for a variety of the services, and this expected to be one of the reasons for the low uptake of the services. In order to change this a co-operation with Austria's biggest mobile phone provider has developed a user-friendly method to generate a digital signature. It only requires a mobile phone and a free user account at the Mobilkom's A1.net webpage but no signature card. Both cases therefore indicate that event portals may not be attractive enough for citizens to drive the uptake of digital signatures.

The development of the services on Netcitizen has put focus on the fact that laws and legislation relating to interaction between the public and citizens can be a major obstacle for services that are feasible and logical from an organisational, citizens' and technical perspective. Typically, such obstacles are either related to the juridical validity of the interaction between the citizen and administration (an example of this are currently laws relating to applications for buildings that stipulates that "even digital signature is not valid" as a means of application for constructions). Or they are related to the amount of information on a citizen that a public office is allowed to integrate in their dealing with the citizen. In effect this means that strict laws that prevents different administrative levels to share or pool information on citizens are becoming a problem when digital services aim to create administrative savings by the re-use of data. However, the fact that different parts of the administration cannot pool data on individual citizens for legal privacy reasons, does not prevent the individual citizen him or herself combining, through a specially designed front end, their own data derived from the different back-offices. This is part of the pensions eService of the Netcitizen portal, and represents an interesting way forward where users are able to access and combine their own data for their own use, even though the administration cannot do the same because of data privacy restrictions.

[71] All citizens in Denmark have a unique personal number, which is stored digitally.

8.10 Business social contributions for employees

8.10.1 Background goals and drivers

The social insurance system for employees is one of the most complex services at all in all states because it combines at least three social insurances (health, unemployment, and pension) which make the service per se a multi-services / multi-stages service (model "D"). The whole system not only covers insurance for employees but also those for independent workers and civil servants. The most important features of this service are that its performance is very high in all countries (millions of transactions per year) due to its social relevance and that all involved agencies have a long history of cooperation and technical development (and often of competition, too). Basically, within this service we have to distinguish between notification of changes (begin and conclusion of employment) and regular (monthly, quarterly or annual) notifications (also for statistical purposes) on the one hand and payment of contributions on the other.

We selected the Belgian system because no general reorganisation or rationalisation has taken place in the Belgian social security landscape by the late 80s, but since then we can observe strong re-engineering efforts during a short period of time organised from a newly installed task force which made the system one of the most advanced in Europe. Hence it could be a good example for NAS. Other cases from Finland, The Netherlands, Sweden and Germany can also be recommended, the Finnish mainly because of its interface between users and administrations which is built on a clearinghouse-solution (cf. the description in the environmental permits-service), the Dutch because of its RINIS-system (Routing Institute for National Information Streams) which underlines how more and more steps of a social security system can be taken over[72]. The Swedish system can be recommended because of its high degree of digitisation and combination with tax services (cf. the description under "business portals"), and the German solution because of its remarkable high take-up.

The selected Belgian case has been designed to be one of the tools to remedy the problem of repeated collection of information. In the past, there was little standardisation among the Belgian social security institutions: they all had their own requirements and forms to submit to their "clients". Companies had to maintain a time-consuming permanent contact with several social security institutions in order to comply with their duties towards the State as well as towards their employees. The new system should provoke the end of this considerable waste of time for companies but also result in better coordination between those public offices that previously maintained their distinct files with no global coordination scheme at all. Therefore, since 2003 the "quarterly declaration" became a "multifunctional declaration" to guarantee data exchange between the authorities without additional requests to the clients. No overall institutional change has been undertaken simultaneously with this process – neither through mergers nor through large-scale devolution. Administrative relations between the social security institutions (SSIs) have remained quite similar since 1988, except the introduction of the Crossroads Bank of Social Security (CBSS) founded in 1991.

On the social security web portal, each company has a personal interface at its disposal where documents related to the service (including those sent by the public office) can be stored and consulted. But despite its functional side, this portal and the related e-services may only be considered as a small part of the efforts made since they are included in a more important movement that works towards the building of an integrated information network. The task of this network is to comprehensively link all social security institutions (SSIs) in Belgium. The effort is all the more consistent as they all have fundamentally different statutes and missions[73]. Under the coordination of the CBSS, social security processes and information flows have been deeply harmonised and reengineered so that there is now serious and large back-office integration among those institutions and consequently real gains in terms of service delivery. The goal was to coordinate the SSIs, to make them communicate and concretely to re-engineer back-office workflows in order to simplify transactions between the institutions and also between them and citizens or companies.

[72] Beside "traditional" social security services like health care, unemployment, also car registration or student allowance is included.
[73] For a list of those institutions, see http://socialsecurity.fgov.be/broch-fr.htm.

8.10.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
www.social-security.be (www.sociale-zekerheid.be, www.securite-sociale.be)	Belgium[74]	4	3	D	1 x 7 (NOSS + CBSS, 7 Social Security Institutions)	~200,000 employers sent declarations with information about ~1.2 mio employees (data from 2nd quarter of 2003)	Clearinghouse (CBSS) The service is a portal with ten services Existing network of stakeholders

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.10.3 Implementation

User service provision

The e-services offered to Belgian end-users (companies or their representatives for social security purposes, known as "social secretariats") by the social security e-government program consist of an automation of some social security duties these end-users have to comply with: Retirement pension, unemployment, insurance against working accidents; insurance against professional accidents, family allowances, illness and incapacity insurance and yearly holidays. These services have been made available through several communication modes: an interactive web portal, an application-to-application mode, file transfer to the system, and a vocal server – for some services only. The most-used service is the quarterly statement of employee's salary and work length (which are the main issues of the case description), the statement of an employees' social risks (sickness, accident, dismissal and pregnancy) and the statements of beginning, interruption and end of work (or work periods). For instance, the "quarterly declaration" is a legal obligation for every employer; a unique electronic declaration now replaces previous multiple forms that had to be transmitted to several social security institutions. These wage and working time data currently collected for the quarterly declaration are used to calculate the due social security contributions (by the National Office of Social Security - NOSS), the holidays wage and the retirement allowances.

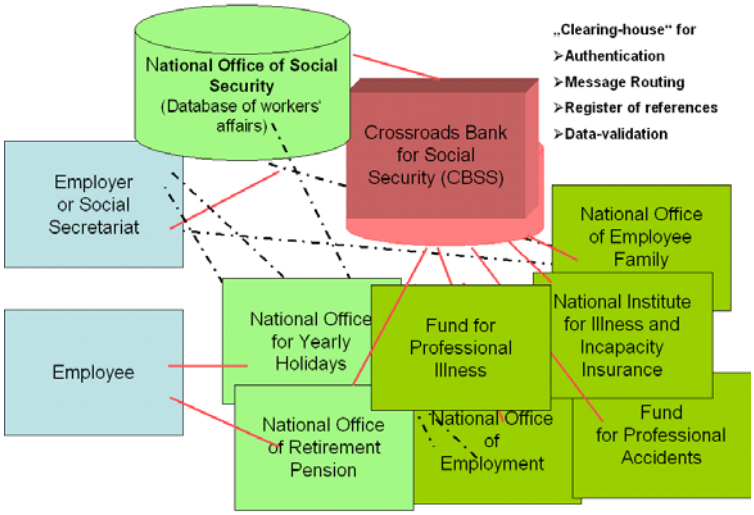


Figure: The Belgian system to transmit quarterly statements of employees' social contribution data

[74] Case report by CITA-FUNDP, Computer Science Institute, Belgium

The social security web portal – managed by the SmalS on behalf of the Public Service for Social Affairs – is composed of different parts, viz:

- a gateway (allowing single sign-on, supporting the SSL security protocols);
- a portal and web server;
- a directory server controlling access authorizations;
- a central application server;
- a document server;
- a customer relationship management server;
- a content management tool (using standardized metadata and thesauri) allowing authorized institutions to publish up-to-date information.

The portal is the public part of the social security Extranet while the latter is the interface between the web portal and the internal back-offices. It has initially been designed to ensure data transmission between the social security institutions from the public sector. Providing them with full services (connection with the Internet or with public networks, web hosting [it hosts the websites of most public social security institutions], SMTP mail exchanges, DNS management, IP addresses translation, etc.) it is also linked to the general Federal network FedMAN ("Metropolitan Area Network"). This Extranet is a TCP/IP-based network. It is separated from the CBSS infrastructure and directly depends on the Public Service Social Security.

Since 1990, the NOSS runs a huge database of data collected in the companies that concern the position of their workers (considered here in their quality of insured persons). Since then, this database collects statutes, work conditions, salaries, working times, working accidents and occupational illnesses of almost every employee in Belgium. This database was built up on the grounds of the new multifunctional declaration. Before 2003, it was known as the "quarterly declaration", and the only uses outside the calculation of contributions by the NOSS were destined for calculation of rights to holidays wages and old age retirement benefits. Since the beginning of 2003 the electronic declaration has been made mandatory. It can be done either via the social security portal, via file transfer, interbanking network, vocal server or even in batch mode (but in this case the employer will not be in a position to receive a calculation of owed contributions). If the company opts for the direct mode (so not for the batch mode), there is a real interactivity that enables it to immediately check the correctness of information and, if necessary, to rectify it.

The information is handled through the general Extranet. While the National Office for Social Security acts as the collector, the information is dispatched by the CBSS to authorized institutions (such as Employment Office, Illness Fund or Office for Family Allowances) in connection with their own authorized use schemes and using the protocols and formats just reviewed. The "end user" of the system – the employee as an insured person – can be automatically entitled to benefits he would get in regard to the information entered by his employer (thus related to salary and working conditions/time) and not only for holidays wages or pension purposes anymore. For instance, there is - thanks to the multifunctional declaration - a direct calculation of his rights to a premature pension if he is unemployed or incapable of working.

Back-office reorganisation

The "multifunctional declaration" is mainly linked to the NOSS (the National Office for Social Security). This agency is a public organisation detached from both the Public Service for Social Affairs and the Public Finance Service. It collects the social security contributions on behalf of the Federal State. While the NOSS is officially in charge of collecting and distributing the information already mentioned, the service reviewed here is a typical case of reorganisation and information exchange coordinated by the CBSS, since nearly every structural information process aspect has been delegated by the State to this organisation. The new naming of the service (since 2003), i.e. "multifunctional declaration", clearly shows a change in its nature since all given data are also used by other institutions from now on – above all those in charge of the payment of social security allowances and services.

The data exchange between back-offices can take place either by terminal emulation (requiring manual intervention), application-to-application or Internet protocol. The centre of the social security back-office communication is the register of references of the CBSS. Its task is to route every message according to the rules jointly decided and managed by the CBSS. This register consists of three tables:

- available data: where (in which institution) determinate data is available and for which purpose;
- access authorizations (who can access what);

- directory of persons: in which databases a person is known, in which quality and for which period (if relevant).

The data combination of those three tables enables automatic routing of every incoming message. So the CBSS itself holds absolutely no core data about the insured persons: this task remains the exclusive mission of the SSIs in their respective sectors. The CBSS grants the authorisations, organises and coordinates the transmission and communication, and supports the communication in itself.

The technological choices inside the back-office reorganisation system were made respecting the fact that clients should not adapt their resources to the CBSS requirements, but on the contrary that the CBSS should act as a clearinghouse. At the beginning the working environment was made of mainframes – from different brands – so that the CBSS opted for open-standards such as Edifact. In spite of that it seems that the CBSS has always strived to allow the use of other standards as well as of "flat files" - even if they had to convert them. Actually one could first of all see the CBSS as a sort of "conversion centre". The harmonisation led by the CBSS takes place on four levels: technical and organisational standards, means for authentication, used notions and instructions. The CBSS calls itself a "service integrator"; this means that they act as the coordinator of the reorganisation projects linked to e-government processes in their field of activity (the social security).

8.10.4 Results and benefits

User benefits

The reorganisations related to the e-services already implemented led to the following benefits for users: standardisation of communication with employers (allowing multi-channel diffusion: portal, application-to-application, vocal server in some cases, etc.):

- principles of sole and appropriate collection of information, better back-office synchronisation, automatic granting of rights, personalised push-pull services built upon 'life event'-oriented concepts;
- the multifunctional declaration renders some 50 types of forms obsolete (on a national basis this means a decrease of one million contacts with companies) while at the same time 27 others are consistently simplified (an estimated five million contacts decrease);
- the introduction of a customer relationship management, based upon a Contact Centre ("Eranova"), in order to deal with the complaints and questions from the companies that are related to their relations with the public sector SSIs and among other things to their problems with the use of the (sometimes mandatory) electronic communication methods. This contact centre can be reached 24 hours/24 and 7 days/7 either by phone, fax, mail or by a contact form.

Before these reorganisations, the communication between the SSIs concerning the insured persons were mostly non-coordinated exchanges based on individual paper forms for each institution type (i.e., collection offices, mutual insurance offices, control offices, etc.). Employers (or even citizens) were considered central in the management of the different cases they could submit to the social security institutions "by default".

The process of concept harmonisation (like working time, wages, etc.) has been crucial in the process to implement such a multifunctional declaration that can be used by every SSI that needs some of those data for its own business. This harmonisation firstly helps the employer who is not obliged anymore to handle a proper given data in many different ways just to communicate it to the different social security institutions in the form each one requires. The uniform declaration – one declaration per company per quarter – is willing to spare him the task of giving the information more than once: the transmitted information will be dispatched to the SSIs by the CBSS for authorised purposes following commonly decided rules and routines. If some SSIs need complementary information they are supposed to request them directly from the most competent SSI and not from the employer anymore. The principle is that an employer is asked an information only once by the social security "system" as a whole (provided that the information is not supposed to be updated).

According to estimations, about 218.000 employers are officially asked to fill in a quarterly multifunctional declaration. During the second quarter of 2003, 213.418 employers introduced at least one declaration. This declaration was considered correct for at least 190.900 employers. This is a better figure than for the first quarter – the first of the mandatory electronic declaration – when 4000 further employers made mistakes. The CBSS has received and transferred information on about 1.261.000 workers.

Agency benefits
Even if no general reorganisation or rationalisation has taken place in the Belgian social security landscape – with federal entities even gaining some social security competencies to the account of the Federal State – the partners (Federal ministry, public offices, public, semi-public and private agencies) feel confident and are willing to participate in the reorganisation. They did not consider the creation of the CBSS as a central coordination organisation a threat for their existence or their autonomy. Such fears seemed more present ten years ago when they clearly missed a common organisation where to discuss and exchange. Thus the crucial problem for the social security partners is not anymore their own existence but the added value of their work for the beneficiary (company or citizen). So the focus is now on the correct course of the back-office reorganisation and of the information remodelling. The other benefits of this reorganisation process lie in the aspects of security and quality of the information exchanged.

These e-services must be considered as a part of a general movement coordinated by the CBSS that has led to:
- security precautions through external control and mandatory agreement of every new communication flow as well as through rationalised use of personal data:
- quality of information: information modelling that renders it independent of unavoidable changes in political or legal concepts; unique identification key for citizens and companies; functional back-office task sharing where responsibilities are well-defined and which allows *ad hoc* compulsory information validity checks between institutions;
- introduction of work quality control processes;
- adoption of centralised computer infrastructure and network; the very different natures of those institutions is bottled up through the implementation of a solid but flexible interoperability framework.

8.10.5 Lessons and good practice

Creation of a clearinghouse, an autonomous public office
The creation of an autonomous public office called the "Crossroads Bank for Social Security" (CBSS) in 1991 is the main factor of success of this case. The CBSS is no central general register. It only manages registers about where is information, who and for which purpose can it be accessed; its mission is to route data exchanges and find the most effective and efficient way to carry the most up-to-date information.

The advisory board of the CBSS is entirely composed of representatives of its "clients" (the social security institutions). By so doing these clients are enabled to ensure their deep involvement in the evaluations and goal-settings. Its main mission was to propose solutions promoting and consolidating good collaboration among the network of social security institutions created (on the basis of the CBSS). Hence, it has been leading the e-government movement more than it had to follow any imposed policy.

The main change due to this general initiative has been that cooperation between the different partners of the social security network (at least as far as information is concerned) seems to have become a common and shared principle.

Step-by-step approach: Analysis, computerisation, standardisation, harmonisation of legal concepts
A global plan and vision has been developed during the recent years and validated by the political authorities. Workflows between back-offices have been surveyed to estimate their added value. Databases of the public SSIs have then been analysed, equipped with common identifiers, computerised where feasible and rendered accessible for each other (in a first phase without changing the concepts in use) through standardised formats (Edifact and later XML). Then again, information flows from official forms have been analysed and corrected so that there is no more indirect forwarding but only dedicated forms directly sent to and emitted by concerned organisations. Harmonisation of the legal concepts has then taken place. This allowed to computerise other flows as well as to begin computerising relations between citizens/employers and the social security institutions since the Web was becoming popular among them. We can state that this harmonisation is the base of the offer of e-services to the companies.

Assessments and quality control
Continuous assessments and evaluations of the back-office relations managed by the CBSS take place through indicators allowing measurements of message integrity, content appropriateness, exchange speed and performance, service availability, reliability and security of operations. The figures are collected on a data warehouse system and so form 136 indicators. Moreover, the resources of the CBSS are handed out following a precise task distribution evaluated by task time recording, analytical accountancy and demand management.

- A task distribution also rules the functioning of the exchanges between the SSIs and between them and the CBSS. It is based on mutual agreements between the SSIs and its acceptance and adequacy is controlled by the CBSS advisory board.
- A skills management system has been progressively implemented into the CBSS structure since 1998. Since then every back-office task is analysed and divided in minimum and coherent units of time-human-logistical resources. It allows to define measurable work objectives for employees, to calculate the effective workforce costs and so to be able to precisely evaluate financial needs.

Incentives for users
From the start, services offered by the CBSS are not paid individually (per message fee) but funded by a mandatory taxation directly taken at the source, i.e. from the social security contributions included in the salaries and collected by four public SSIs[75] which are obliged to finance the CBSS. This amount constitutes the operating costs of the CBSS. Thus the more an institution uses the system, the better its return on investment is. This would probably not have been the case if a standard fee or price per message had been fixed. Another way to avoid reluctance to encourage acceptance is the competition between most organisations in most sectors of the social security: once an organisation decides to use the system, its direct competitors cannot afford to neglect it any longer.

Obligation to request information from users (employers and employees) only once
The newly introduced "multifunctional declaration" is likely to create other needs for other social security institutions thanks to the computerisation and the back-office reorganisation process launched by current and future e-government projects. The process of concept harmonisation (like working time, wages, etc.) was crucial for the process to implement such a multifunctional declaration that can be used by every SSI that needs those data for its own business. This harmonisation firstly helps the employer who is not anymore obliged to handle a given data in many different ways just to communicate it to the different social security institutions in the form each one requires. The unique declaration – one declaration per company per quarter – spares him the task of giving the information more than one time: the transmitted information will be dispatched by the CBSS to the SSIs for authorised purposes following commonly decided rules and routines. If some SSIs need complementary information, they are supposed to ask directly the most competent SSI and not the employer any more.

8.11 Business corporation tax and VAT

The following report is based on a Portuguese and Irish case on corporation tax and a Greek case on VAT.
Background, goals and drivers

8.11.1 Background goals and drivers

In all three cases the fundamental drivers behind the systems- and organisational developments were measures to decrase bureaucracy and public spending while increasing the value of the serivce in it self and reduce the the time that users neede to spend to utilise the service. The Irish and the Greek case are to a large degreee build on existing ICT structures and workflows that have been developed and re-organised throughout the 1990ties. In the Portugues case the system development is of a more fundamental charater. In the followint the issues of the three cases will be describe in more details. In all three cases the service describe are etiher all ready part of a one-top-shop/portal concept or are planned to become part of one in the near future.

Greece: The TAXISnet
The General Secretariat of Information Systems (GSIS) of the Ministry of Economy and Finance was the first organization of this size in the country to introduce large scale IT systems in its everyday administrative operation as well as for direct service delivery to citizens, professionals and enterprises. Advanced electronic service delivery actually provided to end users is the result of a large modernization procedure of internal processes and work flows taking place in the Organization through the use of IT which has its origin back in 1995. Electronic service delivery by the Organization began in 2000 as a result of the political will to bring direct benefits to end users (citizens and

[75] That is to say, the regulatory institution of each of the three regimes (employee, independent worker, civil servant) plus the institution in charge of overseas social security.

companies) by making use of the large-scale digitisation of internal processes taking place in the framework of the deployment of TAXIS computer system. TAXISnet web site was then created providing on-line some popular services. More specifically the goals of the TAXISnet are:

- to provide faster and better services to citizens and enterprises through the exploitation of alternative forms of service delivery,
- to ensure uniform interpretation and application of tax legislation,
- to improve the monitoring and control systems of public revenue,
- to cope with tax evasion problems with a view to applying a fairer tax policy, and
- to facilitate everyday work of the employers of the Organization.

The VAT service is only one of the services available on the TAXISnet, and the general idea behind the TAXISnet, may therefore be considered to be a portal in line with the other portal described in the chapter on business portals.

Ireland: The Revenue On-Line Service (ROS)

The Irish Government is taking a leading role in encouraging electronic business and the development of the infrastructure for Internet trading. This includes a significant effort to develop eGovernment services for citizens and business. As part of this initiative the Irish tax authorities, the Revenue Commissioners (RC), are developing Internet services that are aimed to be of direct benefit to the majority of taxpayers. They have identified tax return filing as such a service and to meet this need developed the Revenue On-Line Service (ROS) to allow taxpayers to make returns and payments and deal with other tax-related activities online. The Corporation Tax service is just one element of the overall integrated ROS service that provides a one-stop-shop access to all of a customer's main tax accounts. The taxes covered include Income Tax returns by self-employed individuals, VAT, Corporation Tax and Employers payroll returns, as well as registration of vehicles by motor traders. ROS is a secure Internet-based system that allows individuals to file tax returns, make payments and view details of their various tax accounts. Security is provided by the use of PKI technology, with digital certificates issued to each customer. The ROS system went live in September 2000 and the Corporation Tax service was rolled out in November 2001. The specific objectives set for the ROS service overall is to have 50% of tax returns filed and 75% of payments made over the Internet by the year 2005. Apart from being part of the overall ROS strategy and plan, there were some specific problems with Corporation Tax processing that it was hoped the online service would help to solve. In particular, there was a backlog of approximately 2 months in processing corporation tax forms which resulted in a 2-month turn-around time wait for customers.

Portugal: Seg-Social

According to law, every company must send the sheets of salaries of their employees to the social Security every month As a consequence, a firm operating in several districts was obliged to unfold their declarations of corporation tax by district and deliver them at the correspondent District Centre of Social Security. In these circumstances, if a firm wanted to consult its contributively situation and ask for it to the National Services of Social Security, was obliged to wait for a set of bureaucracy procedures: the central services would forward the request to every district services where the firm maintained its activity and then wait for their reply. In order to enhance administrative efficiency and provide a better control of the workflow, a Law Decree (106/2001) was approved April 6 2001. The decree obliges entities with more than 10 workers to submit their salary declarations by a digital way (e.g. DRD) or by the internet. The implementation of these changes was gradual: entities with more than 100 workers were obliged to submit their declarations in a digital way until July 1 of 2001; firms with more than 20 and less than 100 workers until April 1 of 2002; and entities with more than 10 and less than 20 until July 1 of 2002. The main objectives of Seg-Social are:

- to liberate workers for other activities of the social security,
- to reduce administrative costs (employer entities and social security),
- to promote the utilisation of ICT,
- to improve the control of the revenue by the social security,
- to improve the quality of the submitted information, and
- to make the service available 24 hours a day, 7 days a week.

8.11.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
Seg-Social	Portugal	3+1+0	3	C	C (2 b.o.) 1 stage	46% of the total registration in June 2003 was done via seg-social	Service improvements for users combined with administrative savings. Initial problems with implementation since there was no strong vision for the project to facilitate change management processes at the administrative level.
Revenue On-Line Service	Ireland	4+1+1	3	D	2x2 Two stages: 1) declaration/assessment 2) payment Two Back-offices: 1) Corporation tax dept. 2) Bank	10% of the users and 25% of the payments	Improvement case administration time from 2 months to 10 minutes. Resources saved since staff no longer has to work overtime.
Taxisnet	Greece	3+1+1	3	C	1x1x4	635.805 registered users out of the 800.000 professionals and companies that have a legal obligation to submit a VAT declaration	VAT declaration can be made online. A range of other services are also available. Cost cuttings has been achieved while service levels has been improved.

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.11.3 Implementation

In all the three cases the organisations behind the service have developed parts of the service in-house. This have meant significant investment in human resources and equipment and the rationale behind these decisions have been that organisations wished to achieve a maximum degree of autonomy and operational freedom to control service and systems development. In other aspect the implementation strategies in the three cases differs significantly. In the Irish case development and implementation strategies involved continuously dialogue and consultations with a range of actors and representatives of personnel groups before the project was implemented while much of this work was done after a first implementation round in the Portuguese case. All cases show that implementation is much more than systems development and organisational development. Set-up help desk and service strategies related to the heterogeneous user groups of the services has been imperative in all three cases and the Irish case also show that developing marketing strategies and tying these in at the organisational level may indeed boost the popularity of the services among the users.

Greece: The TAXISnet

New electronic services provided in the framework of the e-oikonomia portal have been internally developed in the Organization, through the use of its own financial and human resources. They mark a clear change of direction by using more and more platform-independent technologies (Java, XML) and open source products (e.g. Linux, Apache servers, etc). Only the use of Oracle databases is maintained for compatibility reasons with TAXIS system. Future e-income and e-VAT services that will replace existing TAXISnet services will also make extensive use of open source tools, since integration of services is a key issue for the Organisation, which shows an increasing interest in scalability and interoperability of applications. In addition, technical interoperability between government agencies is currently dealt

with at national level, mainly through the national project "Syzefxis", which aims to provide public administration agencies with a high bandwidth network, forming the intranet of public administration.

Ireland: The Revenue On-Line Service (ROS)
A major exercise in digitisation and back-office re-organisation was needed in order to enable the online ROS service to be provided. This involved integration of the previously separate back end tax systems into the Integrated Taxation Processing (ITP) system.

All the major tax, accountancy and representative bodies affected by the introduction of the various business taxes were consulted and briefed on the plans for the introduction of ROS. The consultation process is ongoing and customers are actively encouraged to provide feedback. As part of this process the RC issue a quarterly "Tax Briefing" publication to all practitioners. Prior to the development of ROS the RC, between 1990 and 1995, carried out a major project to integrate their various separate back end tax systems (Employers Income Tax, VAT Corporation Tax etc.) to replace the separate tax processing systems. It was essential that this Integrated Taxation Processing (ITP) system be in place to enable the ROS system to provide the online tax services to its customers.

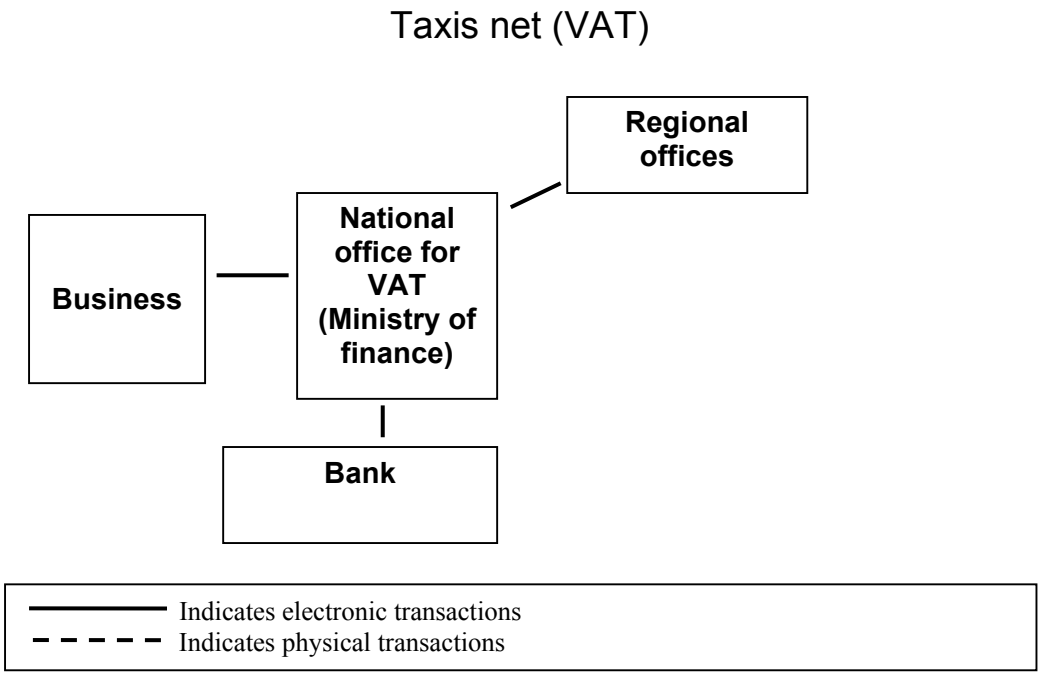
A detailed Change Management plan was prepared and agreed with the business areas and the Human Resources Division. A change management working-group was appointed to oversee and resolve any issues that arose as a result of the new services. A Partnership group was also set up consisting of management, staff and union representatives to notify relevant areas of prospective development and to allow for the opportunity for comment. Internal news magazines were used to keep staff informed.

The ROS public image was designed by external marketing consultants, Murray Consultants Ltd., to promote the attractiveness of using the service. A series of leaflets, brochures and free CDs were designed and issued in regular mail-shots. ROS is now an integral part of all RC advertising in newspapers, on radio and on television. The ROS marketing team organise information seminars and visit all areas of the country making presentations, addressing meetings and providing information on ROS.
The ROS marketing team is supported by a team of ROS liaison officers (RLOs) from local tax offices. They were trained to assist with the promotion of the service locally for tax agents and businesses. There are currently over 80 RLOs engaged in the promotion of ROS. There is also a Help Desk available for ROS users that is supported by the development team. The help desk is open from 8:30 to 18:30 Monday to Friday, with these times extended at peak filing times.

Portugal: Seg-Social
As a consequence of the back-office reorganisation, human resources were specifically contracted by IEES in order to develop and implement this service, namely for organisational roles because of the new procedural needs. Technicians were also contracted for the development of new applications (hardware and software) as well as other employees to integrate the helpdesk team. In addition, IEES has also made large investments in computers and networks. According to the persons interviewed, the service started with low dynamic, which, and quoting "may be due to the culture of the institution which is public owned. As a consequence, the implementation period was a bit long". The development and implementation of the service was not a generally accepted concept within the institution. At the beginning of the process, there was a need for a strong vision from key actors within the institution with a strong will for the service integration.

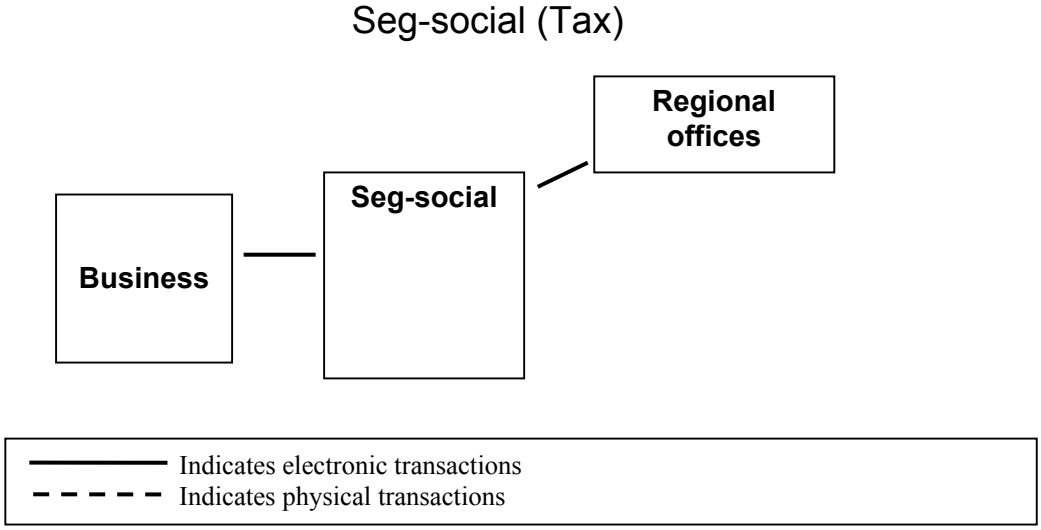
User service provision

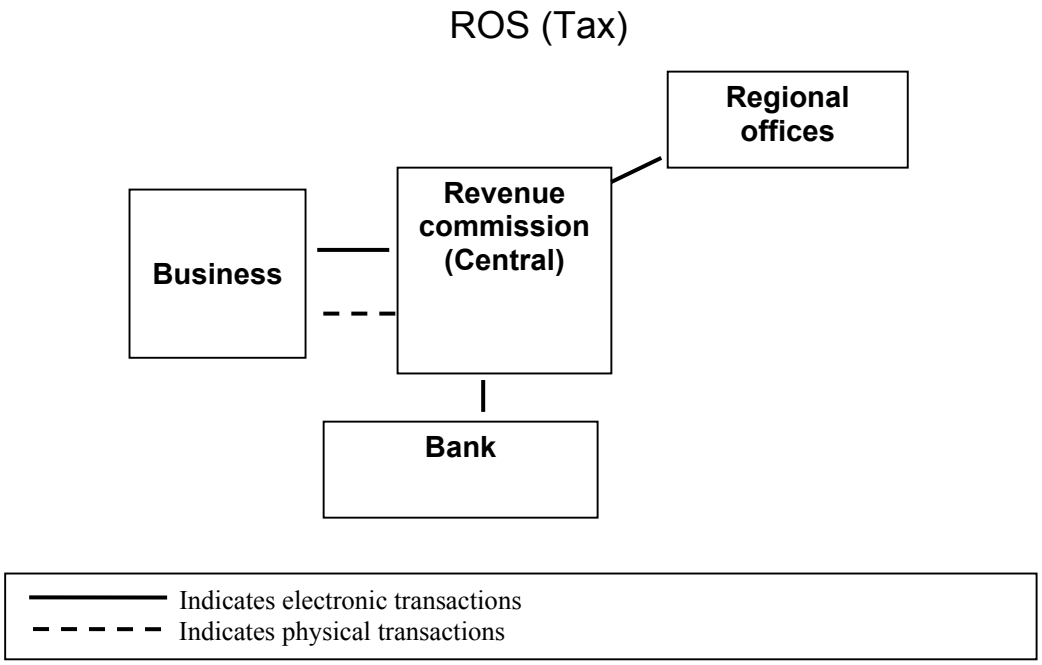
In all three cases the service provision is targeted to enable the users to choose when and where they want to use the services. The services have typically been dealt with on regional level which has incurred significant extra work for companies present in several regions. The ICT solutions presents an opportunity to deal with the service centrally while regional offices still plays an important role in the day to practice of the administrative routines.



Back-office re-organisation

No major re-organisations has been made as direct effects of the digital service provision. The primary reason for this is that most organizational changes took place as new systems and integration project took place during the 90ties. Most projects are therefore built on top of an existing structure and are therefore predominately modeling existing workflows. Another reason for the relatively few organizational changes that has happened is that the take-up of the service isn't big enough to create major benefits from re-organisation projects.





Greece: The TAXISnet
Deployment of IT systems in the Organization in the beginning reproduced identically conventional (manual) procedures, replicating at system level the usual operation of local tax offices. The development of local autonomous applications and databases was aiming to ensure operational self-dependence of local tax offices. This system architecture has proved successful, bringing about the automation of linked internal procedures and significant improvements in the operation of local tax offices. Electronic service delivery was deployed based on this architecture, by incorporating at different stages new web applications and by reproducing strong and weak points.

Ireland: The Revenue On-Line Service (ROS)
So far there have not been any major changes in functions or organisational structures as a result of the implementation of ROS. However, when a critical mass of users has moved to the online service there will be significant scope for strategic and operational change.

8.11.4 Results and benefits

User benefits

User benefits are primarily related to the flexibility and ease of use that the new systems offer, but another important point is that the as systems are being used internal workflows in backoffice are beaing eased with the effect that service levels are enhanced for all users regardless of their access challen to the services. One example of this is the Irish case where normal administration time for a tax form has been cut from two months to a couple of minutes.

Greece: The TAXISnet
Benefits for end users are significant, as electronic services provided and available tools dramatically reduce time and expense that would be necessary if they had to go to the local tax office. Those benefits are even more obvious for VAT on-line service, as declaration is periodical (varying from once every four months to monthly) while possibility of on-line payment, when necessary, through e-banking is further contributing towards this direction. With the progressive inclusion of an increasing number of on-line services addressing citizens and enterprises aforementioned benefits are expected to be maximized.

Ireland: The Revenue On-Line Service (ROS)

Filing Corporation Tax returns electronically via ROS is a faster and a more convenient way for customers to fulfil their obligations. They no longer need to copy the return and land mail it to the RC. The validation (checks and balances) and the calculation of the customer's tax liability that are built into the electronic form ensure that mistakes in filing and surprises in relation to tax liability are kept to a minimum, thus reducing further contact with the RC.
The turn around time for making a Corporation Tax return and receiving an assessment for customers using the ROS systems is in most cases a matter of minutes once the CTI form is uploaded, compared with about 2 months for the paper based system. Customers can also file early, and not have the payment amount debited from their bank account before the due date.

Portugal: Seg-Social
Benefits for the firms are the following: it is no longer necessary to go to the social security district offices personally to submit their declarations; as a consequence users save a lot of time and, in addition, save money from related travels when they do it on-line.

Agency benefits

Greece: The TAXISnet
As noted above user benefits are a significant reduction of the time time and expense necessary to carry out transactions with the tax system, but this also has important impact on the productivity of the administration, by reducing time and cost necessary for the assessment of tax declarations, by releasing congestions at local tax offices and by facilitating fiscal controls. These obvious benefits gradually influence to a great extent the overall internal workflows of the administration, since they are taken into consideration by the leadership of the GSIS and of the Ministry, which progressively reorient the focus of the overall operation of the administration to the electronic service delivery. This trend is accentuate by the high uptake of the service (in October 2003 a total of 635.805 registered users out of approximately 800.000 professionals and companies that have the legal obligation to submit VAT declaration).

Deployment, maintenance and provision of the above services in conjunction with high uptake and usage rates had as a result significant benefits for the Organization:

The GSIS has now the necessary experience and know how for operating an advanced electronic service delivery system through the Internet, with regard to the necessary technical, functional and organizational requirements.
A remarkable number of tax payers (citizens and enterprises) has become familiar with the use of the new electronic channel, providing for the Organization the critical mass of users required for the maximization of the benefit resulting from the provision of the on-line services.
Specific needs and problems as well as the technical and functional specifications for a major upgrade of the system that will respond to them have been identified.

Ireland: The Revenue On-Line Service (ROS)
There are benefits for both customers and the RC from the fact that there is no processing of CT1 forms and payments at local office level when customers use the ROS system to make their tax return and make their payments online. Since customers make payments online there is no need for RC local offices to forward payments physically to Limerick for entering into the system. This simplifies the procedures and the number of back offices involved in processing payments.

Apart from this, the introduction of ROS has also helped to speed up the turn around time for traditional users by reducing staff workloads, staff are less stressed and there is less need for overtime. It is also hoped that with increased take-up of ROS by companies RC staff will be freed up to concentrate on non-compliant customers.
The development of ROS also provided a stimulus for a review and streamlining of existing forms and procedures used by the RC. For example, each field of the Corporation Tax return was scrutinised in terms of the role and value of the information generated and this resulted in the development and issuing of a shorter, more streamlined form for both ROS and non-ROS customers.

Portugal: Seg-Social
Benefits to public administration are the following: reduction of the working steps regarding the acceptance of the declarations and in case of mistakes data can be found very easily and efficiently.

8.11.5 Lessons and good practice

Local vs. central organisation
Organization possibilities offered by the electronic mean not only for the improvement of the quality of services provided to end users but also for the reorganization of the internal processes and the simplification of traditional procedures for service delivery. What characterizes this new era of the GSIS that places the Internet at the heart of its operation (as viewed by the major upgrade of the system to take place under the 3rd CSF) is that the Organization has progressively realized that new web applications enable data collection and elaboration at central level, making local tax offices another user of the central system. This progressive reorientation of the focus to electronic service delivery redefines gradually the operational role of local tax offices as integrated local units that should upgrade quality of services provided to citizens and perform fiscal controls.

Laws and legislation
All cases indicate that laws and legislation may be used to promote change both in the administration and for the companies to use the services. Furthermore existing laws and legislations may prove to be "show toppers" of the more integrated services since rules related to data protection and data exchange can be very strict. Thus existing laws and opportunity to create new laws should always e examined closely in relation to development of digital public services.

Public private partnerships
Maximum exploitation of the internal first-hand knowledge of the Organization on its own needs and on those of its clients as well as **involvement of the Organization in its whole** are necessary to ensure efficiency of services provided. Furthermore, the **significance of the design phase** has been highlighted, in order to ensure attainment of targets set and sustainability of services provided. As an indicative example the Organization mentioned their experience of unexpected high uptake of the electronic services initially provided, which required immediate actions to be taken in order to respond effectively. Preventive measures for the **management of crisis** are essential to achieve reliable electronic service provision and gain the trust of the public. On-line services should respond to **real user needs** and take into consideration the way that they think and act when they are using the service.

The drive towards one-stop-shopping (service portals)
All service in this section has been analysed "per se", but it is vital to recognize that they all ready are part of service portals where users may find and use related services thereby saving more time and generating "data synergies". Furthermore all three cases have future vision for extended service portals like the ones described in the section on portal services.

Corporate commitment
The Portuguese and the Irish case shows that a strong commitment at corporate level is essential to be successful. In the Portuguese development and implementation was less than optimal in the first years until a holistic vision for the project and the "top layer" commitment was formulated and communicated strong enough. In the Irish case the commitment was secured from the Board of the Revenue Commissioners in 1999. A key feature was the appointment of a dedicated Strategy Manager from the outset. It was also important that the necessary best qualified personnel were made available as required. A project board of senior Revenue officials was established to advise, direct and oversee the development and implementation of the service. These actions cleared the way for a visionary and dynamic implementation and roll out of the services to customers.

Effective marketing
The Irish case showed that such projects needs a marketing budget and need people with appropriate skills to do the marketing. Marketing consultants were employed to develop a service image and a marketing strategy and approach. Significant resources were allocated to an extensive and ongoing marketing programme directed towards the RC's customers.

Training
Sufficient attention to in-house end-user training has been imperative in all cases in relation to service development and use of the new systems.

Timing
The experiences with the implementation of ROS indicated that the time scheduling of releases is a very important aspect. For some releases the scheduling was driven more by the internal considerations of the development team than

by the external schedules of the targeted customers. For example, the ROS Corporation Tax system was implemented in November 2001 which was not at all an optimal time of the year since the annual return had been made by most companies a month before this. The result was that uptake was quite slow initially and also that the initial marketing was taking place a long time before potential customers were going to actually need to use the service (for their tax returns the following year).

Removing human intervention gives efficiencies, but can result in new issues
The Irish case showed that when tax return forms were dealt with the old way a human operator keyed in the information from the customer's form. This provided the opportunity for correction of small mistakes (such as obvious mistakes in ticking of boxes) on entry and therefore enabled the elimination of a certain number of unnecessary but time consuming interactions with customers to straighten out problems. The direct entry of data by customers has removed this aspect of human intervention. Sensibility checks are run to eliminate as many obvious errors and inconsistencies as possible, but not all are picked up.

Help desk set-up in relation to uptake.
Finally, **efficient help-desk services** and continuous provision of precise and clear information to users (without taking anything for granted) is as important as the service delivery itself.

8.12 Business customs declaration

8.12.1 Background goals and drivers

Since the trade in goods is one of the four liberties on the Common Market, customs declaration is not required among states of the European Union and the same conditions (import/export quotas and/or duties) apply to all of them; this is a service area where the solutions of the countries are better comparable than in others. We can divide the custom issue on the one hand into imports and exports, on the other we have goods that underly quota-regulations which means that importers have to apply for licenses for their imports because the import of specific goods (steel, food like wheat, etc.) is limited by EU quotas. Importers of such goods have to register their imports from non-EU countries and possess a valid import license for the declaration of the goods. For these quota regulations, technical improvement and resulting profit in one country is another's loss because imports under quota regulations is a zero-sum game on the EU level.

We found good examples of reorganisation and integration in customs declarations in Austria, Ireland, Germany, Spain (cf. under "business portals"), Sweden and in the UK[76] and selected an Austrian/European case of customs declaration over the Internet for importers of textiles and steel because it was developed within a very short time and resulted in an impressive benefit for the Austrian state. Nowadays, applications for import licenses can either be filed with the Ministry for Economic Affairs and Labour (BMWA) which is responsible for import licenses, or via the online platform of the "paperless foreign trade administration" (PAWA). The service is free of charge. The Austrian system benefited from the well-integrated European database SIGL (Système Intégré de Gestion de Licenses) developed in the DG Trade[77]. SIGL is a computer system linking the European Commission with the departments issuing import authorisations in the Member States. Although this improvement of Austria's position in the competition for jobs and custom duties can only be achieved at the expense of other member states, increases in efficiency in one EU country could be realised in every member state (and especially the new accession states), thus benefiting Europe as a whole.

Since large clothing companies require large quantities of licenses to bring their goods to the Austrian (and EU) market, the communication by fax or letter has been consuming a lot of time and resources, representing a cost factor for businesses. While Germany already operated an electronic system, the process in Austria was only partly supported by IT. Processing an application by letter or fax took five days on average, resulting in additional storage costs that undermined the competitiveness of Austrian businesses on the common market. The aim was to cut process time by reducing the workload of officials. Routine tasks like error checking or transferring files to SIGL accounted for most of the process time. These tasks had to be automated and paper-based communication to be replaced by electronic workflows. Therefore, in 1999 the largest importer of clothes in Austria decided to transfer his import management to

[76] www.zoll.de for the ATLAS-system in Germany, www.ecustoms.ie for the Icarus-system in Ireland, www.aeat.es in Spain, www.tullverket.se for the Swedish customs administration, and www.hmce.gov.uk for Customs and Excise in the UK.
[77] http://sigl.cec.eu.int/

Germany. The resulting loss of 25 percent of applications went along with the corresponding losses of customs duties and contracts for forwarding agents. In August 2001, a number of Austrian companies announced that they would leave Austria and declare their imports in Germany from January 2002 on, unless the Austrian government provided a faster import administration system. On September 27, 2001 the Minister of Economic Affairs announced the implementation of an electronic service until the end of the year. A system was developed that provides 24x7 availability and, during office hours, is able to generate a license within minutes instead of hours or even days.

The main objective and short-term goal of the PAWA was to keep major textile importers from shifting their import operations to other EU countries. The result would have been a massive loss of jobs and customs duties for Austria. At least six companies would have shut down their import departments in Austria. After the loss of about 25 percent of the volume of applications in 1999, the migration of further import businesses would have meant an even larger economic damage. Besides jobs in these companies, corresponding positions in the transport business would have been in danger. According to the BMWA's declared goals, within three months a system had to be developed that would save time and costs for businesses and secure customs duties, taxes and jobs for Austria. The objective for the service itself was to significantly reduce the time between application and delivery of a license.

The PAWA project is embedded in the larger strategy of creating an extensive electronic platform for import and export. Information and transaction services are intended to support imports as well as export procedures. The import module is only the first component and a kind of learning model. It was implemented first because the export process is many times more complex. In its final stage, the system will provide paperless and fast administration of foreign trade as well as up-to-date information and support for businesses in foreign trade.

8.12.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
PAWA; http://www.aussenwirtschaft.info and http://sigl.cec.eu.int/	Austria and EC[78]	4+1+1	3	C	SIGL (EU-level), 2 Ministries	70% via web, 33,263 applications for imports in 2003 (end of period: August 18th)	Pressure of companies to leave the country led to new technological developments; sophisticated service with high take-up (quantifiable economic benefits)

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.12.3 Implementation

User service provision

The project was implemented in several stages following the announcement of the BMWA in September 2001. The first stage from September to October 2001 only provided the opportunity to send an application by email but provided a basis for today's web-based service. At this stage organisational questions had to be tackled like who should receive emails and process applications. It also had to be clarified, which official is responsible for which goods (textiles or steel) and how emails can be distributed accordingly. The application by email already reduced the process time from 5 to 3 days. Since December 28th 2001 applications can be submitted via the web portal of the PAWA. The generation of licenses was not automated, yet: Users only received a provisional advice which had to be presented to clear a cargo for import. Within four weeks the importer had to provide the original import license which was sent by mail in the meantime.

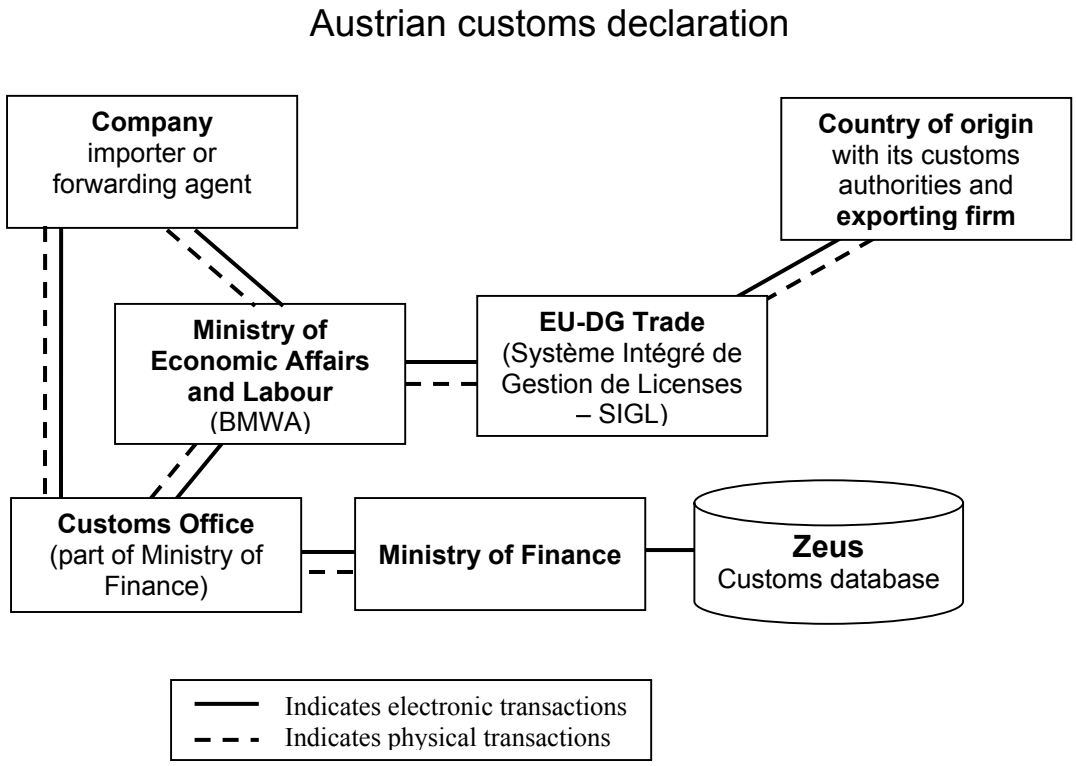
Since November 2002, the BMWA offers companies in the import/export business to obtain import licenses and integrates part of the customs declaration over the Internet. As already mentioned, the import of textiles and clothing,

[78] Case report by The Institute of Technology Assessment, Austria

iron and steel products and other less important goods is limited by EU quotas. Importers of textiles and steel have to register their imports from non-EU countries and possess a valid import license for the declaration of the goods. In Austria, applications for import licenses can either be filed with the department C 2/2 of the BMWA, which is responsible for import licenses or via the online platform of PAWA. The service is free of charge. The importer can immediately start to use the system by filling in the online form provided: When registering for the PAWA system, the user can choose whether the license is delivered as a physical document or digitally. Either is possible, but to prevent misuse it is excluded to have both for the same application. In the latter case the importer receives a digital notification for download and printing. However, the delivered document has only declaratory character. The right to import goods is constituted when the license is transmitted to the Ministry of Finance (BMF). The notification therefore only serves as an information for the user, e.g., stating his import license number. Users can monitor the state of their application online at any time.

Back-office reorganisation

When an official at the BMWA receives an application it has already gone through a number of error-checking routines. Because automated error checks are not always able to detect all mistakes, especially deliberate ones, an official has to review the application and decides whether to contact the importer for additional checks or clarifications. The second input into the process is the export license of the country of origin outside the EEA. It is part of the two-sided control system that the information in the export license has to match the application for the import license. Most Non-European countries transmit their export licenses electronically to the European database SIGL which is the DG Trade's system for the management of licenses for textiles, clothing and steel imports into the EU. Still, for those countries that cannot send export declarations electronically, the importer is required to send the original export license document to the BMWA. If the export license of the country of origin is not available digitally or physically, the workflow is halted. If the export license is in order, the official concludes the file and generates and digitally signs a notification. The relevant data from the file (export license number, volume and category) is transmitted to the SIGL server for matching it with the database of EU import quotas. The matching is entirely digitised and returns a confirmation to the PAWA system within 180 seconds. If quotas for the product category in question have not been exhausted[79] the conditional character of the notification is cancelled and the notification is stored in the user account. Simultaneously it is transmitted to the BMF which extracts the necessary data for the customs declaration.



[79] Import permissions are granted on first come-first serve basis.

Two main changes in the workflow were caused by the new system. First, the SIGL is now integrated into the electronic workflow. Second, all customs offices which are part of the Federal Ministry of Finance (BMF) were connected to the system and receive licenses of importers directly from the BMWA over the Internet. The back offices involved are the Department for Export Controls and Import Licenses (C 2/2), departments in Section IV of the BMF and customs offices at federal level. On EU level, SIGL is included. Private organisations involved are importers and forwarding agents of textiles and iron or steel products.

The main change for the participants in the PAWA is the disappearance of all paperwork connected to an import license. Instead of the importer receiving a paper document, the BMF that administers customs declarations receives a notification in form of an XML file directly from the BMWA. There the necessary data is automatically extracted and fed into ZEUS, a network that connects all customs offices in Austria to the BMF and is used to process customs declarations. This system was already in use but it was never intended to be linked with other systems. Therefore no interfaces existed and officials from the BMF's IT section at first opposed to the idea of linking an Internet-based system with the dialog-oriented ZEUS. Requirements for the PAWA were to reach the same level of availability as ZEUS and to guarantee data protection.

Without a notification the declaration of goods cannot be executed. When the goods arrive at the border or in a bonded warehouse, the local customs official uses ZEUS for the actual declaration of goods. If a valid license has been transmitted, the official can continue the declaration process else the process is halted. If no license is noted in ZEUS[80] the official can access the PAWA database and search it. If the license still cannot be found the goods are bonded. By this procedure, the risk of illegally dispatching a cargo with a fake import license has been significantly reduced because the goods are only cleared if a valid import license number is found in the system and not just in the importer's documents. This makes the task of customs officials easier and errors less frequent. It also reduces the number of personnel required for the administrative work. This leaves more resources for controlling and searching cargos.

The PAWA had to provide a web interface for ZEUS to be used by customs officials. The necessary adaptation of ZEUS was accomplished in two steps. First, interfaces for customs officials consisting of online forms and database querying routines had to be designed. Next, formats and content of data exchange between the two ministries had to be standardised. This was achieved by using the XML syntax, which was also the key to building an interface for the proprietary ZEUS network.

8.12.4 Results and benefits

User benefits

Main benefits for businesses are:

- Shorter processing times: The maximum time needed to generate a license is now three hours instead of five days. This allows users to work in real-time.
- Already the first phase (email applications) brought a reduction of workload for companies.
- Because of the faster access companies have better chances to secure quotas for their imports. Quotas are distributed for the whole EU on "first come, first serve" basis.
- Transparency is increased by the possibility to review the status of applications in real time.
- The reduction of the storage time of five days per product gave Austrian companies a competitive advantage.

Agency benefits

While a single process has been considerably accelerated, the number of applications for licenses has dramatically increased. Yet, thanks to the PAWA the workload can be managed by less personnel. This allows assigning more employees to the export sector. A much stricter export regime and changing EU regulations require much more resources and effort in this sector.

For the employees in the ministries the workflow has changed in that the time spent on each application has become significantly shorter. Error checking of an application is automatically carried out by the software. Beside that, officials

[80] E.g. if an importer has applied for a license only shortly before the cargo arrives it is possible that the customs official looks up a license before the ZEUS database is updated. The interval for updates is several minutes.

do not have to retype any information. Also, communication with the SIGL system of the EU is tightly integrated into the digitised workflow thus reducing the probability of errors and speeding up the process.

PAWA led to measurable benefits both for the businesses concerned and the Austrian government. The economic return of the PAWA project is quite impressive considering the fact that major importers of textiles and clothing had threatened to stop importing goods for the Austrian market and the EU through Austria. This would have meant the loss, for the BMF and the Austrian state, of the share of overall duties paid (25%) which remains in the member state. The threat of losing imports was credible since one large company already had abandoned its import operations in Austria and moved to Germany. As a result of the efficient workings of the PAWA all companies were retained in Austria. Further, negotiations are underway with companies who are planning to organise their future imports into the EU through Austria. Besides the income for the Austrian state from customs duties and interest on import turnover tax, jobs have been secured by the PAWA system. Jobs organising the imports for the firms would have been "transferred" to other countries, jobs in the transportation business would have been lost.

Benefits for the Austrian state are:
- Revenue generated by customs duties and interest on import turnover tax (which would have been lost due to migration of firms to other countries).
- Improvement of Austria's quality as a business location.

Benefits for the EU are:
- The volumes of products reported and actually imported can be compared for the first time. This makes fraud more difficult. Since the launch of the PAWA not a single case has occurred.

8.12.5 Lessons and good practice

Pressure from business due to competition from abroad

The aim of the PAWA was to make the process of importing and exporting goods faster and easier for businesses. The task was to substitute the slow and cumbersome paperwork involved in the process by electronic communication. Since imports can be brought into the EU through any member state, businesses try to handle their imports in countries with efficient trade administrations in place. In 1999, the largest importer of clothes in Austria decided to transfer its import management to Germany because the process in Austria was only partly supported by IT and took several days. The resulting loss of 25 percent of applications went along with the corresponding losses of customs duties and contracts for forwarding agents. Two years later, a number of Austrian companies announced that they would leave Austria as well and declare their imports in Germany from January 2002 on unless the Austrian government provided a faster import administration system. Under this pressure, the Minister of Economics immediately announced the implementation of an electronic service until the end of the year.

Small target groups easier to handle
Lessons learnt from organisational theories can be transferred to eGovernment-development as well: An aspect that helped making the PAWA a success was the pressure from businesses that strongly emphasised economical interest in the project. With such a well-defined and organised target group a service is easier to be tailored to user needs. The narrow target group of the service also explains the unusually high uptake rates and the economic success of the case. Transferability to other EU countries is high, because all member states have to comply with the common market's import regime and therefore have to issue import licenses. The checking of imports against import quotas is required in every EU country.

Step by step approach
1) Evaluating routine tasks first
The objective for the service itself was to significantly reduce the time between application and delivery of a license. Processing an application by letter or fax took five days on average, resulting in additional storage costs that undermined the competitiveness of Austrian businesses on the common market. The aim was to cut processing time by reducing the workload of officials. Routine tasks like error checking or transferring files to SIGL accounted for most of the processing time. These tasks had to be automated and paper based communication to be replaced by electronic workflows.

2) Handling of the less complex system first to learn for the more complex one
The PAWA project is embedded in the more comprehensive strategy of creating an extensive platform for import and export. Information and transaction services are intended to support imports as well as export procedures. The import module is only the first component and a kind of learning model. It was implemented first because the export process is many times more complex. In its final stage, the system will provide paperless and fast administration of foreign trade as well as up to date information and support for businesses in foreign trade.

As a kind of pilot project for the much more complex task of administering export licenses, the electronic import license has brought up important security considerations. In order to protect business data and, more important, to ensure 24 hour availability of the service, double demilitarised zones around the server clusters as well as secure connections between the clusters were realised. The result of this thorough planning is a system with a high level of availability and security. It is easily scalable and expected to be able to cope with the increasing traffic from importers and exporters in the next years. Further, identification and authentication schemes have to be enhanced in order to confront the safety issues in connection with the sensitive export of high-tech or dual-use goods.

Transparency through real time data-access
Transparency increased by the possibility to review the status of applications in real time. A similar effect for the EU is that the volumes of products reported and actually imported can be compared for the first time. This makes fraud more difficult. Since the launch of the PAWA not a single case has occurred.

Transferability to accession states
Still the PAWA can serve as a learning model for some aspects of Austrian e-government services. Even more important, it can serve as an example for the modernisation of the foreign trade administrations of the new accession states. With their entry into the EU, these states will have to adopt the import/export regime of the Union. The NAS then are in a similar situation as Austria in 1995. The reorganisation and digitisation of the administration will then be inevitable. Operating an efficient administration system is a competitive advantage for domestic businesses which is not only essential for NAS but for all member states.

8.13 Business registration

8.13.1 Background goals and drivers

The TELEMACO project was set up by Infocamere[81] to enable all administrative procedures required by the Chambers of commerce to be simplified and carried out via the Web. On a more general level the initiative is an important step to reach the goals and fulfil the demands of the "Bureaucracy simplification law" (Law 34 of November 2000).
More specifically the users of TELEMACO can submit registration, amendment and closure notifications in relation to a business to the Business Register offices by Internet and obtain access to relevant information to keep track of each procedure. By this operation a variety of goals are achieved while better service is provided to the clients. From the perspective of the Chambers of Commerce the initiative is expected to improve efficiency and create cost savings. Furthermore the quality and accuracy of stored data are improved. From the "customer" perspective the services become faster and more transparent. Furthermore it is no longer a need to attend the Chamber of Commerce in person to make reports and the fees on declarations has been reduced.

[81] Infocamere is the IT consortium of the Italian Chambers of commerce

8.13.2 Case overview

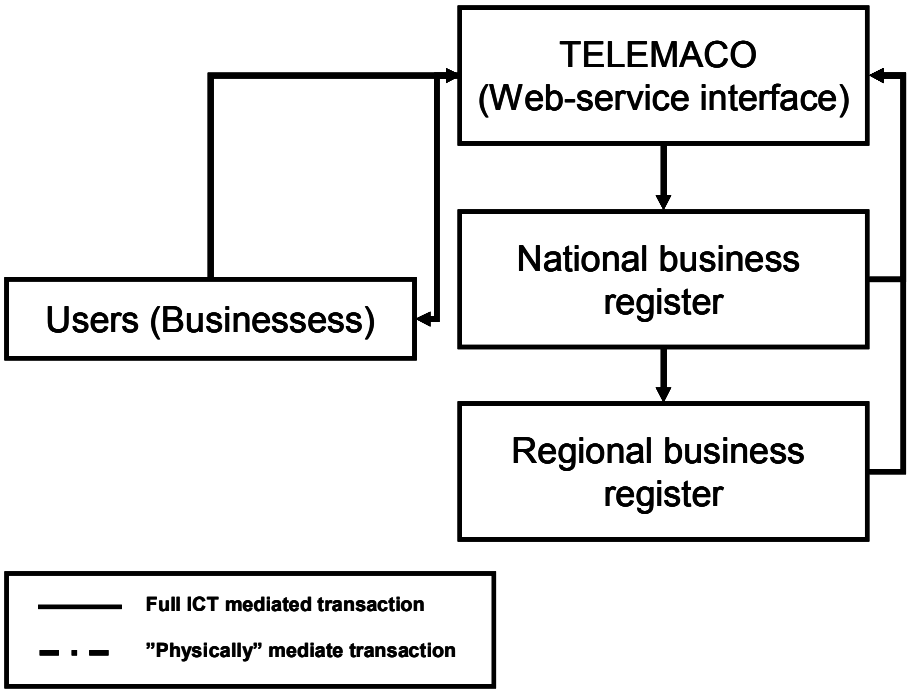
1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
TELEMACO	Italy[82]	3+1+1	2	C	Stage 3 x 2 (business registry and ministry of finance)	NA	The case in an important part of the bureaucracy simplification initiative.

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.13.3 Implementation

User service provision

Users of TELEMACO can submit registration, amendment and closure notifications to the Business Register offices by Internet and obtain access to relevant information to keep track of each procedure. TELEMACO also provides web access to extracts, Chamber certificates, optically stored documentation and financial statements all with due respect for the current legislation on remote certification and the standards set by law for access to administrative documents in electronic format.



[82] Case report by Nomisma S.p.A., Italy

The service is accessible on the web and available 24x7x52. It allows the possibility to verify progress on-line and easy payment for the electronic declarations. It enables the sharing of document by various users, who will also be able to amend/up-date them. The service also enables time stamping of documents to provide reliable evidence of time of transmission, then an unequivocal identification of the application procedure and documents it contains. It also registers the steps carried out on each application and procedure and the path followed by each application and procedure.

The TELEMACO service also includes the "Fedra" product which enables users to compile electronic files by attaching relevant papers and documents and to draw up the schedule for each file. Once the file has been compiled and digitally signed, it is sent to the Business Register using TELEMACO. Fedra is distributed free of charge from Infocamere and is based on open source.

Back-office re-organisation

All though efficiency and transparency has been major focus areas of the TELEMACO initiative few organisational re-structuring has been documented. Most of the efficiency gains are related to the digitalisation of existing workflows and the opportunity for business to apply directly without any help and mediation of personnel form the back offices. Finally the improved archiving and storing facilities related to the service has also provided significant benefits in the back offices involved.

8.13.4 Results and benefits

User benefits

User benefits are primarily related to the flexibility and speed that the new system provides compared with the traditional workflows since users themselves may decide where and when they register. Another benefit is the opportunity to follow the development of the processing of the application which ensures transparency and a sense of security in relation to the service user. The system is secured via digital signature enabled by a smart card technology which may be used in relation to a variety of other public services.

Agency benefits

The back offices of the Chambers usually managed paper documents but with electronic forms they save the time of recording data to the Register and time for scanning documents for the optic archives. There is also a significant growth of use and knowledge of new technologies among people used to deal with old tools: papers, front-offices, postal communication. Thus, a modernisation of ways of working for more of 100.000 users and 4000 government employees has formed people that sustain new valued services and solutions both in private and public sector.

In addition, it also improves the quality and accuracy of data stored in the databases that are updated from the declarations, and reduces costs by limiting the need for paper document handling, scanning and electronic storage. The advantages of the storage service are secure management, access to electronic documents through the digital authentication certificate on the smart card and secure document transmission, ease of retrieval of electronic documents, possibility of back-up optical storage of electronic documents, flexibility in setting the period of legal validity for each digitally signed electronic document and extension of validity of digitally signed documents even after the period of validity of the signature certificate.

8.13.5 Lessons and good practice

As in many other cases the relationship between general political and administrative ambitions and new technology is very apparent in the case of TELEMACO. ICT is used as vehicle to achieve simplification and efficiency in the bureaucratic structures and the ambitions in relation to this is underlined by the fact that laws has been passed in order to facilitate the changes. In this sense much of the changes occurring related to this case is driven by changes in the legal structures.

Seen from a back-office perspective the key to success in TELEMACO has been the successful interoperability of the many different systems that must be used to perform the service. Another key success factor is the development of a

secure system that is easy to operate via digital signature. The digital signature may also be used for other e-services and this means that the probability for high uptake of the digital signature is quite good. The interrelationship between generic services such as online payment and digital signature and the specific services such as TELEMACO is a key for the success of both types of initiatives. The fact that the generic services are around for the use in the TELEMACO increases the likelihood of success in this project and the more specific services that are using the general service the more penetration these services will achieve.

The TELEMACO case shows that good services and public savings can be made without too many reorganisation if the existing structures and workflows are adequately integrated before the development and implementation of digital public services begins.

8.14 Business public procurement

8.14.1 Background goals and drivers

The online public procurement services from Austria, Germany and Norway have been chosen as European good practice examples. All three cases are very different from each other since the procurement subjects as well as the procurement providers are diversified. Austria offers a nationwide proceeding for the procurement of schoolbooks. All schoolbook sellers and schoolbook publishers and the relevant authorities are integrated in the service provision as well as (until now) almost all schools in Austria. Hamburg, Germany offers a fully online local platform for the procurement of services and goods for the local public administration including the digital signature smartcard. The German law makes high demands on the official proceeding; the platform fulfils these conditions in an excellent manner. Norway offers a solution for the Norwegian municipalities for public procurement with 19 municipalities involved in the pilot phase. This system is based on 'offline' negotiated framework contracts between wholesale dealers and municipalities and offers a kind of shopping basket and catalogues.

Austria's solution which results, despite its organisational complexity, in a high uptake, has been chosen for an in-depth description. Moreover the procurement of schoolbooks is a service with defined user groups (schools, schoolbook sellers, schoolbook publishers, ministries) who are all real beneficiaries of the proceeding SBA-Online[83] is a closed user system i.e. the target groups are identified. The uptake by such a closed user group can be influenced more efficiently than with potentially unknown users i.e. by showing the users the benefits or by giving advice to use the system. Thus, this solution can be used as an example for other online services operating under similar conditions.

The online ordering of schoolbooks (SBA-Online) can be considered as a result of the Austrian Government's endeavours to promote e-Government services. This service is not embedded in a particular e-Government programme, though it is accompanied by several programmes and initiatives set by the BM:BMK[84] in the field of e-education. Before SBA-Online was created, schoolbooks were numbered consecutively (i.e. each schoolbook of a particular school subject was allocated an article number). In the year 2000, article number 9999 was reached and it became necessary to re-think the old administration system. The modernisation of the hitherto used programme would have caused high costs without gaining any remarkable optimisation effects on the administration of schoolbook ordering. Thus, the responsible players in the public administration (BMSG[85] and BM:BWK) decided to go for a new, web-based system: SBA-Online. However, there were additional reasons prompting the development of a new system:

- Schools, the BM:BWK, the BMSG, book sellers and publishers used different electronic and manual administration systems for schoolbook orders. This caused numerous media breaks and increased the complexity of administrative processes in peak-periods.
- Schoolbooks are "valuable" goods. An average Austrian school (with approx. 1,000 pupils) spends between 80,000 and 100,000 Euros on schoolbooks yearly. However, the old systems included only few analysis and control options regarding the spending of public funds and the realisation of education policy targets. Thus, the scrutiny of the allocated schoolbook budgets was highly time-consuming and required a lot of manual work.
- There were several different order forms and article lists which had to be dealt with manually several times a year and which had to be sent by post.
- Bad readability of hand-written forms caused several order failures.

[83] "**S**chul**B**uch**A**ktion-Online"
[84] Ministry of Education, Science and Culture
[85] Ministry of Social Security, Generations and Consumer Protection

8.14.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
Ordering of school books (SchulBuchAktion online (SBA-online))	Austria [86]	3+1+0	2	D	2 Ministries (BMSG, BM:BWK) IT-Office (BRZG) Chamber of Commerce Ca. 900 schoolbook sellers The schoolbook publishers Ca. 6,000 schools Austrian Post Savings bank PSK	2003: 5,620 schools of about 6,000 ~ 93 % all schoolbook sellers and publishers who are interested in selling schoolbooks to meet the above 93% (about 900 schoolbook sellers now)	Closed system with known users + centralises data from the involved participants in one system + there are more beneficiaries than the schools, also the schoolbook sellers and the publishers as well as the Ministries (bundling to schoolbook related services like i.e. financial planning, agreement about schoolbook list) + more just in time production of schoolbooks + high uptake is forecast + cost savings - paper-based invoices

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.14.3 Implementation

User service provision

To face the above mentioned problems and challenges, the online ordering of schoolbooks was developed in several phases and was implemented in February 2001. SBA-online is not only a service enabling schoolbook orders online, it is also a service where all the involved participants benefit from: The Ministries[87] monitor the schoolbook budgets and base their calculations on this service; the schoolbook sellers and publishers optimise their business operations since they receive relevant data for the production and delivery of schoolbooks earlier.

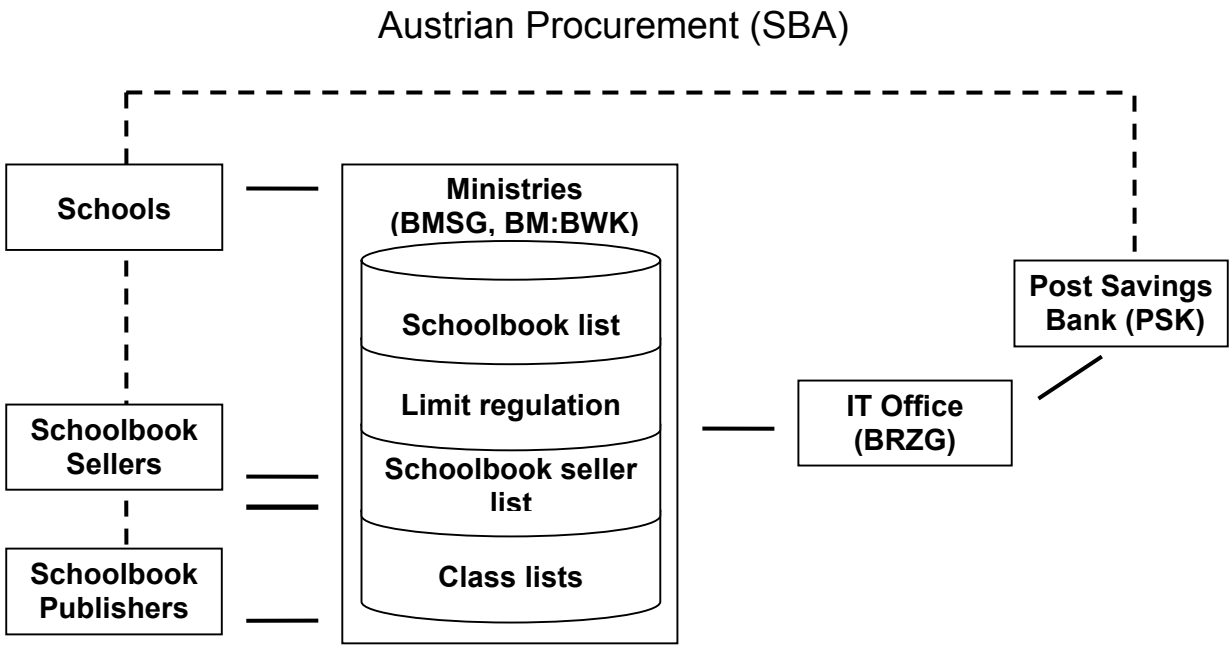
In order to make use of the service, a school respectively a school representative has to register and afterwards he/she can order schoolbooks fully online. The SBA-Online service is based upon several databases which are strongly interwoven. These databases mainly involve 1. 'schoolbook-list including certified schoolbooks'; the list is compiled by the schoolbook publishers and the two Ministries; 2. 'Limit regulation'; sets the financial frame for each school; 3. 'schoolbook seller list': this list contains all registered schoolbook sellers, and schools select their book seller(s) from the list; 4. 'class list' contains all relevant data on school subject, class size, schoolbooks, etc.

Schools select the schoolbooks either according to the subjects or the class(es) they are teaching . Moreover, they select one or several book sellers who are asked to deliver the ordered books. If a schoolbook seller has been chosen as book supplier by a school then he/she gets a note in his/her personal SBA account. The teacher finishes the order process by sending the orders to the Post Savings Bank (P.S.K.)[88]. The schoolbook publishers receive a note from the Austrian Chamber of Commerce informing them about the approximate amount of schoolbooks needed in order to plan the book production. Then, during a preliminary and a final phase[89], the schools hand out the schoolbook order forms to the schoolbook sellers who deliver the books. The sellers then cash these order forms at the P.S.K.

[86] Case report by The Institute of Technology Assessment, Austria
[87] see footnote 84 and 85
[88] via the Federal Office of Data Processing and Computing (BRZG)
[89] The two phases depend on the school year; the first phase is in June where the sellers deliver the first instalment of books and the final phase in September: when it is known how many classes and pupils a school will have, the remaining books will be delivered.

Back-office re-organisation

SBA-Online is a service based on the need for a change in service provision. Basically, SBA-Online triggered only slight modifications concerning the re-organisation of back-offices given that the new online service involves all those actors who have already been co-operating for a long time regarding schoolbook orders. The re-organisation of back offices has not been envisaged for a long time since there was no need or option for a change of organisational structures. Once the decision for an Internet-based service had been taken the involved Ministries started to develop a project team who was responsible for the development and implementation of a new online service. The organisational tasks of the project team comprised the establishment of the hotline, the training of the trainers and the development of new forms for schools without online access at that time. The technical part involved the ordering, installation and testing of the infrastructure and the programmes within the public administration. Therefore, a common database under the umbrella of the Ministries was built up including the four main modules: schoolbook list, limit regulation, schoolbook seller list and class list. Before SBA-Online was further developed, a 'user-day' had been organised to collect the users' expectations. In addition, the feedback from the hotline calls was analysed. This provided a valuable input for extended service options for teachers. Moreover, an online tutorial has been developed and provided to users. The schoolbook sellers have been integrated in the system later on and a hotline has been implemented for them. Further important steps will be the integration of e-payment for schoolbook orders and the introduction of the digital invoice replacing the current schoolbook order forms. The relations between the participants are as follows:



Indicates transactions fully operated via the SBA-Online service
Indicates transactions operated "offline" (media break)

8.14.4 Results and benefits

User benefits

According to the BSMG, the electronic order service facilitates the order process tremendously. SBA-Online has reduced the administrative complexity for schools, enables teachers to save time and costs, allows a more rapid order

processing in the BRZG and ensures that all pupils get their schoolbooks on time. Moreover, the technical infrastructure at schools has been improved with the implementation of SBA-Online.

Teachers benefit from the service in many respects. They can access the service from any place (school, home, classroom etc.) at any time. The system provides all information needed to complete schoolbook orders, reminds the users of deadlines, missing information and informs about news related to the Austrian schoolbook initiative. Furthermore, each user can trace his/her operations (status monitoring). SBA-Online enables specific search options, and users can save their enquiries as a bookmark. This allows users to access their records immediately. Book titles which are demanded very often (e.g. each school year) can be saved as "favourites". Since data records are usually based on particular classes, it is possible to detect very easily which books were ordered for which classes. The organisation of schoolbook conferences was facilitated due to the evaluation option per classes or school subjects. The automatic monitoring of the schoolbook budget enables each school to find out very easily how much of the allocated budget has already been spent. The operation of schoolbook orders has become faster which allows teachers to prepare their lessons earlier. Furthermore, each saved data record can be re-used in the following school year and requires only slight modifications (such as number of pupils per class or order quantity).

Schoolbook sellers and publishers get all relevant data at an earlier date, and production and delivery of schoolbooks can now be carried out much faster and with less administrative effort. Additionally, schoolbook sellers receive their money earlier.

Agency benefits

The Austrian Ministry of Social Security, Generations and Consumer Protection (BMSG) has had a strong interest in getting a better overview on the public expenditures for schoolbooks to ensure the optimal provision of schoolbooks as it has been outlined by law. The financial means for the schoolbook initiative are provided by a certain public fund ("Familienlastenausgleichsfonds") which is administered by the BMSG. Since the Ministry is concerned with the financial settlement of the schoolbook order forms, it desired a service delivering exact and transparent figures on all schoolbook orders, late orders, order failures etc. The officers from the Financial Control Authorities carry out their controls more easily and faster either from their desks or directly at the schools to be examined.

Certainly, it was also intended to reduce administrative costs and to optimise the expenditures for schoolbooks. According to BMSG, since SBA-Online has been introduced the expenditures for schoolbooks could be kept lower than in previous years or at least on the same level. It is important to note that this is not because the public schoolbook budget has been cut down but due to the more effective usage of public funds for schoolbooks. The overall Austrian public schoolbook budget accounts for approx. 96 million Euros each year. In 2001/2002 when SBA-Online was introduced, the costs for schoolbooks were about 300,000 Euros less than in the previous school year. Moreover, the costs for paper, printing etc. could be reduced given that today fewer forms are needed then three years ago (however, there are no exact figures available yet).

8.14.5 Lessons and good practice

Centralisation of data sources allows more qualified and faster service provision
Since all relevant data of the whole schoolbook processing is centralised in strongly interwoven databases under a common roof several services can be provided respectively accessed at the same time, e.g.:

- support of the Ministries' budget planning, which is the framework for the schoolbook provision to schools and pupils,
- provision of a solid basis to publishers and sellers for the publishing and delivering of schoolbooks
- provision of a functional system to schools for a more comfortable and faster ordering system.

Besides, the centralisation allows the schools

- an overview regarding their remaining (financial) budget for schoolbook ordering,
- searching and ordering of schoolbooks from the list and
- choosing a book seller from the book seller list
- with one single access to the SBA-Online service.

Putting a service online where all participants are known, a high uptake could be forecast

Basically, SBA-Online is a service for schools. Since all schools are known, the target group can be clearly identified. Moreover, most of the schools are public and under the authority of the public administration. Therefore, when developing and implementing a service which relates to such a closed (public) user group the uptake can be influenced more efficiently than with potentially unknown users. Besides, in these cases the uptake can be forced by showing the users the benefits or by giving advice to use the system. As the Austrian example demonstrates, about 93 % of the schools are using SBA-Online. The sellers and publisher have no other choice than going online to take part in the ordering process of schoolbooks.

Digitising a service based on the existing network of participants (instead of huge network reorganisations) can improve service performance
The new SBA-Online service emulates mainly the traditional service provision on the Internet. This means the steps for ordering schoolbooks are still the same within the existing network of participants but only in an online format. However, the service provision is highly improved for the schools as well as for the schoolbook sellers and publishers (as well as for the ministries). If users are registered to the system, respectively certified, they are connected to each other which leads to a better service performance for all without building up new service provision structures.

Technical means can be used to re-think the service provision and lead to renewals
Due to numeric constraints (article number 9999 was reached) a new system had to be developed in order to keep up the schoolbook delivery in Austria. Since the time budget was very tight, all actors were interested in gaining a common service solution as soon as possible. This provided the basis for the development of the first service options (phase 1) which can be described as an open system that has already been enlarged since then. The IT experiences of the BRZG with sophisticated service applications for a large group of users supported the realisation of SBA-Online.

Hotline increases acceptance of new technologies/services
Mainly the hotline determined the high acceptance of SBA-Online among the users. The hotline staff provide technical support and inform about the functionality of the service. This service is provided at no charge which may be perceived as an important service aspect when a new online system is introduced.

A phased implementation process guarantees time for error testing
The project development and implementation should be carried out in steps. As SBA-Online shows, the open and expandable design turned out to be a valuable strategy towards the achievement of large usage potentials. The project team holds that it is more important to define logical interfaces which may be extended at the beginning instead of focusing on the full integration of all relevant systems. This minimises the risks involved in the development of a new online service for the service providers and enables the users to get used to the re-organisation of services more smoothly. Good service performance is a premise for high user acceptance rates. The different service options of SBA-Online were tested several times in order to ensure failure-free service operation. The service providers recommend carrying out several load tests during the development phase of a service to have enough time for hardware, software and network adaptations. Moreover, the paper-based operation of schoolbook orders was still operated when SBA-Online was introduced. This helped to decrease initial scepticism since users were offered a second option at the beginning of the project. Today, this parallel operation is less and less important and will be suspended soon (see high service diffusion rates).

Training and "user day" are preconditions for acceptance
The success of each online service is also determined by the users' IT skills. Thus, clients should be trained before a new service is provided. This should encompass online training and training with experts in classrooms. Particularly, online training are indispensable when hundreds of users are to be trained within a short period of time. However, this opportunity might fail when users lack basic IT and/or PC knowledge. During the introduction phase of SBA-Online, the SBA-project leaders have experienced that only a part of the users can be reached by online training. A lot of users addressed their enquiries to the hotline. Therefore, the SBA-Online team suggests providing online training considering different levels of skills and knowledge. The training in classrooms were very successful and a valuable completion to the online support. The involvement of very interested and IT experienced teachers turned out to be a useful and fruitful aspect in the planning of training. Teachers passed on their knowledge to others, and SBA-Online has become more and more known in the educational community ("snowball effect").

Each year a "user day" is carried out which provides a very good feedback platform. Users are invited to raise any service problems, to comment on (new) applications and to put forward new or alternative suggestions concerning the extension or optimisation of SBA-Online options. This ensures a permanent communication between service providers and service users.

Cooperation of all involved participants provides the basis for integration
The initial project stage was accompanied by different user intentions and goals due to their diverse backgrounds and activities. On the one hand there are those who had a strong interest in improved financial monitoring options (e.g. the BMSG), on the other hand there are players whose interests are mainly economical (e.g. schoolbook sellers and publishers). Others had a more or less neutral role in the project development (e.g. the BRZG as a non-profit IT provider). All actors were aware that the common goal, the development of an electronic schoolbook order service, can only be achieved by consensual solutions. Thus, the development phase involved intense discussions among the involved participants. This provided the basis for the integration and the consideration of individual interests. Each actor was aware of his/her duties and of the fact that data provision is decisive for establishing a fast, user-friendly and effective service. Therefore, users have to be involved in the service development from the very beginning and should become an integral part of the project cycle. This helps also to detect weaknesses in the system, and counter-strategies can be implemented on time. Furthermore, the SBA-project team recommends saving a certain part of the project budget for later adjustments since the optimisation of service options often occurs at a later project stage.

8.15 Business environmental-related permits

8.15.1 Background goals and drivers

This cluster only covers one service out of the 20/25 services: Environment-related permits. The permit itself is only one phase in a longer chain that starts with the customer's application for a permit, e.g., to build an animal stable or a chemical plant, its approval (or rejection) which is often combined with obligations including, for instance, periodical reports about emissions into the air and into the water. Implementation of control instruments and sanctioning in the case of disregard of obligations and licenses are further processes within this "permission chain". The whole chain is interspersed with the demand for reliable information which is not only required by the state or a municipal authority but also by the applying company itself or by competitors or citizens. Meanwhile, this information is partly required for statistical purposes on the domestic level as well as on the European level.

On-line environment-related permit services are hardly developed, neither on the users' side (front-office) nor on the backoffices' side: CGEY (2003) stated that it is the lowest performing cluster with a cluster average of 44%. The only remarkable exception on the front-office side according to the CGEY-study is Ireland with its Reachservice (www.reachservices.ie). The study argued that "the centrally organized administration of Ireland combined with the important efforts of the government to develop and implement electronic government solutions explain these exceptional results" (CGEY 2003, 18).

To show the complexity of this service described with the processes covered by the "permit-chain" and with the different authorities being in charge of environmental permits, we selected a case from Finland as an example of good practice for delivering and evaluating monitoring information. As mentioned above, monitoring reports are obligatory parts of a permit, e.g., for larger industrial plants to make sure that the plant does not exceed the threshold of emissions given in the permission document. The Finnish case (VAHTI with TYVI) is innovative at least in two aspects: It integrates a very flexible "clearing-house"-solution between a large number of applicants and authorities as a module that is also used for many other services. Besides, it integrates data in a central database that is used for permit purposes as well as for information delivery about the state of the environment.

The demand to improve this service did not come like a big pressure but constantly. So far the companies (especially the smaller ones) had a lot of different systems to gather and to deliver the required information which often did not fit to the systems of the state authorities in charge of this service. Besides, the demand was indirectly increased by the costs that the suppliers had to bear.

The main medium-term goals of the Finnish case (and permit cases in general) are the following:

- Providing electronic data transfer service with *standard interfaces* to facilitate the access of a large number of customers who all have different IT applications for delivering the required information electronically; similarly, internally (and between the municipal agencies and the state authorities) a change of the technology used should be avoided;

- Reduction of costs for the applicants (and pollution report providers);
- Offering *one joint operational platform* for all the authorities working with environmental permits,
- Finding arguments and win-win-solutions to *convince* all (most) *customers to provide their data electronically*;
- Elimination of manual work between different parts of the back office by simplifying the exchange of information among the different stakeholders involved in the process by digitisation to be able to implement forthcoming new (inter-)national (EU) regulations (like shorter periods of monitoring) and tools (like emission trading);
- Facilitating better use and re-use of environmental information. In the case of electronic information systems, for the question of openness two aspects have to be taken into account because it is more complicated compared to the paper forms: The interest of the applicants who are not willing to make it too easy for *competitors* to *collect information* about their pollution reports contrasts sharply with the *freedom of information* demand articulated by citizens or NGO's.

8.15.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4 +1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
VAHTI and TYVI	Finland [90]	4+1+1	(2) to (3)	D	446 Municipalities 13 Regional envir-onment centers 3 Environmental Permit Authorities TYVI-operator as ASP Citizens, business customers, and European author-ities (e.g. EPER)	1,600 customers (of ~4,000) (for pollution announce-ments) had the opportunity to report electronically, exact figures not available (more than 50%)	Since 2003 part of TYVI-service (5 private ASPs that provide a "clearing-house" - a standard interface for several services and different software applications on the users' and authorities' side); Provides all kinds of environmental pollution and control information, which has been the conditions of the permit, from the companies (ie. environmental reporting including the statistics), Common data bases among diffferent agencies, Comprehensive information provision scheduled for 2004

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.15.3 Implementation

In this service, the user can be an entrepreneur like a farmer who wants a permit for building an animal stable, an SME that wants to mine sand or other soil material, or a big company that is applying for a permit to build a large chemical plant that has huge implications on air and water quality in a larger region. "Environmental permit" is a service mostly relevant for the regional and the local level of government because in most European countries, the municipal level of government is in charge of the "easier" kinds of permits (e.g. "normal" trade garbage, building permits combined with environmental destruction) while the regional or state level is responsible for large industrial plants.

The Finnish environmental authorities are 446 municipalities, 13 Regional Environment Centres (REC) and 3 Environmental Permit Authorities (EPA). The two last ones are part of the state government. EPA decide if impacts on the environment are remarkable, if it has multiple (air and water) effects, and if a REC is the applicant etc. (some 500 companies as customers). Pollution reports are mainly linked to these decisions. REC decide if the effects cover several municipalities (e.g. sewage cases) (some 5,000 customers). All other decisions (animal stables, slaughterhouses, small factories, all kinds of use of soil etc.) are taken by the municipalities (some 25,000 customers). By now, the latter kinds

[90] Case report by Association of Finnish Local and Regional Authorities, Finland

of permits do not include pollution reports but they are expected to be introduced in the near future. The municipal environment authorities are obligated to control air and water pollution. This structure corresponds to the need of information: National environmental permit authorities need a lot of information for each of their cases, but on the local level the amount of information is relatively low.

The customers (i.e. permission seekers) expect simple ways to receive the permits and less (better: not any) control and obligations, sometimes they even want to hide that they go beyond the permission. On the other hand, the state has to act as a regulative authority on behalf of the interest of the "whole", including, e.g., future generations and the environment but has also to fulfill national obligations within international regulations. Therefore, permits are often combined with obligations, at least pollution reports. Simultaneously, it is necessary that freedom of information is granted about comparable permissions for companies but also for the public as a whole because of rising awareness of the state of the environment.

It is the duty of the municipalities to inform the environment administration on the permits accepted by them but they have also the right to get information on the decisions of the state government. The duties of a company or another organisation are expressed in the permit. This includes the threshold values, which should not be exceeded. Pollution reports of the customers are an important part of the monitoring system of the permits and their threshold value conditions. The duty to monitor the pollution and to report regularly varies by company or customer. The potential number of customers within the framework of these reports is about 4.000. It has been forecasted that it will clearly increase in the future. Most customers have to make the report annually, some monthly. That is why the number of reports is only slightly higher than the number of customers. But there will be a fast increase of monthly reports, and there are also plans for even shorter monitoring periods.

Both the permits and the pollution reports are covered in a central database, the VAHTI. It includes decision and document management, too. The main purpose of VAHTI has been to help the regional environment centres with decision-making and control and create an integrated tool for all back offices participating in the environment monitoring. VAHTI also produces information on the total environmental pollution effects of the permits for different purposes in the society. In June 2003, the total number of environmental permit customers in VAHTI was 30,000. More than 4,000 of these customers have to submit pollution reports regularly. It has been estimated that most of the environmental permit holders must also submit similar reports in the future. Although permissions (and especially the reports) mostly depend on emissions of point sources (e.g. a chimney), the authority may not grant the permission if the pollution is already too high on the regional level or for certain substances mainly on the national level. Therefore, a central database like VAHTI is sensible which includes information since the 1970ies and provides a possibility to monitor changes in the environmental pollution over relatively long periods and meanwhile offers access to all public authorities involved in environmental permissions and monitoring. By now, the municipal agencies do not have digitised access but this is going to be possible in January 2004.

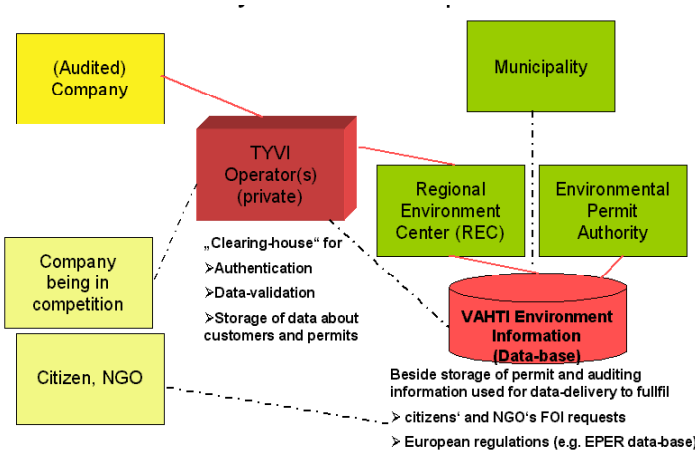


Diagram 1: The Finnish system to audit environmental monitoring as part of environmental permits (for details of the workflow, cf. the case's workflow diagram in Annex 6.)

Beside the problem to handle the content of environmental permits, the stakeholders also had to face the problem of many technical point-to-point solutions in order to match the different applications customers and authorities had. The solution was a clearinghouse-concept of TYVI that fits like a module to many different services[91]: The TYVI-service developed in the Ministry of Finance covers all important Finnish B2G and G2B information transfers as well as many G2G processes. The basic idea of the TYVI-concept is that technical changes in the organisations are not needed, and the conversion is carried out by special service operators. The data transfer takes place mainly on the application-to-application level, but also some Internet forms have been developed for smaller organisations or low volume cases.[92] The main principle is that TYVI service is free of charge for the information suppliers. The information receivers pay the cost of the service to the (five) private TYVI operators. Nevertheless, quite often also the information suppliers have internal costs, when they produce information in the format needed in TYVI service. TYVI operators provide some chargeable added-value services related to the data transfer. After login the user opens the forms he or she needs and fills them in. On the screen, the user also has the information of the previous report for re-use or control of validity. When the user has filled in the form and saved the information, the service will automatically make the first check keeping it in the TYVI service. The service will send an email on an accepted report to the inspector in charge of this customer. If the report is rejected (or data transfer not successful), the customer will be informed later by email or will have the negative feedback already during the data transfer.

TYVI is a flexible solution combining different technologies used in the various municipalities and other governmental authorities as well as in the different companies and SMEs. Almost all possible common standards are used (like EDIFACT and XML, TCP/IP and FTP, encryption with SSL and SSH, PKI).

Problems arise because it is not mandatory to make the report on the web. The alternative way is to send the paper form to the environment authority. Consequently, it has been a challenge to convince companies and especially small enterprises to use the electronic system.

8.15.4 Results and benefits

The direct costs of the data transfer were reduced both for users and the administration. This is true especially in the case of big customers, which will have more benefits in the future when using direct data transfer within different applications. In the old system, information suppliers paid the main part of the transfer costs regardless of the way it was made. For the customers VAHTI-TYVI has also increased the transparency of the environmental administration instead of the existing three-level structure.

VAHTI is editing information for national statistics as well as for other systems like the European Pollutant Emission Register (EPER). The working time for the pollution reports has decreased, too. It is also easier in a more standardised environment to develop the software that automatically produces the reports needed by the administration and other interest groups. The service makes it easier to adapt to a much more complicated future on the field of environmental pollution monitoring. The administration has much less need to save the information, which also means big savings of human resources. More automatic data transfer means less mistakes in the information itself and less critical manual saving phases. According to the persons in charge, the administration can now deal electronically with a huge amount of customers, which solved one of the main problems in the old environmental monitoring system.

The use of the existing TYVI-concept and service facilitated a big change without large investments. This allowed the administration staff to concentrate on organisational and content questions instead of the data transfer technology and applications of the customers. In general, the new system means also better re-use of the information in the administration since one of the main obstacles currently is the difference of the classifications used in the environmental monitoring and environmental statistics.

The new system has also decreased the amount of manual work between different parts of the back office. The next important development step will be in the beginning of the year 2004 when the municipalities will have their own interfaces with the system. This provides the possibility to have one joint operational platform for all the authorities

[91] TYVI connects companies, employers, municipalities, parishes, tax administration, VAT customers, exporters and importers with tax administration, custom, pension insurance companies, employer associations, trade unions, statistics Finland, accident insurance companies, church council and employers. (See also the services ”income tax”).

[92] Another way of reporting is going to start at the beginning of 2004: The environmental administration and one pulp and paper company have finalized the project where a customer can send an xml-file to TYVI operator instead of filling form in TYVI service. Already many customers build up systems to use it instead of filling the forms.

working with environmental permits. In the Finnish public administration with very independent local authorities, a good cooperation between the different levels of government is always a valuable result.

Privacy has been one of the discussion issues. Based on the Finnish legislation and differing from all other European countries (except Sweden), all the documents (on paper) are published as well as the detailed information in the permits and reports. Anyway, a company can ask to keep certain information non-public, e.g., if the application or other documents include very detailed information on the production process. The decision itself should be formulated so that no business secrets are included. The task to store and deliver information was solved by combined databases that enable access to different target groups (e.g. the municipalities and state authorities, the customers to their own data, European registers, or the public) but out of one source.

8.15.5 Lessons and good practice

Clearinghouse solution
The main lesson learnt in the development of an environmental permit process with the help of TYVI service is that in the fast changing and complex technical environment an external electronic data transfer service with standard interfaces to both directions of the back-office process is a critical success factor. An electronic data transfer solution deeply integrated in the basic databases is in most multi-organisation cases not a reasonable decision anymore. One of the best and strongest features of the TYVI service is that it works with the necessary high number of technical and organisational combinations. According to the persons in charge of TYVI, the clearinghouse system has reached the main objectives by providing a low-cost and simple solution easy to implement also in new connections.

Regulations or incentives to use the clearinghouse?
If the public administration wants to be successful in getting data electronically from companies and other organisations, the main alternatives are 1) to decide that electronic data transfer is mandatory or 2) to use the win-win principle. Regulation can be appropriate in some quite simple cases mainly inside the public administration. The use of electronic data transfer for pollution reports brings clear benefits for the big organisations with monthly reporting duty and own monitoring applications. In future, the number of small organisations in the system will increase and there will also be new customer groups like farmers. One proposal in the discussions concerning the development of TYVI was that the organisations should be paid for sending the information electronically by using the savings in the administration. Other tools under discussion are added-value services like faster decision-making processes or feedback from the administration and later deadline of the application or report. Inside the Ministry of Environment there have been some discussions on the possibility of a fee for pollution reports and then have two different categories, cheaper or totally free solution for electronic data transfer.

The advantages of a private clearinghouse
It is also important to recognise that, especially when comparing TYVI with alternatives like centralised public or public-private solutions, the whole TYVI concept provides a very wide range of expertise, which is needed when merging thousands of different applications and organisations together. Another important aspect is that the IT-companies, working directly as TYVI operator or developing interfaces with TYVI, have a better feeling for the daily problems of their customers than the public administration. Public funding has mainly been used in TYVI only to develop and start the pilot phase and later for marketing. As a result of a quite good leverage effect, it is financially almost independent.

Transferability of the clearinghouse-module
The environmental pollution monitoring system VAHTI itself is transferable, because it is based on common technology, international classifications and European legislation. Probably most countries already have something similar. Instead of trying with point-to-point and very task-oriented solutions in the B2G and G2G relations, Finnish experience supports the development of a common platform or clearinghouse more or less similar to TYVI. It is still a long way to go until standardisation can provide a common solution for all levels of electronic data transfer.

8.16 Business portals

8.16.1 Background goals and drivers

In 1998 the Swedish National tax board (RSV) implemented a technology leap which included the upgrading of the computer system and the integration of the information flows in a more process-oriented manner. This did not include digital links to the business but in 1999 a debate started in Sweden why companies not could do the monthly declarations of tax on the Internet. All individuals authorised to sign for a company had to fill in a form for VAT and social contribution on paper and send it to RSV. The pressure to make possible to do the declaration process on the Internet was a need (or wish) from the users. The RSV felt that the pressure were realistic and initiated an internal project to fulfil the demand from the users.

In Spain, the Agencia Tributaria is in charge of the effective tax and customs management at national level. The agency has always considered Internet as an excellent tool to improve the services offered to companies and citizens in general. In 1996 the first services were offered via Internet. The demand was much higher than expected. Therefore, in its Plan de Modernización (Modernisation Plan) of 1998, the Agencia Tributaria decided to include Internet as the instrument to develop its informative and interactive services, based on the proven accreditation of the user.

8.16.2 Case overview

1. Name of case	2. Country	3. User experience: on-line service score 1,2,3,4+1+1	4. Back office digitisation score 1,2,3	5. Model A, B, C, D	6. Number of stages and agencies at each stage	7. Performance: on-line proportion of total service use (incl. raw data)	8. Main summary points: in relation to goals, challenges and issues
AEAT-portal	Spain[93]	4+1+1	C(3)	D	4x3	NA	Corporation tax declaration and notification
RSV-portal	Sweden[94]	4+1+1	3	C	3x3	NA	Corporation tax and social contribution

For explanation of scores in columns 3, 4 and 5, see beginning of section 8.

8.16.3 Implementation

User service provision

In the Swedish case, the major service on the portal is related to calculation and payment of tax, VAT and social contribution on a monthly basis. By implementing the possibility for firms and organisations to deliver the declaration of tax, VAT and social contributions via Internet, all regular tax-related information as well as the actual economic transaction can be made digitally. To use the electronic tax return the individual have to obtain an electronic identification document. Posten AB (The postal service) or one of the seven major banks in Sweden can provide the individual with an electronic identification document (providing the individual has a personal identity number). The information process handling the monthly declarations means that all individuals authorised to sign for a specific firm declares VAT and social contributions on the same form and sends it to the National Tax Board. Thereafter, the form is scanned and the information is digitised and automatically put into the information system where the firm's tax account is registered. Finally, the firm's taxes are summarised and the information is sent to the firm. Almost all economic transactions are put through the bank system, where the majority of the organisations and companies have an Internet

[93] Case report by Telefónica Investigación y Desarrollo, SAU, Spain
[94] Case report by Intersecta AB, Sweden

account. Apart form these services it is possible to use the portal for company registration, Special schemes concerning VAT and download a range of publications related to the area of taxation.

In the Spanish portal 10 different services related to tax can be accessed. Information submitted by users is stored centrally so it may be reused in other services for the benefit of the user and the agency. The majority of services has been developed and implemented over the same template as the VAT declaration explained in the following. After a company has submitted its information it is informed of the amount it must pay. This can be done through the AEAT portal or by normal means. If it is done through the portal a digital signature, provided by the Agencia Tributaria, must be used. Once the signature is validated, the service connects the user directly with associated bank and the payment may take place using a NRC. When this step is finished, the company submits the declaration signed with the digital signature and including the NRC. The digital signature is checked with the CERES and trust centres and the NRC is checked with banks. If the declaration results in refund, the application sends the information to the Refunding System (standard system), where order to refund the money is generated. Before making the payment effective the system checks that the company has debts. If there was any debt, the system uses the refund to pay it.

The first telematic presentation for big companies was available in July of 1998. From January of 1999 on, it is obligatory for big companies to present the declaration via Internet. As result of the advantages showed by the use of this service, SME's (Small and Medium Enterprises) requested the same kind of services. Services for them are available since the third quarter of 1999.

To raise awareness and provide help, the Agencia Tributaria issues informative publications on new possibilities and services. The number of copies during year 2002 was 21.225.000. These publications are specifically sent to those taxpayers who are affected by specific services or measures. The Agencia Tributaria also provides instruction manuals. In 2002 570.600 manuals have been printed and distributed.

Back office reorganisation

In the Swedish case, the traditional issues of back-office activity already had been taken care of back in 1998 – when the integration of VAT, social contributions and the tax account had been implemented based on a process perspective – the work on the digitisation of the processes focused on creating functions/interfaces etc became prioritised. Functions/interface that were adjusted to the customers needs (i.e. the companies/organisations registered as a employers and/or registered for VAT). Another important area was the connection to the banks. For several years, Swedish companies and organisations normally settled their taxes at the bank (since the late 1990s, a majority of the companies used the Internet as a means of payment). Thus, in reality no need to integrate payment functions existed, since the system already was well integrated, i.e. the information system that handles the VAT and social contributions automatically also makes a registration when the tax payments were made.

In effect this meant that there were only few back office re-organisations connected with he implementation of the project. The period of implementation was quite short, only one year. This was to a great deal a result of the fact that the project were both prioritised and supported by the executive managerial bodies at RSV. The major challenge was to develop an interface for the users as well as routines that could handle the information that was registered on the website. In other words, that it was possible to transform the “new” data into to compatible strings that worked with the already existing systems.

RSV is a pioneer when it comes to component-based development. Web applications (such as "Online tax returns") are based on an Internet framework created by the RSV's architecture unit. The framework consists of a web client component and a Java-based server component. The RSV's IT department is one of the largest in Sweden with almost 600 employees providing IT support for all of RSV's activities. This department develops and administers IT support for processing tax claims, national registration, general elections and tax collection with the help of both new and well-tested technology.

The Spanish case is very similar to the Swedish in relation to the issue of back office reorganisation. The majority of processes and working routine between the different agencies involved were all ready in place before the portal was created. Consequently major challenges were related to the integration of front-end and back-end IT systems, integration to banks, security issues and the legislative frameworks.

To address both issues a multidisciplinary team was created in the Departamento de Informática Tributaria (Tax Computing Department) to co-ordinate the development. The objective was to develop and implement digital services

and suggest legislative changes that would improve service, usability and efficiency for all involved parties (including the end-users).

8.16.4 Results and benefits

User benefits
In Sweden, approximately 450 000 companies and organisations are bound by law to complete their declarations of tax, VAT and social contributions monthly. The major benefits for these users is the integration between reporting and payment, the 24/7 access and the fact that they get a direct confirmation that the declaration has been processed. At present, about 8 000–9 000 companies and organisations of 450 000 (i.e. 2 per cent of the users) use the electronic alternative to declare VAT and social contributions.

In Spain, the main user benefits are considered to be the following. Companies can take advantage of benefits provided by Internet services. The Agencia Tributaria's Virtual Office is open for the users 24 hours per day, 7 days per week. Now companies have a more flexible timetable to present their declarations. No need of physical presence allows to save the time and cost of journeys and waiting for being attended in the agency's offices. Companies can present their declarations using a more comfortable and flexible service.

Agency benefits

In the Swedish case, one of the major advantage considered was the fact that electronic declaration of tax, VAT and social contributions via a web-based form would make it possible to minimise the number of errors made by the single tax-payer, provided that the control functions and the functions that simplified calculations was integrated and included. Another important advantage was that collecting the declarations of tax, VAT and social contributions electronically implied the possibility of minimising basic back-office functions (i.e. the handling and registration of physical documents, etc).

Furthermore, the elimination of the tax declaration forms means that the resources for filing the information have decreased. Other expected benefits such as cost decreases and reorganisation has been fairly small due to the relative low number of users (only 2 percent of all users of the system use electronic tax declaration). When concerning economic benefits, every declaration of tax delivered via Internet reduces administrative costs etc at RSV with about 60 per cent.

In the Spanish case few back-office reorganisations has been made (due to the same reasons as mentioned above) but savings are considered to much higher than in Sweden, since it is obligatory for larger companies to use the digital service. Unfortunately there are no publicly available figures to substantiate this.

8.16.5 Lessons and good practice

Specific lessons

The two cases are similar in the sense that the citizens services are "built" on top of an existing and integrated ICT infrastructure between different agencies and offices. This makes design and implementation much easier than in the case where everything has to be (re)designed from scratch. Both initiatives are predominantly a response to user demands, but no users have been involved in the actual development process.

Even though the two cases are similar in many aspects, the uptake of the services is significantly different. In the Spanish case legislation has made the use mandatory for some groups, and in relation to other groups big marketing efforts are being undertaken. This is not the case in Sweden and this seems as obvious reasons for the very low uptake of the service there.

The Spanish approach with multi disciplinary teamwork in preparation and development of the services seem to a very sensible strategy since it is ensured that all involved actors have a say in the design. This is also important when hidden administrative, organisational, legislative or technical challenges are to be identified.

General conclusions

In relation to both cases the role of the legislative framework is important to understand uptake and success of the services. In the Spanish case preparatory work has been made to harmonise laws that would counter ambitions of the portal, and new laws were created to bind companies to use the service. In the Swedish case the preparatory work was primarily organisational, which meant that some legislatory issues proved to be an obstacle for success. More specifically this is related to fact that law allows only one person to sign for the firm. This person usually is the managing director or the CEO for a company. Most of the companies and organisations obliged to do the monthly tax declarations have either an economic department or a consultancy service that handles the declaration. Therefore, the person authorised to sign the firm only signs the filled in declaration. And that is a major disadvantage. In order to change this the law that allows authorised representative to sign tax declaration needs to be changed.

9 Transferability of good practice in eGovernment

9.1 Good practice in eGovernment

This report has deliberately employed a terminology which stresses 'good' rather than 'best' practice. It is important not to imply that any particular case's real life experience is the best that can be found anywhere or could have been done under the same circumstances. 'Best practice' needs to be reserved for rigorous frameworks of performance measurement where all stakeholders can agree the indicators and agree their application. The present study has not employed such an approach, nor is it one that readily lends itself to subject matter which will always be contingent upon a large number of qualitative judgements and diverse human activities under highly variable and multifarious circumstances, such as eGovernment.

For the purposes of this report good practice is thus loosely defined as highly successful practices which represent leading edge experience, though not necessarily the best, ideal or unproblematic. Good practices are also those which can provide useful learning experiences for others, likely to stimulate creativity, ingenuity, self reflexivity and the transfer of good ideas.

The good eGovernment practices presented in this report result from highly specific and unique conditions and contexts, which means that there can be no one-to-one transferability to other circumstances. However, they represent an important learning potential if contextual considerations are borne in mind and they are used to create a dialogue between peers facing similar challenges and objectives. A process should be established which:

- draws upon a number of good practices to illuminate particular challenges and how these can successfully be met
- attempts to understand their context, objectives, resources, implementation, results and lessons learnt (as presented in the good practice case reports included in Annex 6)
- seeks to synthesise good practice lessons, barriers and opportunities across cases, perhaps by developing guidelines, scenarios and roadmaps, stressing that a variety of routes can be followed to achieve specific goals which will depend upon the unique circumstances of the context to which transfer is sought
- encourages the creation of one or more 'communities of practice' in eGovernment, as part of a peer-learning process, where participants are able to assess their own situation and needs and be self-reflective about the experiences of others using:
  - on-line media: good practice database, e-fora, e-events, dialogue with other users, posting and reading comments, etc.
  - off-line methods: workshops and seminars, road shows, mentor learning, 'nearest neighbour' learning, etc.

9.2 Good practice transferability framework

The good practice strategies and issues, important for eGovernment, identified in this report have been developed from the 29 detailed case studies presented in Annex 6, the good practice service cluster reports in section 8, as well as more widely from the 115 cases studied by the National Experts.

The eight major strategy options explained and exemplified in section 6 are identified as currently being pursued within the most advanced European eGovernment initiatives. It must be emphasised that these strategies are, of course, not mutually exclusive, but represent successful major approaches in using ICT to improve services and/or reorganise back-offices which are typically combined in various ways, depending on circumstances, needs and aspirations. Similarly, the major issues and sub issues explained and exemplified in section 7 are those which seem to be critically related to good practice regardless of the type of strategy mix being pursued.

As a general guide to further study and application of the various strategies, an example of a strategy transfer matrix is given below and provides an initial mapping of strategies against certain contextual conditions and foci of action likely to be relevant to decision-makers. From this perspective, different types of strategy are apparent (numbers refer to sections in this report):

1. **Structural strategies**
   a) mainly back-office oriented strategies:
      – new definitions of workflows (deep reorganisation of back-offices: 6.2)
      – centralisation of back-office (centralisation of back-office functions: 6.3)
      – back-office clearing house (6.4)
   b) both front and back-office driven changes:
      – digitisation of largely unchanged back-offices (6.1)
      – generic types of interaction between user and agency (6.5)
      – portals (6.6)
      – de-centralisation of front-office functions (6.3)

2. **Process-driven strategies**
   a) pro-active services (6.7)
   b) greater user responsibility and control (6.8)

An example of a strategy transfer matrix

	1. STRUCTURAL STRATEGIES		2. PROCESS-DRIVEN STRATEGIES
Strategy likely to be useful	**a) mainly back-office orientated strategies**	**b) both front and back-office driven**	
1. Digitisation of largely unchanged back-offices		✓	
2. Deep reorganisation of back-offices	✓		
3. Centralisation of back-office and de-centralisation of front-office functions	✓	✓	
4. Back-office clearing house	✓		
5. Generic types of interaction between user and agency		✓	
6. Portals		✓	
7. Pro-active services			✓
8. Greater user responsibility and control			✓

The goal in each cell of the matrix is the same, i.e.:
- high quality user services in the front-office (for example, saving users time and money, easy to use, providing new opportunities, maximising fulfilment, good integration where beneficial across services and channels, etc.)
- high back-office integration as a basis for increasing productivity, value for money, dynamism, innovation, etc., reducing costs, providing better jobs and working conditions, etc.

Indeed, these two goals are mutually supportive.

10 Conclusions and recommendations

This report presents and analyses the detailed results of one of the first studies at European level to systematically research how public agencies are using ICT to reorganise, and the impact this has upon how electronic public services are experienced by citizens and business – in other words, on the changing relationship between the front and back offices. A large scale survey across the EU Members States (plus Iceland, Norway and the European Commission itself) has been undertaken, culminating in 29 in-depth case studies. The survey and the case studies reflect the many good practices found, i.e. clear and beneficial links between back-office reorganisation and improvements to front-office services.

10.1 Conclusions

The cost effectiveness, as well as the quality, of eGovernment services delivered to users depends decisively upon the degree of integration between:

- the services themselves, and how they are presented to users
- the government agencies responsible for delivering the services (as well as with non-government agencies if such are involved).

The latter typically involves the integration, or cooperation, between different back offices, and must involve the digitisation of a back office process (work flow), typically between existing so-called legacy or ERP applications which are often up to 20 years old and which form the basis of existing work flows.

'Back-office' is a term relative to the 'front-office' which, in this context, is either a user interface to an online service or a one-stop-shop office where staff assist users directly or indirectly in using the services. The back office receives and processes the information which the user of a service enters in order to produce and deliver the desired service. This may be done completely manually, fully automatically or by any combination of both. In some cases such a service is produced by one unit or back office, in other cases several back offices of the same organisation or of different organisations, at the same government level or at different levels, may be involved.

When work flows are digitised, maximum effect is produced if they are re-organised at the same time (i.e. process reorganisation or re-engineering). In fact, there may be little choice in this given the specific ICT being applied. This has further ramifications for the overall structure of the government agencies involved, including the distribution of authority and decision-making power. It is clear that the greatest benefits do not come from replicating paper based processes directly onto a computer, but rather from using the potential of the technology to re-engineer the process, to check whether each step is still necessary, whether steps might be merged, etc. In terms of cost effectiveness and the quality of service experienced by the customer, this might include a change in the way service delivery is initiated. Recently some government agencies have changed from reacting to requests to the proactive delivery of the service based on information (such as dates) available to the system, for example with the payment of child allowance, housing or other benefits. Some have referred to this as the 'disappearing' service, i.e. services which are so automated that the may not be noticed by the user, even though he or she is dependent upon them.

For many services provided to the user several sub-services through a large number of offices are often involved. The highest level of back-office integration according to the model typology used in this study to assist in selecting cases is model D, with several services, several stages and fully digitised work flows (see section 4.1.5). Examples of model D type arrangements are not common as yet in Europe (see section 5.1), and where they are found it is often where there has already been a history and tradition of relatively intensive coordination and cooperation between the agencies involved, based on the exchange of paper documents or propriety data files.

However, even in those cases with existing high levels of integration, even some minimal reorganisation turned out to be necessary when introducing electronic public services. And this was not a once off change but rather a process consisting of several change initiatives. Such structural changes concern both back and front-offices. Although each case is different from all others, this study has identified a number of organisational options, or strategies, which may serve as a conceptual framework for further comparative benchmarking, as well as for strategic planning within agencies.

The first strategic decision is whether existing coordination and integration between offices and agencies involved in producing a service can be improved without structural changes, for example, by only adding or changing an electronic gateway and electronic data interchange, or whether some degree of reorganisation seems to be necessary. (See section 6.1). However, as a first step in a long term strategy, this may be a good starting point to achieve quick results, as well as providing a platform for further steps.

In most cases, reorganisation was considered necessary to improve cost effectiveness and/or the quality of service. As several offices and agencies are invariably involved, this becomes a complex process of inter-organisational change, which is highly dependent on the character and the traditions of the organisations involved, their legal and cultural environment, and many other factors.

However, three basic options or models have been identified for **improving coordination and integration between different back-offices**:

1. centralisation of previously separated back offices by placing them under one common management, as well as by integrating data bases

2. integration of previously separated and differentiated workflows into one inter-organisational workflow to which all agencies involved are obliged to adhere, while leaving the lines of jurisdiction and assignment of personnel largely unchanged

3. setting up a clearing house as an additional office between existing agencies and offices to provide services such as the conversion of data exchange formats, integrate data bases, etc.

In relation to **improving the quality of services and the user-orientation of the front-offices**, another set of three strategies has been identified:

1. There is a tendency to combine and integrate services of different back offices with one face towards the user in portals which attract attention, give orientation, provide contextual information as well as common auxiliary (or horizontal) services.

2. As many services are built from very similar elements, standardisation of modules is a strategy which improves cost effectiveness as well as making services easier to use so that the user does not have to completely re-learn from scratch how to use a service they are using perhaps only once a year. We have termed this generic types of interaction.

3. The third strategy is to improve user orientation by bringing front office functions closer to the user by decentralising services and/or moving them into physical offices which users frequent for other purposes.

The above three back-office strategies and three front-office strategies are not mutually exclusive. For a given service cluster, all three back office strategies may be applied and may be supplemented by different combinations of front office strategy.

Within such a reconfiguration, a decision finally has to be taken about where the initiation of a process should start, who is in control of the data, who has responsibility for service levels, availability, etc. All cases try to overcome the present situation in which users are required to get obtain documents from one office only to carry them to another office.

There are thus two different directions of change:

1. In the proactive mode, the agency takes more and more responsibility and control and is more likely to initiate a service by collecting data and submitting declaration or application proposals to the user which s/he only needs to confirm. This implies a high degree of centralisation of data and may come into conflict with privacy interests and obligations.

2. The alternative option is to hand more and more responsibility and control over to the use so that they themselves are in a position to initiate a service.

With regard to the same data, either option excludes the other. But with regard to one service, one option may be chosen for some data and the other for other data. Further work is needed to elaborate these sets of options and to identify the conditions under which they are the most effective.

There are also important conclusions from the study about inter-operability and identity management.

Much of the evidence from the case studies examined in this report show that interoperability is easiest to achieve where there is a tradition of inter-organisational cooperation, and shared legacy technology. Where there is no such tradition, interoperability can be built using open standards (preferably modular and open source), retaining flexibility and knitting together the new work flows and organisational units, so that the technology and the organisation are changed at same time. As described in section 6.4, there are also 'back-doors' to inter-operabilty which allow different back-offices and agencies to continue to use their legacy systems, so that legacy technology is not 'opened up' but 'wrapped around'[95]. There is no reason why this should not be a longer term solution, where appropriate, at least until there are other pressing reasons to change the technology.

Some of the main conclusions from the cases regarding identity management are that digital signatures often create new barriers for users and keep traffic volumes low, although in some situations, like use by specialist and professional user groups, they can be successful, or when, for example, they constitute a standard horizontal function across many different services. In many cases passwords are considered sufficient for the time being and for the kind of risks related to the service in question. Take-up tends to be higher where simple solutions build on existing authentification systems (for example mobile phone service providers in Austria, SMS messaging in the Netherlands). If a pro-active service mode is adopted (see section 6.7), password based procedures become more secure, because the agency knows to whom the initiative is directed.

The extent and effectiveness of digitally re-engineering work processes, and of the back office integration involved, can be shown by:

- the completeness of the service as experienced by the user according to usability (e.g. through availability of transactions, automatic data re-use by the system, etc.) and the degree of fulfilment experienced (i.e. how much the service fulfils and satisfies real user need)
- the integration of auxiliary (horizontal) services like payment or identity management by electronic signature according to open standards (syntax such as XML, including semantics such as EDIFACT, HBCI / OSCI messages)
- the completeness of integration of sub-processes in all stages of the supply chain (i.e. technical interoperability within and between government agencies and other involved actors)
- the intensity of back-office integration , i.e. electronic data exchange only, or integration of work flows, with the highest level also enabling monitoring/tracking by the user, or the reorganisation of back-office interaction, e.g. through platform and project-oriented work
- the application of open standards in the whole service supply chain (syntax such as XML, or semantics such as EDIFACT, OSCI messages).

There are very few cases in Europe which have as yet reached this level of re-organisation and re-engineering. As the overall organisation of the production and delivery of similar services varies greatly across Member States, the preconditions for back office reorganisation are also very different. For example, Member States with a federal structure, such as Germany and Austria, have one additional level of government without a higher level decision making unit, which makes coordination much more difficult. And there are many other reasons why the provision of services is organised differently. There are two consequences following from this:

i) On the one hand, where there has been no reorganisation so far, it will be a long and complicated process to achieve at least some back-office integration and work flow reorganisation because the structure for managing the coordination process has to be established before or during such a process.

ii) On the other hand, the diversity of conditions across Europe, as well as of technical solutions, can lead to two types of benefit. Where preconditions are comparable, innovative technical solutions and changes of work flows may immediately be adopted. On the other hand, where preconditions, in particular the overall organisation of a service including its legal provisions, are different, the need to achieve enhanced quality of service, or efficiency of service

[95] Waggemaar, R,, 2003, *From legacy to modularity*, Proceedings of Second International Conference EGOV2003, Prague, Czech Republic, September 2003, Springer, 2003: discusses technical modularity ('plug and play') which provides built-in interoperability and standardisation, and the concomitant degrees of freedom and tailorability in an open platform context.

delivery, could be taken as an occasion to rethink the present situation, from scratch if necessary, and to consider a basic reorganisation of the whole supply chain.

10.2 Recommendations

10.2.1 eGovernment decision-makers: downsize the back-office, upsize the front-office

Much of the evidence examined in this study shows that a major medium to long term vision of eGovernment should be to downsize the back-office and upsize the front-office. The back-office needs to become smaller and smarter, whilst the front-office needs to become bigger and better. Downsizing and smaller back-offices in the sense of becoming more cost effective, saving resources and exploiting economies of scale and scope. Upsizing and bigger front-offices in the sense of putting the user in the centre, channelling greater resources to provide better services (perhaps saved from economies in the back office), whether these be electronic or traditional. Many of the strategies and issues presented in this report are bound up with such a way of thinking, or mindset, and many of the good practice examples and cases presented support its ramifications.

Such a mindset is a metaphor for simultaneously:
- developing high quality user services in the front-office (for example, which save users time and money, are easy to use, provide new opportunities, maximise fulfilment, are well integrated where necessary across services and channels, etc.)
- integrating back-offices, including their processes and functions, thereby increasing productivity, value for money, dynamism, innovation, etc., reducing costs, providing better jobs and working conditions, etc.

Indeed, as this report has very clearly shown, these two goals are mutually supportive.

Thus, a re-balancing (an 'e-balancing') of the front and back-offices is necessary, as part of a gradual and deliberate policy vision to move resources and re-trained staff from a more efficient and streamlined administration to direct citizen contact and service, fully within the best traditions of European public service. This can be a win-win situation for all.

This is not a question about down-sizing government – this is firmly a political decision and outside the scope of interest of this study. But it is a question of down-sizing the administration (the back-office) and up-sizing services (the front-office); i.e. a re-balancing from back to front-office, from administration to services, from control to content – preferably on a planned, continuous and relatively long-term basis. Thus, it may not be a question of an overall saving of resources, but one of freeing up and re-deploying resources to other, arguably more deserving, areas of government.

Such a goal involves the transformation of government to prioritise the production and distribution of public goods ('content') rather than public administration ('control'). As suggested by recent research[96], it also strongly implies:

- a **centralisation of back-office functions**, even up to national and international levels (without compromising the ability of local democracy to leverage those functions where local democracy is deemed to be important), exploiting open standards, comprehensive security systems, interoperability, standardisation based on knowledge management principles, integrated processes, shared databases, economies of scale and scope, etc. Steps towards the centralisation of the back-office function include the 'middle-office' and 'shared service centres'.

- a **de-centralisation of front-office functions** to provide high quality but relatively simple customised eGovernment services, based on both Customer Relationship Management and data protection principles, related to the appropriate regional or community level, grounded in local situations, responding to the large variety of individual needs citizens and businesses have, and respecting and promoting democracy at all levels – the subsidiarity principle writ large. Steps towards the de-centralisation of front-offices could include clearing-houses, building generic service models, etc., some of which may be privatised.

Although the above vision is both a powerful and practical medium-term strategy, it is not itself a panacea despite leading eGovernment policy makers decisively in the right direction. The 'front-office' / 'back-office' dichotomy can

[96] Millard, J. (2003) *ePublic Services in Europe: past, present and future – research findings and new challenges*, prepared for the EC's Institute of Prospective Technological Studies, Joint Research Centre (http://www.jrc.es), Sevilla, Spain, September 2003.

only take the debate so far, as many eGovernment issues cannot be reduced to one or other of these two categories. For example, is Customer Relationship Management a back-office or front-office function? Clearly it is both, and there are many such examples. In the sense that the debate is about the control (back-office) function versus the content (front-office) function, there has of course been a clear separation historically, but as in the future we move towards 'intelligent content', it will no longer be possible to distinguish between the two (the content will itself be in control), and the dichotomy will become redundant. Even though this is probably still ten years or more away, governance (including service delivery) will have, to all intents and purposes, outgrown 'bureaucracy'.

10.2.2 European Commission: establish a good practice exchange framework for eGovernment

To date, eGovernment implementation within Member States has tended to leave established structures and procedures in place. In contrast to the private sector, including telecommunications, public utilities and broadcasting, the European Commission has not been given any competency with regard to regulating governmental services. Although this is not being recommended here, national and regional governments, more so than in the past, should take the opportunity to learn from their peers how to improve service delivery, even accepting the need to retain different institutional, cultural and political structures according to democratic need. The European Commission should support this process. To restrict support to technical issues only will not be sufficient, given the real benefits which stem from reorganisation.

As described in section 9, a good practice exchange framework and mechanism for eGovernment should be established as soon as possible, which is open to all and both self-contained but also embedded within other relevant activities (such as the research programmes, eEurope, IDA, etc., as well as other international, national and regional initiatives). The case studies, analyses and results of the present study, as demonstrated by this report, could become an important resource of such a framework.