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

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European good practice case studies

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Volume 3: Annex 6

This annex contains the individual and detailed reports for each of the 29 cases used for analysing good eGovernment practice. One extra case has been added from Norway, but was not included in the analysis because the service was first launched in December 2003.

Most case reports contain workflow diagrams. The following explains the common symbols used.

LEGEND:

PARTICIPANT

● starting point

action

→ digital workflow

◇ selection

◉ end of process

--▶ physical workflow

(1) human keying in
(2) human checking
(3) automatically processed by the system

DATABASE
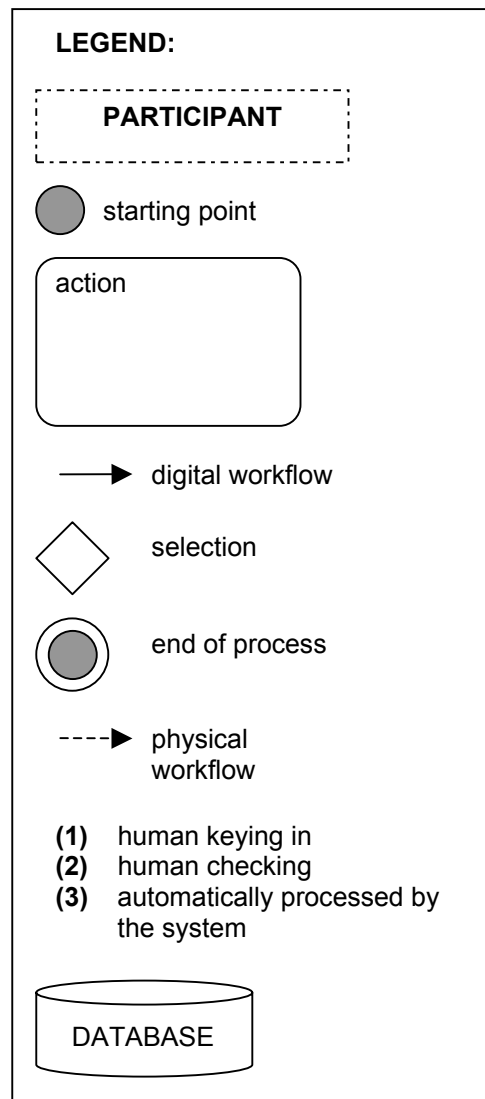
Austria

Cases 1 and 2:
Citizens change of address and portal:
The portal help.gv.at and the certificate of residence

1. Executive summary

The case describes a bundle of three electronic services: the *HELP* portal (http://help.gv.at), the certificate of residence and the central register of residence. The three services combine to an advanced e-government application integrated into a one-stop-shop for administrative procedures.

The portal http://www.help.gv.at is designed as Austria's central electronic interface between public administrations and civil society. It embraces four sub-portals, dedicated to key target groups: citizens, businesses, handicapped people and foreign citizens. Each of these sub-portals is structured according to typical life events (around 150 altogether) and offers access to a large number of information, communication and transaction services spanning across all levels of administration. A further characteristic is that on each life event a set of useful core information is offered in a standard format (e.g. on procedures, required documents, responsible agency, etc.), as well as links to the relevant public administration bodies and forms for download. As such, *HELP* serves as a hub which advises and channels users in each of these life events to the competent authority and online services. *HELP* offers significantly improved user-oriented guidance in administrative contacts to citizens as well as businesses, facilitates and simplifies them, and allows for faster and more flexible delivery of an increasing range of administrative services, especially where they include full online transactions.

Run by the Federal Chancellery, the portal is a front-end that integrates services provided at national, i.e. federal level ("Bund"), provincial state level ("Laender"), district authorities at regional level ("Bezirkshauptmannschaften") and municipalities ("Gemeinden") at local level. These can be accessed via their own URLs as well. Among others, *HELP* includes the *certificate of residence* as one of the most advanced transaction services provided at national level. To date, most other transactions are provided on a lower administrative level (regional or local) and thus provided by particular state administrations, district agencies or municipalities. Therefore single-sign-on and user accounts are not yet part of *HELP*. Nevertheless, some services on "Laender" level (e.g. Land Salzburg) save the user's personal data secured with login and password, so that it does not have to be re-entered. Until 2005, out of the e-Austria initiative within e-Europe, the *HELP* portal is intended to include all administrative services as online transactions.

The *certificate of residence* is a brand-new model application which is accessed via HELP. Such a certificate is required by many institutions like social insurances, schools, universities, insurance companies, etc. as a proof of regular residence. The online service offers its full electronic transaction. It offers choice between user identification/authentication via electronic signature on smartcard ("Concept Citizen Card") and via a mobile phone-based option ("Citizen Card Light"), requires access to the *central register of residence* or *population register* (ZMR: Zentrales Melderegister), and includes online payment of charges and secure electronic delivery. The service represents the first practical implementation of standardised software modules and specifications developed by the CIO (Chief Information Office), department 'Technology & Standards' of the ICT Staff Unit of the Federal Chancellery. Before the reorganisation of the registration, citizens had to register with local police authorities using three registration forms. Since the establishment of a central register of residence, only one paper form is issued at change of residence, and certificates of residence need to be applied for at municipal registry offices whenever required, either in person or online. Such certificates are frequently demanded by citizens because they are required for many applications at social insurances as well as educational institutions. However, due to the fact that the electronic service has only been offered shortly before the summer and the traditional holiday period, no sufficient indication of use is available by now to build

on any user figures and experience. Moreover, issuing a certificate of residence in conventional form (in-person at a registry office) is at least € 13 cheaper than the online version with charges of € 16 on average, up to now. However, the extra charge for online applications will be abandoned with the new e-government law planned to enter into force on the 1st of January 2004. The positive aspect of this service is mainly its successful demonstration of the practical implementation and operation as a pilot application of the core concept for future services based on the integration of advanced service modules.

The third key element of the service bundle in the present case report is the connection with the *central population register* which allocates a registration number as a unique identifier for every citizen. This identifier is used, in a two-step process, as the basis to authenticate the identity of an applicant for a certificate of residence, and the register also serves for information retrieval (details of residence). The draft e-government law tries to cope with the significant risks to privacy involved in the use of a central register number and employs a strategy which builds on two pillars: *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 the application area.

While *HELP* is an e-government portal which already integrates a large number of services and increasingly also integrates back offices across different levels of administration (back office model D), the *certificate of residence* represents back office model C (i.e. one service, multistage) and principally integrates five back offices of public and private entities (HELP office, ZMR, local registration office, payment service provider, mobile phone service provider). *HELP* was selected as good practice within this study because of its outstanding, user-oriented portal design which was awarded the eEurope Award 2003 in the category "A better life for European citizens". The *certificate of residence* was chosen since it represents a model case for advanced e-government services because of its modular design principle, its integration of electronic signature, payment and flexible electronic delivery components as well as the innovative integration of mobile technology for broader access to advanced e-government services.

2. Background

HELP was created in 1997 as an aid for official administrative or governmental contacts. Structured according to life situations such as pregnancy, birth or marriage it gives detailed information – in a standardised form – on the related official procedures, e.g. information on administrative processes and responsible agencies, required documents, fees, deadlines, etc. Additionally it offers forms for download and printing and the possibility to make individual requests. The motivation was to provide a single point of entry for citizens who do not need to know which authority is responsible for a certain issue. HELP is therefore best described as a virtual guide through the world of administration. It is an interface to 12 federal ministries, 9 states, 80 district administrations and 2359 municipalities. It has evolved from a pure information to a communication platform, and a number of transaction services have already been added up to now.

Via HELP, the certificate of residence can be requested and processed fully online. It serves as a pilot project for modular e-government services. The advantage of modular services is that in case of changes in technology or regulations, modules for sub-processes can be easily changed and upgraded. The application as a whole stays unchanged. Standardised prefabricated components are also much easier to implement than new solutions to be developed. The applications have been tested and documentation is publicly available. The ready-to-use modules are therefore expected to stimulate the supply of e-government services because it allows such services to be built easily and fast.

Four actions are specified by the e-government strategy and demonstrated by the online certificate of residence:
- Filling in an application form online which is based on the Austrian e-government form style guide as an instrument of standardisation
- Identification of the user and signing of the application data
- Electronic payment of charges
- Secure electronic delivery of a document which can also be used as a printout in paper form.

These four actions are defined as essential part of every future administrative service in Austria. They are designed to make e-government as user-friendly as possible, while at the same time complying with strict data security and privacy standards.

Long-term goals are to demonstrate the user-friendliness and practicality of e-government services, thus stimulating their acceptance. The most important aspect of this pilot project is to show the practicality of the so-called Concept Citizen Card. This is a smartcard containing the personal signature key of the user and information for finding personal information in the central registration database ('personal identity link'). This central register of residence is the backbone of future e-government applications in Austria because it holds the names and addresses of all natural Austrian citizens. It is used to unambiguously establish the identity of a user.

The electronic central register of residence was started on 1st of March 2002. Until then, citizens had to register their address at the local police headquarters because Austrian law stipulates that residents have to be officially registered. These decentralised records have been digitised and merged in one single national database. Yet, local registration authorities still keep their own records and act as contact points for the registration and the notification of changes of personal or address information. Changes are electronically reported to the central registration authority immediately.

The objective for the completion of the central register of residence was to have one consistent, central database. The content consists of personal and residence information of every citizen. Personal data include name, sex, date and place of birth, address, nationality and the personal identifier ("ZMR-Zahl"). The complete address, along with the date of registration and the name of the accommodation provider are the residence information. The personal identifier is the ultimate key to correctly identify a person in an administrative procedure.

Out of data protection considerations, the central register was also faced with criticism for its ability to centrally store and make available citizen information, with potentially increased risks of misuse. On the other hand the initially poor quality and redundancy of the data in the register has also raised concerns that problems for the quality of services provided on this basis might arise. The question was raised what would happen if the data of the register contradicted the data on a person's Citizen Card.

3. Specific objectives

The five main objectives of the HELP portal were:
- HELP was designed to provide one single point of access to the administration and a user-oriented structure. Regardless of which authority is responsible, the portal forwards applications, requests etc. automatically to the correct authority.
- Correct and up-to-date information was another objective. For the time being, information on approximately 150 life situations is updated regularly and adapted to legal and social developments.
- To facilitate communication with citizens, HELP offers various channels of communication. Users can also submit questions via "Questions and Answers" and they are regularly asked for their opinion by the HELP-questionnaire.
- The section "Official Proceedings Online" ("Amtsweg Online") offers online official procedures and also supports participants from different administrations (authorities on federal, state, regional district and municipal level) with the development of online-services. The objective is to provide all official procedures via WWW by 2005.
- Online access to the administration for all aims at giving everyone the opportunity to use the services of HELP. Therefore HELP is accessible via public access terminals and is available in English with more languages soon to follow.

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. Until 2005 the portal should deliver every administrative service online.

The certificate of residence is a first example and pilot project to be accessed at an Austria-wide level, with the City of Vienna as a partner for this pilot stage. The objective of this service in relation to users is to provide a fast and easy-to-use service for obtaining a certificate of residence which is frequently required by organisations like universities, libraries, insurance companies or other administrative agencies.

Still, as long as the demand for e-services is not more clearly articulated and as long as further applications for which there is a real demand potential will yet have to be created, the critical mass for an interest to obtain Citizen Cards is lacking. Such electronic signature cards are far from being broadly available up to now. Therefore the aim of the certificate of residence was to utilise a technology with high penetration and consequently low access barriers in Austria. The uptake of signature cards and similar technologies is expected to rise as more and more administrative services using signature and encryption are coming to the net. In the case of the *certificate of residence* the mobile phone has been chosen as an alternative strategy: Via Austria's largest mobile phone provider Mobilkom Austria (nearly 50% market share) the service is also offered with identification and authentication via mobile phone, i.e. without the need for a smartcard independent of the chosen mobile provider. The service set out to prove the technical viability of the concept and the interaction of all components which have not been used in a real life service.

4. Resources

Maintenance costs including minor development tasks (e.g. redesigning data entry forms) for the HELP platform amount to about € 1.2 million per year. Personnel attached to the core team of HELP consist of eleven persons. Five, of the private company net@value, do editorial work and answer user requests. Four persons of the Federal Data Processing Centre ("BRZ") are responsible for the technical operation and two persons represent the Federal Chancellery.

Depending on individual projects and activities, an extended working group consisting of more than 100 persons can be assembled. For "Official Proceedings Online" there is one person in the Centre for Public Administration Research. Additionally, about 150 specialists from the administration, the Austrian Chamber of Commerce and the Federation of Austrian Industry review HELP contents and answer user requests.

HELP is operated by the Federal Data Processing Centre (http://www.brz.gv.at) in Vienna. It runs on a scalable high-performance web server configured as a cluster (with two servers) which uses AIX (a derivate of the UNIX operating system developed by IBM) as operating system. An Apache Web Server and an Oracle Application Server manage web-based official proceedings, online form data validation and the delivery of forms to the responsible authorities. The servers connect to an Oracle database for the management of the HELP content, links, public agency address registers, the generation of procedures, etc. The overall availability of HELP in 2002 was 99.14%. Because of maintenance, power outages, etc. the site was unavailable to users for a total of only 75.25 hours during the last year.

Open standards and technologies tackle the problem of heterogeneous technical equipment. The application development follows W3C standards (XHTML, CSS, WAI, XML, SOAP, etc.) and employs the portable Java platform. Conformance to open standards (technologies, methodologies, structures, and formats like e.g. Person Data Record, Online Applications Structures, Delivery Data Record) defined by the CIO is obligatory for Austrian e-Government portals and applications because it ensures interoperability between the applications of different service providers. It also facilitates application development so that more services can be offered to the public.

The secure environment of the Federal Data Processing Centre provides a high level of data security. Data transmission is protected by encryption and the obligatory SSL standard. For all other services but the certificate of residence, user authentication is still achieved by username and password but the support of electronic signatures has been prepared for years and is currently tested.

For the generation of a certificate of residence, the service employs software modules which have been developed by the Operating Unit of the CIO. This agency provides specifications and solutions which implement the Austrian signature law and conform to the draft of the e-government law. The server modules (Modules for Online Applications, MOA) conform to open standards and its specifications are publicly available. The modules which are coded in Java facilitate message-based communication between applications using SOAP as transport protocol. Due to the use of existing modules, the development of the certificate of residence took four developers only 14 days.

For user authentication by signature card, the software of the smartcard also communicates with the server modules via XML messages. Since XML is used as syntax and an XML file only contains ASCII text, it cannot transport viruses and therefore is not blocked by firewalls. As international standards, SOAP and XML allow communication between applications regardless of programming language or operating system. Interoperability between government agencies or applications is therefore ensured. XML is also readable for humans and can easily be transformed into formatted documents for printing, e.g. as official notifications. The official specifications of the MOAs call for scalability and

24x7 hour availability. Testing has been completed in July 2003. Since then the modules 'ID' (identity verification), 'SP' (signature verification) and 'SS' (server signature) are available as version 1.0. Together with the Citizen Card, the modules implement a PKI for Austrian e-government. While the Citizen Card represents the client side, the MOAs enhance administration servers with public key encryption and digital signature.

In order for a secure authentication to become reality, the draft of the Austrian e-government law specifies that every person in the central registry must have a unique basic identifier. The aim is to correctly establish a person's identity when dealing with administrative authorities. However, the same identifier must not be used in different administrative procedures. Therefore an application in a specific area of the administration deduces a new identifier from the basic identifier. Identifiers are derived in a mathematical one-way function, which does not allow finding out the person's main identifier. So, one person is represented by a different identifier in every area of the administration. This mechanism is intended to make it impossible to trace a person across administrative procedures. On the other hand it complicates the interconnection of administrative procedures across different sectors of the administration. However, this concept is largely theory so far and has not yet been sufficiently tested in practical use.

On the user side, three prerequisites are required:
- Possession of a digital signature (smartcard or customer of a mobile phone provider)
- Registration with payment provider for online payment
- Registration with delivery service

For agencies, participating in Official Proceedings Online requires:
- Access to the Internet and Email
- A homepage and the possibility to link from a life situation in HELP to this page
- Usage of the automated maintenance of links
- A page displaying information for users about online procedures, costs etc.
- Readiness for administrative innovation
- Adoption of existing procedures of Official Proceedings Online if within competence of the agency

5. Implementation

HELP started out as a pure information pool on public administration agencies. Official proceedings, responsible authorities, documents to be presented and fees to be paid were listed. One problem was that the Austrian administration and public had little knowledge of HELP, and uptake therefore was minimal. Awareness and usage had to be encouraged both in the public and the administration. A practical measure was to give HELP a new design and a new word-picture-brand. Therefore, an advertising campaign was launched already in 1998 by the responsible Federal Minister. The campaign included all types of media and was accompanied by a PR-campaign to increase the brand awareness of HELP. In order to raise awareness within the administration, events like exhibitions, lectures and seminars were staged throughout the country.

To improve access of citizens to HELP, those who do not have a connection to the Internet have to be included, too. More than 1000 tobacconists' shops offer the download and printing of forms for a small fee. In Vienna public access points, so-called Info-Columns were set up. These terminals can be used to surf certain websites, including of course www.help.gv.at. Additionally, at least 60 Internet cafés across Austria provide access to the net.

To meet the objectives mentioned above, HELP takes a pronounced user-oriented approach. Using life situations as access points allows the user to find information equally fast as access to a transaction service under "Official Proceedings Online". Ease of understanding is enhanced by the five member editorial team that keeps the site up-to-date and responds quickly to changes of laws and citizen requests. HELP Coordinators from different ministries control the accuracy of the content. User requests which do not fit into the framework of life situations or very specific questions which are not covered are primarily handled by the communications services of HELP. Unstructured requests still have to reach the appropriate authorities. Additionally, services like question-and-answer forums, a form service and a dictionary of governmental terms were developed. The Q&A forum resembles the structure of HELP in so far as a corresponding forum exists for every life situation. Most requests are immediately answered by the editorial team of HELP, others e.g. "establishment of business" are hosted by HELP Coordinators from a federal ministry. HELP visitors are also invited to share their experience and give advice to users.

HELP focuses on its target groups with different sub-portals for "Citizens", "Businesses", "Disabled Persons" and "Foreign Citizens". The Federal Chancellery, the Austrian Chamber of Commerce, the Federation of Austrian Industry and the Federal Ministry for Economic Affairs and Labour cooperated to provide all relevant content and explain official proceedings to businesses. On the other hand, HELP for Disabled Persons supports handicapped people, relatives and nurses at handling official proceedings for their patients. In order to improve accessibility of web contents, the Web Content Accessibility Guidelines (WAI) of the W3C were implemented at conformity level "A". Currently work is under way to reach "AA", and subsequently "AAA" will be headed for. The project is coordinated by a team at the Federal Chancellery with representatives from several organisations for disabled persons and from the Federal Ministry for Social Security and Generations. In order to provide barrier-free access, WAI guidelines call for:

- Alt-tags containing text descriptions to be added to pictures
- Tables to be modified, e.g., that data cells and headers can be connected with each other
- Colours with sufficient contrast to be chosen
- Links to be underlined
- Texts in foreign language to be labelled with the respective abbreviations (e.g. de, fr).

Networking and linking authorities is a special focus of HELP. Administrative agencies can be reached via automated and permanently updated links, e.g. for information on office hours and responsible staff. HELP is also closely linked (more than 40 links) with the EU-Portal *public-services* (http://europa.eu.int/public-services).

In 2001, HELP began with first steps to integrate transaction services. In cooperation with interested cities and municipalities, a team with experts from the Federal Chancellery, the Federal Data Processing Centre and the Centre for Public Administration Research chose selection criteria for online official proceedings such as:

- Frequency
- Simple official proceeding
- Utility for citizens and administration
- No concerns about data protection or privacy
- Focus on target groups

In spring 2003, the selection and implementation of online official proceedings started. The aim was that at least one service should include e-payment or the use of a digital signature, and one proceeding should focus on businesses. Cities, municipalities and district administrations collaborated to initiate a number of e-government projects. By March 2003, 90 local administrative services were offered. Moreover, the unification of forms and processes has spurred administrative reforms. The HELP Council and special partner meetings, held twice a year, serve as coordinative bodies.

For the integration of an administrative procedure, HELP provides a web space on its server, the necessary online forms and an electronic inbox for every partner agency. The platform acts as an intermediary who, if a user has submitted an application, stores the form data in the HTML or XML file format and sends an automated email notification to the relevant authority. The XML file format is mostly used by larger municipalities or cities where the data is automatically fed into workflow systems. Smaller agencies download data as HTML files. The application is then processed electronically or paper based, according to the capabilities of the agency. A payment solution was realised by "bezahlen.at", a private payment platform which provides electronic bill presentation (EBP). Invoices are not mailed to the actual user but electronically transmitted to the EBP provider who stores and presents them to the user. The user settles the account by periodically transferring the accumulated amount to the payment provider. Also the payment method using mobile phones was integrated: 'Paybox' (www.paybox.at) users confirm the payment-process via their (personal) mobiles with a PIN.

As the official platform provided at federal level, HELP cooperates with the federal states in the Joint Federal and State-level Working Group. A major aim is to harmonise processes and forms. It has developed an official style guide (http://reference.e-government.gv.at/) for e-government forms which is successfully applied by authorities and private suppliers of public administration software. In a European context, HELP participates in the IST-project number 2000-28471: "eGov: An Integrated Platform for Realising Online One-Stop Government" through the Federal Chancellery and the Federal Data Processing Centre. The portal won the eEurope Award 2003 in the category "A better life for European citizens" besides other aspects for its integration of transaction services. At present the range of services *for citizens* includes:

- Income taxes: declaration, notification of assessment
- Job search services by labour offices

- Personal documents (passport and driver licence)
- Declaration to the police (e.g. in case of theft)
- Public libraries (availability of catalogues, search tools)
- Other education and training related services
- Announcement of moving (change of address)
- Transport-related services
- Services related to the elderly
- Services related to the disabled
- Services related to the policy development and decision-making process
- Lost and Found service

For businesses:
- Corporation tax: declaration, notification
- VAT: declaration, notification
- Registration of a new company
- Submission of data to statistical offices
- Customs declarations
- Environment-related permits (incl. reporting)

Levels of administration agencies involved are:
- Local
- Regional
- State (sub-national level in federal system)
- National (federal level)
- Pan-European

The portal integrates back offices across different levels and sectors. Vertically, different levels of government are integrated by providing services of states and municipalities. Horizontally, various services at the same level of government are also provided. The platform also integrates government and private sector as well as third sector back offices (i.e. non-public and non-profit).

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 of 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.

The new registration system required a digitisation of workflows on national and on local levels. 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 ask 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 only 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. However, it is not an official document like the old certificate. On the other hand, the old certificate which most people who have not changed their residence since the launch of the central register still possess need not be accepted by administrative institutions. In this case the applicant has to obtain a certificate of residence. For this the citizen has to authenticate himself at an office of the registration agency. There he receives the certified printout with his registration data just as if registering anew. Depending on the purpose of the application, different charges have to be paid. For the presentation to an administrative agency € 3 is charged. The use for social security services is free of charge. 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 raise the costs of e-government for citizens significantly, the draft e-government law specifies applications per WWW as not requiring extra charges. The

registration with the payment provider Paybox costs € 15 per year with no extra charges per transaction. Paybox is a partner for the demonstration of the upcoming standard for electronic payment confirmations. The Electronic Payment Standard 2 (EPS2) [1] will allow integrating familiar internet banking interfaces into administrative websites for payment by bank transfer.

In the process of obtaining a certificate of residence, *four different steps* have to be fulfilled. These steps will be the same in every future e-government application. *First* the user has to fill in the online application form. The form for the certificate of residence, as well as all other online forms for national services, complies with the official style guide developed by the CIO in cooperation with authorities of the Austrian cities, federal states and local communities. Regardless of the character of the agency, the style guide ensures the uniform appearance of all e-government forms.

Second, if required, as in case of the certificate of residence, the user has to be identified and to digitally sign the application. For this the user has to allow the server application to extract his identity link ("Personenbindung") from the memory of the signature card or from the storage place on the server of the mobile phone provider if the Citizen Card Light is used. The browser then displays the form the user has filled in with his personal information added by the server. The user does not enter any personal information himself. The server module uses the identifier from the signature card to search the central register of residence for the user's personal information. In the next step the user signs the form using his signature card again (including the entering of a PIN) and submits it. The Austrian PKI specifies that the application form is signed by generating a hash value of the message and encrypting it with the sender's private key.

Since the uptake of signature cards is very low at the moment, the CIO in cooperation 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. 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. Currently the application is being extended to customers of other providers or prepaid phone users who register personally with their identity card for an A1.net account to receive a digital signature. Whether this solution is a temporary or permanent one will depend on the uptake of signature cards.

The process of the identification by mobile phone (see attached workflow diagram) differs from the Citizen Card in the way that when submitting the online form, the user is redirected to a page at A1.net where he enters his mobile phone number. The user is then identified and the form, complete with his personal data, is displayed. The user receives a short message (SMS) on his mobile phone containing a TAN. By entering his PIN and TAN, the user initiates the signing and sending of the form.

The *third* and next step for the user is online payment. In the case of the certificate of residence, the application is processed immediately, because accessing the central database and generating the certificate is achieved in a matter of seconds. At the moment only the Paybox system is integrated into the service. Paybox is a private payment provider which allows registered users to transfer funds from their account. The Paybox system calls the user's hand phone and asks for authorisation of the payment, which is given by sending an SMS containing a PIN. The payment application then sends a payment confirmation to the administration's application which hands the certificate over to the delivery service of the user. Payment confirmations are standardised XML messages conforming to the Electronic Payment Standard (EPS2).

The *fourth* and last step in the process is the delivery. Electronic delivery of official notifications as specified in the draft of the e-government law can be fulfilled by privately run services. This does not violate privacy requirements because the design of the delivery process does not allow the delivery service to read the content of the delivered documents. (See also specification of electronic delivery on http://www.cio.gv.at/onlineservices/delivery)

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[1] http://www.cio.gv.at/onlineservices/payment/eps-v20-20031001.pdf

Workflow of certificate of residence - Austria

one stage | multi stage

USER	NATIONAL PUBLIC ADMINISTRATION		LOCAL PUBLIC ADMINISTRATION	PRIVATE BUSINESSES	
	Portal help.gv.at	**Register of Residence (ZMR)**	**Local Registry Offices**	**Delivery Service (w-deliver.itsolution.at)**	**Payment Provider (Paybox)**

Sends online form

Provides interface for application and user authentication* **(3)**

Checks identity and authenticates user, (returns domain specific identifier) **(3)**

Feed registry with residence data **(3)**

User is redirected to payment provider **(3)**

Enquires TAN via hand phone, sends payment confirmation to BO **(3)**

Generates certificate and delivers it **(3)**

Logs on to delivery service and downloads certificate **(3)**

Sends notification, that a document is waiting or delivers by postal service **(3)**

Receives file, printout or letter **(3)**

Workflow of user authentication by digital signature - Austria

USER	NATIONAL PUBLIC ADMINISTRATION	PRIVATE BUSINESS
	Portal help.gv.at	Mobile Phone Provider

(3)

Selects "Citizen Card Light" as method of authentication, fills in form

(3)

Receives form data and redirects user to site of mobile phone provider, enters phone number

(3)

Looks up personal data, puts data into form

(3)

Presents form to user, along with charges, asks if form should be signed and submitted

(3)

User receives short message containing TAN, initiates signature with TAN

(3)

Signs application and sends it to registry service

(3)

Instructs registry to process signed application if payment is confirmed

(3)

The user receives a notification from the delivery service that a certificate is waiting to be downloaded. He has to authenticate himself once again with his signature card or via mobile phone. This ensures that only the authentic receiver can download the certificate. The waiting document is an encrypted XML file which can be downloaded to the user's computer, saved in a secure data box or printed on paper in legible form. The printout shows the public signature of the agency, which can be used to call up the certificate of the agency to authenticate its identity, and the hash value of the document which verifies its content. This paper version of the certificate can be presented to other administrative agencies. If required by the agency, a delivery confirmation is automatically returned for the receiving of the certificate.

Because of the digitisation, from the user's perspective the service has mainly changed in that the citizen saves time and does not have to travel to his local registry office with limited office hours and is not facing a break of media. The service is now available around the clock independent of office hours. For the 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 maintained on national level.

The management of the project is embedded into the activities of the CIO. Software applications and specifications are developed by the Operating Unit. Coordination between administrative agencies is achieved by the so-called Chief Information Officers of each Ministry who gather as the ICT board headed by the federal chancellor.

6. Results

Since the launch of HELP, user uptake has steadily increased from 19.778 in January 1999 to 220.064 in January 2003. In the same period, the average duration of a visit increased by about one minute. While HELP started with 15 different life situations in 1998, it now features about 150. The portal is accessed mostly during working hours, i.e. from Monday to Friday, and 65% of the users visit between 8:00 a.m. and 5:00 p.m. HELP for Businesses, which was launched in January 2001 and offers about 50 life situations, enjoyed 4876 visits with an average length of 6:18 minutes. The forum "Questions and Answers" receives 5.524 entries per year and is a source of suggestions and feedback for HELP. Frequently repeated questions have been collected from the beginning on to be converted to FAQs (Frequently asked Questions). The list contains 15 FAQs and answers for about 93 life situations. About 250 contact persons from different levels of the administration contribute to the platform as members of HELP. They are invited two times a year to coordinative meetings. During these meetings opinions are exchanged, information is forwarded and work schedules are set up.

Currently, the Official Proceedings Online service has 23 partner municipalities. About a dozen official proceedings can be handled completely via the Internet. The Austrian government has announced to offer all administrative proceedings electronically by 2005. The development and implementation of online services in cooperation with administrative authorities often requires administrative reforms and reorganisation. Agreement on standards for forms and routines which are based on heterogeneous state regulations should be mentioned as an example as well as the simplification of the registration of businesses. In the case of the latter, the central register of residence substitutes the residence registration form and the proof of citizenship for the founder of a business.

HELP also uses the central population register for the generation of a certificate of residence. So far, the online certificate of residence has not had much impact on users, mainly because of the following reasons: the main reasons are the required legal adaptations by the e-government law which is planned to enter into force on the 1st of January 2004 (therefore the service is not being pushed before this date except for testing and pilot usage); secondly, higher charges than for service in conventional form (€ 13 plus on average, which will also be abandoned with the new e-government law); and finally the low diffusion of digital signature smart cards. At the same time, the portal www.help.gv.at itself has had enormous impact on citizens, which is reflected in the monitored user satisfaction.

Cost savings for the 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 of a digital and conventional delivery or even below the latter. In any case, costs below the current level are seen as realistic.

As a model case for future e-government services, the automated certificate of residence employs the same usability guidelines as the HELP portal. Conformity to the Web Content Accessibility Guidelines of the W3C assures that certain groups of disabled persons can use web documents. Further, all online forms are designed according to the form style guide of the Joint Federal and State-level Working Group.

In relation to back office reorganisation, changes were brought about by the establishment of the central register. From the police stations, which were formerly responsible for keeping residence data and recording changes of address, this responsibility was shifted to municipal offices together with a switch to computer-based data entry. The new system facilitates the task of updating the citizen's addresses and runs without keeping copies of the forms of residence.

For users, 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. Usually it costs € 3. The fee of € 13 for an application in written form will be avoided in future by treating online applications like oral applications which are free of charge.

Therefore current uptake of the online *certificate of residence service* and its prospects are somewhat difficult to assess at the present stage, mainly for two reasons: *Firstly*, the use of old certificates is still prevailing since this is possible in all cases where no change of residence has occurred. This will change as the share of this group is diminishing. *Secondly*, the higher costs for users, due to the additional fees for online applications, are a prohibiting factor. Their removal depends on the entering into force of the new e-government law which adapts the legal preconditions accordingly (expected by January 1, 2004). Because of the reasons stated, the number of certificates requested offline is not very high at present. Around 300 per month are issued.

7. Learning points and conclusions

HELP is a well designed and managed platform, considering the large number of actors, who contribute to the project. The core team that governs HELP consists of the Federal Chancellery, the editorial team and the Federal Data Processing Centre as the technical partner. The participants meet twice a month to discuss and coordinate current projects. Even though cooperation is voluntary, agreements and meetings have to be laid down in writing. This is done in order to strictly distinguish between workflow processes and competences of administrative agencies.

To make sure that the content of HELP is correct and users receive valuable information, employees of the public administration have been recruited for the project. Persons from ministries and other authorities help with the preparation and review the documents of the editorial team. The collaboration of experienced public administration staff is essential because officials who routinely execute regulations know proceedings and pitfalls very well. They are also the first to be informed of legal changes. Therefore, in 1998 the Austrian council of ministers decided that every ministry has to nominate a HELP Coordinator as an expert for issues concerning his ministry.

Critical factors for the development of advanced e-government services are the low diffusion of digital signature cards among the public and the necessary adaptation of legal regulations. Official Proceedings Online therefore takes a more careful approach and does not aim for unrealistic goals. Services that are suitable for online delivery have been identified. Other services have been reorganised but not selected for online execution. Renewals or issuing of passports for example are processed very efficiently without a higher level of electronic service. Applications can be submitted to passport offices at municipal level and passport departments at regional district authorities respectively. The document is produced immediately within very short waiting time, so for application and collection the citizen has to visit the agency only once. It was therefore decided that an electronic transaction for a passport currently would not significantly benefit citizens. In contrast to the certificate of residence which can be obtained entirely online, a passport requires delivery of a physical document which can be combined and achieved with a single visit to the issuing office. What HELP offers online is detailed advance information on the procedure and on other issues around the document and, at least in Vienna, scheduling of appointments. Most recently, the possibility to file applications in advance of the visit at the office has been created.

One of the biggest problems that emerged concerned the payment of charges. One question was how to check the purpose of the certificate of residence. Since the amount of charges depends on the institution the certificate is presented to, the user entry in the appropriate form field has to be verified. Also still unclear is what happens when a user cannot print his certificate although he has paid his fees, e.g. because of technical failure. The problem how a payment can be revoked is still unsolved.

The currently implemented Paybox system of the online certificate of residence is not a very popular method. Although it is relatively fast and save, it also charges the user extra transaction fees. Alternative payment systems are currently not available because the internal organisation of the agency does not allow assigning payment flows to specific departments or cases. Currently, a transaction database is being developed which will make credit card payment and bank transfer possible. Also banks are slowly adopting EPS2 which will further facilitate payment by online bank transfer. The user will be able to use his/her familiar online banking interface which has various benefits: *Firstly*, users do not have to register with another payment provider; they can use a bank they are already customers to. This also eliminates the need to register three times for using a service. The registration for a signature card and a delivery service has to be considered as a procedure that has to be undertaken once in order to use a wide range of future services. The registration procedures can therefore not be seen as requirements for the certificate of residence only. *Secondly*, banks are trusted organisations which generally have high safety standards. This can be expected to positively influence user uptake. *Thirdly*, using an existing bank account for online payment does not cause any additional costs for those users who have a bank account. The costs for participating in the EPS2 standard are paid by the service suppliers.

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. 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 digital signature with mobile phone could make an increasing number of people adopt a new technology thus building a user base for e-government services.

HELP constitutes a considerable lever for reorganisation on all levels of the administration. Especially, the transaction services of Official Proceedings Online influence the internal organisation of authorities. Due to the decentralised processing of files, faster communication via email and a higher degree of unification are necessary. This is reflected by standards for workflows, the appearance of the authority and the length of processes. Digitisation of processes and the decentralised processing of tasks has two consequences for the management. On the one hand, officials have to get used to receiving information from citizens or other administrative bodies in a new, non-traditional way. On the other hand, employees possess more information than before in relation to the management. With more agencies linked together, information flows might be diverted from the management to employees. Individual responsibility of an official increases while management control lessens. Additionally, personal accountability of officials will increase with the upcoming use of digital signatures. When a certificate is signed with the signature card of an official, his personal responsibility is undeniable. Both aspects may enhance a culture of trust and personal responsibility.

Officials working in the new technical environment are confronted with new requirements considering skills and knowledge. Training and education are an important prerequisite to effectively use support databases and knowledge management systems. In cooperation with the employees, the management has to develop those objectives and standards that allow effective decentralised decision-making. Institutionalised communication, both personal (e.g. regular meetings of the department) and electronic, has to be intensified when professional work is organised in a decentralised way. By this, the unification of proceedings of administrative bodies is managed. An example is the unification of nine different state-level regulations for the registration of dogs. Every municipality participating in HELP had different fees for dogs and each state had its own registration form. HELP now offers one standardised registration form which is used for data entry for all participating municipalities.

The transferability of this case is different for the HELP part and the certificate of residence: The successful portal concept of HELP is largely transferable to other administrative systems. However, in the case of the certificate this is questionable because it is based on very specific technical, organisational and legal principles. At the core is the dependence on a central register of residence. Around this central repository, services can be built sharing a common strategy for identification and authentication of citizens. Countries with another structure of official registers will have to come up with other solutions. On the other hand, the use of public key cryptography with smartcards and international open standards for the communication between administrations and citizens entails more commonalties across countries within the development of e-government in Europe. The establishment of a central register of residence as an essential precondition is not undisputed and makes high demands on privacy and data protection strategies to avoid its potential misuse. A delicate matter in this connection is the marketing of registry data through business partners to gain revenues for government.

Whether the attractiveness of the online availability of certificates of residence will materialise in adequate demand by users, is too early to assess reliably and has yet to prove itself. With the use of citizen cards, registration processes for

various online services can be reduced to a minimum, since the input of personal data and its verification becomes obsolete and access via mobile phone is certainly innovative. Still, although this concept of the Citizen Card Light seems to be a very promising way of stimulating demand for digital signatures, some problems have to be solved: *Firstly* the concept presupposes legal adaptations as it contradicts the existing Austrian signature law. This law stipulates that the means for generating and using a digital signature must lie in the hands of the owner of the signature only. This means that, at the current technical level, a signature and the associated information has to be stored on the owner's smart card or on some other device solely under his personal control. In the case of the Citizen Card Light, the signature is stored on a server of the mobile phone provider and therefore not exclusively under the control of the user. *Secondly*, as long as the mobile phone provider is not a certified certification authority, digital signatures produced by the provider are not secure digital signatures conforming to Austrian law. In order to become certified, certification authorities have to fulfil strict technical and organisational requirements that result in high development and maintenance costs. The aspired standard for electronic interactions with government authorities is the use of secure digital signatures. This aim is missed by the diffusion of products of a lower security level.

Yet, both problems are to be solved with the new Austrian E-Government Law. This law introduces the "signature for public administrations" (Verwaltungssignatur) and therefore paves the way for the electronic signature made via mobile phone. For the signature itself the same principles as for the secure signature are requested: possession of the means, full awareness of the signature activation through signature PIN and protection against use by unauthorised persons. The signature and the associated information can be stored on a secure server of the mobile phone provider. To ensure a sufficient level of security, the technology used by the provider has to be tested by an appointed agency. The law has already passed the Council of Ministers and is scheduled to enter into force on the 1st of January 2004.

Regarding the back office typology, the case corresponds to model C (one service, multi-stage) as it provides a service on national level and integrates several back offices: One is the ZMR which is operated by the Federal Ministry of Interior. Another is the site where the citizen applies for a certificate; there are no human actors involved either. The site handles the application as well as the identification and authorisation of the user. The interaction between these two back offices is entirely digitised. Further back offices involved are the local registration authorities, which report changes of citizen's place of residence to the ZMR. The data input at the local offices is done manually, the transmission online. A fourth back office is the payment service provider and a fifth is the mobile phone service provider, both integrated with fully digitised communication. A mobile phone provider is not needed, when a Citizen Card is used for digital signature.

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Staff unit for Austrian ICT strategy – Chief information Office:

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Austria

Case 3:
Business customs declaration:
PAWA Paperless Import Administration, Federal Ministry for Economic Affairs and Labour (BMWA)

1. Executive summary

Since November 2002, the Austrian Federal Ministry for Economic Affairs and Labour (BMWA) offers companies in the import/export business to obtain import licenses and integrates part of the customs declaration over the Internet. Importers of textiles and steel have to apply for licenses for their imports because the EU has imposed import restrictions on these two categories. 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 the "paperless foreign trade administration" (PAWA). The service is free of charge.

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. Plans of importing companies to leave Austria and organise their imports from other countries virtually forced the Austrian government to order a faster and more efficient solution. Therefore 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.

Two main changes in the workflow have been caused by the new system. First, the SIGL (Système Intégré de Gestion de Licenses), which is the DG Trade's system for the management of licenses for textiles, clothing and steel imports into the EU, is now integrated into the electronic workflow. Second, all customs offices which are part of the Federal Ministry of Finance (BMF) have been connected to the system and receive licenses of importers over the Internet directly from the BMWA. 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 which is also an agency of the EC is included. Private organisations involved are importers and forwarding agents of textiles and iron or steel products.

The service corresponds to model D: two services, multi stage. The case has been chosen for its high efficiency and impact, which is also reflected in the high uptake. The system is also already fully operational and has become an essential service in everyday use with quantifiable economic benefits for both the businesses concerned and government.

2. Background

With the entry into the EU in 1995 Austria had to implement the foreign trade regime of the Union. It stipulates that the import of textiles and clothing, iron and steel products and from other less important categories is limited by to 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. The change of regulations resulted in a 1000 percent increase of applications for import licenses. At this time file cards were still in use in the involved back offices. In May 1995 a software application running under MS-DOS was introduced. It was kept in service until the PAWA was launched.

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 with 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. While Germany already operated an electronic system, the process in Austria was only partly supported by IT. The average processing time of an application was five days. Therefore, in 1999 the largest importer of clothes in Austria decided to transfer its import management to 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 27th 2001 the Minister of Economics announced the implementation of an electronic service until the end of the year.

The service involves two federal ministries and an agency of the European Commission. The BMWA supervises the compliance with import and export restrictions in cooperation with SIGL/EC. The BMF is responsible for the administration of customs declarations and customs offices at the EU's external border. Further participants are exporting countries and private import/export businesses.

25 persons from the BMWA work with the PAWA system. In the domain of the BMF, about 300 administrative workers and 3,640 customs officials can access the PAWA. In 2003 (end of period: August 18th) 1,340 officials have cleared goods for import using the PAWA. The applications of 816 companies and 241 forwarding agents have been processed by the PAWA. 142 users working at 99 companies and 43 forwarding agents have applied electronically. In the same period 33,263 applications for imports have been handled by the PAWA. On average more than 70 percent of the applications are submitted via the web. Since the start of the service 70,881 transactions between the PAWA and SIGL/EC in Brussels have been conducted. Since the interconnection of the PAWA with the BMF's ZEUS system[2] on November 20th 2002, 64,693 transactions between these two back offices took place. Currently between 100 and 150 applications arrive daily.

The PAWA project is embedded into the larger 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.

3. Specific objectives

The main objective and short term goal of the PAWA was to keep major textiles 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 at these companies corresponding positions in the transport business would have been in danger. The Minister for Economic Affairs and Labour therefore formulated the objective and in September 2001 announced a faster and more efficient electronic system until the end of the year. 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. Processing an application by letter or fax on average took five days, resulting in additional storage costs which 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 with electronic workflows.

4. Resources

The Internet team of the department which is responsible for the PAWA consists of one fulltime position and two halftime employees. In cooperation with a private software company the team has succeeded to provide operation 24x7 and availability of more than 99.7 percent. Because the individual right of a company to import into the EU only exists "virtually" as a dataset in the system, availability around the clock is vital to importers for conducting their business.

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[2] ZEUS is a network that connects all customs offices in Austria to the Ministry of Finance and is used to process customs declarations

Because of this focus on data security and high availability, the system has required substantial resources. Yet, the infrastructure built will have to house the much more sensitive data of the export module for which it currently serves as a test environment. Therefore hardware costs must not be seen in relation to the existing PAWA system, only.

Hard-, software and infrastructure costs amounted to about € 2.27 Million (Software: 1,495,944; Hardware: 633,418; Infrastructure: 138,235). This sum is due to the fact that the existing hardware and infrastructure of the IT section could not be used and a new one had to be set up. In addition to that, operating costs totalling € 2.2 Million have been reported by June 30th 2003. Due to the innovative character of the project it was not possible to calculate all possible costs. Of the total project costs of € 4,447,850 (including operating costs) about 2.1 million are due to external factors like faulty hard- and software, relocation and management decisions of supporting departments. Also costs of the foreign trade portal, which is not part of the PAWA, are included. This leaves a "net profit" for the Republic of Austria of € 3,461,730 between January 1st 2002 and June 30th 2003.

This system runs on two independent server clusters of 25 servers altogether. The data centres are located in different parts of BMWA in order to guarantee physical fail-safety and reliability. Connection to the Internet is maintained via the two biggest Internet providers in Austria. Each server cluster is protected by two firewalls which use entirely different hard- and soft ware configurations. The main server cluster includes an RAS (Remote Access Service)-Server, an Exchange server cluster, Mail- and Websweeper, an FTP server, a file server, development and test servers for web applications and database servers. The clusters are connected by dedicated 20 x 1 GB light-wave connections which provide data security and a backup connection in case of the crash of a server. This configuration does not only backup the breakdown of a single server but also that of the whole site (e.g. in case of fire or flood), thus guaranteeing uninterrupted operation for the firms, the BMF and SIGL even in this case. The appropriateness of this concept has been practically proofed with success several times during the past 18 months (e.g. in connection with site relocation, power outage at one server location, interruption of the connection between the two sites).

5. Implementation

The project was implemented in multiple stages following the announcement of the Minister of Economics 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 processing 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 in the meantime was sent by mail.

After the web front-end was implemented successfully, talks between the BMWA, the BMF and the CIO (Chief Information Office)[3] began on how to link the PAWA to ZEUS. ZEUS is the computer system of the BMF, which handles the declaration of imports and exports. This system was already in use but was never intended to be linked with other systems. Therefore no interfaces existed and officials from the BMF's IT section at first opposed 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. Two subordinate working groups, one for technical the other for legal aspects developed solutions for these problems. In consultations with the CIO, a general standardised XML data structure for official notifications was adopted. One aspect that is special to the PAWA is that the official notification is simultaneously transmitted to the user and to another agency. The right to import goods is constituted by the generation of an affirmative notification by SIGL and its automatic transmission to the BMF. Only with the connection to ZEUS, an integrated workflow was achieved. Before that the administration of import licenses was an external paper based process with a notification as output that was mailed to the importer who then presented it to the customs officials who re-entered the data into ZEUS.

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

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[3] The Chief Information Office is a staff unit attached to the Federal Chancellery advising on the ICT strategy at federal level in Austria.

proprietary ZEUS network. The development process revealed that the BMF did not have enough manpower with the necessary technical skills so employees had to receive trainings, especially for networking, web and database technology. In the department of the BMWA responsible for the PAWA two members of staff visited courses for online editors, while the project coordinator earned an MAS in New Media Management during the project. Further, three employees each received basic and advanced trainings for Oracle databases on which the PAWA is based.

Currently 25 employees of the BMWA are occupied with foreign trade administration. The majority of users of the PAWA come from outside the BMWA, usually being customs officials. The import section employs eight persons (six for textiles, two for steel) of formerly ten. Two less qualified category B posts have not been reassigned after the completion of the PAWA system.

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 fewer 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.

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. At the same time the file is transmitted to the BMF. There the necessary data is extracted and fed into ZEUS. Without this 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[4] 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.
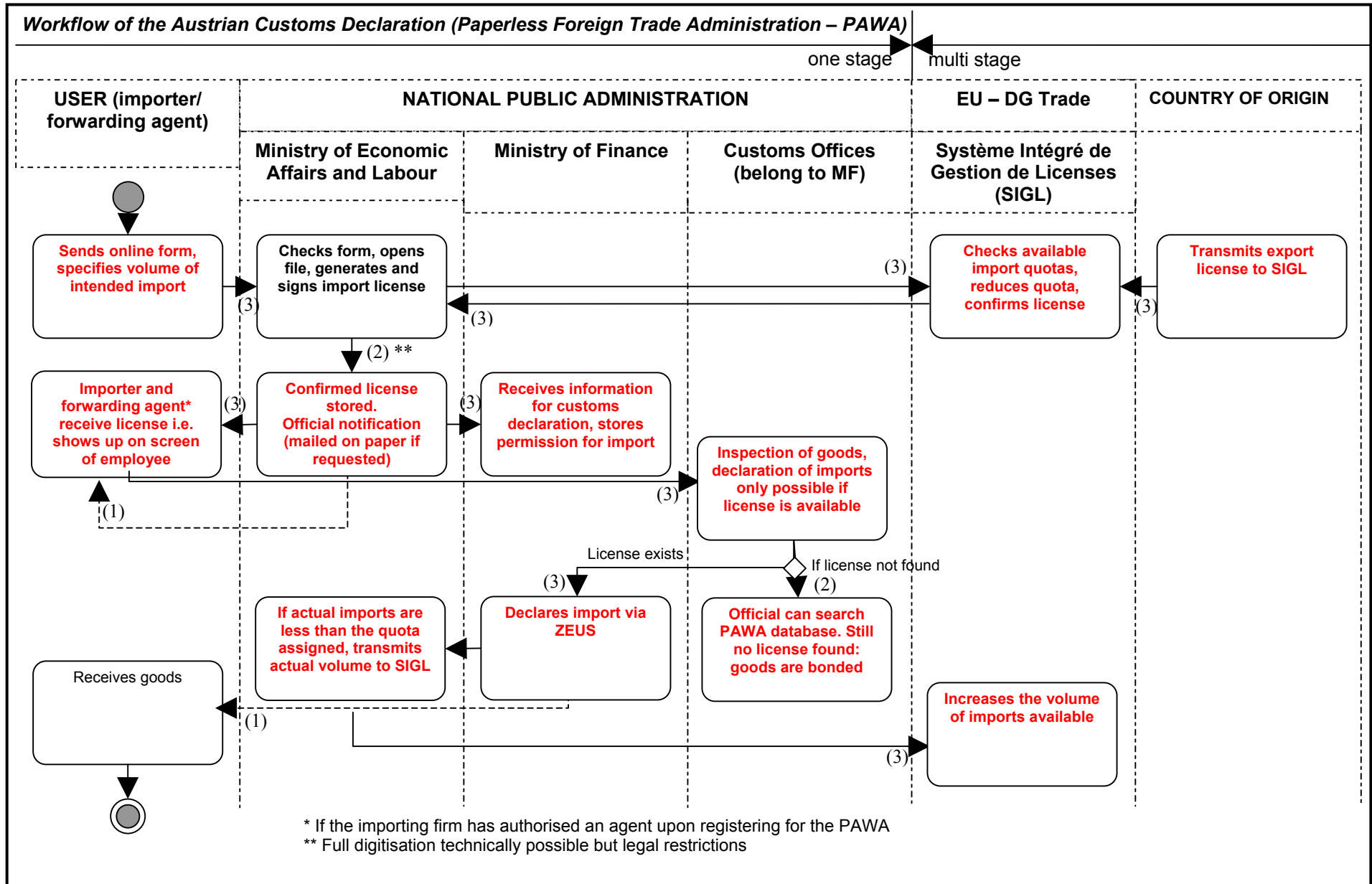
For the employees at the ministries the workflow has changed in that the time spent on each application has become significantly shorter. Error checking of an application is automatically done by the software. Beside that, officials do not have to retype any information. Also, communication with the SIGL system of the EU is tightly integrated into the digitised workflow thus reducing the probability of errors and speeding up processing.

For using the PAWA, importing companies have to register and authenticate their identity. There is also the possibility to authorise a forwarding agent to act on their behalf and to obtain a license. The registration is achieved by downloading, filling out and signing of an application form. It is then faxed or sent to the department for import licenses at the BMWA. The department replies with a conventional RSA letter, which has to be received and signed personally by the user. The BMWA receives the return receipt and compares its signature with that on the application. If the two signatures match, a user account is opened for the importer.

The importer can immediately start to use the system by filling out the online form provided. 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 to the process is the export license of the country of origin. It is part of the two-sided control system that information in the export license has to match the application for the import license. Most countries transmit their export licenses electronically to the SIGL database. Still, for those countries that cannot send export declarations electronically the importer is required to send the original export license document to the BMWA. Unless the export license of the country of origin is available digitally or physically, the workflow is halted. When the export license is in order, the official finishes off 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 within 180 seconds returns a confirmation to the PAWA system. If quotas for the product category in question have not been exhausted[5] the conditional character of the notification is cancelled

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[4] 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.
[5] Import permissions are granted on first come-first serve basis.

Workflow of the Austrian Customs Declaration (Paperless Foreign Trade Administration – PAWA)

one stage | multi stage

USER (importer/ forwarding agent)	NATIONAL PUBLIC ADMINISTRATION			EU – DG Trade	COUNTRY OF ORIGIN
	Ministry of Economic Affairs and Labour	Ministry of Finance	Customs Offices (belong to MF)	Système Intégré de Gestion de Licenses (SIGL)	

Sends online form, specifies volume of intended import

Checks form, opens file, generates and signs import license

(3)

Checks available import quotas, reduces quota, confirms license

(3)

Transmits export license to SIGL

(3)

(2) **

Importer and forwarding agent* receive license i.e. shows up on screen of employee

(3)

Confirmed license stored. Official notification (mailed on paper if requested)

(3)

Receives information for customs declaration, stores permission for import

(1)

Inspection of goods, declaration of imports only possible if license is available

(3)

License exists | If license not found

(3) | (2)

Declares import via ZEUS

Official can search PAWA database. Still no license found: goods are bonded

If actual imports are less than the quota assigned, transmits actual volume to SIGL

Receives goods

(1)

Increases the volume of imports available

(3)

* If the importing firm has authorised an agent upon registering for the PAWA
** Full digitisation technically possible but legal restrictions

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.

When registering for the PAWA system, the user can choose whether the license should be delivered as a physical document or digitally. Either is possible, but to prevent misuse it is excluded to do both for the same application. In the latter case the importer receives a digital notification for download and printing. However, the delivered document only has declarative character. The right to import goods is constituted when the license is transmitted to the BMF. The notification therefore only serves as information for the user e.g. stating his import license number. Users can monitor the state of their application at any time online.

Before it was integrated into the electronic workflow of the PAWA, batch processing was used for the data transmission to SIGL and the generation of licenses. For each application a file had to be created. Two to three times a day, these files were compiled to a request which was uploaded on the SIGL server via FTP connection. After the request was processed, the response was sent back over the same connection and the files were distributed to the officials. The batch processing programme running under MS-DOS had to be operated by two employees exclusively assigned to this task, not by the persons handling the applications for licences. Unlike today it was impossible for the importer to see the status of his application.

As an auxiliary service secure digital signature based on qualified certificates is used by officials for signing digital licenses. Every official at the BMWA issuing a license has a personal signature card and a secure card reader for his workstation. Before filing a license for delivery he has to sign it by inserting the signature card into the card reader and entering his PIN. At the moment, there is no possibility to sign more than one license at once therefore this procedure has to be repeated for every single license issued. The workflow software also does not allow sending a license unsigned. This makes the personal responsibility for a license more transparent than a server certificate by identifying the official who has signed the document, thus emulating a handwritten signature. In this aspect it is more advanced than the average Austrian e-government service because currently most notifications delivered by administrative applications are unencrypted and unsigned.

Planning for the use of digital signatures started at the beginning of 2002. Since commercial software that supported digital signature in conformance with the Austrian signature law was not available at this time, a private partner company was assigned to develop a solution. The outcome did conform to the signature law but not to the more specific standards of the CIO which were still unfinished then. In order to take the service online in time an upgrade at a later point of time was agreed. Currently work is underway to adapt the PAWA to support the Security Layer standard of the CIO until October 2003. This upgrade is also an essential prerequisite for the realisation of the export module, which will support user authentication by digital signature.

6. Results

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 a loss of customs duties for the BMF and the Austrian state. The threat of loosing 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.

The revenues (i.e. duties and taxes) generated by imports that would have been lost without PAWA amounted to € 4,286,685 (January 1st 2002 until June 30th 2003). This sum is based on the value of actually imported goods in the same period and the assumption that it would not have materialised if the companies had relocated their import management. Taking compulsory write-offs into account, the "net profit" in 2002 for the republic of Austria was € 1,888,404. According to this calculation model, PAWA therefore has achieved amortisation within only one year. Further more 50 jobs at importing companies and in the transportation business were saved. The general effects of PAWA were:

Sum 1.1.2002 to 30.6.2003	€
Value	257.415.824
Duties	67.919.014
Value duties paid	325.334.838

Types of duties 1.1.2002 to 30.6.2003	
Total ammount of duties	67.919.014
Import turnover tax	51.483.165
Customs duties	16.435.849

Revenues for the Republic of Austria 1.1.2002 to 30.6.2003 because of retained 6 firms	€
Austrian share of custom duties (25%)	4.108.962
Interest on import turnover tax	177.723
Additional revenue for Austria by the PAWA until 30.6.2003	4.286.685

Costs of the PAWA until 30.6.2003

Type	Total costs PAWA and foreign trade portal	Costs caused externally	Costs of relocation	Costs foreign trade portal	Net costs PAWA until 30.6.2003	Years of amortisation	Deferred costs PAWA €
Operating costs	2.180.253	1.312.475	163.618	538.022	166.138	1	166.138
Software, APCs	1.495.944			112.421	1.383.523	4	518.821
Hardware	633.418			112.829	520.589	6	130.147
Infrastructure	138.235			85.706	52.529	8	9.849
Total	4.447.850	1.312.475	163.618	848.978	2.122.779		824.955

Net revenue PAWA until 30.6.2003	3.461.730

Sources:

BMF - Abt. VI/5	AD Gerald Baldasty	(+ 43 1) 711 23 - 2121
Bundesfinanzierungsagentur	GF Dr. Eder	(+ 43 1) 512 25 11 - 14
Deloitte & Touche	DI Markus Bonner	(+ 43 1) 531 33 - 761

For businesses:
- Shorter processing times: The maximum time needed to generate a license is now tree 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.

For the Austrian state:
- Additional revenue generated by customs duties and interest on import turnover tax.
- Improvement of Austria's quality as a business location.

For the EU:
- 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.

Acceptance of the service is high. Currently 70 percent of all applications for textiles are submitted over the Internet. In other countries the PAWA has aroused interest. New accession states have inquired the possibilities to implement the system themselves and the system has also been presented to a delegation from the USA.

Generally speaking, the digitisation of the workflow has brought more ease of use and better quality to the service. The main reasons for this are automatic error checking routines built into the website, the absence of media breaks and the seamless integration of external data sources into the workflow. At one point in the workflow, the process is halted and awaiting clearance to proceed from the SIGL system in Brussels. Without the positive confirmation of SIGL, any further processing of the electronic file is blocked. Only if approval is electronically stored with the file's other data in the PAWA database, the file can be taken through further steps. Before the digitisation the confirmation from SIGL was obtained with the help of a standalone batch processing software. This was a potential source of error. The applications had to be transmitted manually and at fixed points of time twice a day. This mode of asynchronous communication had slowed down the process substantially.

Another result of the PAWA was the better integration of the data transfer between the BMWA and the BMF. The latter receives the data of upcoming imports required for the customs declaration when the importer applies for a license. For the importer this means less effort: He does not have to go through the whole process of declaring his goods again because the relevant data was already collected for the import licence and transmitted to the BMF's ZEUS system. There it is used for the generation of the customs declaration. For the administration this minimises the risk of inconsistency and redundancy of the gathered data.

For private companies, the PAWA has greatly reduced communication costs. Compared to letters and faxes the Internet is significantly cheaper and faster. Expensive waiting times for goods because of unavailable or faulty licenses have been reduced. Also customs clearance is now easier and faster: On the one hand due to automated checks (the customs official cannot even begin with the clearing of goods in ZEUS without a valid license), on the other hand due to the direct data transmission between PAWA and ZEUS. Importers also have a better overview of previous cases since all applications and issued notifications show up in an individual user account and the status of applications can be viewed online during the processing.

Regarding user friendliness and design principles the result of ongoing consultations with users and the CIO has led to compliance with the Web Content Accessibility Guidelines 1.0 of the W3C. This means better accessibility for users with disabilities but also benefits for all other users because of better navigation and content presentation.

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 the business data and more important the 24 hour availability of the service, the need for double demilitarised zones around the server clusters as well as for secure connections between the clusters was 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. Authentication by digital signature will therefore replace login by username and password also on the side of business users in the near future.

7. Learning points and conclusions

One reason for the successful implementation of the PAWA is the inclusion of representatives of every potential participant organisation in the development process. Members of participating agencies have been equally included into the planning as hard- and software suppliers and import/export businesses. This strategy helped to overcome a number of obstacles of which not the least was the scepticism towards Internet based systems. Officials at the IT section of the BMF first opposed the plans for the PAWA because they never considered connecting ZEUS with other systems. Thanks to the universal XML standard a solution was found. According to the project coordinator of the PAWA, the project succeeded despite serious time pressure because many steps were taken in a fashion completely opposing usual bureaucratic proceedings.

Another aspect that helped in making the PAWA a success was the pressure from businesses that have 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. It is doubtful if a service for such a specific problem like an import license with its strong economic interests can be easily transferred to other sectors. On the other hand, transferability within its field 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.

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 become 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.

One point to be aware of, though, is that the fixed import quotas within the EU constitute a zero sum game for the competition among its member states: From the European perspective the success of the PAWA is a national one. Improving Austria's position in the competition for jobs and custom duties can only be achieved at the expense of other member states. If an importer decides to import into the EU from another member state because of better administrative services, a number of jobs is created in the country he moves to, while an equivalent number is lost in the former place of import. The same holds true for customs duties: one country's gain is another's loss. Still, increases in efficiency could be realised in every member state, thus benefiting Europe as a whole. Also the case shows that the competition between member states can lead to innovative administrative services.

Apart from being a success story for the import administration, the PAWA can be considered a pilot project for the digitisation of the export administration. The system provides a technical solution and a foundation that can be transferred to this more complex component of foreign trade. The importance of export licenses is still higher, because many more products, like chemicals, machines, hard- and software, require licenses. Also exports are generally more important than imports for economies pursuing trade surpluses.

Regarding technological aspects, the case is a good example how an application can combine the use of latest technologies (digital signatures for the smaller professional group of involved officials) with more conventional ones (identification and registration procedure for the larger group of business users) in a reasonable way. By following a step-by-step approach, features are added as legal and technical frameworks are developed according to the national e-government strategy. Personal signature cards as employed in the case of PAWA increase accountability and transparency of the bureaucratic process. It shows the personal responsibility for a decision which is a characteristic of bureaucracies. Besides raising an official's accountability it fosters his/her awareness for data protection.

A final lesson learned was that data security is an act of balance between what precautions are technically and economically required and feasible. It is evident that 100 percent security can never be achieved. Yet, a reasonable level of security can be achieved even without the assistance of a large IT section. The PAWA case also shows that reliability is not a question of open or closed networks. Initially there were serious security concerns on behalf of the BMF when

linking to an open Internet-based system. Yet, since the PAWA was connected to the proprietary ZEUS system not a single successful intrusion occurred. It also became clear that technical solutions are not enough for achieving a high level of security. It is equally important to create awareness for data protection issues within an organisation and among its members. On a personal level, individual understanding of data security is raised by the use of digital signature cards for which every official is personally responsible. The fact that the official has to confirm the signing of each notification he sends also contributes to more caution and a higher awareness of the responsibility an individual official has for the cases he processes.

8. References and links

http://www.pawa.at/
http://www.aussenwirtschaft.info

Service contact person: MR. Dr. Helmut Krehlik, Bundesministerium für Wirtschaft und Arbeit, Abteilung C2/2 (Export control/Import licences); email: Helmut.Krehlik@bmwa.gv.at

Austria

Case 4:
Business public procurement:
PAWA Paperless Import Administration, Federal Ministry for Economic Affairs and Labour (BMWA)

1. Executive summary

"Schulbuchaktion-Online" (SBA-Online) is a modern e-procurement solution involving G-2-G and G-2-B services. Since its introduction in 2001, the number of users has been steadily increasing. In 2003, there are already more than 5,700 schools and about 900 schoolbook sellers in Austria carrying out schoolbook orders via SBA-Online. The old schoolbook order systems were mainly paper-based and used different standards. This caused a high degree of heterogeneity in terms of interoperability and resulted in numerous media breaks among the key players in this field. The basis for the successful kick-off of SBA-Online was the common interest of the public administration (Ministry of Social Security, Generations and Consumer Protection, BMSG and Ministry of Education, Science and Culture, BM:BWK) and the private industry (schoolbook sellers and publishers) in establishing a modern order system. Hence, the project objectives, a time schedule for the realisation of the project stages and milestones were agreed upon a consensual basis meeting the requirements of all involved actors. SBA-Online is a transparent and open system considering the different needs of its users and providing several win-win situations for all partners. However, each user is obliged to deliver the relevant data on time in order to keep the online schoolbook order processes running.

In general, schoolbook order processes have become more transparent since the SBA-Online has been introduced. The overall schoolbook budget is provided by the "Familienlastenausgleichsfonds" which is a particular public fund. The BMSG, which is responsible for the monitoring of the schoolbook budgets, has been provided a tool which allows rapid and exact budget calculations concerning the provision of free-of-charge schoolbooks. The optimal provision of schoolbooks for all pupils in Austria is demanded and regulated by law. Schools benefit from the user-friendly design of the service which has made schoolbook orders faster and easier. SBA-Online also optimises the business operations of schoolbook sellers and publishers since they receive relevant data for the production and delivery of school books earlier. Thus, the principal changes have taken place by connecting different interfaces (players), reducing administrative costs (e.g. for paper) and optimising public expenditures and time budgets.

The technical realisation of SBA-Online is based on industrial standards (e.g. Java, SQL etc.). The open and expandable project concept envisages the provision of further service options in the near future. The players are involved in the whole project cycle by public events such as "user days". Further service support is offered by local contact persons and free-of-charge hotlines. Online trainings and trainings in classrooms complete the user support services of SBA-Online.

This service has been chosen for an in-depth interview since it shows a high transaction level. Austrian schools are enabled to browse several databases and conduct schoolbook orders fully online. Furthermore, the SBA-Online service is salient regarding the high number of players involved in the schoolbook order processes. In 2003, about 94 % of all Austrian schools used SBA-Online for their schoolbook orders. There are numerous different agencies and companies involved such as the BMSG, BM:BWK, the Federal Office of Data Processing and Computing (BRZG), the Austrian Book Centre, the Austrian Post Savings Bank (P.S.K), the Austrian Chamber of Commerce, schools, schoolbook sellers and publishers.

Against the background of four proposed back office models, SBA-Online corresponds to model D (multi service, multi stage) with digitisation degree 2. This service can be regarded as a good practice example due to the high degree of digitised processes and the ongoing development and forthcoming integration of the digital invoice between 2004 and 2005 (instead of the "schoolbook order forms" representing the official mode of payment so far).

2. Background

Basically, the Austrian schoolbook order initiative ("Österreichische Schulbuchaktion") is regulated by law (in the "Familienlastenausgleichsgesetz" from 1967) and comprises the operation of schoolbook orders. The BMSG is responsible for the implementation of the legal order. The schoolbook order initiative involves several public and private institutions contributing to the full realisation of the schoolbook order initiative: the BMSG, the BM:BWK, the BRZG, the Austrian Book Centre, the P.S.K, the Austrian Chamber of Commerce, all registered schools, schoolbook sellers and schoolbook publishers. The logistics of the schoolbook order processes encompass the submission of manuscripts for a new schoolbook to the authorisation office at the BM:BWK, the price fixing for a new book by the BMSG, the registration of a new book in the official schoolbook lists, the order processes in schools, the scrutiny of the pre-determined schoolbook budget by the BMSG, the delivery and the distribution of the schoolbooks and financial statements.

"Schulbuchaktion-Online" (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 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 in the administration of schoolbook ordering. Thus, the responsible players in the public administration (BMSG 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.

SBA-Online has overcome these problems and is outstanding in terms of the involved target groups. Since the new system has been implemented in February 2001, the number of actors using this online order service (schools, schoolbook sellers and publishers, the involved Ministries and the Austrian Chamber of Commerce) has been steadily increasing:

School year	2000	2001	2002	2003
Number of SBA-Online players	0	7,600	7,700	8,000

Source: BRZG, August 2003.

At the same time, a tremendous decline in the use of "offline" forms can be stated and, obviously, the number of schools which have not yet changed to the new system is decreasing too:

School year	2000	2001	2002	2003
Number of "offline" forms (pieces)*	30,000	2,500	1,000	500

*Order forms exchanged between the schools and the schoolbook sellers
Source: BRZG, August 2003.

School year	2000	2001	2002	2003
Number of schools not yet using SBA-Online	6,000	1,732	815	380

Source: BRZG, August 2003.

3. Specific objectives

SBA-Online is an "e-shop" solution involving complex business processes. The quantity and the sort of schoolbooks which are ordered each year are subject to complex rules determining the schoolbook budget of each Austrian school. It was the major goal of SBA-Online to develop a tool that facilitates the electronic realisation of these rules and to provide schools with a system making schoolbook orders more efficient and transparent. Since the schoolbook sellers and publishers are the main (economic) beneficiaries of schoolbook orders, they had a strong interest in a harmonised system, too, and contributed to the development of the SBA-Online concept. The Austrian Chamber of Commerce provided financial means for the development of the system.

In general, SBA-Online pursues three major objectives: Firstly, the different intentions and interests of the involved players (BMSG, BM:BWK, private industry, schools) have to be co-ordinated. Thus, SBA-Online considers a G-2-G and G-2-B solution (for a more detailed description see "Results"). Secondly, administration processes at schools have to become more easy and efficient. Therefore, it was a major requirement from the very beginning that the new system is user-friendly in terms of handling and design. In order to increase the acceptance rate of SBA-Online the implementation phase was accompanied by trainings organised for different kinds of players (e.g. teachers, book sellers etc.). SBA-Online was also created to enlarge the group of users in schools (i.e. teachers). Usually, schoolbook orders are mostly undertaken by one person. SBA-Online enables schools to assign access permits to several teachers and to handle the schoolbook orders for their subjects by themselves. This means an increase in autonomy and self-responsibility. The expenditures for the ordered books can be calculated at any time. In case of a schoolbook budget surplus, the school may save the money on later orders. Again, processes have become more transparent for both, the school and the BMSG. Thirdly, the BMSG (responsible for the financial monitoring of the schoolbook budgets) can estimate the schoolbook costs more easily, and budget calculations can be done immediately at the push of a button.

4. Resources

The web-based system enables a high quantity of actors to access the SBA-Online service at any time and any place. The identification by user-name and password was considered a sufficient protection tool in order to avoid unauthorised service access. All data are stored in a central database. The data transfer to the bank (P.S.K) occurs via a secure data stream. The data evaluation is carried out via data export to a datawarehouse. SBA-Online involves a webserver (Apache), a Java application server (SilverStream), a database server (Oracle 8i) and an evaluation server (WebFocus) which run on two Sun-Solaris servers connected in two clusters. The system is based upon the following standards: HTML 4.0, HTTP 1.1, J2EE and SQL. Moreover, it uses open standards such as Struts[6].

The project costs could be kept low due to the common intentions of the BMSG and the BM:BWK concerning the realisation of the project and the financial contributions of the Austrian Chamber of Commerce, the schoolbook sellers and publishers. In total, the BMSG, the BM:BWK and the Austrian Chamber of Commerce spent about 2.8 million Euros for the development of SBA-Online. The introduction of SBA-Online necessitated improved technological equipment at schools. Thus, schools benefited two-fold: They were provided with a more efficient schoolbook order system and better hardware and software equipment. The BRZG still provides staff resources and technical support which are covered by monthly payments within the overall operations of the BRZG. The project costs for the BRZG comprised initial investments for the purchase of licences (Oracle, SilverStream, Webfocus) and staff costs. The maintenance costs for software and hardware are regulated in a contract concluded between the BRZG and the BM:BWK. The BRZG was the main contractor responsible for the project management and realisation of SBA-Online. Other private enterprises served as sub-contractors.

Several workshops initiated the project start and targeted the development of a first project draft. The development teams consisted of experts who had solid knowledge in OO-modelling (object orientated), database modelling, SQL and J2EE. The core team comprised about 10 persons, though in peak-periods up to 45 experts were involved in the project development.

Partner companies supporting the BRZG particularly at the beginning of the project were: E-Lisa, SBS (Siemens Business Solutions) and Focus. E-Lisa is the marketing platform of the Austrian schoolbook sellers and contributed to the design of the online courses. SBS (Siemens Business Solutions) developed in co-operation with the BRZG the SBA-Online application and Focus (a subsidiary company of the Austrian Raiffeisen Bank) was responsible for the reporting.

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[6] Struts are software components used for the creation of web sites.

5. Implementation

The development of SBA-Online encompassed several stages and can be considered as an ongoing project since more and more service options will be integrated in the near future. The project started in July 2000 with a first brainstorming concerning the project goals. The definition of objectives and milestones were based upon expected technological, economic and organisational developments (e.g. e-Book, development of the educational system in Austria and the economic developments concerning the Austrian book market). Moreover, the initial stage involved the establishment of the project team and the selection of the IT provider (BRZG). In September and October 2000, the project team developed a new marketing concept for the ordering of schoolbooks, outlined organisational changes and competencies, planned trainings (online and in classrooms) and a hotline for the future users. Regarding the technical development of SBA-Online, this stage included the definition of the platform (HTML masks), the functionality of the system (i.e. the complexity of the provided service options), the database and the technical infrastructure (hardware, software, and network).

Phase 1: The realisation of the SBA-Online project started in November 2000 and lasted until August 2001. 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 those schools without online access by then. The technical part involved the ordering, installation and testing of the infrastructure and the programmes. SBA-Online was publicly accessible after the winter holidays in February 2001. Until August 2001, when the first project phase ended, about 250,000 data records, 500,000 orders and approx. 5,000 user records were entered into the system.

Phase 2: 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 (April, May 2001). This provided a valuable input for the second phase which primarily comprised extended service options for teachers. Between June and August 2001, the training documents were improved and further adjusted to the user needs. Moreover, an online tutorial was developed and provided to users. The realisation of Phase 2 started after the summer holidays in 2001 and lasted until February 2003. Basically, the new service options have met the teachers' approval.

Phase 3 was planned between May and August 2002 and targeted the integration of the schoolbook sellers. Representatives of the Austrian schoolbook sellers were mainly involved in this project stage, and the requirements on the schoolbook sellers have been extended. Accordingly, schoolbook sellers have to be online in order to be entitled to sell schoolbooks. A hotline for schoolbook sellers was planned, and regarding the further technical development of the service, this stage included the definition of the platform (HTML masks) for the schoolbook sellers, the functionality of the system, the database and the technical infrastructure. The implementation began in September 2002 and ended in May 2003. Furthermore, the training documents were finalised and the hotline was developed and tested. Full operation started in February 2003. Since May 2003 the options for the schoolbook sellers have been accessible online.

Currently, the project team is concerned with the development and the integration of an e-payment solution for schoolbook orders. This has initiated phase 4 which involves the introduction of the digital invoice replacing the current schoolbook order forms ("Schulbuchanweisungen" which currently represent the official mode of payment). Hence, the transmission of the orders between the schools and the book sellers will be fully digitised. Before the e-payment solution will be online, the following steps have to be taken within the next two years (2004-2005): The training documents have to be adjusted to the extended service options, and new contracts have to be concluded with the P.S.K (the involved bank). The technical changes will mainly concern increased security requirements. It is expected that the digital invoice will be available by 2005 at the latest.

SBA-Online involves different service actors and provides manifold service options. In order to give an overview of the different types and relationships of users, the following classification lists the core users and providers, explains the options they are provided and describes their roles in the order processes.

Types and relationships of users

The largest group of service users comprises more than 5,700 headmasters responsible for the schoolbook orders at their schools. Basically, headmasters do not order schoolbooks by themselves but nominate teachers responsible for the order processes ("SchulbuchreferentInnen"). Their tasks involve the administration of data records related to the school enrolment, the searching, selecting and ordering of the schoolbooks, the selection of the schoolbook sellers, the release of the schoolbook orders, the monitoring of the payment of pupils' own share ("Selbstbeteiligung"). Additionally, they are in charge for the administration of all those teachers who may also use SBA-Online. In October 2003 there were

1,600 teachers using SBA-Online together with about 5,700 "SchulbuchreferentInnen". Usually, before the schoolbook order transaction can start, the school nominates a teacher who is the responsible person for schoolbook order processes ("SchulbuchreferentIn"). This may be the headmaster or any other teacher at a school. Some tasks will be delegated to other teachers who are responsible for certain classes ("KlassenreferentIn") or school subjects ("FachreferentIn"). All these activities produce the relevant data for the schoolbook order initiative and deliver the basis for the:

- Schoolbook sellers who may adjust the quantity of ordered schoolbooks according to their experiences of the previous school years and report the revised orders to the schoolbook publishers.
- Schoolbook publishers who determine the quantity of issues that has to be printed according to the schoolbook orders.

The schoolbook publishers enter their book titles into the schoolbook list. Schoolbook publishers get the first data records from the Austrian Chamber of Commerce in May. Since data packages are rather huge (about 500,000 data records), the BRZG sends the records as MS Access files to the Austrian Chamber of Commerce which holds a distribution function. In the next step, the data records are forwarded to the schoolbook publishers by the Austrian Chamber of Commerce. Generally, the schoolbook publishers receive order data at regular intervals via data export from the Austrian Chamber of Commerce. The final set of order data is provided by the schoolbook sellers. Between June and August most schoolbook sellers report the expected demand of schoolbooks to the schoolbook publishers and place their orders. This business transaction is not supported by SBA-Online since schoolbook sellers and publishers use different order systems for their business operations.

The schoolbook sellers have been part of SBA-Online since phase 3 has been fully realised (May 2003). Currently, there are about 900 schoolbook sellers using SBA-Online. They are enabled to administer data records related to their businesses by themselves. However, the new entry of a schoolbook seller into the SBA database or his/her cancellation is carried out by particular administrators who are responsible for the hotline and the support service. Given their tasks this group can access all schoolbook seller options. Another group of administrators is based at the BRZG and supports teachers in case of any problems related to the online service. This group has "read only" access and may not modify any records. Due to security reasons, schoolbook sellers can only access school-related data (i.e. data related to a particular school and schoolbooks orders) if they have been previously selected as a schoolbook supplier by a school. Basically, there are no person-related records available via SBA-Online. Schoolbook sellers registered as SBA-Online users can conduct statistical evaluations regarding the schoolbook orders and the schoolbook order forms. Moreover, the system offers a tracing option enabling the schoolbook seller to monitor the status of his/her business operations (e.g. whether the P.S.K has already transferred the money or not).

Types and relationships of back-offices (agencies)

The BMSG is responsible for the overall schoolbook administration. The Ministry determines the schoolbook budget per pupil and the price per schoolbook (the latter is carried out by a particular commission at the BMSG). Since the BMSG acts as an inspection authority, it is entitled to control the financial matters of all Austrian schools. In the case of SBA-Online, the Financial Control Authorities are responsible to the BMSG which act as their control authorities. The Financial Control Authorities are also responsible for the payment of the additional "teaching aid" budget which entitles each school to spend 15 % of the overall school budget on teaching aid that is not listed in the official schoolbook lists. The BMSG regularly receives reports including figures on schools and schoolbook orders via an MSAccess application.

The involved BM:BWK officers have particular monitoring and administration rights since the Ministry is one of the responsible public bodies in this matter. There is another hotline at the BM:BWK providing support for teachers. In regular intervals the Ministry receives reports informing about the quantity of ordered books, the number of pupils attending particular schools etc. The Ministry plays an important role for the admission of schoolbooks. The "schoolbook list including certified schoolbooks" is one database upon which SBA-Online is based. This list is generated by the BMSG, BM:BWK (responsible for the content) and the schoolbook publishers. All information on schoolbook prices and asmission procedures are delivered from the schoolbook database and forwarded to SBA-Online.

The Austrian Chamber of Commerce is the official representative of the Austrian schoolbook sellers and publishers. It operates the hotline for the schoolbook sellers and is part of the "price fixing commission" determining the prices for schoolbooks. Moreover, it distributes the order records electronically or in paper format to the schoolbook publishers.

Evidently, schools are the major players in the schoolbook order processes. They are responsible for the administration of all school-related data, the schoolbook orders and the data transfer to the schoolbook sellers. Based upon the entered data into SBA-Online, schools receive

- Schoolbook order forms from the P.S.K
- Forms and payment forms for the pupils' own share to be paid for the schoolbooks
- Forms and payment forms for the application of a free public transport ticket from the P.S.K (SBA-Online provides an additional service asset here: Austrian pupils are entitled to use public transport free of charge for their way from home to school; schools may use the relevant data produced by SBA-Online, such as number of pupils per classroom, in order to request the application forms from the P.S.K).

The schoolbook order forms are the official mode of payment, i.e. when schoolbook sellers deliver the ordered books they are handed out the schoolbook order forms. These order forms are still exchanged in paper format but will be replaced by an electronic invoice system in 2005. Teachers are also provided a tracing option, i.e. they can monitor the status of their business operations. This includes information about the printing status of the schoolbook order forms at the P.S.K. Furthermore, authorised users in the schools can check when schoolbook sellers cash the schoolbook order forms at the P.S.K.

The P.S.K is the bank which is concerned with all financial matters related to SBA-Online. The bank keeps the accounts for the schoolbook sellers and the BMSG. It prints, delivers and cashes the schoolbook order forms, the forms for the pupils' own share and forms for the application of the free public transport tickets. All relevant data are provided by the BRZG.

The BRZG is responsible for the implementation, the operation and the technical support of SBA-Online. This includes the following data imports:
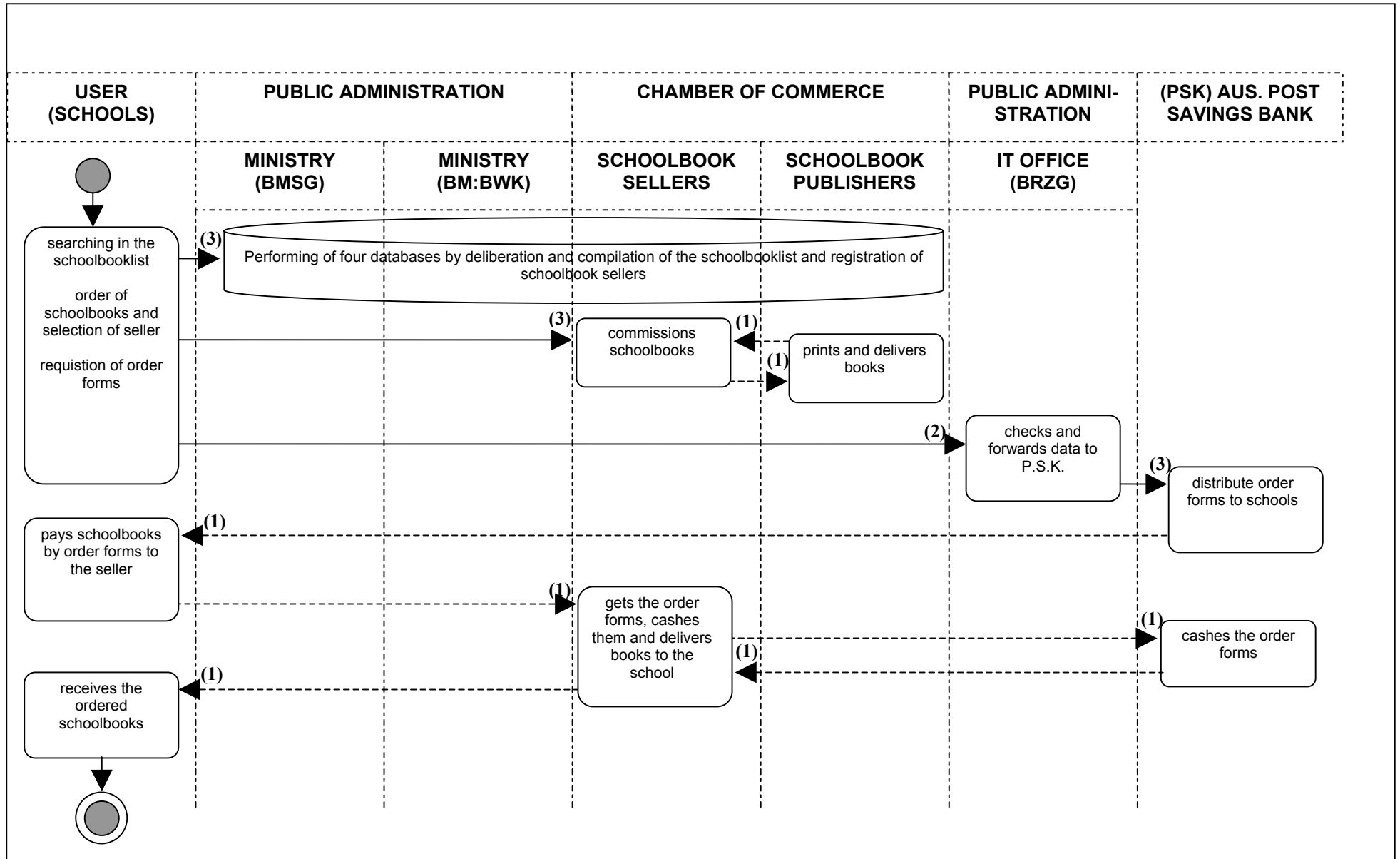- School-related data (delivered via the central school database by the BM:BWK)
- The schoolbook budget per pupil and school year (outlined in the "limit regulation" by the BMSG: Every Austrian school is allocated a certain schoolbook budget. Based upon these budgets, SBA-Online sets the financial frame for each school when using this online order service and impedes the exceeding of schoolbook budgets).
- Schoolbook data (delivered via the central schoolbook database by the BM:BWK)
- Data on the encashment of the schoolbook order forms (delivered by the P.S.K)

The BRZG exports the following records:
- Order data per schoolbook (delivered to the central schoolbook database of the BM:BWK)
- Print command for the schoolbook order forms and the deductible forms including school records and schoolbook data (delivered to the P.S.K)
- Cancellation commands in case of order failures (delivered to the P.S.K)
- Consolidated data on pupils and schoolbook orders (delivered to the BMSG and BM:BWK)
- Consolidated order data for the schoolbook publishers (delivered to the Chamber of Commerce)
- Order data concerning the teachers' schoolbooks for the schoolbook publishers (delivered to the Chamber of Commerce)

Based on these major players, the schoolbook order workflow can be described as follows: In order to make use of the SBA-Online order service, a school respectively a school representative has to register. By entering his/her password and username, teachers can carry out schoolbook orders fully online. The SBA-Online service is based upon several databases which are strongly interwoven. There are four major modules: 1. "Schoolbook list including certificated schoolbooks": The list is compiled by the schoolbook publishers, the Ministry of BM:BWK and the BMSG. 2. "Limit regulation" (mentioned elsewhere). 3. "Schoolbook seller list": This list contains all registered schoolbook sellers and schools select their book seller(s) from the list. 4. "Class lists" contain all relevant data on school subjects, class size, schoolbooks etc.

Teachers select the schoolbooks either according to the school subjects they are teaching or the class(es) they preside over. Moreover, they select one or several book sellers who will be inquired to deliver the ordered books. Before a book seller can be entitled to act officially as a schoolbook seller he/she has to sign a contract with the Austrian Chamber of Commerce. Subsequently, he/she can register at the SBA-Online and will be listed in the database. If a schoolbook seller has been chosen as book deliverer by a school, then he/she will receive a note in his/her personal SBA-account. The teacher terminates the order process by sending the orders to the P.S.K (via the BRZG). Usually, this happens at the end of April during a school year. However, teachers do not know at that time the exact amount of schoolbooks needed for the following school year. Thus, the P.S.K prints only 50 % of the demanded schoolbook order forms and sends them to the schools (by post) in June.

USER (SCHOOLS)	PUBLIC ADMINISTRATION		CHAMBER OF COMMERCE		PUBLIC ADMINI-STRATION	(PSK) AUS. POST SAVINGS BANK
	MINISTRY (BMSG)	MINISTRY (BM:BWK)	SCHOOLBOOK SELLERS	SCHOOLBOOK PUBLISHERS	IT OFFICE (BRZG)	

searching in the schoolbooklist

(3) Performing of four databases by deliberation and compilation of the schoolbooklist and registration of schoolbook sellers

order of schoolbooks and selection of seller

requistion of order forms

(3) commissions schoolbooks

(1) prints and delivers books **(1)**

(2) checks and forwards data to P.S.K.

(3) distribute order forms to schools

(1) pays schoolbooks by order forms to the seller

(1) gets the order forms, cashes them and delivers books to the school **(1)**

(1) cashes the order forms

(1) receives the ordered schoolbooks

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. At the end of June the school hands out the schoolbook order forms to the schoolbook sellers who deliver the first tranche of books. At the beginning of September when it is known how many classes and pupils a school will have, the school can place repeat orders. Accordingly, the P.S.K prints the remaining 50 % of the schoolbook order forms and sends them to the schools. The schoolbook seller delivers the missing schoolbooks and is handed out the schoolbook order forms which he/she has to cash at the P.S.K. The pupils receive their schoolbooks and have to prove that their own share has been paid.

Until now books are still delivered as "hard copies". However, there is a trial operation on e-books running called "schoolbook extra" ("Schulbuch Extra"). This project is currently testing the use of e-books. By 2004/2005 all Austrian schools shall be enabled to order online book versions via SBA-Online. The e-books will be delivered by the schoolbook publishers.

The diagram above summarises the workflow and illustrates the interaction between the different players:

6. Results

Given the different intentions and ideas about the design and the organisation of an online schoolbook order service, it is the overall objective to create a win-win situation for all involved participants. The BM:BWK intends to provide Austrian teachers with the necessary teaching aids and to warrant a high degree of autonomy. The BMSG focuses on the cost-effective handling of the schoolbook budgets and demands transparent and comprehensible transaction processes. The schoolbook publishers want to optimise their production capacities and need exact electronic information. The schoolbook sellers wish to learn about the demanded schoolbooks at an early stage in order to get paid as soon as possible.

To sum up, SBA-Online provides more detailed data[7], accelerates order processes and contributes to cost savings. There was some mistrust among teachers when the project started. Particularly those who had used their own order programmes were more opposed to the new service than those who had not used any electronic order programme at that time. Some teachers were also reluctant to use the new order service for fear of high online costs. In the meantime, the service has been very well accepted by the users since it does not require any specific installations on the user's side. Due to the web-based solution the use rate has increased very fast and enables teachers and all the other involved users to use the service from any place at any time. In addition, it is the only approved electronic schoolbook order service in Austria today. Thus, SBA-Online has to be used when schoolbooks are ordered online.

Future project steps include the introduction of the digital invoice (instead of the current schoolbook order forms), the delivery of e-books and the involvement of parents' unions and student unions having a say in the selection of teaching aids. As soon as the digital signature will have become a common form of identification in Austria, e-payment options will become more popular regarding financial operations related to schoolbook orders and the payment of deductible fees.

Win-situation for the BMSG

The BMSG has had a strong interest in getting a better overview over the public expenditures for schoolbooks to ensure the optimal provision of schoolbooks as it has been outlined by law (Act: "Familienlastenausgleichsgesetz"). The financial means for the schoolbook initiative are provided by the "Familienlastenausgleichsfonds" (a public fund) 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. Since SBA-Online has been introduced, the expenditures for schoolbooks could be kept lower than in previous years or at least at the same level. It is important to note that this is not because the public schoolbook budget has been cut down

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[7] SBA-Online gives exact indications about the quantity of pupils in a classroom and detailed information about the quantity of ordered schoolbooks for each school subject.

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).

The following model summarises the organisation and the roles of those actors which directly benefit from SBA-Online:
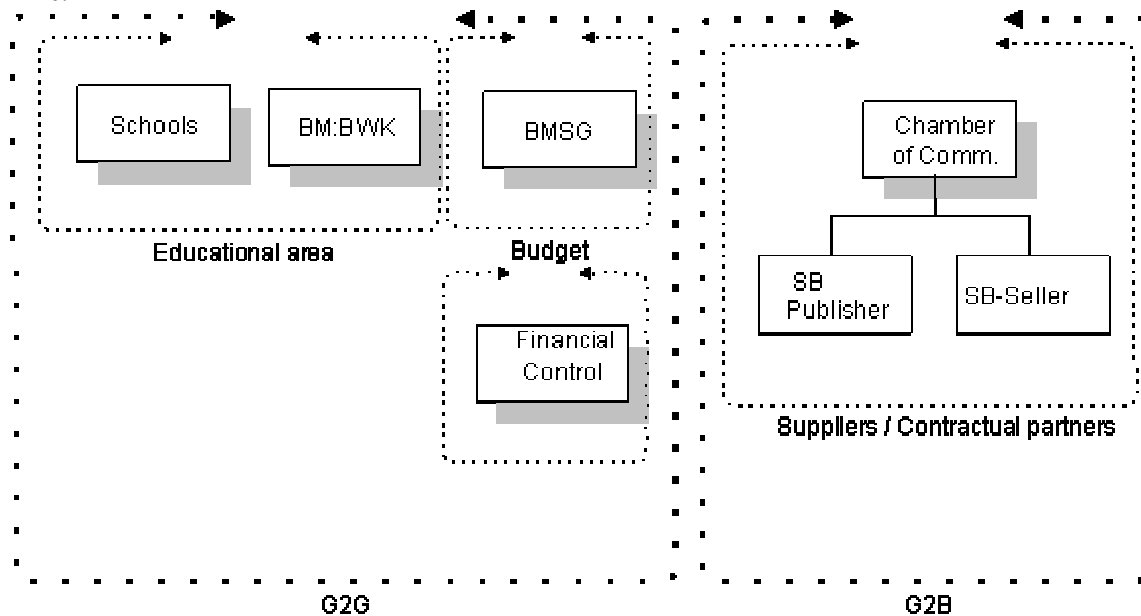
Win-situation for the schools

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 on deadlines, missing information and informs about news related to the Austrian schoolbook initiative. Furthermore, each user has the opportunity to 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 have been ordered for which classes. The organisation of schoolbook conferences has been 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 more rapid which allows teachers to prepare their lessons earlier. Furthermore, each saved data record can be re-used in the following school year and necessitates only slight modifications (such as number of pupils per class or order quantity).

Win-situation for schoolbook publishers

Basically, there is a very tight production period (from May until August) for schoolbook publishers. Thus, it is of utmost importance to receive all relevant data as soon as possible to ensure the timely book supply. SBA-Online rapidly delivers all data which are necessary for schoolbook production. High security standards guarantee that each

schoolbook publisher receives only those data which refer to his/her own business processes. No publisher is enabled to access any order records of any other publisher.

Win-situation for schoolbook sellers

Schoolbook sellers deliver most of the demanded schoolbooks a couple of weeks before the new school year starts (in August). Thus, this group has a strong interest, too, in receiving all data as soon as possible. Business operations such as repeat orders which have been very time-consuming before SBA-Online had been introduced are now carried out much faster and with less administrative effort. Additionally, schoolbook sellers receive their money earlier. The system enables schoolbook sellers to compose schoolbook packages per classes. This offers additional services and facilitates the distribution at schools.

7. Learning points and conclusions

Towards a common objective
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 economically driven (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 the decisiveness of data provision in order to establish a fast, user-friendly and effective service.

Crossing the border… no way back
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
The hotline has mainly determined the high acceptance of SBA-Online among the users. The hotline staff provides technical support and informs 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.

Trainings and "User Day"
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 shall encompass online trainings and trainings with experts in classrooms. Particularly, online trainings 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 trainings. A lot of users addressed their enquiries to the hotline. Therefore, the SBA-Online team suggests providing online trainings considering different levels of skills and knowledge. The trainings 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 trainings. 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" takes place 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 the permanent communication exchange between service providers and service users.

Service performance
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).

Usability
Users have to be involved in the service development from the very beginning and shall become an integral part of the project cycle. This helps 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.

Finally, the project development and implementation shall be carried out in stages. As SBA-Online shows, the open and expandable design turned out to be a valuable strategy towards the achievement of large use 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.

In general, the SBA-Online service corresponds to model D with digitisation degree 2. Based upon the definition of model D (multi service, multi stage) SBA-Online encompasses several online service operations and back offices as it has been outlined in this report. SBA-Online is a multi service including processes that range from the "mere" search for adequate schoolbooks to the schoolbook order process per se. However, there are different degrees of interaction among "direct" service users such as schools and all other actors involved (ministries, schoolbook sellers etc.). While some order processes are carried out fully online (i.e. orders are transferred directly to the schoolbook sellers), other processes such as the transfer of schoolbook order forms from the P.S.K (bank) to the schools are conducted offline (delivery by postal mail). Thus, the overall digitisation degree of this service corresponds to "2" describing services that are digitised to a great extent although involving processes which partly require human action (e.g. transfer of schoolbook order forms from the P.S.K to schools). The attached workflow diagram depicts the various process digitisation degrees more explicitly. Given that data are used by several players active in different sectors, model D appears to be adequate describing the organisation and structure of the SBA-Online service.

Basically, this service appears to represent a good practice example for other European administrations dealing with schoolbook orders since it is not restricted to particular organisation forms determined by political or organisational frameworks.

8. References and links

Schulbuchaktion online (SBA-Online): http://www.schulbuchaktion.at
BMSG: http://www.bmsg.gv.at
BM:BWK: http://www.bmbwk.gv.at
Chamber of Commerce: http://www.wko.at
"Buch- und Medienwirtschaft": http://www.buchwirtschaft.at
Federal Office of Data Processing and Computing: http://www.brz.gv.at
Marketing platform of the Austrian schoolbook sellers: http://www.e-lisa.at

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Belgium

Case 5:
Business social contributions for employees:
Federal Public Service Social Security

1. Executive summary

The e-services offered to end-users (companies or their representatives for social security purposes, known as "social secretariats") by the Belgian social security e-government program consist of an automation of some social security duties these end-users have to comply with. These services have been made available through several communication modes: an interactive web portal, an application-to-application mode, a file transfer system, and a vocal server – for some services only. The best-known proposed services are the quarterly statements of employees' salary and work length, the statement of an employee's 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; now one single electronic declaration replaces previous multiple forms that had to be transmitted to several social security institutions.

On the social security web portal[8], 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 e-services related must only be considered as a small part of the effort made since they are included in a more important movement that works towards the building of an integrated information network. The aim of this network is to link in a comprehensive way all of the (2000) public and private institutions linked to the social security in Belgium and which are in charge of the execution of missions in the field (from now on we will call them "SSIs"). The effort is all the more consistent as they all have fundamentally different statutes and missions[9]. Under the coordination of the Crossroads Bank for Social Security (the CBSS) created in 1991, social security processes and information flows have been comprehensively harmonized and re-engineered through a global computerization process so that there is now large back-office integration among those institutions and consecutively real gains in terms of service delivery. The goal was to coordinate those SSIs, to make them communicate and concretely to reengineer back-offices workflows in order to simplify transactions between the institutions and also between them and citizens or companies. In the past there was little standardization among the social security institutions: they all had their own requirements and forms to submit to their "clients". Their business processes were not "customer-oriented" at all and one (company, social secretariat, citizen) had to inform many different institutions for a single social security related event to be correctly handled.

No overall institutional change has been undertaken simultaneously with this process – neither through mergers nor through large-scale devolutions. Administrative relations between the SSIs have remained quite similar since 1988, except the intercession of the newly created CBSS. The Belgian social security system is split between three systems: one for the employees, another for the independent workers and the third for the civil servants. It is made of 7 fields: retirement pension, unemployment, insurance against working accidents; insurance against professional accidents, family allowances, illness and incapacity insurance and yearly holidays. Let us consider the employees regime more precisely since it is the system where the e-services considered here take place. Two Federal Public Services (Ministries) are concerned: Employment and Social Affairs. The NOSS ensures the contributions collection and their repartition between the institutions. In the regime, the payment of the allowances is managed by a separate public institution per social security field (7) and these institutions work for determinate purposes with other public or semi-public institutions like the labour unions and the mutual funds.

Among the principal changes thus brought to the situation in social security services we would like to underline the automation of information transmission between the social security institutions under the "knowledge management system" run by the CBSS. It has lead to a drastic decrease of the effort demanded from insured persons and to

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[8] http://www.socialsecurity.be/
[9] For a list of those institutions, http://socialsecurity.fgov.be/broch-fr.htm.

companies (or their representatives). The automatic granting[10] of social security benefits or derived rights is such a consequence as well as the automation of employers' social security duties considered here.

This service involves at least two stages and has a 'depth' of two back-offices (agencies) – although more back-offices are involved if we consider the situation on a horizontal plan. The back-office communication process has been completely digitized. The Belgian Federal social security system – mainly through its "Crossroads Bank for Social Security" agency – assumedly runs one of the most functional applications of data exchange in Belgium; what is more, it is binding entities of different types and natures. In the context of growth in IT and Internet usage at large, it had to be considered as one of the best practices in Belgium in this survey.

2. Background

Social security in Belgium mainly remains a competence of the Federal State even if there is a strong tradition of decentralisation and power delegation (to non-public institutions) in the field. In the social security sector information has always been a crucial resource. However, information has long been considered as a power mark rather than as a cooperation tool. In the late eighties (1986), the National Ministry for Social Affairs published a "global plan for the computerization of social security" and created a small working group. This group was assigned the mission to carry out this plan and to improve the communication between the social security institutions. In January 1990, one of this team's pilot projects – the creation of an autonomous public office called the "Crossroads Bank for Social Security" – was adopted by the Parliament. The "CBSS" has consecutively been implemented in 1991.

In Belgium, e-government in the social security field can be considered as a precursor. It has been leading the movement more than it had to follow any imposed policy. It has even imposed some choices and views to the global federal e-government policies (for instance the idea of the Universal Messaging Engine and the principle of an electronic identity card). Anyway let us note that the reorganisation process in the social security field coordinated by the CBSS has been quite autonomous– that is to say it did not have to bear many external strategies or pressures.

The main change due to the general initiative is 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. Even if no general reorganisation or rationalization has taken place in the Belgian social security landscape – with federal entities even gaining some social security competences 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 as 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. The CBSS is no central general register. It only manages registers about where is information, who and for which purpose it can 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 second change brought by the initiative lies in the current generalisation of a renewal in the classical public conception of the relation between citizens or companies and the social security institutions; from now on information will have to be requested by them with the maximum thrift possible on behalf of the public administrations and the SSIs besides the fact that they will have to exchange this information with respect to security and authenticity guidelines. The Belgian law now entitles the citizen to transmit personal information only once to the social security "network" (even if this can be considered as a general principle only). The implementation of this principle should also allow the automatic granting of specific benefits and rights for the citizens. More precisely the e-services to companies analysed here have been designed to be one of the tools to remedy the problem of multiple collection of information. Actually 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 be 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.

The ultimate goal of social security is to prevent the human hardship or a least to give financial support if it turns out to be unavoidable. In this respect one could see e-government as a tool to reach this long-term goal with the maximum

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[10] That is to say, without any instruction or demand from the insured person.

efficacy and effectiveness. Effectiveness and equity request a fine-tuned knowledge of the characteristics of the insured persons; operational information must be available in order to provide the politic authorities with accurate data so that they are enabled to make the social policies positively evolve according to the evolution of the society. This reflects the view of the CBSS CEO, Mr. Frank Robben; but indeed, some serious chances of positive evolution of the social security concept (for instance social security contributions moderation in relation with personal positions) could remain unknown today if no relevant computerisation and networking took place. The Active Welfare State needs a strategic use of informatics since its aim is to preventively find people who will be likely to have problems in the future… Hopefully, all this will lead to a real strategic use of informatics in order to create new types of services.

3. Specific objectives

The reorganisations related to the e-services already implemented aspired to introduce:
- mandatory computerisation of some relations between employers and the social security in order to promote the general process of computerisation necessary to run large-scale internal reorganisations;
- a unique declaration to the social security system considered as a whole in some common cases (beginning or end of a work contract, quarterly declaration of wages, occurrence of a social risk at work, etc.);
- in consequence, the abolishment of about 50 types of forms employers or insured persons had to request at one particular administration and to send to another one. Also the drastic simplification of the (30) remaining forms;
- 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 and 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 as central points in the management of the different cases they could submit to the social security institutions "by default".

These e-services – only interesting for transactions of small data volume because of the limitation inherent to any web interface – must be considered as a part of a more general movement coordinated by the CBSS that has led to:
- 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;
- security precautions through external control and mandatory agreement of every new communication flow as well as through rationalizsed 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.

4. Resources

Among the e-services to companies, the "multifunctional declaration" (which replaces the former quarterly declaration) we analyse here is mainly linked to the NOSS (the National Office for Social Security). This important agency is a public organisation detached from both the Public Service for Social Affairs and the Public Finance Service. This organisation 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 – officially entitled to deal with the general e-government policy in the social security field. We will, above all, analyse the role the CBSS plays in the implementation of this e-

service all the more that 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.

ICT resources
The social security web portal – managed by the SmalS on behalf of the Public Service for Social Affairs – is composed of different parts:
- a gateway (allowing single sign-on, supporting the SSL security protocols);
- a portal and web server;
- a directory server controlling access authorisations;
- a central application server;
- a document server;
- a customer relationship management server interfacing with the "Eranova" contact centre;
- a content management tool (using standardised metadata and thesauri) allowing authorized institutions to publish up-to-date information.

The social security web portal is the public part of the social security Extranet. This Extranet is positioned as 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[11].

This Extranet is a TCP/IP-based network. It is separated from the CBSS infrastructure and directly depends on the Public Service Social Security. The e-services are also offered through other communication channels (FTP file transfer or Isabel inter-banking networks) using the same XML message structure made available on the web portal for companies use. All communication channels pass through the Extranet infrastructure that delivers information to the SSIs and the CBSS.

Human resources
The CBSS really is at the heart of the e-government process in the social security field. About 70 people work at the CBSS. About 50 of them are computer experts and engineers, the other 20 are occupied in the financial, R&D, legal, KM and administrative fields. The computer expertise is spread out among three entities: development, exploitation and information security[12]. Most of the computer specialists are detached from the "SmalS[13]", a non-profit public autonomous organisation created by the State 50 years ago. The problem with the creation of the CBSS was that recruitment of system engineers was a long and costly process that had to be carried out by the official recruitment office which moreover only recognised one profile of system engineer –even if the reality already asked to recruit people from various backgrounds and with various professional profiles.

Management resources
The functioning of the CBSS is ruled by a legislation adopted in 1990[14]. The CBSS is hierarchically linked to the Federal Public Service Social Security but its daily functioning is submitted to a negotiated business contract concluded with the Federal government[15]. This contract defines the general framework; provided that the CBSS stays within this framework (discussed and negotiated every two years) it is completely autonomous.

Financial resources
The budget of the CBSS amounts to 10-12 billion € a year, and this figure has remained more or less constant from the beginning in 1991 – but this cannot be considered as a negative sign since all important investments are now paid off (the cost per message keeps diminishing) and since the general costs for telecommunications are far lower than ten years ago. The resources mainly come from the mandatory contribution of the four Federal public institutions in charge with the collection of social security contributions. The organic legislation permits other income sources: yearly subsidy

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[11] "Metropolitan Area Network".
[12] See "the data exchange" at point 5.
[13] « Société de mécanographie pour l'application des lois sociales », litterally *mecanography society for the application of social legislation.*
[14] See *Loi du 15 janvier 1990 relative à l'institution et à l'organisation d'une Banque-carrefour de la sécurité sociale*, in *Moniteur Belge du 22 février 1990* (modified since then. Last modification : see *Moniteur belge du 26 juin 2003*).
[15] See http://www.ksz-bcss.fgov.be/documentation/fr/organisation/contrat_2002FR.pdf.

from the Social Security public service but also perception of royalties for extra missions or data transmissions done in favour of non-social security institutions.

5. Implementation

The e-services
The new multifunctional declaration to the ONSS – in use since the beginning of 2003 – has to be submitted electronically. Let us note that this service is only a part of a three-sided project. Actually the two other branches of the current e-services offer are:
- the statement of the beginning and the end of a work contract;
- the statement of social risks that change the social security position of workers (like an accident, an illness, etc.).

Even if the sending of data physically (e.g. on tapes or disks) remains authorized for an undetermined period, remote communication is clearly preferred. As already written, among those communication channels the web interface is by nature only useful for small structures. Through the web portal companies (or their representatives) can easily browse through their data and correct them if necessary; in the other cases such a "manual" interface is of no help.
These wage and working time data currently collected for the quarterly declaration are used to calculate the due social security contributions (by the NOSS), the holidays wage and the retirement allowances, but this declaration is likely to serve other needs for other social security institutions thanks to the computerization and the back-office reorganisation process served by current and future e-government projects. The process of concept harmonization (like working time, wage, 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 harmonization firstly helps the employer who is not anymore obliged 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 them the task of giving the information more than one time: the transmitted information will be dispatched by the CBSS to the SSIs for authorized purposes and this, 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 anymore from the employer. The principle is that an employer may be asked an information only once by the social security "system" as a whole (provided that the information is not supposed to be updated).

This 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 estimate five million contacts decrease).

There has been a constant will that harmonisation of working concepts would remain neutral towards the insured persons and their rights. The operation is also said to be neutral in terms of costs for the employer.

The data exchange
A global plan and vision has been built 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, computerized where feasible and rendered accessible for each other (in a first phase without changing the concepts in use) through standardized 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. Harmonization of the legal concepts has then taken place. This allowed to computerize other flows as well as to begin computerizing relations between citizens/employers and the social security institutions since the Web was becoming popular among them. We can state that this harmonization is at the base of the offer of e-services to the companies.

The data exchange between back-offices can take place either by terminal emulation (requiring manual intervention), application-to-application or Internet protocol. Message standardization takes place independently of the exchange mode. Every message is composed of two parts: the headers (in flat format) contain all necessary information for correct routing: sender and addressee, type and kind of message, mandatory information to obtain authorization, answer management. The message in itself (in XML, Edifact or flat format) contains the personal data (related to the SSIN[16] number contained in the headers). The communications between back-offices rely on XML-structured messages while

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[16] Social Security Information Number. See next page, same point, last paragraph.

the CBSS ensures protocol- and syntax-conversion if necessary[17]. The input from the outside (web portal, FTP, interbanking) is collected through the Extranet and directly converted into structured messages. The connection between the CBSS and the social security institutions is made through leased lines or through the Extranet to which all SSIs have a direct connection.

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) and indeed of the authorisations granted by the Expert Control Committee (see next page). This register consists of three tables:

- available data: where (in which institution) determinate data is available and for which purpose;
- access authorisations (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.

A government decree[18] defines the obligations relating to personal data transfer between social security institutions. It depicts the cases where an authorization is required to establish a data transfer. Those authorizations are delivered – in paper form – by an independent Expert Control Committee created in the context of the general Commission for the Protection of Private Life (designated by the Parliament). This Control Committee is entitled to give recommendations relating to the appropriate application of the law ruling the exchanges and the CBSS in general; it also helps resolving related problems. What is more, its preliminary recommendations are mandatory to designate the security counsellors every social security institution linked to the CBSS must employ. And above all, its (mandatory) recommendations must also be followed for every authorization of data communication requested by other than social security institutions. Let us note, moreover, that inside the CBSS there was a clear will to entirely detach the "security" concerns (by transferring them to a separate department) from the informatics departments in order to avoid the problem of deciders being judge and party in security concerns.

The "SSIN" serves as the common and unique identification key of the insured person used in the social security network. Let us note that only the SSIN is the general national identification number. Indeed it could be considered as the easiest way to supply an unequivocal identification of the insured person without any extra effort (besides being stable over time); but the fact that it was not compulsory to write it down on each identity card forced the authorities to adopt a system of social security cards (SIS) in 1996. This card contains the SSIN and the social insurability status as well – this is important for persons and entities like doctors, hospitals or pharmacies.

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 warehouses system and include 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 adequacy is controlled by the General Coordination Committee (the CBSS advisory board).

A customer relationship management has been set up together with the e-services to companies. The Eranova contact centre has a central role in this CRM since every contact produces an insertion into a knowledge database where problems and solutions are written down. The concept is now customised and integrated relation-oriented rather than product-by-product (or service-by-service)-oriented.

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 time-human-logistical resources units. It allows

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[18] See Arrêté royal du 4 février 1997 organisant la communication de données sociales à caractère personnel entre institutions de sécurité sociale, in Moniteur Belge du 3 avril 1997.

defining measurable work objectives for employees as well as to calculate effective workforce costs and so to be able to precisely evaluate financial functioning needs.

Technological choices
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 an integrator. 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".

Open source seems no absolute priority since the system cannot afford to depend on the good will of unsteady solutions and needs guarantees of performance and availability in order to respect the administration contract with the government. The CBSS holds partnerships with software and computer suppliers that stipulate that within a period of five years none of their software will be allowed to run only on dedicated machines from the same brand. Such long-term contracts are considered necessary to ensure the development of stable, reliable and support-provided open source software. For instance, object-oriented programs like Java have yet become stable and powerful 4-5 years ago. Moreover, these new techniques asking for more abstraction call for a renewal of the development teams that cannot be immediately satisfied.
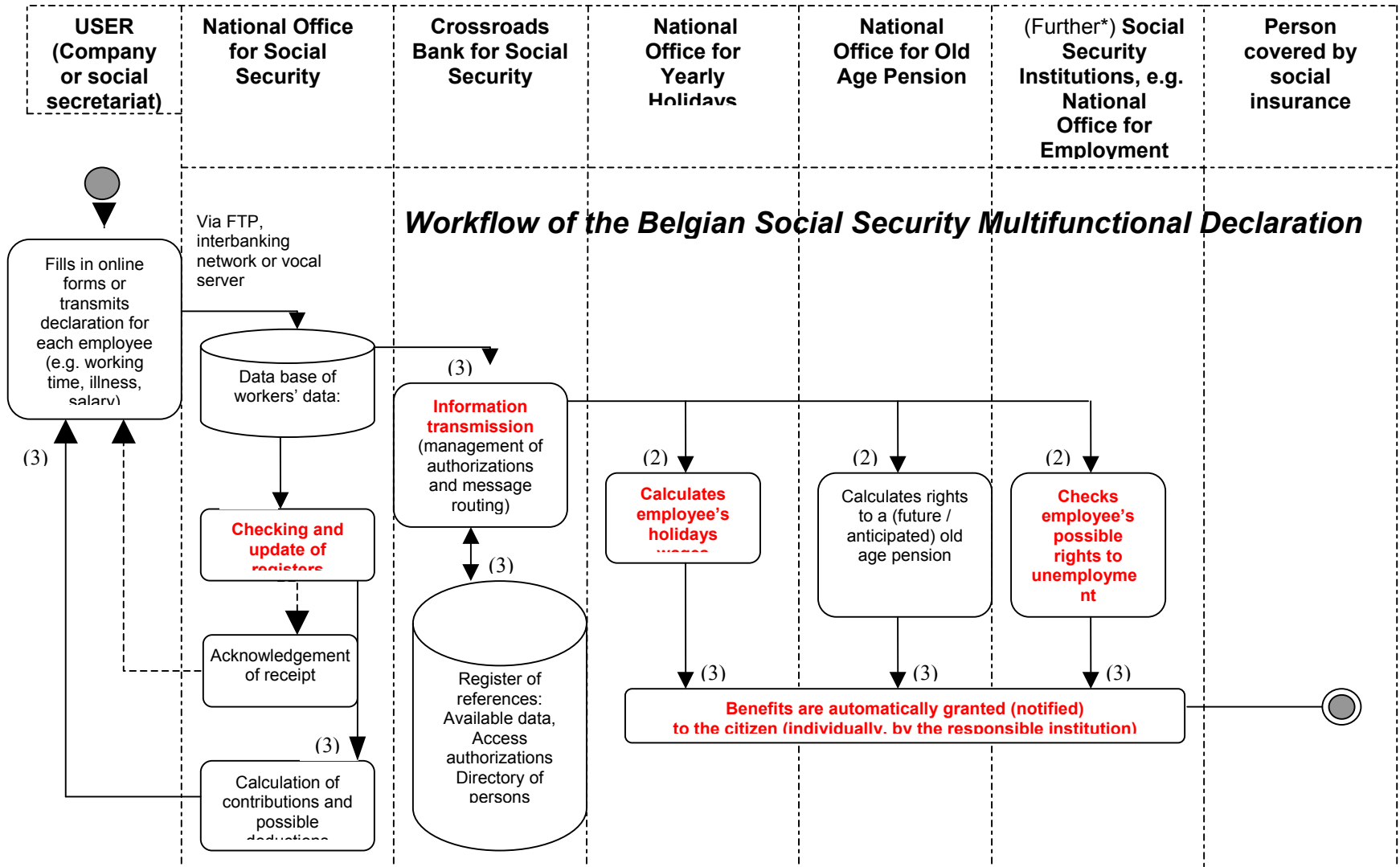
The multifunctional declaration
Since 1990, the NOSS runs a huge database of data collected in the companies that concern the position of their workers (considered here in their quality of insured persons). Since then, this database collects statutes, work conditions, salaries, working times, working 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 and vocal server or even in batch mode (but in this case the employer will not be in a position to receive 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 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 we have 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. And now allowances for work incapacity or unemployment allowances can be calculated by the *ad hoc* institutions who are entitled to receive the information concerned on behalf of the NOSS and by means of the CBSS.

The Crossroads Bank for Social Security: the "motor of e-government in the social security sector"
The CBSS is a particular public agency in that it profits from a working autonomy regulated by the "administration programme contract" with the government. The implementation of this programme contract – and in more general terms of the relations with the partner institutions – is checked through the use of control panels allowing measure, comparison and correction of task distributions.

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). The advisory board of the CBSS (the General Coordination Committee) is entirely composed of representatives of its "clients" (the social security institution). By so doing these clients are enabled to ensure their deep involvement in the evaluations and goal-settings. The main mission of the General Coordination Committee is to propose solutions promoting and consolidating good collaboration among the network of social security institutions created on the basis of the CBSS. It must be considered as the coordination organisation where coherent development is examined. Indeed,

USER (Company or social secretariat)	National Office for Social Security	Crossroads Bank for Social Security	National Office for Yearly Holidays	National Office for Old Age Pension	(Further*) Social Security Institutions, e.g. National Office for Employment	Person covered by social insurance

Workflow of the Belgian Social Security Multifunctional Declaration

Fills in online forms or transmits declaration for each employee (e.g. working time, illness, salary)

Via FTP, interbanking network or vocal server

Data base of workers' data:

(3)

Information transmission (management of authorizations and message routing)

Checking and update of registers

(2)

Calculates employee's holidays wages

(2)

Calculates rights to a (future / anticipated) old age pension

(2)

Checks employee's possible rights to unemployment

Acknowledgement of receipt

(3)

Register of references: Available data, Access authorizations Directory of persons

(3)

(3)

(3)

(3)

Benefits are automatically granted (notified) to the citizen (individually, by the responsible institution)

(3)

Calculation of contributions and possible deductions

*) we consider only one flow (related to the national office for employment) for the example among those potentially introduced with the new "multifunctional declaration" (Fund for Working Accidents, Fund for Vocational Diseases, National Office for Employee Family Allowances, National Institute for Illness and Incapacity Insurance). Before 2003, only the "National Office for Yearly Holidays and the National Office for old Age Pension "quarterly declaration": could transfer information from the declaration to the NOSS.

the Management Committee still holds the concrete decision power but as far as the functional division of tasks among the SSIs is concerned they have to ask the advisory board's advice.

The relations binding the CBSS and the SmalS have to be stated more precisely. The system engineers working at the CBSS are recruited by the SmalS and their work contract links them to the SmalS rather than to the CBSS. In public social security organisations, system engineers had worked separate from the core business until 1986; indeed there was an autonomous "informatics" structure (the SmalS). Thus one could observe a real hiatus between the people from the social security business and the software engineers. The first ones were not familiar with computers and did not know the strategic opportunities offered by informatics; the system engineers were not familiar with the real problems in the field of social security. When any information management problem arose, the chief officer could tell his Minister he was not responsible but the SmalS was. Since then information is more and more considered as a fundamental production resource; so its management and business has been integrated in the SSIs core structures; at the same time, the chief officers have been asked to acquire information management skills. The mission of the SmalS then evolved, and it became a recruitment bureau besides being a more integrated informatics department.

6. Results

Messages on the social security network are reported to cost about 5 eurocents and on-line messages (a batch-mode communication still exists) are reported to take less than 4 seconds between query and reply (for 99,3% of them). In 2002, some 242 million messages have been exchanged on the back-office system. Among them there were 63.5 million exchanges concerning the NOSS database on wages and working time – which is fed by, among other sources, the quarterly (now "multifunctional") declaration reviewed here.

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 – where 4000 supplementary employers made mistakes. The CBSS has received and transferred information on about 1.261.000 workers.

As far as the e-services are concerned, it is more difficult to state a general evaluation since no assessment has taken place (or at least communicated). In 2002, 236,000 different employers submitted 7.2 million declarations electronically. Sixteen types of transactions can be done electronically:
- the multifunctional declaration;
- the immediate declaration of recruitment and discharge;
- consultation of own staff employed;
- integrated electronic notification of a building site;
- withholding of contribution in the construction sector;
- request to send an employee abroad;
- advance notification of temporary layoffs;
- declaration of an accident at work and monthly report (2 transactions);
- declaration of the beginning of a part-time job with retention of rights to unemployment benefits;
- monthly declaration of part-time work for the calculation of guaranteed income payments;
- monthly submission of work as an employee employed in a protected workplace;
- monthly submission of work in the framework of an activation programme;
- declaration for the establishment of young people-vacation rights;
- monthly declaration of young people-vacation hours;
- authorszation request for the dismissal of a pregnant employee (private sector).

Backlashes have been experienced in the general back-office reorganisation process since some organisations feared for their existence and were reluctant to share information they possessed. Though, the conviction of the CBSS manager Mr. F. Robben is that a large part of potential backlash has been avoided through the fact that from the beginning on, 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[19] (a part of it is transferred to the CBSS budget on a yearly base). This amount constitutes the operating costs of the CBSS. Thus the more an institution uses the system, the best 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 is the competition between most organisations in most sectors of the social security: once an organisation decides to use the system, its direct competitors can't afford continuing to neglect it.

There were no advertising campaigns, neither addressed to the citizens nor to the social security institutions. So the CBSS management was nearly obliged to tour the country and promote the initiative even if legal constraints force the institutions to cooperate; actually in Belgium there are currently well-known cases of serious take-up reluctance concerning non-negotiated administration structural reforms.

7. Learning points and conclusion

General assessment

As a result of this back-office reorganisation and integration project – combined with the introduction of elements of a customer relationship management logics – one can identify consistent gains in terms of efficiency: a general communication system now exists that is favourable to the citizen and the companies and that saves energy and paper and reduces operating costs.

Collection of information was rationalised simultaneously as cooperation between institutions was "forced" (we mean accepted and formalised into task-sharing agreements) and as the general effort initiated has led to a very useful harmonisation of the working concepts (such as working days, income, residence, etc.) among social security administrations and private offices. These concepts are now unequivocal, common throughout the social security system as a whole, and they have been made independent from the multiple and constantly variable regulatory framework.

The system can be fruitfully used to combat fraud in a more efficient way: false declarations, illegal accumulation of benefits, fraud on social security obligations have been rendered more difficult[20].

The cooperation has, moreover, permitted the development of a single portal for the whole social security. This is an interesting sign of transparency and efficient public service. We could identify a real will to give the citizens and the companies more services and services often delivered in a more intuitive way.

Transferabilit*y*

In Belgium there are some concepts or ideas that have been extended to other projects:
- The Universal Messaging Engine (UME) that supports the "FedMAN" general public information network is based on the CBSS principles.
- The now emerging Crossroads Bank for enterprises is also inspired by these concepts.
- In the same way the methods used in the social security field concerning authentication will be reused on a wider scale (Federal State and Federate Communities and Regions).
- The distribution model (task sharing) with a *clearing out* has become widely used.
- The SIS card also was at the origin of the electronic identity card.

Some concepts and methods developed here have been notably reused in Bulgaria and in the Netherlands. Concerning the cooperation on a European level, it appears that Belgian social security leaders – even if deeply involved in some working groups – regret the decision speed and mode as well as the lack of power delegation granted by some Member State to their representatives in those groups. Indeed, the implementation of information systems or data exchange requires more effective discussion than the simple transposition of a directive. According to them, another barrier is the great number of groups discussing aspects of European e-government (nearly 80). The system governing social security discussions ("*open method of coordination*") should be worth being considered for e-government purposes creating a common and agreed way for discussion with only a few written rules.

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[19] 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.
[20] Such a program (building of an "anti-fraud datawarehouse for the social security") is being developed by the Federal Public Service Social Security OASIS.

Success factors
We think there are two critical success factors in such projects: privacy and transparency for the "clients". These factors seem to have been met in the present case – what is more in a way that is compatible with efficacy: on one side the law is restrictive and all precautions have been taken (for instance the surveillance commission that is asked to decide data-exchange authorisations). On the other side every decision is made public and despite the complex institutional landscape in the field a consistent transparency and pedagogy effort has taken place.

Mr Frank Robben points out as success factors a mix of three aspects that he considered as being simultaneously gathered here:
- innovative projects issued by people with no known political membership so that they benefit from initiative freedom – Belgian public administrations are usually strongly politicised;
- a team built with people chosen from the public administration for their work experience (what may guarantee realism to projects);
- political support coming from a powerful Minister which gives people the time they need to build a project and is willing to defend his team even if it can't show tangible results immediately.

Future projects coming out/resulting from the back-office reorganisation/digitization process
Let us finally note that some projects should ensure the continuity and the growth of the reorganisation project:
- the creation of a "social security e-workspace" to allow workers in social security institutions to have a shared work environment at their disposal;
- extension of the back-office integration to institutions from other levels of administration (cities, region, communities) concerned with social issues and missions;
- the generalization of automatic granting of benefits based on a person's social security status – including other purposes than social security (telephone charges, public transportation, taxes, etc). A recently published law entitles citizens to such automatic granting;
- new electronic transactions for three target groups: citizens, companies and health care professionals. The new services should be more and more person-oriented;
- promotion of the use of the SIS-card by health care professionals in order to support the equipment prior to introducing the new electronic identity card – that will a.o. replace the SIS card;
- creation of a Federal network of service integrators for the coordination of a comprehensive and coherent e-government framework in Belgium.

Among these projects the automatic granting of due benefits appears to us as a concrete guarantee of a good public service. In this respect successful back-office integration could become one of the most serious ways to prevent and avoid the so-called "digital divide"; indeed, web presence and e-services alone should not be considered as a must since they do not necessarily mean better service for common citizens.

8. References and links

Contrat d'administration entre l'Etat belge et la Banque-Carrefour de la Sécurité Sociale
Social Security Portal
www.socialsecurity.be
National Office for Social Security
www.onssrszlss.fgov.be
Crossroads Bank for Social Security
www.ksz-bcss.fgov.be
Contact persons
CEO, Crossroads Bank for Social Security
Mr. Frank Robben
Secretariat: management@ksz-bcss.fgov.be
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General concerns about the Belgian e-government
Mr. Jan Deprest
Fedict (Federal Information and Communication Technologies service)
info@fedict.be / + 32 2 790 51 11

Denmark

Case 6:
Citizen student grants:
"My Student Fund" ("My-SU")

1. Executive summary

SU-Agency (SU = Statens Uddannelsesstøtte: State Education Fund) is the Danish agency responsible for the administration of student grants in Denmark. All students studying approved courses at approved educational institutions in Denmark can apply for financial support from the Danish government. This support can take the form of grants and/or loans, applied for at the educational institution where the student wishes to study. The educational institution checks whether the student application is valid (in terms of whether they are qualified and the course they are applying for entitles them to support) and passes their application (or query if they are already registered) to the SU-Agency. The SU-Agency cooperates with the Danish tax authorities to check tax rates and income, and then replies to the educational institution which in turn provides the information to the student.

Up until the mid 1990s only the SU-Agency was on-line with its mainframe system, but this was also linked electronically to the tax authorities. The student's paper forms sent via the educational institutions were passed by the SU-Agency to a data input bureau for data entry to the mainframe system.

In the middle of the 1990s it was decided that employees at the largest educational institutions should have direct access to the SU-Agency's mainframe system. Thus, these institutions could now not only check if student applicants were enrolled and 'active', but also key in data from the student forms into the mainframe system. This dramatically changed the job functions of staff at both the SU-Agency and the educational institutions. It also cut-out the need for the data-input bureau, and even though the SU-Agency still cooperates with this bureau, it is now only used minimally.

In 2002, a web-based system for use both by students and the educational institutions was established which communicates directly with the traditional mainframe system of the SU-Agency. The whole system is called "Min-SU" ("My SU"). Now, the main task of data input and query rests directly on the students themselves, thus again dramatically altering the job functions of staff at the educational institutions.

The authentication of users and of data input to the mainframe system via "My-SU" is undertaken by a public-key developed by KMD (Kommunedata). This is not the same as a digital signature, but very similar. KMD have developed many service systems for the public sector and many of these use the KMD public key as a means of identification (together with the student's civil registration number). Thus, this KMD public key can be used as authentication of users in many different public systems, but it is not a digital signature as there are some specific legal restrictions, for instance it is not possible to apply for a loan fully on-line as this requires a physical signature.

With "My-SU" the administrative work undertaken by the educational institutions and the SU-Agency has been drastically reduced. However, the system still coexists with the procedure introduced in the mid 1990s so that the educational institutions still need to process paper based applications for most students, which requires them to continue to undertake a lot of direct data input work. On the other hand, the need for the data-input bureau has more or less vanished. In the summer of 2003, roughly 20% of applications are made via the Internet, which is considered quite a success rate as the "My-SU" has only been in place for one year.

2. Background

The SU-Agency (SU = Statens Uddannelsesstøtte: State Education Fund) is the Danish office responsible for administration of student grants in Denmark. All students studying approved courses at approved educational institutions in Denmark can apply for financial support from the Danish government. This support can take the form of

grants and/or loans. All students receive grants if they qualify, whereas the taking of loans is voluntary. The size of the grant is dependent on the applicant's personal financial situation, i.e. if their personal income exceeds Euro 560/month, the size of the grant is reduced and any previously paid grant could be repayable. Thus it may be appropriate for students receiving grants to forego them for a period of time if their personal income is too high. Thus, the SU-Agency:

- administers grant and loan applications from students
- responds to queries from students
- administers the grant pay-back process in cases where a student's personal income has exceeded the limit
- administers requests for terminating grants, either temporarily if the students discovers that his/her personal income is too high, or permanently if the student fails to live up to certain activity standards determined by the educational institution.

In order to perform these tasks, the SU-Agency cooperates with, and is dependent on data from, the various educational institutions. Furthermore, the agency cooperates with the Danish tax authorities in order to access tax rate and other personal financial data. Thus, the SU agency, the educational institutions and the tax authorities are the main agencies in this case study.

In order to ease the transactions, primarily between the students, the educational institutions and the SU agency, a web-based system, which communicates with the traditional mainframe system of the SU agency, has been implemented. This is called "Min-SU" ("My SU").

The implementation of "My-SU" is not a part of any specific programme, though there has been much debate in Denmark on introducing ICT into the public sector, but the initiative at the SU agency has been partly inspired by this debate. Neither is the implementation of "My-SU" part of a major reorganisation project, but it has caused some significant changes in the job-functions at the SU-Agency and the educational institutions, as well as given a much improved service to students.

3. Specific objectives

As mentioned above, the implementation of "My-SU" 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 SU-Agency's existing mainframe system, and this then enabled these institutions to directly key in data instead of only being a physical staging post for paper-based applications on the way forwards and backwards between students and the SU-Agency. This was very beneficial seen from the perspective of the SU-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 did result 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 give student applicants access to instant information and a better service more generally.

4. Resources

ICT
The main functionality characterising the online service "MY-SU" is the web-based interface providing the link between the SU-Agency's mainframe system/database and the user, enabling the latter to make requests for information and type in changes and queries. Furthermore, this mainframe system communicates with the Danish tax system. There has been no need to implement proprietary systems to facilitate communication between the SU-Agency and the tax authorities. This continues to run on the legacy technology existing prior to 1995, before "My-SU" started to be implemented. Thus, in this case it has not been necessary to change the legacy system in order to integrate it with the new online services for the educational institutions and the student users. Within the public sector generally, many different legacy systems exist and it would be a huge task to integrate these on the basis of a new common system.

The users communicate with the mainframe database via a homepage with Java applets. The user either inputs data into the database if s/he needs to record changes, or she/he initiates a query to which the system responds with requests for information. Where communication with other systems (such as the tax authorities) are necessary, this is done via batch-job processing. Thus the system is open in regard to integration between the SU-Agency and the tax authorities.

PKI
Security and authentication of users is not assured by means of a digital signature in the strict sense, but via a public key administered via KMD, a private sector organisation previously owned by the Danish municipalities. This organisation manages many public sector web-based services, and users apply to KMD for a public key, which then can be used to access many different services. This key is accepted, together with a civil registration number, as a secure and accepted means of identification. Thus, once first-time applicants wish to use "My-SU", they need to apply for a key to KMD. This is sent to the user and when s/he then logs into "My-SU" they are requested to fill in the code. For the user it appears that this is managed by the SU-Agency, but in practice once the user clicks on "log-in" they are actually transferred to a KMD-site. Here, data is keyed in and, if the KMD-system accept the key, the user is transferred back to the "My-SU" system and all requests for information and/or changes are thereafter accepted.

However, the KMD public key is not the same as a traditional digital signature, even though it closely resembles this. For instance, if an applicant wants to apply for a loan, rather than a grant, then this is not possible fully on-line. The applicant can fill in an application online, but this will be transferred to a paper document, which is sent to the user in order to obtain her/his formal signature. If an official digital signature existed it is expected that this procedure could also be handled fully online. This is also something, which the SU-Agency is considering to implement, once the digital signature becomes available in Denmark.

Scalability and process automation
The implementation of "My-SU" was specifically to provide the basis for scalability with regard to information requests. Prior to implementation, the administration of basic information requests was quite troublesome. There was no problem in finding information, as this only required a query in the mainframe database. However, administering paper forms and sending these back and forth was a huge problem. Today, this is handled 100% automatically via "My-SU", i.e. no human interface is involved. In relation to more advanced activities, such as grant applications and similar, "My-SU" has also enabled the procedures to run much smoother. Data is directly keyed into the system, instead of previously sending this to the data input bureau or having the educational institutions input the information. Once data is in the system, communication with the tax authorities takes place 100% electronically and information flows more easily and effectively. Thus, "My-SU" has enabled the SU-Agency to cope with ever increasing demands on the system from users, although it should be noticed that "My-SU" is still only one available method as the old channels still exist.

Human-resources
It is evident that the implementation of "My-SU" has drastically changed the job-functions at the SU-Agency. There have not been any direct redundancies, apart from the drastically reduced use of the private sector data input bureau and the expectation that the contract with it will soon be terminated. However, as the students, or in first instance the educational institutions, have themselves now been given the task of data input into the mainframe system, the job functions of staff in the educational institutions and the SU-agency have changed dramatically. Instead of endlessly collecting applications, storing and keying these into the system, as well as sending information back and forth, employees at the SU-Agency now work much more with technology development and maintenance, as well as in training the administrative staff at the educational institutions who maintain the distributed system.

Organisation resources
As mentioned above, the SU-Agency uses a private sector data input bureau, which previously undertook all keying in of data from paper forms to the mainframe system. Even though this contract still exists, it is expected that it will soon be terminated because of the changes which have taken place.

The implementation of "My-SU" has mostly been financed and initiated independently by the SU agency. The agency did receive minor financial support from the Danish Ministry of Science.

5. Implementation

Implementation has gone through two sets of changes to existing procedures, each time changing workflows, job functions and task responsibilities. With each set of changes the level of digitisation of the workflow has increased but has also left existing procedures in place (see attached workflow diagrams):

Pre-existing system – only SU agency digitised (pre-1995): the workflow is as follows:
1   students who want to apply for a grant or loan have to fill in official paper-based forms
2   these are collected by the educational institution, which checks whether or not the student is active and enrolled, and then
3   physically sends them to the SU-Agency which then
4   physically ships them to a commercial data-input bureau where employees key the data into the mainframe system
5   the SU agency can then deal with the application and
6   if relevant, communicates electronically with the tax authorities via batch-job processing
7   then physically returns the application/query to the educational institution
8   which has physical contact with the student.
In procedure 1, eight steps (as above) and four stages are involved: educational institute, SU-Agency, data input bureau and tax authorities.

Educational institution on-line (1995): the workflow is as follows:
1   students who want to apply for a grant or loan have to fill in official paper-based forms
2   these are collected by the educational institution, which checks whether or not the student is active and enrolled, but instead of physically sending these to the SU-Agency and to thence to the data-input bureau, the mainframe system has now been made available to the educational institutions whose employees can input the data direct (thus also cutting out the need for the bureau)
3   if relevant, the SU-Agency communicates electronically with the tax authorities via batch-job processing
4   the educational institution can then deal with the application electronically individually or in cooperation with the SU-Agency
5   the SU agency can then deal with the application electronically individually or in cooperation the educational institution
6   the educational institution has physical contact with the student.
In procedure 2, the number of steps has been reduced to six (as above) and the number of stages to three: educational institute, SU-Agency and tax authorities.

"Min-SU" -- whole process on-line (2002): the workflow is as follows:
1   students who want to apply for a grant/loan or enter a query log on via KMD's PKI software
2   students enter their own data into the web-based template, which is directly integrated with the mainframe system.
3   if relevant, the SU-Agency communicates electronically with the tax authorities via batch-job processing
4   both the educational institution and the SU agency can deal with any applications/queries electronically between themselves and/or direct with the student
5   the student receives an electronic response to his/her application/query.
In procedure 3, the number of steps has been reduced to five (as above) but the number of stages is increased from three to four but only so that the student logs in electronically via KMD's PKI software.

Note between procedure 1 and procedure 3, the simplification of the overall procedure by a reduction in the number of workflow steps, and the reduction in the number of stages (data-input bureau cut-out).

The two procedures co-exist at the present time and, as can be seen, the central element is still the mainframe system of the SU-Agency. Each of the different workflows access and enter data in different ways, via different interfaces. It is also the mainframe which communicates with the tax authorities via batch-job processing. The web-enabled interface has not changed this.

Procedure 3 was introduced in the summer of 2002, thus it is difficult to give actual uptake figures. However, the SU-Agency is of the opinion that the implementation of "My SU" has been successful as already more than 20% of all requests and applications are made electronically. The system is free to use for applicants.

Implementation of "My-SU" is not a part of any large-scale ICT programme within the Danish public administration. It may be thought that integrating the SU agency with the tax authorities would require that both have similar systems. However, this is not the case. Neither the SU-Agency nor the tax authorities have changed their central systems to facilitate integration. The mainframe system and the system implemented at the tax authorities have existed for many years and also communicated electronically before "My-SU" was launched. The web-interface has simply been added and has thus extended the link out to the users.

The "My-SU" system facilitates the following activities:
- Applications for grants and/or loans: student applies for a grant or loan.
- Changes to application: student requests a change to his/her grant/loan, e.g. chooses not to receive grant for a certain period.
- Requests for information: student queries size of grant, grant payments, status on balance between received grants and personal income, yearly statement, how much grant left for her/his course of study, etc.

In terms of job functions, with the opening up of access to the SU-Agency mainframe system a lot of work has been decentralised, firstly, to the individual educational institutions, and then to students themselves. Thus, employees at the central SU-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. The educational institutions now keep their own files and do most of the data input and query work, so both sets of staff job functions and task responsibilities have changed:

Changing functions of the educational institutions:
- Procedure 1:   collecting forms, physically forwarding these to the SU agency, receiving physical answers back and direct interface with students
- Procedure 2:   collecting forms, data-input and query, electronic communication with the SU agency, and direct interface with students
- Procedure 3:   electronic communication with the SU agency, and direct interface with students

Changing functions of the SU-agency:
- Procedure 1:   collecting physical forms, forwarding these to the data-input bureau, data query, physical communication with the educational institutions
- Procedure 2:   data query, electronic communication with the educational institutions plus education, training and ICT-support.
- Procedure 3:   data query, electronic communication with the educational institutions, plus education, training and ICT-support.

Opening up the system to the educational institutions has been a success in the sense that work pressure on the SU-Agency has been minimised. On the other hand, after the first change to procedure 2 some educational institutions complained that their work pressure had increased rather drastically. This was one the main arguments for implementing procedure 3: "My-SU", i.e. further de-centralising data input and some data query work from the educational institutions out to the students themselves. A good example of what happens in many eProcesses where the end user achieves simultaneously more control but also takes on more responsibility and work.

Thus, it is seen that the implementation of "My SU" is not a part of any major re-organisation, but it is evident that the job-functions have changed quite dramatically. In terms of cooperation with other back-offices, the implementation of "My-SU" has not changed this drastically. Data is still stored in the old mainframe system, but is now entered and accessed via a new web-based interface. In cases where users make simple requests for data it is very simple. "My-SU" runs as a Java-enabled applet at a front-end server.

The user types in information, which is then sent to the mainframe, which responds to the query and data is presented back to the user. In cases where the user wants to make changes, it is necessary to distinguish between basic and advanced changes. If the user, for instance, wishes to change his/her bank account into which grants are paid, this is simply inserted and submitted and the mainframe database is updated instantly. In cases where students wish to apply for a grant or make changes to the number of grant payments (e.g. refuse payments for some months), communication with the educational institution and the tax authorities is necessary. In such cases, the students submit data which is instantly stored in the mainframe as a request. This does take some time to handle, but the process is as follows:

- If the necessary information is not in the database, employees handling student administration at the educational institution receive a request to look up the student and check if he/she is enrolled and conforms to activity standards. The institution then either accepts or refuses the application.
- If the application is accepted by the institution, a request is sent electronically to the tax authorities in order to get information on the tax rate, etc., and other financial information. This is not done instantly, but once a day all accepted applications are collected in a batch job which is then sent each evening to the tax authorities, so that next morning the SU-Agency receives data back and is ready to make any necessary financial transaction.

When discussing the changes at the SU-Agency it is necessary to distinguish between the three procedures as described above. The central feature is the mainframe database. Data from applications needs to be entered into this database before anything can happen – acceptance, payments, information and/or communication with the tax authorities. This data input process is now undertaken in two different ways, currently co-existing. Firstly, data can be input via the educational institutions as the mainframe has been opened up to them for access. In the summer of 2003, roughly 80% of transactions took place via this method, i.e. paper forms are handed in by student applicants and administrative staff key-in the data to the distributed mainframe system. Second, the full "My-SU" system which functions in the same way but data entry is undertaken by the students themselves, who can also instantly access specifically requested data. Roughly 20% of transactions take place via this method, i.e. purely electronically.

The first change was giving the educational institutions access in the middle of the 1990s. This resulted in less administrative work for the SU-Agency, but more training and technology development and maintenance. As the educational institutions discovered that this resulted in much more work for them and students were dissatisfied by the slow speed of requests, especially related to troublesome process of getting access to basic information, it was decided in late 2000 to start the development of "My-SU". This was finished by late 2001 and more or less functions in the same way as the system used by staff at the educational institutions. Student applicants can type in data, thus reducing the workload on the educational institutions. This can be done 24 hours a day, and thus the applicants avoid physical queuing and gain the opportunity to get instant information on basic queries. Data can be accessed much faster than was the case previously. The electronic workflow has been extended out to the end-users, which has reduced pressure on both the educational institutions and, in particular, on the SU-Agency. It is also found that job-functions at the SU-Agency have become more rewarding for staff.

The initiative for developing "My-SU" came solely from the SU-Agency. There was, as mentioned above, some pressure from the educational institutions. as well as the students. Once the decision was taken, external special consultants were contracted in, but most work was done independently by staff at the SU-Agency. System integration was not a significant problem, as the underlying legacy system remained in place. The main work was concerned with building a web-interface to the existing mainframe database, enabling applicants to input data and retrieve information.

Surprisingly few problems were experienced during the implementation phase. Communication via the database and the web-interface is done via Java-applets stored at a front-end server, and security and authentication of users is done via the KMD public key. Integration between the SU-Agency and the tax authorities is undertaken via batch-job processing. This is quite basic, but every night a batch-job consisting of civil registration numbers in an agreed format is sent to the tax authorities. Because the SU-Agency has a long history of cooperation with the tax authorities, this format has been used for many years and this fits perfectly into the existing systems at the tax authorities as well as the mainframe system of the SU-Agency. There has been no need to change this. The latter organisation receives back the requested information from the tax authorities overnight and is ready to process the work. There is no need for human interference during the process and data flows back and forth between the systems of the tax authorities and the SU-Agency.

Thus to make it totally clear, applicants input data or make queries to the mainframe via the "My-SU" web-interface, and, at the end of each day, the mainframe accumulates a list of users who have made changes. This list is then posted electronically to the tax authorities system, which undertakes the requested queries in their system, generates responses in the file, which is then sent back to the SU-Agency. All this takes place without any human interference.

6. Results

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 SU-Agency out to the formers' administrative staff.

Further, 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 SU-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 rest, about 80%, still takes place by students handing in paper forms to the educational institutions whose staff input the data to the SU-Agency's mainframe. The original procedure whereby students' paper forms were sent, after checking by their educational institution, to the SU-Agency, which, in turn, passed these forms to a data input bureau, has now virtually disappeared.

Given that currently only 20% of applications are submitted via "My-SU", it is too early to say anything conclusive about the long-term success or otherwise of the system. However, it is found that satisfaction among student users as well as the educational institutions themselves has improved significantly.

The SU-Agency is also of the opinion that the implementation of "My SU" has been successful given the rapid take-up in only one year The system is free to use for applicants.

The main success of the system should be measured in terms of user satisfaction. Prior to "My-SU" it was a rather troublesome task for the user to get even basic information, not to mention make changes to data. Today, "My-SU" enables 24/7/365 access to data and changes. However, these changes are not made instantly as they are collected in "batch-jobs" once a day overnight in cooperation with the tax authorities.

Thus benefits are currently rather tentative, but it is estimated that, if "My-SU" achieves a higher penetration, it will have significant and positive impact on the workload previously laid upon the administrative staff working at both the educational institutions and the SU-Agency. Furthermore, service levels have certainly improved, especially with regard to the provision of basic information. In the future, the SU-Agency expects to implement a tool which can give users intelligent information on the balance between their grant situation and personal income, and this should provide them with better grounds for making decisions. Finally, it is also expected that the implementation of a fully digital signature facility will make it possible to administer and apply for loans online.

Further development of the system is expected. This is likely to include a more intelligent integration between the SU-Agency, "My-SU" and the tax authorities. Today, it is the responsibility of the individual student to keep track of the balance between payments received and other personal income, and to re-adjust grants payments if personal income exceeds a certain level. Within the next six months or so, it is expected that it will be possible via "My-SU" for students to directly access data from the tax authorities on personal income, both current and historic, and so that the system provides recommendations to the student, for example, not to take a vacation job and/or reject grants for a certain period in order to avoid demands to return grant payments.

7. Learning points and conclusions

The significant aspect of this case study is that it is possible to integrate different back offices without the need for investing in, often expensive, propriety software. Via Java-applets it is possible to implement a web-based system which enables user interrogation of a very old mainframe-based database. Thus customer service has improved and the system is scaleable in the sense that any rise in usage will not impact the workload at either the SU-Agency or the educational institutions, as everything is handled electronically without human intervention.

Furthermore, integration between the SU-Agency and the tax authorities is based on traditional batch processing using an agreed format. This may not be possible in highly flexible environments, where integration takes place between often changing partners, but in a world where co-operation has existed for many years and is likely to continue, this case had shown that there is no need for close system integration. Extending the useful life of legacy systems with a web-based interface can result in significant improvements and provision of new, or at least, faster, more robust and higher quality services.

The implementation of the "My-SU" system has been undertaken in steps, which are still incomplete as a full digital signature and student interrogation of their tax data are not yet implemented. Stepwise implementation 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.

Unlike many cases, pressure for change in the Danish "My-SU" case came from below, i.e. from the student users who wanted a faster and better service, and from staff (both in the educational institutes and in the SU-Agency itself) who felt that they were overloaded with too much routine work (data input and answering queries). This pressure, coupled with the limited financial resources involved in adding a web front-end to an existing system and the incremental implementation process, has ensured success as those involved in using and implementing the system have been those pushing for the changes. In addition, the SU-Agency has saved money by cutting out the need to send paper forms to a data input bureau. The only loser has been this private sector bureau and its staff.

In terms of job functions, with the opening up of access to the SU-Agency mainframe system a lot of work has been decentralised, firstly, to the individual educational institutions, and then to students themselves. This is a good example of what happens in many eProcesses where the end user achieves simultaneously more control but also takes on more responsibility and work. 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. In order to enable this to take place successfully, of course, the users need to have the necessary access, skills and motivation. Each of these can be said to exist in this case, although how usage of the full "My-SU" system increases in the next few years will be the acid test of the extent to which these are widespread amongst the user group. The one drawback is that, even if 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, so that the paper-based procedure between students and the educational institutions will need to remain in place for some time. However, maintaining this alternative physical channel is not inordinately expensive, as its cost is purely to be measured in terms of administrative staff time 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 other cases, maintaining expensive alternative infrastructures.

Finally, in contrast to significant changes to the job functions, tasks and skills of staff, formal organisational changes, which can be expensive and disruptive, have been minimal, and all existing forms of cooperation between agencies and back-offices have been maintained virtually unaltered (apart from cutting out the data input bureau). This also has meant that any potential resistance from lower level or departmental managers has not been a problem. The main challenge is to the skills and tasks of staff, and the need for them to be prepared to be flexible and adopt new ways of working. This has not been problematic in this case because, as described above, the drive for change has largely come from these staff themselves, they have experienced less routine and more interesting work and there has been no threat of redundancy or other unwelcome changes.

8. References and links

The web-site URL for the "My-SU" service is: https://min.su.dk/susb/

See the attached three workflow diagrams, one each for each procedure.

Workflow of student grants ("My-SU") Denmark -- 1

USER	PUBLIC ADMINISTRATION				
Student	**Educational institute** Stage 1	**SU-Agency** Stage 2	**Data input bureau** Stage 3	**Tax authorities** Stage 4	**KMD** Stage 5

1) Pre-existing system prior to 1995

Applies on paper form for grant/loan or change/query data

Paper forms/ queries (also tele-phonic), check qualification and conformity.

Receives paper forms and/or queries, and sends these to data input bureau

Keys in data from paper forms to SU-Agencies mainframe system .

Application or query processed on mainframe

Batch job queries on student tax rates and income

Student receives reply to application or query (on paper)

Student status forwarded on paper

Determines student status

LEGEND:

PARTICIPANT

● starting point

◉ end of process

action

——▶ digital workflow

–·–·–▶ physical workflow

◇ selection

Workflow of student grants ("My-SU") Denmark -- 2

USER	PUBLIC ADMINISTRATION				
Student	**Educational institute** Stage 1	**SU-Agency** Stage 2	**Data input bureau** Stage 3	**Tax authorities** Stage 4	**KMD** Stage 5

2) Educational institution online
post 1995, pre 2002

Applies on paper form for grant/loan or change/query data

Paper forms/ queries (also telephonic), check qualification and conformity, key in to SU-Agency's mainframe.

Application or query processed on mainframe

Batch job queries on student tax rates and income

Student receives reply to application or query (on paper)

Student status forwarded on paper

Determines student status

LEGEND:

PARTICIPANT

starting point

end of process

action

digital workflow

physical workflow

selection

Workflow of student grants ("My-SU") Denmark -- 3

USER	PUBLIC ADMINISTRATION				
Student	**Educational institute** Stage 1	**SU-Agency** Stage 2	**Data input bureau** Stage 3	**Tax authorities** Stage 4	**KMD** Stage 5

3) "Min-SU" -- whole process on-line
post summer 2002

Students who want to apply for a grant/ loan or enter a query log to the web interface ●

Student receives electronic reply to application or query ◉

Both the educational institution and the SU agency can deal with any applications/queries electronically

Students enter their own data into the web-based template, which is directly integrated with the SU-Agency's mainframe

Batch job queries on student tax rates and income

Electronically logging in via KMD's PKI software

LEGEND:

- - - - **PARTICIPANT** - - - -

● starting point

◉ end of process

action

———▶ digital workflow

–·–·–▶ physical workflow

◇ selection

Denmark

Case 7:
Citizen social benefits -- public libraries:
Bibliotek.dk

1. Executive summary

Bibliotek.dk is a service that 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. This is a six doubling from 1-1-2001 where the service had been active in a couple of months. The service has fundamentally changed the way that citizens may interact with libraries. They no longer need to speak with expert personnel to locate and order books that aren't present at their local library since they can access the entire "population" of books in Denmark through the internet and order them. This has lead to significant changes in the back-office of libraries. First and foremost the traffic and lending generated by the system has meant that many of the employees have had to develop new ICR 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. Both end-users and librarians have been involved in the various development phases of the project.

The case was chosen because it ties all Danish libraries together and offers a service that is significantly better and more efficient for all involved parties. Seen from administrative, technological and project management perspectives the service is also interesting because it is an example of a centrally developed initiative that manages to include more than 500 local actors that has very different organisational and technological set-ups. The case is a model B or C case depending on the specific libraries.

2. Background

There were several factors that prompted the start of 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.

The formal responsibility for the development of the service was allocated to the "Department of libraries" of the Ministry of Culture. They chose DBC to develop the system since DBC was already operating DanBib and had significant experience within the library area. Throughout the development process the "Department of libraries" were in very close contact with DBC, and DBC mentions this as one of the significant success factors behind the project.

In principle all libraries in Denmark are included in the service. More specifically this means the municipal libraries, the two state libraries and research libraries operated by different university department. Even though it is mandatory for libraries to participate, each library has an opportunity to choose how involved it wishes to be in the service. The basic level is that all libraries are obligated to lend their books to other libraries without receiving any kind of payment for the

service[21]. It therefore an important point, that legislation and much of the infrastructure and database systems that supports bibliote.dk was available when the decision to develop the service was taken. This meant that it was an interface to an existing structure that had to be developed, rather than an entirely new service.

Funding for future development and operation of Bibliotek.dk are specified in the yearly political negations of the public budgets. It is the Department of libraries that has the responsibility to allocate this money for DBC. In 2003 DBC received approximately 850.000 Euro to operate the system and the hotline for the system.

3. Specific objectives

The purpose of the initiative was that it should be a supplement to existing services, not something to replace existing services. This is also reflected in the fact that no significant marketing activities have been undertaken and there are no plans to do this either. The rationale and logic behind the service is therefore more user-oriented than motivated by ambitions to create efficiency effects on the level of back offices. 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.

A newly developed functionality of Bibliotek.dk is just about to be implemented. This functionality will allow the user to search the availability of the book he is searching for in local bookshops and get the price. This alternative will appeal to users who needs the book right away and may not have the opportunity to for it to become available or be transported from a library in the other end of the country.

4. Resources

The system specification developed by the Department of libraries was intentionally rather general formulated. This gave the opportunity for DBC and Department of libraries to discuss and develop the project as the development phases went along. In this sense the Department of libraries have also invested resources in the development of the project.

From 1999-2000 approximately 13.000 working hours to develop the system (roughly 10 man-years) and the total investment in bibliotek.dk was estimated to 1,17 million Euro. Bibliotek.dk was paid a fixed price for the development by "the Department of libraries" and are paid an annual fee for operation, development and maintenance of the system.

Throughout the development project groups of librarians have been involved so they could give input to functionality and design of the system. End users (citizens) have also been involved thoroughly in the development project and currently DBC have a mailing list of citizens that are interested in giving new ideas and evaluating existing activities. The search engine was ported to Linux since it turned out that this was the reliable environment seen from an operational perspective. No public key and/or pin-code systems are necessary for the operation of this system.

5. Implementation

General development and organisation
One of the dominating success criterias for The Department of libraries 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

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[21] This is stipulated in the Danish library law

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. Seen from an organisational perspective DBC also had to develop and implement the system fast, while they ensured that the implementation was flawless. DBC did this by organising the development project in 12 different project groups that worked simultaneously on the projects. The groups would meet 1-2 hours at a co-ordination meeting once a week where different issues would be discussed. During the 1,5 years development period approximately 40 employees where involved. The development, design and implementation process can be described in relation to three systems; Bibliotek.dk, which is the system that the citizens uses to order books, the VIP systems which is the system that enables libraries to set-up their library profile and level of participation in Bibliotek.dk and the BOB-base where orders from bibliotek.dk are stored. In the following we will take a closer look at these three systems.

Bibliotek.dk
In the development process, 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.

From the beginning of the project DBC used focus groups, mock-up sessions and other tools to involve the end-users of the system. DBC and The Department of libraries were very clear that the "real" users of the system were the citizens and this lead to the continuos involvement of end-users in the development phase. This focus means that DBC today have 8000 users who have agreed to give feed back input to existing functionality and design of Bibliotek.dk. The users subscribe to a mailing list where DBC regularly informs of new development ideas and activities.

The VIP system
As noted earlier speed, flexibility and the participation of all libraries in bibliotek.dk were among the most important parameters for success, and the VIP systems plays an important role in this. The system is the "configuration" interface for a library's connection to Bibliotek.dk. Through the system a library uploads all relevant data (address, contact persons etc,) but also define which parts of the service offerings it will participate in.
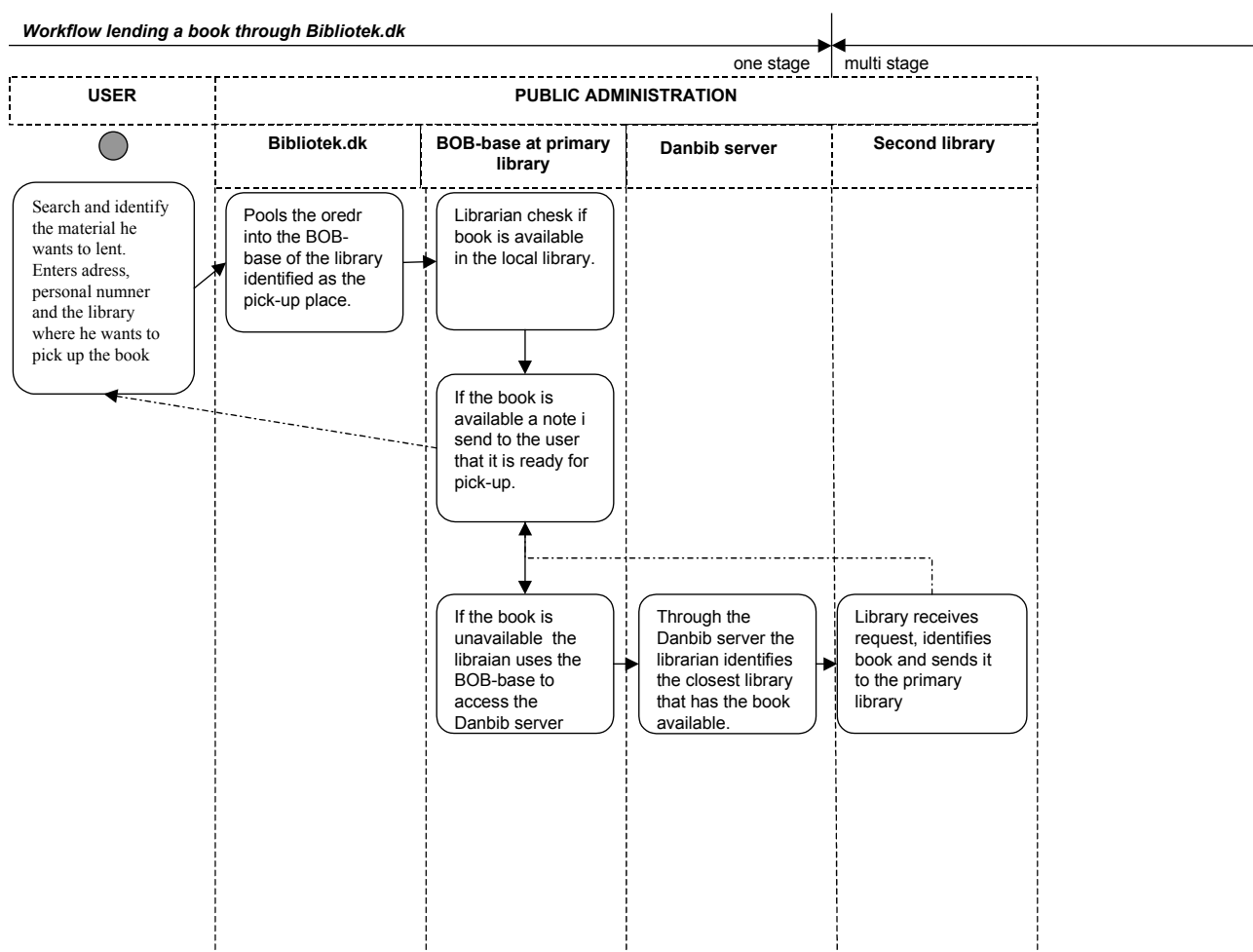
The VIP system was developed in close co-operation with user-group representatives from the libraries. DBC views this as a very important factor in relation to the subsequent successful implementation of the system at the local libraries. When the VIP system was operable, guidelines for the use the system was sent out to all libraries and a hotline at DBC was set into operation. All libraries then had 2-3 months to enter their data in the VIP system before Bibliote.dk was launched. The hotline proved very useful in this part of the project, and as it turned out, the feedback and questions from libraries gave ideas to further development of VIP functionality and interface, which were implemented before Bibliotek.dk was started.

The BOB base
The BOB base is the central system in the daily operation of Bibliotek.dk. Whenever a user orders a book through Bibliotek.dk and selects a library where he wishes to pick it up, it is registered in this library's BOB-base. Employees of the library will frequently enter the BOB base to see which books that have been ordered for pick-up at their library. If books aren't available at their own library, they will use the BOB system as an interface to the DanBib system, where they will identify the nearest library where the book is available and order it from there. In this sense the process from the user orders the book until he receives it, is far from fully automated, but this was one of he trade-off's related to the fact that the system had to flexible and be developed and implemented fast. But the introduction of the BOB base and its interface facilities to DanBib, has made the work of librarians easier.

Employees from libraries were involved in the development in the BOB-base in order to validate the appropriateness of functionality and interface design. At the time the system was developed and implemented DBC employees held a wide range of courses in order to teach as many librarians as possible to use the system. Correct use of the BOB-base has been critical for the success of bibliotek.dk seen from a public administration's point of view. If the system isn't used correctly service for the citizens will deteriorate and books may be ordered from the wrong libraries which will induce

more costs on transportation and handling of books. Consequently DBC have spend a lot of time on "road-shows" where they teach librarians how to use the BOB-base optimally. These sessions are also used to gain feed back of the functionality and usability of the BOB-base in order to secure a continuously development of the system. DBC also took initiative arrange workshops on new ways of work and corporation between libraries in order to help foster a new work-ethos that would allow the libraries to gain maximum efficiency effects of the system.

Workflow lending a book through Bibliotek.dk

one stage | multi stage

USER	PUBLIC ADMINISTRATION			
	Bibliotek.dk	**BOB-base at primary library**	**Danbib server**	**Second library**
Search and identify the material he wants to lent. Enters adress, personal numner and the library where he wants to pick up the book	Pools the oredr into the BOB-base of the library identified as the pick-up place.	Librarian chesk if book is available in the local library.		
		If the book is available a note i send to the user that it is ready for pick-up.		
		If the book is unavailable the libraian uses the BOB-base to access the Danbib server	Through the Danbib server the librarian identifies the closest library that has the book available.	Library receives request, identifies book and sends it to the primary library

6. Results

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[22] and this means that the search and identification of books in DanBib no longer is handled by a few specialist at each library. Most of the librarians at all libraries spend some time pr. day using the BOB-base and the DanBib system. 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.

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[22] Some libraries have witness a 400% increases in loans between 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.

7. Learning points

The importance of the legislation and existing infrastructure as fundamental drivers of success in this case 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 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 fact the Department of libraries have been very clear about their priorities of the project has also made the development and implementation of the project much easier for DBC. This has enabled DBC to hold a strong focus on the end-users through out the projects.

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.

8. References and links

An English version of the service is available at: http://bibliotek.dk/index.php?lingo=eng

DENMARK

Case 8:
Citizen portal:
Netcitizen.dk

1. Executive summary

www.netborger.dk (named Netcitizen in the rest of this description) is a portal for digital citizen services, most of which are placed at the municipal level. Services are offered within eight different categories, and are partly build on the „life event" interface. The services offered are grouped in the following categories and range from level 1 to level 3 services: Work, House, Economy, Health, Family, School, Pension and Other. The portal (and the majority of the services available at it) is run by KMD, which is a private organisation and one of the largest ICT-systems development houses in Denmark.

The concept is built on a public private partnerships that allows public and private organisations to promote complementary digital services on site. This creates synergies as well as scale that makes the portal the natural place to start for citizens who are looking for a public digital service to solve a specific need.

The concept has been developed over a period of five years, and gone through different phases where focus has changed from formation of partnerships and development towards efficiency, scalability and flexibility, as Netcitizen has become more and more popular. Netcitizen is run by a little group of people that outsources development to different departments inside KMD or other private companies. The fact that KMD develops mass customised services enables them to price the services rather low, and this means that the majority of the 271 Danish municipalities use solutions made by KMD. In order to achieve efficiency and consistency in the services offered the management team of Netcitizen has developed a set development and design templates. The portal as such has approximately 45.000 unique visitors pr week, and has roughly 310.000 registered users (out of population of 5,1 million). Since this is a portal study the general development of the portal will have the main focus of the report. Development and implementation of two specific services will be described in section 4.8.

2. Background

Netcitizen was created by the development house KMD 5 years ago. KMD is a private company, and all its shares are owned by KL which is the central organisation for the municipalities of Denmark. KMD is among the top three providers of ICT solutions and the biggest development house in Denmark. Its main customer segment is public administrations with municipalities as its core customers.

Netcitizen was created five years ago 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. Most of the services are placed at he municipal level. The services can either be accessed directly on Netcitizen or they can be accessed through an ASP solution on a given municipality's own homepage. Netcitizen is a public private partnership in more than one sense. First and foremost KMD is a private company that develops public service solutions and sells these to public administration entities. But Netcitizen also includes a variety of service offerings from private companies. These offerings are typically related to the services offered by municipalities on Netcitizen. For example private moving companies are advertising their services in relation to the public services for citizens whom needs to move their address.

3. Objectives

Netcitizen was created as a response to the dilemma that providers of digital public services often encounters: "How often does the citizens really need this particular service and will he be able to locate it in the in the overload of information that is often connected with the Internet". The fact is that many of the public services may just be relevant

for citizens once or few times in their lives (e.g. birth certificates, drivers license). This means that development cost of a whole web-enabled infrastructure and marketing efforts for a few services, will be a very expensive seen from the perspective of a single back-office. Seen from the citizens' perspective the task of identifying the relevant public office homepage and to discover if they have the service needed available digitally can also be a time consuming task. Netcitizen is meant to solve both these problems.

The idea with Netcitizen is to offer a lot of different services from public offices and private companies. Since all actors are interested in getting traffic and users to and through their services, they share an interest in combining their service offerings. This will attract significantly more users - which will be encouraged to visit and explore the site much more frequently - than they would if the users had to find the services on 25 different service-sites.
Consequently the long term goal for Netcitizen is to become the all inclusive service portal that citizens use whenever they have "business" with the public administration and with the service providers that has offerings that are natural extensions of this business. This will greatly benefit the citizens who wont have to look through all kinds of different homepages from administrative units, and it will allow KMD to develop digital services at a scale that will make it very cheap for the administrative units to use.

The relationship with private companies is managed through a partnership programme where it is possible to be a strategic partner, a municipal partner and/or a link partner:
- Strategic partners, are partners that either delivers data to Netcitizen or integrates data or applications from Netcitizen in their own service offerings. There are currently 30 strategic partners and 15 of them are private companies.
- Municipal partners are municipalities that either delivers data to Netcitizen or integrates data or applications from Netcitizen in their service offering to their citizens. There are 271 municipal partners, which are all the municipalities in Denmark.
- Link partners are companies that either links to Netcitizen or has links represented at Netcitizen that enhances the service offering of Netcitizen. There are 164 link partners.

Netcitizen mainly contains services that are handled by municipalities. This means that once a service is developed there are 271 potential customers for the services. The service is first made available on Netcitizen when the majority of these customers has bought the service.

As noted above KMD expects to develop and include more service on Netcitizen in the years to come. The success criteria's for Netcitizen can be measured in several ways. Naturally the money generated by the sale of digital citizens services to municipalities, but Netcitizen is also used as an important platform for KMD to sell other services to the municipalities. Consequently a significant amount of money has been invested to grow the market through the portal and investments will first be covered in the years to come.

4. Resources

Financial issues

KMD considers Netcitizen as a long-term investment of strategic importance. An effect of this is that the economic success criterion is tied to Netcitizen <u>and</u> the amount of related business that it will create. So far KMD have had to invest a lot in technology, competence development and marketing in order to build a successful portal that has been accepted by public and private actors as well as citizens. In the following we will take a closer look at some of these issues.

Financial issues -- fees
The original business model for the services that KMD developed and integrated on Netcitizen was that that KMD should receive 50 percent of the savings that the implementation of a system generated for a given back-office. This "no-cure-no-pay model" proved to be a good incentive for municipalities to use KMD services and Netcitizen, but it also turned out that it was difficult for BO's and KMD to agree on a method to access the actual savings generated by the implementation of a system. This was often related to the fact that organisational changes needed to be made in order to leverage the potential savings incurred by the systems and these changes weren't always made.

Therefore KMD has changed it fee structure to a flat fee for all services. Since KMD's goal is that each service is sold to all municipalities, and that services may be customised easily, the price for a digital service for individual BackOffice

is rather low (a small municipality typically pays 3.000 Euro for the implementation of a digital service). In effect this means that the fees collected sometimes won't cover the actual development, implementation and marketing costs for KMD. But as noted earlier KMD views Netcitizen as an essential part of the portfolio of services they provide for municipalities in Denmark[23].

Financial issues -- marketing
"One of the issues that is most often overlook in relationship to the development and implementation of digital citizen services is the marketing of the actual service.", Jon Johnsen Vice Director of KMD.

During the first there years KMD spent 1.2 million Euro on marketing of Netcitizen. The money was primarily spend on adds in newspapers, relevant magazines and out-door posters. The experience with this was that it was very hard to document any effects of these efforts. The primary reason for this is believed to be the fact that the marketing effort must be targeted to reach the citizen who needs the services at the time they need them.

KMD have therefore changed their marketing strategy, and developed a strategy and marketing concept that will enable the municipalities to do the marketing when they are interacting with the citizens. In this way it is ensured that the advertising budget is spend on citizens who was motivated to check out the services offered by Netcitizen. The description of services in section 4.8 will give a concrete example of this.

Development of services

Development of services -- organisational resources
When KMD 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 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.

Seen from a resource perspective, this means that resources related to the development process has to come from the BO as well as KMD. Once a service is developed fewer resources will have to spent when it is implemented in other BO's (municipalities).

Development of services -- ICT
KMD are developing Netcitizen in accordance with the W3C standards though a few of their older services haven't been developed in this way. All systems are developed to allow for scalability and customisation since the 271 municipalities in Denmark has very different size and different needs.

Through analysis and accumulated development experience KMD has 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.

In effect much of the integration between different administrative back offices already exist. The systems may be old compared to modern software technology but they work, and they are integrated. Therefore most of KMD's works has so far been related to development of new backend systems or integration between the front-end and the back-end. This means that the majority of administrative savings can be allocated to the integration of back-end with front-end rather than further backend integration. Furthermore project relating to integration of backend systems is not necessarily contingent on a front-end service as a driver of integration. Some of the most successful backend integration made by KMD do not relate directly to web-enabled citizens service.

All services that entails confidential or sensitive material are encrypted. So far KMD has used ID based pin codes in order to secure transactions between Netcitizen and its users. Users apply for a pin-code by entering their "person-number"[24] and address. The pin-code is then sent by ordinary mail to the address. So far KMD has issued 310.000

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[23] KMD makes most of it money developing back-end systems for municipalities, and the fact that they operate Netcitizen makes them a very interesting partner to municipalities who wishes to develop their backend systems and offer services for citizens. Consequently Netcitizen should not be viewed as a business case in itself, but rather as an integral part of the total value offering from KMD to the municipalities.
[24] Every citizen in Denmark has a unique person number, which is used to identify them in the transactions with the public.

unique pin-codes. The pin code enables KMD to encrypt the data transfer through the SSL technology. Recently KMD has also incorporated the common Danish digital signature that has been developed by a consortium headed by TDC (the dominant tele-operator in the Danish market).

5. Implementation

The development process of Netcitizen has been going through different phases, and these will be described in the following.

Phase one
The formation of strategic alliances and the alignment of strategies with the Danish municipalities were the first major task for KMD in relationship to the development of Netcitizen. Since KMD didn't have any of the data that they needed to build services, they approached the municipalities to obtain an agreement that would allow them to use the data to develop the services. This took some time and a great deal of persistence since many municipalities considered developing the services themselves and were uncertain of what the possible effects of a collaboration with KMD might be. In the long run the fact that KMD had close affiliation with the central organisation for municipalities, may have helped a lot in this phase.

The primary goal in this phase was to form the alliances and begin the development of services. In order to maximise the attractiveness of the services for the municipalities, KMD developed the services in way that would allow the municipalities to integrated them directly on their own homepage, or link from their homepage to the service on Netcitizen. This kind of flexibility allows some municipalities to pursue a strategy where they are building and expanding their own web-site (using the ASP services of KMD) while others use a minimal on resources on their web-sites, and links to the services available on Netcitizen.

Phase two
"Ask yourself: when was the last time that you were interacting with a public office and when do you expect to interact with the same office again?", Jon Johnsen Vice Director KMD

The answer to this question is that citizens actually quite seldom contact public offices and when they do, it may be different offices. From a citizens perspective it may be rather tedious work to identify which office to contact, and to investigate if the office offers digital service solutions. Therefore the aim of the second phase was to integrate as many services as possible and also include private services on the site and to generate as much traffic to site as possible. Ideally this would make Netcitizen the portal that every citizen uses because all that they will ever need may be accessed directly or indirectly through the portal. Seen for the perspective of KMD it wasn't important on which homepages the actual services were performed. The success criterion was that the service was located through Netcitizen and that it involved and that it involved an efficiency effect for the citizens and the organisation offering the service.

The initiatives to generate more traffic included several activities. First of all KMD developed a "killer service", that allowed citizens to see the valuation of all houses in Denmark. This lead to significant media attention and created a vast amount of traffic thereby putting Netcitizen at the centre of attention for citizens looking for digital public services. In order to generate more traffic and offer more services, KMD also began to build traffic and profit generating partnerships with private organisations.

In this phase, the development of services and concepts was often created with the use of external consultants and/or companies. Spending resources on external actors in the development process gave KMD the speed and flexibility they needed in order to grow Netcitizen fast with high quality services. But it was also viewed as an learning opportunity for the employees at KMD, which meant that employees from KMD always was involved in a development project even though the majority of the project was carried out by externals.

Phase three
This phase has just been concluded and its main focus was to improve the efficiency of the development of services and the operation of Netcitizen. This was done by the developing generic templates in the ".net" technology and by the development of ASP (Application Service Provision) based services.

The ASP based services are designed in a way that allows the municipalities to design the interface of the services in accordance with the graphic outline of their own homepage. This enables the municipalities to integrate the services seamlessly in a manner that fits the general design and layout structure of their own homepage.

Phase four
The aim in this phase is to initiate a development that will result in the possibility for citizens to access the public through their own personalised portal where all information relating to them will be available. Before this ideal can be reached a range technical, organisation and legislative challenges must be overcome, but it is achievable in a long-term perspective. Currently KMD are working at the first technical and organisational challenges related to this. More specifically they are working to integrate backend systems between different back-offices. This will allow caseworkers to gather relevant information on the all the cases that a citizen has with the public, and this will open for new opportunities of the organisation of work. In the long run, this data may be made available to the citizen and form the basis of the personalised portal but as noted above there is a range of legislative and technical challenges related to this. Another challenge is the fact that the language used by administration is highly specialised and very hard to understand for layman. Consequently, information in its current form will be useless for citizens unless it is somehow translated to a more understandable form, and this may turn out to be a very demanding task.

Organisation of work at Netcitizen
There are 4 full time employees at Netcitizen. A general manager, a webmaster, an assistant - with the responsibility of the daily operation and update of Netcitizen-, and a liaison manager who spends all his time negotiating agreements with public and private partners of Netcitizen.dk. The actual development of the services is done in the development division of KMD or by external service providers. This means that the day to day operation of Netcitizen is very cheap compared to the amount services offered and the amount of traffic generated on the site. As noted earlier development templates and design manuals ensures that development of new services can be done efficiently and in accordance with formalised guidelines so the consistency is ensured even though the actual development involves a variety of different actors.

Laws and legislation
The development of the services on Netcitizen has put focus 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 isn't valid" as a means of application for constructions). Or they are related to the amount of information on a citizen that a public office are 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.

A way to offer services that "works around" these obstacles is to facilitate an opportunity for the citizens and users to access information on different systems and collect/import them to a personalised systems. This is not illegal since it is the citizens himself that collect the data. One could call this an integration and collection of data on front-end level since, the data integrated never will be stored in a public back-end system.

Competencies
Initialising and operating public private partnerships requires an organisation that understands the different logic's that drives decisions in public and private organisations. It may be a small overstatement, but the experience of KMD is that public organisations tends to go for choices where risk is minimal, while private companies are able to live with more risk, if the rewards are as high as the risks. This needs to be reflected in the offerings made and the strategic alliances that are formed. For KMD this became apparent when they began the partnership programme with private companies. In order for this to become a success they chose to hire a new employee that had different background and a different set of experiences compared to other employees at KMD. Using his experience from previous work in private companies made it easier to develop and "sell" and offering that prompted private companies to enter strategic alliances.

Service description

The following two services forms part of the portal's domain for public services related to children. The first service deals with the enlistment of children in day-care institutions. The second service deals with application for public economic support to pay the fees for children enlisted in day-care institutions.

Service description -- enrolment of children in day-care institutions
Citizens who use this service may enrol their children for day-care in municipalities all over the country. The user registers with the common pin-code provided by KMD. The code matches the personal number with the address of the citizen, so once the citizens enters his pin-code, the KMD system makes an inquiry in the central person register database. The inquiry returns the personal numbers of the children who are „tied" to the personal number of the pin-code. If the user has more than one child, personal numbers for all children will be listed, and the user is asked to identify which child he is enlisting. Once this is done the user may identify two institutions where he wants his child to be on the waiting list. When this choice is made, the user is asked to confirm, and once this is done he receives an electronic receipt and the information is transferred to case system in the municipality where he is enlisting his children. The caseworker checks the data, and if everything is okay, the central registration system for enlistment is automatically updated without the data. The tool that the caseworker uses to do this is a tool developed by KMD that allows the caseworker to see if there are other cases related to the citizen currently being handled in the municipality. If the user wishes to know what number his child is on the waiting list he may access log on Netcitizen, where he will get the updated position of his child on the waiting list.

There are several rationales behind this service. Families with children often have very hectic daily routines, and finds it difficult to find the time to come to the municipal office to enlist their children during normal office hours. The possibility of doing this digitally in the evening has made the service very popular. In some municipalities more than 60% of all enrolments are made digitally.

Seen from an administrative perspective there are several efficiency gains. In relation to the actual enlistment work, caseworkers no longer have to type in the information from paper to the digital systems since this is transferred automatically. The data is also validated against the personal number, so the case worker does not have to check if the applicant is actually living in the municipality and has given the correct address and other basic information. Finally the case-tool that the case worker uses makes it very easy for the case worker ensure that the current application aren't in contradiction with other applications/cases that the citizen has with the municipality.

Another area where the caseworker saves time is in relation to communication about the status of waiting list for different institutions. Before this system was implemented citizens would call and ask the caseworkers of the availability of different institutions and ask what number their children were on the waiting list. Consequently the caseworker would spend a lot of his time on the phone saying the same thing to different citizens.

Municipalities may use the service 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 relation to the external communication KMD helps the municipality to plan a marketing effort of the service. As noted earlier in this description the experience of KMD is that potential user must be reach when they experience an actual need. In relation to this particular case this means that KMD advises the municipalities to get their employees within health care (nurses at birth clinics, nurses that visits parents to newly born children in their homes etc.) to pass on information of the systems to parents of new-born children. More often than not this is a new way of thinking for the municipalities and it often takes some time to implement.

Service description -- application for economic support to pay the fee for day-care for children
If a Danish citizens/family has below a certain amount of money pr. month in relation to the amount of children that he or she has, it is possible to apply for economic support for the day-care for these children. The administration of this law is done by the municipalities and is very flexible, because it needs to take account for the earning profiles of seasonal workers or free lancers that may make significantly less money in some periods (where they are entitled to economic support) than other (where they aren't entitled to support). The amount of support is therefore calculated using the information of income reported by the citizen and not data from the ministry of taxation. At the end of the year income statements reported by the citizen to the municipality is matched with income information from the ministry of taxation. If it turns out that the citizen has reported less earning to the municipality than he has actually made (proved by the income statement from the ministry of taxation) he would be asked to pay back the economic support.

This service also uses KMD's common pin-code, so once the user has registered himself the server identifies his child(ren) by his person number and he is asked to identify the child(ren) he wishes to obtain economical support for. When this is done the user is asked to enter the relevant economic information and the system then calculates if the user may obtain economic support for day-care. It seems logically that this service should be integrated with data from the ministry of taxation, but since the service is calculate don the basis of expected income and the data available in the ministry of taxation are „historical" it makes no sense to make this type of data integration. Instead a caseworker at the municipal office checks that the basic data submitted are correct and that the current application aren't in contradiction with other applications/cases that the citizen has with the municipality.

Implementation and benefits related to this service are very similar to those of the service described above. Caseworkers spend less time validating the data and less time on the phone talking with the applicants. These benefits are rarely converted to organisational changes, but the general feedback from the municipalities is the service does raise the effectiveness of the caseworkers. KMD also advise municipalities to market this service when the citizens need it. In this case it is the caseworkers themselves that meets the citizens the first time they have a need for economic support so the case workers becomes the primary channel for the marketing of the service. There are no statistical data available on the uptake of this service in the municipalities that has implemented it.

6. Results

Statistics
There are currently a wide variety of digital citizen services available within the eight categories of Netcitizen. Netcitizen is visited by 45.000 unique visitors a week which makes it the most visited "public service" site in Denmark, and places it in top 30 of the most visited sites in Denmark. KMD have issued 310.000 unique pin codes, which can be taken as rough indication of the user uptake of their different services. All municipalities have signed strategic agreements with KMD and every municipality in Denmark has some of the digital citizens services developed by KMD. In some municipalities some of the services means that 60% of the transactions are done via digital services, but naturally this is dependent on the services as well as the municipality.

Effects relating to rationalisation in the back-offices
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 them 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.

7. Learning points

Persistence, marketing internally as well as externally
Creating a portal and generating attention and traffic is extremely difficult and time consuming. Incentives must be developed and designed to align strategies and common success critirias for all stakeholders before the process can really begin, and this requires one form of marketing. Once the process has begun a different form of marketing is need to create the attention need for the portal to become a sustainable success. This requires professional marketing initiatives that targets users when and where they need the services.

Timing
In relation to the success of marketing, timing is crucial. One of the reasons for Netcitizen's success is that many of its initiatives have been well timed with general issues in the public debate thereby using the momentum and opportunities created in the public and political discourse. This requires a flexible organisation that is ready to move when the opportunities are there.

Creation of networks
In the case of Netcitizen the creation of networks and strategic alliances has been imperative to create the necessary amount of services that put the site on the map as the service-entrance to digital citizens services.

Needs to anchor at top level of management
The need to form strategic alliances and achieve organisational flexibility means that top-management of all partners of the network must support the initiative.

Heavy investment
This kind of initiatives requires long term thinking, and possible ROI horizon is 5-7 years.
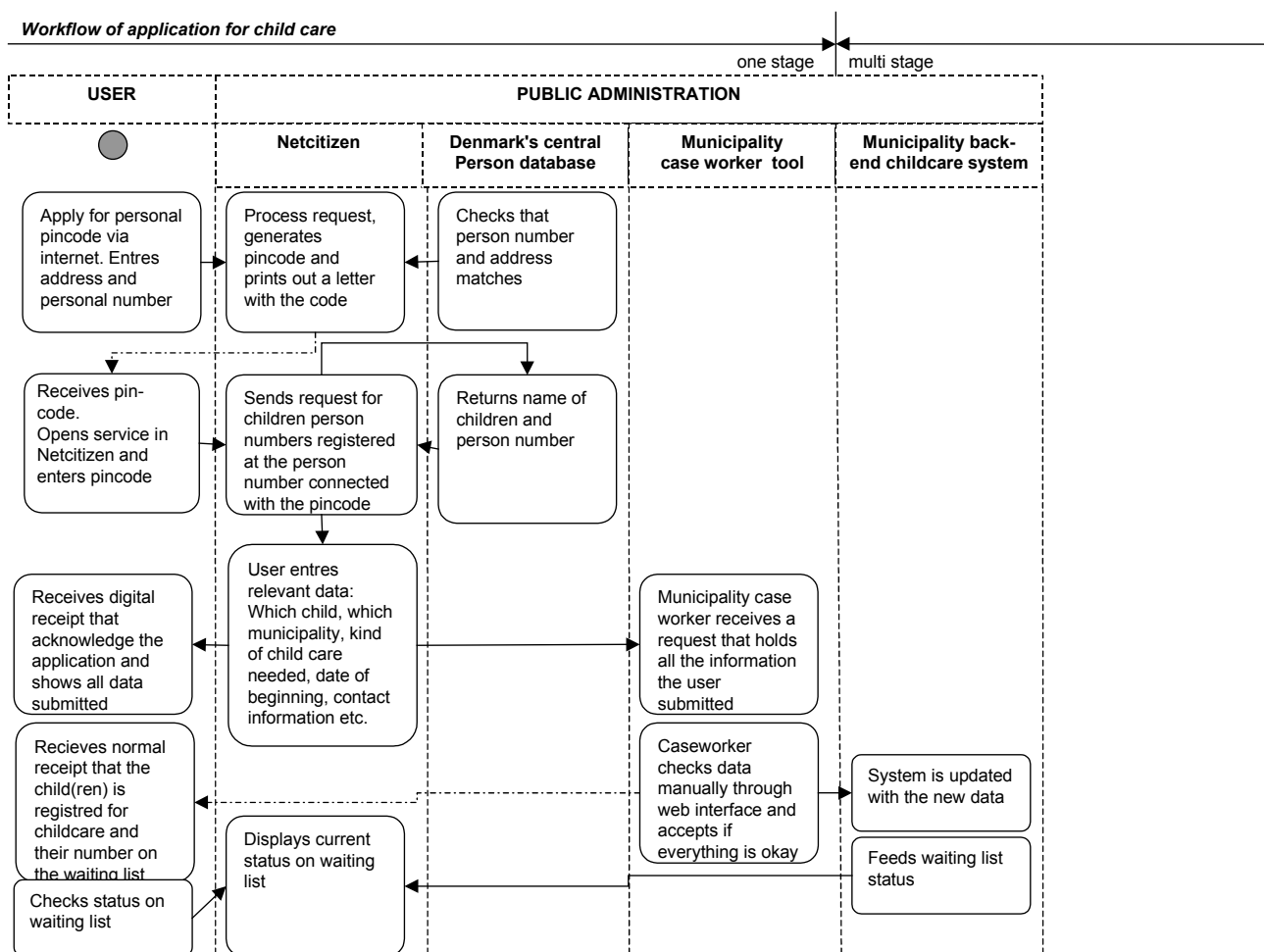
An important condition for the services offered is the very high Internet penetration in Denmark. This means that services that may only interest minorities of the population still generates enough traffic to become economically feasible.
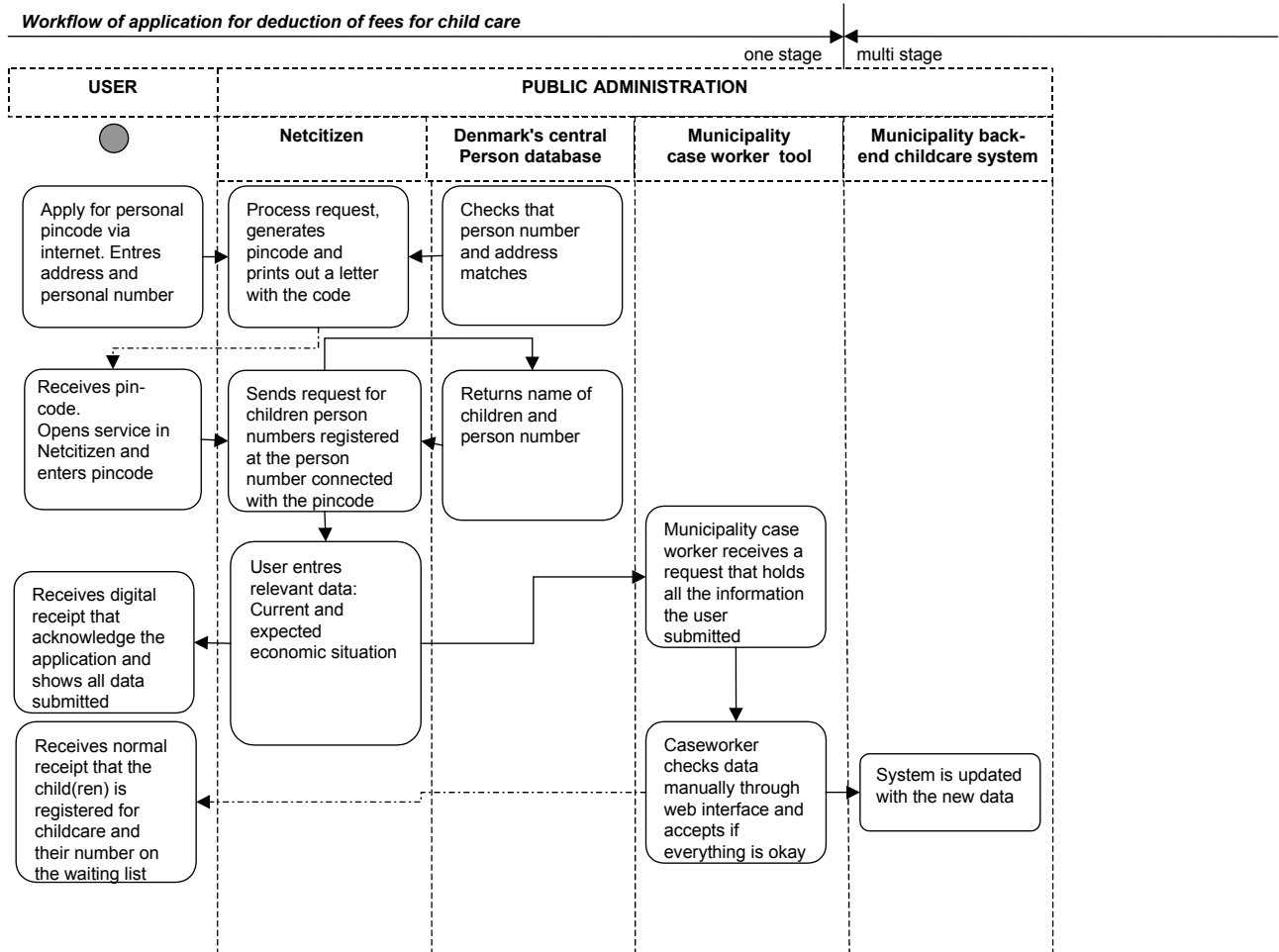
Citizen services needs to driven by large companies that are able to collect services in a portal and make money by following a scale and scope strategy where public and private services to citizens are integrated in the same offering.

Even though transparency for the citizen to the back office is feasible from a technological, organisational and legislative perspective, the expert language being used in the back office means that the majority of citizens will have a hard time understanding how their case i progressing.

8. References and links

www.netborger.dk

Workflow of application for child care

one stage | multi stage

USER	PUBLIC ADMINISTRATION			
	Netcitizen	**Denmark's central Person database**	**Municipality case worker tool**	**Municipality back-end childcare system**

Apply for personal pincode via internet. Entres address and personal number → Process request, generates pincode and prints out a letter with the code ← Checks that person number and address matches

Receives pin-code. Opens service in Netcitizen and enters pincode → Sends request for children person numbers registered at the person number connected with the pincode ← Returns name of children and person number

User entres relevant data: Which child, which municipality, kind of child care needed, date of beginning, contact information etc. → Municipality case worker receives a request that holds all the information the user submitted

Receives digital receipt that acknowledge the application and shows all data submitted

Recieves normal receipt that the child(ren) is registred for childcare and their number on the waiting list

Caseworker checks data manually through web interface and accepts if everything is okay → System is updated with the new data

Displays current status on waiting list ← Feeds waiting list status

Checks status on waiting list

Workflow of application for deduction of fees for child care

one stage | multi stage

USER	PUBLIC ADMINISTRATION			
	Netcitizen	**Denmark's central Person database**	**Municipality case worker tool**	**Municipality back-end childcare system**

Apply for personal pincode via internet. Entres address and personal number

Process request, generates pincode and prints out a letter with the code

Checks that person number and address matches

Receives pin-code. Opens service in Netcitizen and enters pincode

Sends request for children person numbers registered at the person number connected with the pincode

Returns name of children and person number

User entres relevant data: Current and expected economic situation

Municipality case worker receives a request that holds all the information the user submitted

Receives digital receipt that acknowledge the application and shows all data submitted

Receives normal receipt that the child(ren) is registered for childcare and their number on the waiting list

Caseworker checks data manually through web interface and accepts if everything is okay

System is updated with the new data

Finland

Case 9:
Citizen income tax:
Finnish Tax Proposal

1. Executive summary

The Finnish tax proposal, in many ways similar to tax proposals in Denmark, Norway and Sweden, is a proactive service of the Finnish National Board of Taxes replacing not only the traditional personal income tax declaration, but also providing better possibilities to develop other services.

Most Finnish taxpayers receive a pre-completed tax proposal from the Finnish tax administration, filled-in with data received from employers, banks, pension foundations, forest industry, trade unions, Social Insurance Institution, insurance companies and basic databases like population, building and real estate registers. The proposal also includes the amount to be returned or an invoice of more taxes to be paid.

In the past, the tax administration sent 3.000.000 tax proposals every year, which equals 70% of the Finnish taxpayers. The remaining taxpayers are mainly full or part-time entrepreneurs, who submit the ordinary tax declaration. Approximately 70% of the tax proposals are accepted without the need of changes. In the other 30% of the cases, the taxpayer delivers additional information for the tax administration in order to decrease the tax payment or notifies the administration of extra income that was not included in the pre-completed tax return.

The estimated number of the organisations producing data in the back-office process for the tax proposal is 205,000. The main part of the organisations is representing the private sector. The annual amount of the information units[25] sent to the tax administration is 25.000.000. From this data transfer, 92% is carried out electronically.

The final taxation information is mainly exploited by 2,000 public sector organisations. Also in this case the data is transferred electronically from the tax administration to the re-users. One of the most sophisticated services is that of the Finnish police. They can use the mobile phone text messages to check the income information to define the level of fines on the road.

The National Board of Taxes had already the main part of the needed information before the new service. Only some new information from the banks was needed. But this information was used in the end of the process to control the tax declarations. The main change in the tax administration back-office was that in the new process this information is used in the first phase of the process. Of course, the development of the electronic interaction has caused big changes in the back-office co-operation of the organisations - also providing a more effective preparation of the tax proposal as well as a better re-use of tax information in the public administration.

To listen to the end-user (tax proposal receivers) feedback as well as to test the system itself, the service started with a quite limited target group in the year 1995. Since some years, it is practically on the maximum level considering the existing legislative environment. The clear majority of the Finnish taxpayers is happy with the new service, and the user feedback mainly includes proposals to make the service more proactive.

The back office integration model of the new kind of proactive service is difficult to define comparing it with the online services. The tax proposal itself covers services that are more traditional than only the tax declaration, on the Internet or on paper. It is a clear multi-stage process with electronic integration between the different levels of the back offices. Concerning the methodological approach, the back office integration model could be called C/D.

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[25] One information unit is e.g. the annual amount of income and withholding tax from one employer to one employee.

The complexity score of the tax proposal is quite high; there are over 2,000 public government organisations, which play an active role in the preparation of the proposal, participate in the taxation process or use the final information to provide new, even proactive, services. The total number of the organisations participating in the process is over 200,000 including the employers.

The digitisation degree (2-3) in the back office is nearly complete, but not yet in the communication between the taxpayers.

The main reasons to choose the Finnish tax proposal to be one of the best practice cases are:
- big fundamental changes in the most traditional public service
- using back-office reengineering instead of asking the citizens the information the administration already has
- good example of the use of ICT to decrease the number of public services and to make the government more transparent

2. Background

The administration needed for the personal income tax is quite a big share of the administrative staff in the Finnish public government. The whole tax administration including National Board of Taxes, regional offices and the local tax offices employs 6,500 people who cost 330 million euros every year. In the same process, the centralised personal income taxation collects income taxes for the state government, income taxes for the municipalities, church taxes and the insurance contributions for the national Social Insurance Institution providing services to the different parts of the society.

The political background of the tax proposal is an initiative of the Finnish government in the early 1990's, the goal of which was to change the taxation system and especially to simplify the tax declaration itself. Several changes were made in tax deductions helping the implementation of this goal.

At the same time, the number of data received electronically in the National Board of Taxes started to increase. This data was used to control the information in the tax declarations in doubtful cases or for random sampling. The basic idea behind the tax proposal was to change the use of this information from the last stage of the process to the first step to increase the quality of the service and the effectiveness of the public administration.

One of the objectives was also to speed up the completion of the final taxation. The National Board of Taxes is, e.g., taking care of income taxation of the Finnish local government. The municipalities cannot carry out a successful financial planning based on tax information, if this tax income is earned more than one year earlier. Because of many still existing manual tasks in the whole taxation process, this objective has not yet been reached. On the other hand, the increasing electronic data transfer behind the tax proposal and the whole taxation has also increased the validity of the forecast information.

So far, the completion of the final taxation is made for every person simultaneously. This means that the last case (the most complicated one) determines the date. One of the planned changes in the 1990's was to change the legislation so that completion could be made with a different timing starting with the easiest groups. Mainly because of work for technical improvement (like year 2000 and euro), this kind of changes in the legislation have not been proposed.

One important element in the background of the tax proposal was also the centralised national basic register system, which is exploited in almost all services and functions of the Finnish public administration. The main registers used in the tax proposal process are population, building and real estate registers. Of course, the tax proposal would not have been possible without the personal identification number. It might also be worth mentioning that in Finland personal income in taxation as well as the amount of taxes of every citizen is public information. Only the details are protected by the privacy legislation. That is why one of the re-users of the taxation information is also the yellow press publishing the incomes of prominent persons.

The same elements also exist in Denmark, Norway and Sweden, and similar plans in those countries and the co-operation between the Nordic countries had also important effects on the Finnish development.

It is also clear that those elements do not exist in many other European countries. It is not only a question of technical differences like PIN-code and central basic register databases or electronic data exchange between the organisations. More important are the cultural and political differences in the privacy area as well as the differences of centralisation-decentralisation aspects for certain tasks or sectors of the public administration. This does not mean that a decentralised system is always and in any situation better for privacy than a centralised one

For the reasons mentioned above the Finnish tax proposal has no clear political objectives on the European level. It is a national process and national change of the most traditional administrative task, where the result will be final and fair taxation is effected already by the payment of salary or other income. While these kinds of procedures are possibly the most difficult ones for the citizens and companies in foreign countries, it is clear that the simplification and transparency of the taxation helps the implementation of the four European freedoms and the Single Market Policy. Thinking of the number of civil servants working in the field of taxation in Europe, the changes making the taxation process more effective also help the realisation of the Lisbon strategy[26].

The tax proposal service started in 1995 covering only a limited number of persons and a limited geographical area (certain municipalities). In the beginning, the tax proposal service mainly covered retired people, because the proposal based on the third party information was in most cases also the final taxation for them. A pre-release version of the tax proposal already existed before 1995, when the people with a pension income only received a tax demand notice, which showed the amount of tax deficit or the amount of tax refund directly without any intermediate stages.

For the taxation of the incomes for the year 2002 more than 3.000.000 Finnish taxpayers (70%) received the tax proposal in the spring 2003. The rest (30%) are mainly full or part time entrepreneurs. Roughly 2.100.000 Finnish taxpayers do not react to the proposal, which means that for them the proposal is also the final taxation. Because the tax administration has the account numbers of the taxpayers and most Finns use Web-banking, also the final step (payments to both directions) in the process is made electronically in most cases. The rest of the tax proposal receivers are making some changes like adding travel expenses and other costs they had for work, and send their contra-proposal to the tax office.

3. Specific Objectives

Before the year 1995, the Finnish tax declaration process was very traditional; even local tax offices were sending forms partly pre-filled with personal information to the taxpayers already at that time. The taxpayers filled the form with income, deduction and property information and sent it back to the local tax office. All the information was stored in the tax administration.

It included a lot of information (like income and tax withholding certificate of the employers) that the tax administration already had. This information was mainly used at the last step of the process to control the information given in the tax declaration. Because the main part of this information was not received electronically, it was not possible to use it in the beginning of the process.

Because the centralised income taxation in Finland is collecting almost all the taxes and payments in the Finnish public government (including social insurance and official churches) it plays a relevant role in the whole administration.

The main objectives in relation to desired changes in services and the users targeted were:
- to use information already available to increase the quality of the services
- to retain the service accessibility even with fewer local offices
- to better serve external customers in the public administration like municipalities, social insurance and the parishes.

The main objectives in relation to desired reorganisation and related changes were:
- to reach the level needed to produce tax proposals in the electronic data transfer in time
- to incorporate all the organisations producing information needed in the tax proposal
- to minimise the storage work.

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[26] Lisbon Strategy: The European Council held a special meeting on 23-24 March 2000 in Lisbon to agree a new strategic goal for the Union in order to strengthen employment, economic reform and social cohesion as part of a knowledge-based economy.

4. Resources

The development of the tax proposal has been such an integrated part of the normal development resources that there were no extra people hired for tax proposal, no extra IT equipment, and neither external consultancy services. The number of people working in the National Board of Taxes mainly for the tax proposal has been less than eight all the time. The organisation as well as the ICT infrastructure is changing continuously to develop not only a personal income tax system, but also other activities to the same direction. Because of the long and quite soft process, the need of internal training has also been quite low.

The interoperability between the organisations is mainly based on TYVI-service developed in the Ministry of Finance[27]. It covers the important Finnish B2G and G2B information transfers as well many G2G processes. The basic idea of the TYVI-concept is that technical changes in the organisations are not needed and the conversion is made by the special service operators.

The data transfer is made mainly on the application-application level, but also some Internet forms have been developed for the smaller organisations or low volume cases.

Finnish TYVI-concept
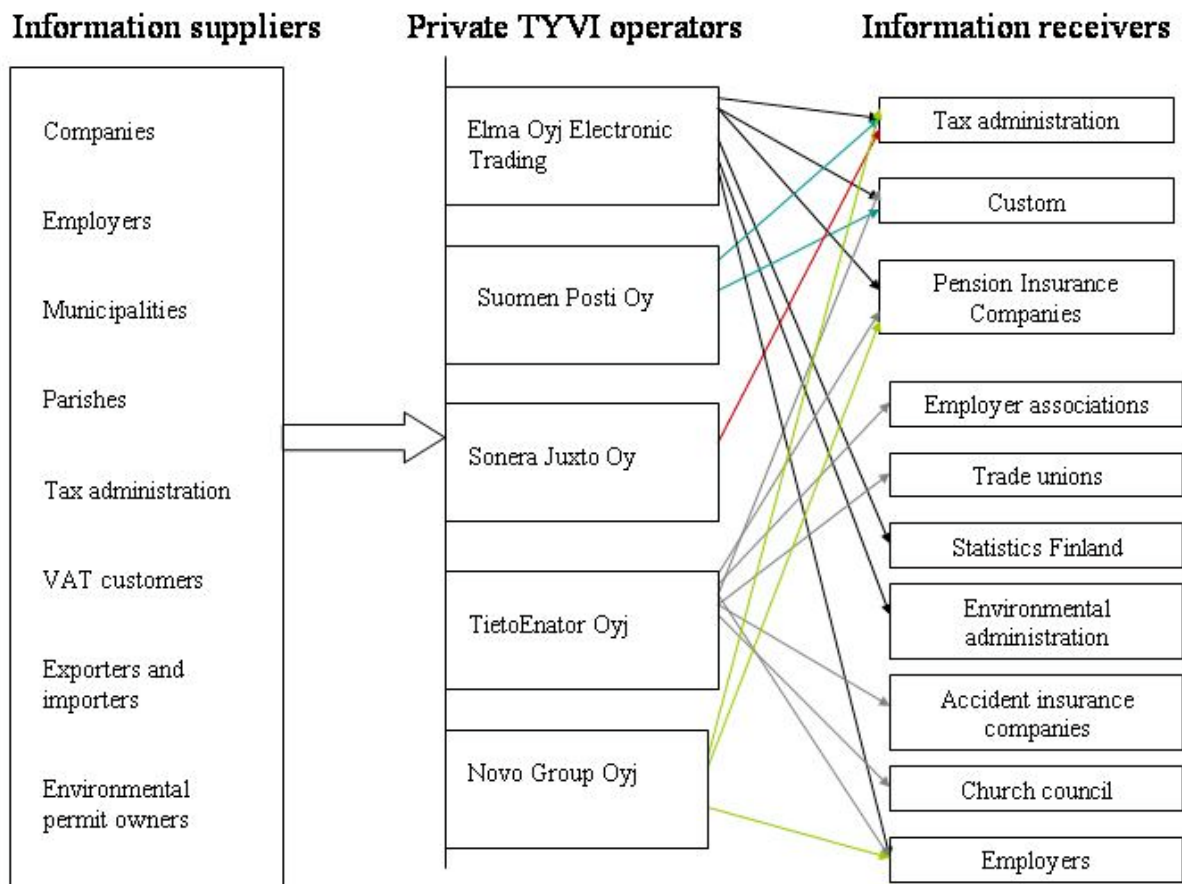
At the moment, there are five private companies in the role of the TYVI-operator. Almost all payroll and financial software have TYVI-interface, which makes joining the service quite easy. As seen in the picture, no operator is taking care of everything. For example, if a company wants to make everything electronically, it must be a customer of at least two TYVI operators. Also the software used in the organisation can have some influence on the most appropriate TYVI operator. Anyway, this kind of engagements is decreasing all the time.

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[27] For more information about TYVI-concept see also the 'TYVI service and environmental pollution announcements' – case description.

The most operational applications in the administration have more or less automated interfaces with the TYVI-service.

TYVI is a flexible solution combining different technologies and different organisations. Almost all possible common standards are used:

- The messages between the applications, and especially between the big users, are mainly based on the EDIFACT-standard, but the use of XML is increasing. The data interchange between the TYVI-operator and VAHTI information system is carried out with XML.
- The data is transferred via the common network connections of the organisations, which today are mostly TCP/IP.
- In some connections, FTP and email are also possible transfer tools.
- On the Internet, the connections are mainly encrypted (SSL and SSH).
- TYVI-operators provide connections secured with PKI. Also the authentication with the tele-banking IDs - quite popular in Finland - and passwords certified by the banks can be used in several TYVI services.
- The increasing use of web-forms provides better possibilities for electronic data transfer in small organisations.

TYVI-operators have also developed web-applications for their customers, e.g. to check the validity of the data before sending it to the administration. The Ministry of Finance has prepared models for the agreements between the TYVI-user and TYVI-operator.

5. Implementation

Implementation of tax proposal
The implementation between 1995 and 2000 was made in several phases enlarging the target group from 350,000 to 3.000.000 today. This is also practically the maximal number of the tax proposal in the current legislative situation. The service has been quite stable all the time and only few changes have been made. Because Finland is a bilingual country, the tax proposal is made in two official languages, Finnish and Swedish. This is a quite natural, also mandatory, way to work in the administration and has been no barrier in the development. The electronic tax declaration form is also in English[28], but the proposal itself has no English version.

The workflow
The main task of the National Board of Taxes in the back office process is to take care of the client registers and calculate the taxes. The basic element of the client information system is the Finnish National Basic Register System, which covers the main databases with following relations:
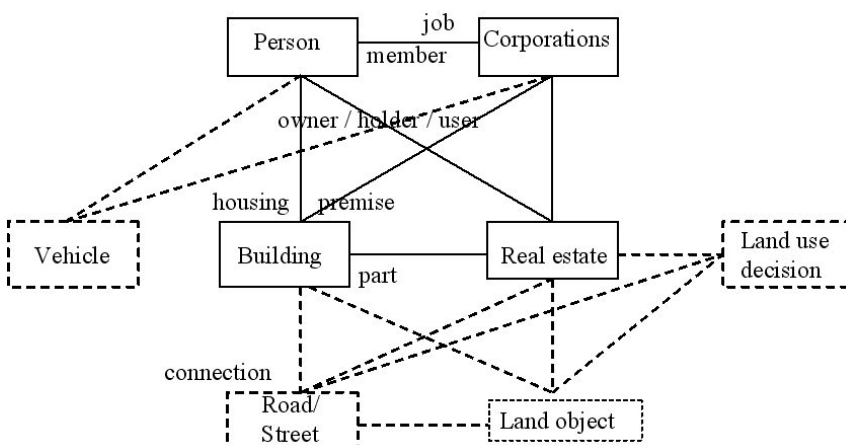
The National Board of Taxes receives the basic register information electronically from different authorities. This means that a change of the address by the citizen will be also visible in the taxation client register almost immediately. In this phase of the tax proposal process the most important back office relation is that between the National Board of

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[28] http://www.vero.fi/nc/doc/download.asp?id=2852;229991

Taxes and the Population Register Centre. The information on taxpayers' names, addresses, family relations, birth and death etc. is updated in the taxation client register by the population register every day. Altogether, there are 1.2 million changes in the Finnish population register every year, including 800.000 changes of address.
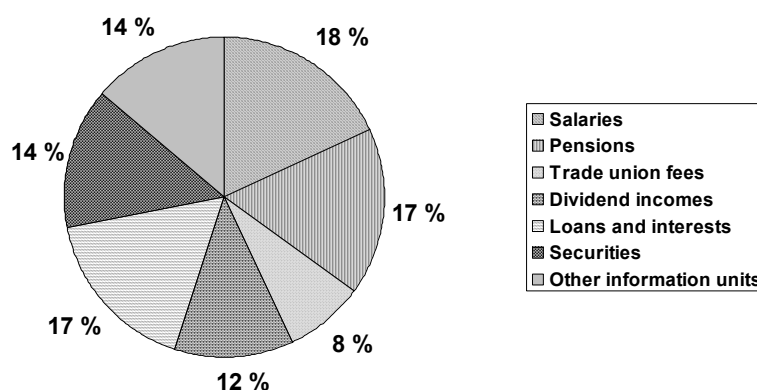
The client register is the basis of the annual tax system including several information systems and databases. The most important workflow in the whole tax proposal process is the information received from the employers. Every employer has to submit, among others, the Employer's annual notification. One part of the notification is the information on wages and salaries, other benefits and taxes withheld of every employee.[29] The Social Insurance Institution of Finland informs on unemployment benefits, sickness and maternity allowances, pensions etc. Banks and other financial institutions send the amount of loans as well as information on securities. Limited companies must also give the information on paid dividends.

There are also many other organisations involved in this part of the tax proposal back office process. Trade unions inform on the paid trade union fees because this payment is deductible in the Finnish taxation. Tax administration also receives information on paid research and artist grants, pensions etc. The nature and estimated number of different kind of organisations participating in the back office process of tax proposal is as follows:
- 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 that are mainly already included above

The number of annual information units needed for the tax proposal in Finland is 25.000.000. One information unit is e.g. the annual salary and tax withheld of one employee by one employer. The salaries and pensions cover 35% of all information units.

Information units by information source 2001

Legend:
- Salaries
- Pensions
- Trade union fees
- Dividend incomes
- Loans and interests
- Securities
- Other information units

[29] More detailed information is available in the electronic form of National Board of Taxes in the address
http://www.vero.fi/nc/doc/download.asp?id=2538;99455

Before the end of the taxation year the tax authority sends a letter to every taxpayers who must do the traditional tax declaration.

The relations between the back offices are as in the workflow diagram below:

After automatically receiving the information needed for the taxation, the tax administration calculates (also automatically) the tax proposals and prints it decentralised including the final assessment results in the tax demand notice. Proposals are sent to the taxpayers by post with the invoices of back taxes or with the information on the bank account to which the return will be paid.
The taxpayer has roughly one month time to react. If the taxpayer does not want to correct or adjust any information or make any additions to the information, the tax proposal documents should not be returned. The proposed changes should be written on the tax proposal form and sent to the local tax office before the deadline in June.

The tax administration is making the final decision on the taxation 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 is receiving the final tax notice before the end of October. After that, the tax administration is paying the return to the taxpayers account or the taxpayer is paying the back taxes. Considering the digitalisation level of the whole process, it is worth mentioning that in Finland 70% of all invoices are paid electronically and 35% on the Internet. The Finnish banks have 2.7 million tele-banking customers with a population of 5.2 million.

The final personal income and tax information is widely used in the Finnish public government. Among others, these organisations can receive this information electronically from the National Board of Taxes:
- 10 Ministries and central agencies
- 130 local tax offices
- 9 regional tax offices
- 600 parishes of the national churches
- 195 Forest Management Associations
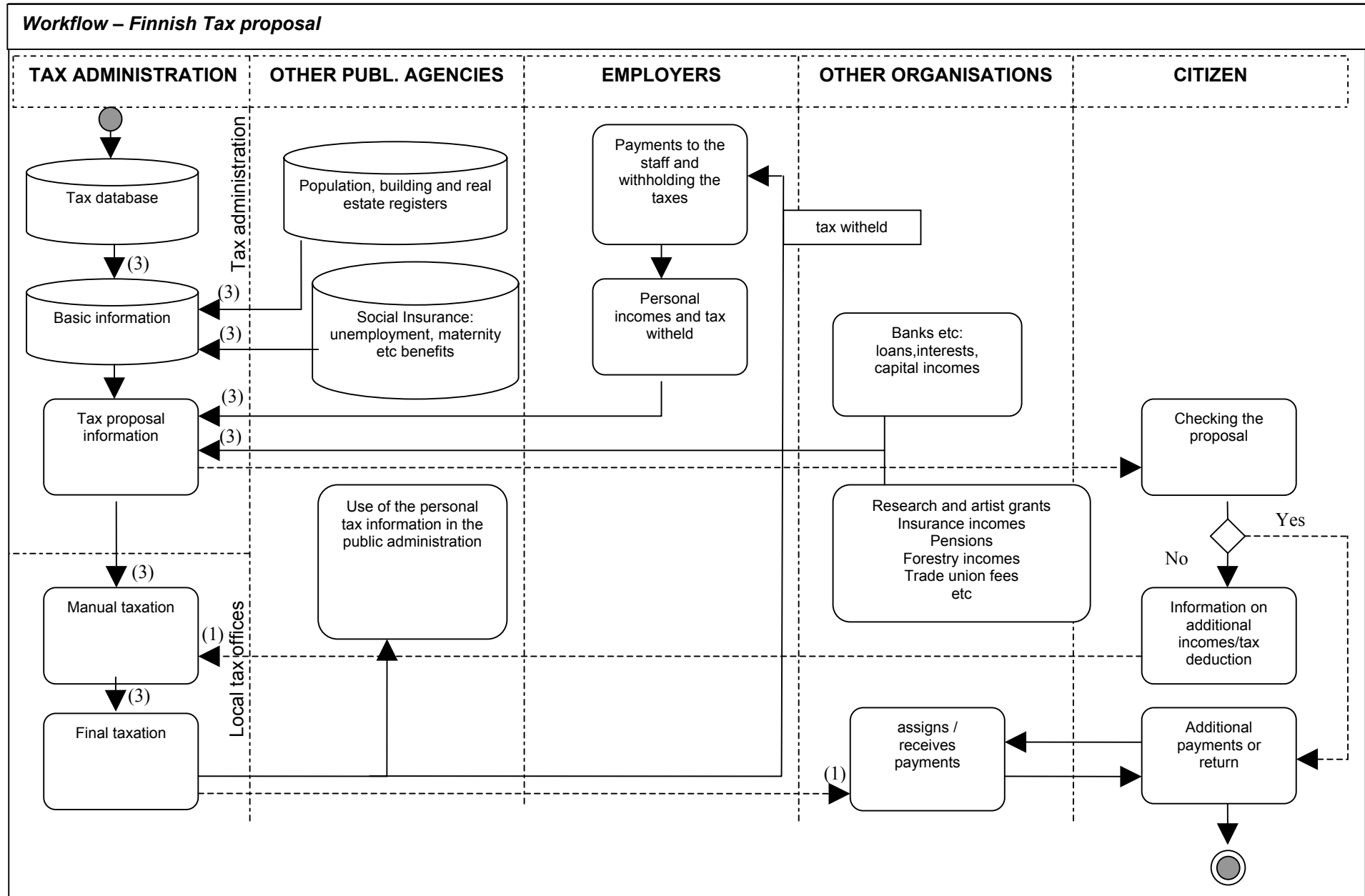- 446 municipalities
- 250 bailiff offices
- 280 police stations

Digitisation of the back office process
A quite important part of the total workflow is the electronic transfer of the personal tax withheld rates from the National Board of Taxes to the employer organisations, including companies as well as the public government. This service covers half of the Finnish wage earners.

The electronic data transfer between the organisations is a crucial element of the tax proposal. In the back office process, the digitalisation level varies depending on the information source. In the year 2001, more than 92% of all information units were transferred electronically to the tax administration. The remaining 1.9 million information units must be stored manually before the tax proposal is possible. It is mandatory to give the tax administration the information needed for the taxation. However, electronic data transfer is not a mandatory task of the external organisations. Neither are they paid for that. Therefore, the only way to be successful is to make it attractive and beneficial for all the participating organisations.

The electronic data transfer in the back office process is based on TYVI-service technically described in the previous chapter.

The lowest level of electronic data transfer concerns the salaries and all kinds of research and artist grants. The explanation of the last one is natural; most of the small foundations giving those grants have no administration or full-time staff. And also data transfer on paper is used between the very small companies and the tax administration concerning the salary and tax withheld information. But the behaviour of the employers is not so clear: Also many big employers are providing this information on paper even if they have it in the computers, and many small employers have used electronic ways many years.

Workflow – Finnish Tax proposal

TAX ADMINISTRATION	OTHER PUBL. AGENCIES	EMPLOYERS	OTHER ORGANISATIONS	CITIZEN

Tax administration

Tax database

(3)

Population, building and real estate registers

Payments to the staff and withholding the taxes

tax witheld

Basic information

(3)

(3)

Social Insurance: unemployment, maternity etc benefits

Personal incomes and tax witheld

Banks etc: loans,interests, capital incomes

(3)

Tax proposal information

(3)

Checking the proposal

Yes

No

Use of the personal tax information in the public administration

Research and artist grants
Insurance incomes
Pensions
Forestry incomes
Trade union fees
etc

Local tax offices

(3)

Manual taxation

(1)

Information on additional incomes/tax deduction

(3)

Final taxation

(1)

assigns / receives payments

Additional payments or return

Even if these two things are not directly linked with each other, it might be important in some cases that the employers can have the tax withheld rates of their employees electronically from the tax administration. Especially in the big organisations, this saves a lot of work in the payroll administration.

Near or full digitalisation in the back office has been reached with the following information sources:
- paid pensions coming from pension funds
- trade union membership fees coming from the trade unions
- public research grants coming from universities etc.
- loans and interests coming mainly from the banks
- all kinds of public social benefits
- voluntary insurance payments
- incomes from dividends coming from the companies
- foreign dividends

Share of electronic data transfer to the tax administration 2001 by information source
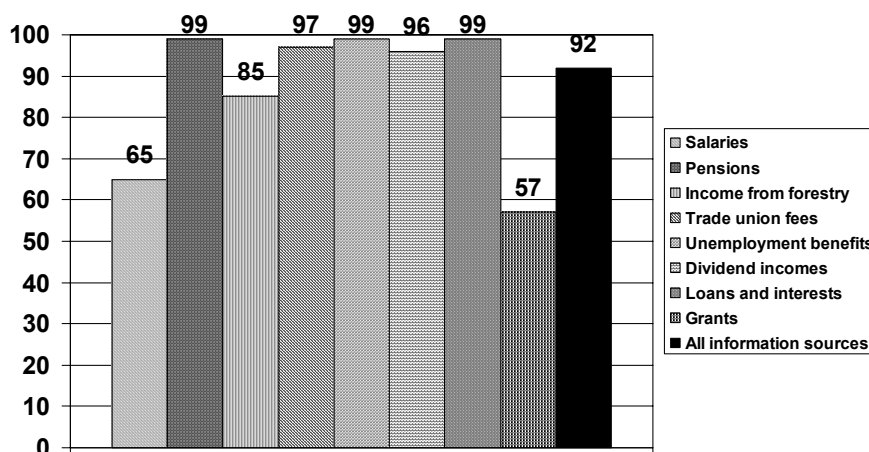
The electronic data transfer from government to the tax administration and from the companies to the tax administration was on a quite high level already before the time of the tax proposal. Since the middle of 1990's the development of the joint public TYVI-concept has provided better possibilities especially for small organisations.

The decision-making in the tax proposal process is in the hands of the National Board of Taxes based on the legislation. For the organisations, it is mandatory to give the information. Moreover, there is a lot of voluntary co-operation between the back offices in the field of the electronic data transfer. Especially on the re-use side of the tax information, this kind of co-operation plays an important role.

Next steps
The National Board of Taxes launched an initiative to make further development steps in taxation (Taxation2005). The same long-term objectives already existed since the beginning of the project. This includes, among others, the following more or less weak points in the implementation of the current system:
- Complete electronic data transfer in the back office process and with the organisations providing the information for the tax proposal. The main targets are the small and medium size enterprises, the same as in the TYVI-concept developing B2G data transfer.
- Possibility to make the changes in the tax proposal on the Internet. This may be the biggest and most difficult change in the wage earners taxation, because according to the current legislation the taxpayer must attach the receipts etc. that he or she has the right to have this certain tax deduction in almost all cases. The main alternatives are:
- No individual deductions, which is probably impossible.
- More pre-calculated deductions e.g. for commuting costs and for certain professions.
- Trust in the taxpayers' reasonable announcement, which in the National Board of Taxes is the most interesting alternative.
- Receipts are sent separately, which will bring no benefits for the users or the tax administration.

- Simplification of the legislation. Actually, the tax proposal has needed quite few legislative changes so far. The most important was the decision that those who are going to receive the tax proposal do not have to submit the tax declaration in January. The other was that the banks must give information of individual loans and interest to the tax administration
- More simple taxation for farmers, forest entrepreneurs, business entrepreneurs and other self-employed persons.

Management
The development from the start with 350,000 to 3.000.000 annual tax proposals has been quite a stable process. It has never been a special project with special resources and management. In spite of the big changes in the service itself, the process inside the administration is quite near the activities with the traditional services.

The main problem, like all the similar processes during the transition time, is that the administration from the National Board of Taxes to the local tax offices is living with double processes, double IT-systems, double guides and double marketing campaigns.

There was some opposition to the change in the local tax offices because they concretely meet this double system problem. Some people argue that the tax proposal is not saving work at the local level. There was a change from a situation where almost all municipalities (number of municipalities: 446) had their own tax office, to the current system, where the offices are mainly sub-regional (130 local tax offices). At the same time, the staff working in the tax administration has been quite stable. The viewpoint of the National Board of Taxes is that during the tax proposal period there has been enormous increase in stock trading and, in general, on the Finnish capital market. This has, much more than the tax proposal, increased the work and brought the need of new kinds of skills in the tax administration. However, without the tax proposal it would not have been possible to take care of these new tasks with the same staff.

So the reason/target of the management of change and training programmes has not been very much the tax proposal or the taxation of the wage earners. Tax proposal has made this part of the taxation a more invisible routine also inside of the administration and has provided the possibility to increase the resources in more complicated tasks.

Marketing
Main marketing efforts of the service are done three times a year. First time is in the beginning of the year when the citizens not receiving the tax proposal must do their traditional tax declarations. The second time is in the spring, when tax proposals are sent and the last time before the deadline of making changes in the tax proposal in June. It looks that this publicity campaigns made every year have been enough to make the tax proposal well known among the citizens.

Innovativeness
As already mentioned, similar solutions also exist in other Nordic countries. The Finnish tax proposal is also a result of long-term strategic and political objectives. From these viewpoints, it is not very innovative. On the other hand, this kind of practical approach and clear efforts towards proactive services, transparent administration and development of the co-operation is unfortunately not often the main feature of the new eGovernment services.

6. Results

Results in the relation to users
- less time and trouble with the tax declaration. This is especially true for the users who accept the tax proposal, but also the changes are much easier to make than with an empty tax declaration form. On the presumption that in the old system it took 4 hours on average 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, 2.000.000 Finns spend altogether 7.000.000 hours less time with the taxation bureaucracy every year.
- no need to save many receipts and employers income declarations during the taxation year
- the legislation and the system behind the taxation is easier to understand because the citizens see everything listed in the tax proposal
- fairer taxation.

Results in relation to the back offices and the agencies
- the limited human resources can concentrate on more complicated services instead of routines
- the record of more than 2.000.000 tax declarations has disappeared (=tax proposals that do not change). This saves roughly 500 man-years in the tax administration
- less mistakes because of the electronic data transfer
- less appeals in the taxation

- increase of electronic data transfer has brought savings also to the information providers. E.g., more than 3.000.000 Employer's annual notifications are sent electronically every year almost directly from the local pay-roll systems to the tax database. Comparing with manually filled-in forms, the savings are remarkable.
- easier and faster use of the tax information helps to improve public services and even provide new proactive services, because in many public services personal incomes in taxation play an important role.

7. Learning points and conclusions

What could have been done otherwise?

According to the National Board of Taxes there are some points that maybe should have been done otherwise:

1. Are the citizens too easy-going and lazy?
Comparing the situation before and after the tax proposal, it looks that some people do not make the changes in tax proposal even if they would have some tax deductions. It might be that they forget the whole thing or they do not see it worthwhile, e.g. because of small benefit. This is a small problem compared to the rest of the passive group who do not know or do not care.

On the other hand, a much more active role was needed with the traditional tax declaration. In the Swedish system, everybody must return the tax proposal with or without changes. This would maybe have been also an appropriate practice in Finland, at least for some years in the beginning.

The plans of the National Board of Taxes to make the personal income taxation much more invisible help to solve the problem and to increase the equality of the citizens.

2. Is the double system too complicated?
At least in the beginning many citizens were uncertain, do they have to fill in the tax declaration in January or do they have to wait for the tax proposal. The definitions of both groups were not clear enough and the situation also changed every year, sometimes some taxpayers were changed also from tax proposal group to the tax declaration group. Also the local tax offices had the possibility to fulfil individual wishes, which has made the differences between the two groups even more unclear.

More clearly defined rules would have saved the time and trouble of the citizens and of the tax help desks.

What could not have been done otherwise?

1. Step-by-step enlargement with the long-term goals and vision
The approach to start the tax proposal with a limited number of people and in a limited geographical area (=limited number of local tax offices) has been very successful. Technically it would have been possible to carry out this kind of big changes quite fast, but it takes time until organisations, staff as well as the users adopt the change.

It is also worth noticing that the final objective of the personal income taxation has not changed very much during the years. The vision expressed in the beginning of the 1990's will be nearly reached after the next reform, which is planned to happen in the year 2006.

2. Development as a part of everyday life
Tax proposal has never been a special project with its own resources and reports. It is impossible to find out afterwards what have been the costs of the tax proposal. 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 have been solved when they are of topical interest and with people involved. It is obvious that this kind of working method has great importance on commitment and creates some kind of "spirit" of development in the organisation. It also encourages the innovativeness in the organisation.

3. Win-win in electronic data transfer
The development of the electronic data transfer is based on voluntary co-operation. One of the success factors has been the national TYVI-concept, which takes into consideration the systems used in the organisations like private companies

and is therefore providing the possibility to save money with electronic integration also in those organisations, whose only mandatory task in the process is to give information. The possibility to send messages from application to application, as used mainly in TYVI, provides much more benefits to the companies than e.g. Internet-forms. It is also worth mentioning that in most cases the administration is paying the costs of the data transfer (the invoice of the TYVI-operator).

Proactive service, privacy and transferability

The precondition of a good proactive service based on citizen's need is that the service provider has information on single customers or at least on a quite limited group of customers. In some cases, this information can be more or less anonymous (e.g. using Internet cookies and personalised web pages). Starting point of the customer relation management systems in the private sector is in many cases to have as much information as possible on the behaviour and needs of a single known customer.

Nordic tax proposals need a lot of centralised detailed information on a certain citizen as well as a lot of data transfer between the organisations. The main idea is not very far away from the CRM-systems in the private sector. The tax proposal has also important societal objectives like fair and equal treatment of the citizens, which might sometimes be a problem in a very decentralised taxation system based more on the activity and skills of the individual citizen.

Tax proposal and back office integration models
The tax proposal is quite close to the definition of Model C (one service, multi stage). There are mainly electronic interactions between the different levels of back offices and back offices of the different organisations. Model C like the tax proposal is characterised by increasing degrees and intensity of backend integration with regard to the whole supply chain.

When comparing the tax proposal with the definition of Model D (multi service, multi stage), the question arises what is a service and is the tax proposal only a modern variation of the traditional tax declaration. In fact, there are many kinds of services inside the tax proposal process; services not only for the citizens but also internal services for the administration back offices and some services also to the companies. The sending of the tax proposal can also be seen as an information service from the administration to the citizen, which, as a service, has not very much in common with the old duty to prepare the tax declaration every year.

8. References and links

The Finnish Tax Administration: http://www.vero.fi/default.asp?language=ENG&domain=VERO_ENGLISH

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Finland

Case 10
Citizen social benefits -- declaration to the police:
Finnish Tax Proposal

1. Executive summary

Seven months old Finnish electronic crime declaration has been a success story of the Finnish public administration form service lomake.fi.[30] Electronic crime declaration is the first results of the web-service development strategy of the Finnish police. The strategy covers the years 2002 – 2010. The service is based on the common standards of the lomake.fi service. This infrastructure is available for the whole Finnish public administration.

Police has started with an "easy" service without using a strong electronic authentication and so far there is only loose connection with the operative systems. The integration will be done after renewal of systems, service processes and after the implementation of the PKI infrastructure solution.

The crime declaration in 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.

There are different forms for the following seven cases:
• 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

Beside the traditional manual crime declaration form citizens can give the needed information using XML-based electronic form including the information about the municipality, where the crime took place and the claims and requests of the user. User benefits most of the service 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. Before the start of the service police found necessary to unify all local policy Internet sites under the same publication system.

When user has filled and sent the form it will first processed by the lomake.fi portal and after that sent to the XML-server of the Finnish Policy. 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.

Case was first piloted by two police districts and the final solution was based on the results of these pilots. Now all police districts use the same system and it is part of daily work of the officers. It is based on their step by step development strategy, which includes trials by pilots to spare resources. Main target of the strategy is to give the citizens better services.

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.

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[30] Lomake.fi is on form portal common to whole Finnish public administration. The aim is that citizens have one place to start dealing with state and municipal organisations.

Electronic crime declaration is part of the Finnish public electronic lomake.fi (www.lomake.fi), which is common solution to all Finnish public organisations. The service process itself is totally inside policy organisation.

Case was chosen because it use common infrastructure for the Finnish public administration and at the same time back-office localisation helps to organise the work in back-offices in the appropriate way keeping in mind better customer services.

Electronic crime declaration form

2. Background

The case is based on two different trials which were selected under the systematic evaluation of potential services during the web-service strategy work started in February 2001. Reason to start strategy work was the political programme of the Government, which made demand on the evaluation of the possibilities to give citizens better services via internet. The strategy was based on the vision for the year 2010, when all the web services should be integrated with the operational systems, customers can follow up their case electronically, 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.

Also 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.

Before this new service all districts had their own individual internet services and their own development work. The first decision made concerned a new standardised publication system and better coordinated development of the web services. The strategy includes an idea of a step by step development. because this would save the resources in the administration.

The first step in the development is to make a pilot application. Dissemination is done first after a successful piloting. This has also been a way to find good practises and avoid large scale mistakes. The main issue is to develop adequate web-services for the citizens.

First after renewal of base systems and processes it is possible to develop more effective back offices. There is also strong need for new G2G relations and processes. This is also one of the main problems, because the most governmental organisations are just now reengineering their processes and having new ICT solutions. It looks that for the stable solutions it is better to wait for some years.

One of the facts is that sparsely populated areas are still going to lose population and it will become financially too heavy to have policy 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.

Police crime declaration is based on the technical standards and solutions of the Finnish public administration. The service saves time and money and makes interoperability with other back offices easier in the future. As given solution in this case was used public lomake.fi partly funded by the central administration.

The police operates in the nation wide service network to satisfy the security needs of the citizens. In all, there are 274 service points. Some of them employ only a small number of people. In 2002, the police employed an average of 10,974 personnel, of whom 7,744 were police officers, 538 police cadets and 2,691 other staff.

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.

3. Specific Objectives

The main common objective was to provide the citizen an easy way to make a crime declaration in cases, which do not require a strong identification or an immediate action. And to make it anywhere and anytime. The network of the public administration service points has during the ten last years thinned out clearly especially on the sparsely populated areas and the police administration has not been an exception. In the Finnish situation the development projects of the public online services have always also strong regional development targets.

Police has identified seven different declaration types, which can be sent through the lomake.fi service. Local police must in any case evaluate the declaration to know, what kind of crime it is. This is attributable to the obligations, local police has when making the decision on investigations. That's why the declaration can not be recorded directly to the case system.

The service provides also possibility to have faster process. In many cases insurance companies require that the customer has made a police declaration before they can pay the compensation. By using the electronic declaration the customer can also speed up this process.

Another objective was to increase the quality of the declarations. And not only the quality: An easier way to make the declaration also provides the possibility to have better picture on the total criminality. A manual process might be too troublesome for minor cases.

Electronic declaration also can also give more depth information on the case than an oral interview. Stolen objects can e.g. be marked by seamless social security number, which every Finnish citizen have and this helps to connect found property with its owner. That kind of information moves over to the local system with fewer mistakes than the old own.

The main internal objective for the police itself was to prepare for the changes in the future, which include better integration with operative systems, more focused services and better cooperation on the back office level.

Of course one of the objectives was also better coordination in the police administration. Some of the local police offices already had own electronic declaration services.

The main objective of the lomake.fi project in the Ministry of Finance has been to create a public service that is:
* Interactive
* Easy to use and implement
* Secure and trustworthy
* Wide support for different organisations of different size
* Scalable

4. Resources

The electronic crime declaration exploits the electronic form portal of the Finnish public administration (lomake.fi), which has been implemented in 1998. The development of the service has been managed by the Ministry of Finance.

The lomake.fi service enables electronic transactions between citizens, companies and organisations and central government and local authorities, their agencies and other relevant organisations. The public administration is taking care of the costs and it is free of charge for users. It can of course also include the payment function if needed in a certain service.

Today lomake.fi includes 800 different electronic forms of 20 public sector organisations. Monthly number of transmitted forms is roughly 5.000. The service is also an integrated part of the Finnish public sector service portal suomi.fi. The administration also provides an User's guide to online public services in Finland[31], which describes the main principles in the use of online services like the political background, data security and privacy.

The lomake.fi service includes electronically submitted web-forms and forms to be printed out and sent by post. The web-forms are filled in, signed electronically when necessary, and sent over the Internet. For a successfully completed transaction, the service provides a receipt which shows the date and time of the dispatch and the data submitted. The number of web-forms is increasing as well the number of the organisations participating as a service provider.

The printable forms are in Word and PDF formats, which users can download for printing or fill before the printing.

Most of the service can be used without logging. The recipient decides the need and methodology for logging on a case-by-case basis. At the initial stage logging and the signing of forms are done with an electronic identity card (FINEID card). During the year the option of logging with Internet banking codes will also become available.

Lomake.fi portal is maintained by a private company Elma Ltd, which is also responsible for the scalability. Police pays to the company based on the number of the crime declarations. With 2.000 monthly declarations the cost of the electronic form service lomake.fi is about 450 Euros. This price includes also unlimited number of user ID's in the police administration.

lomake.fi – Portal for the electronic forms in the public administration

Police did not have to build own web-form infrastructure. The only task needed was to transfer the information from paper form to web-form. In pilot phase there was six persons involved in development and testing. They used totally one working year to receive the final result.

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[31] http://www.asiointiopas.fi/asiointiopas/english/first_page/

lomake.fi – Alternative interfaces
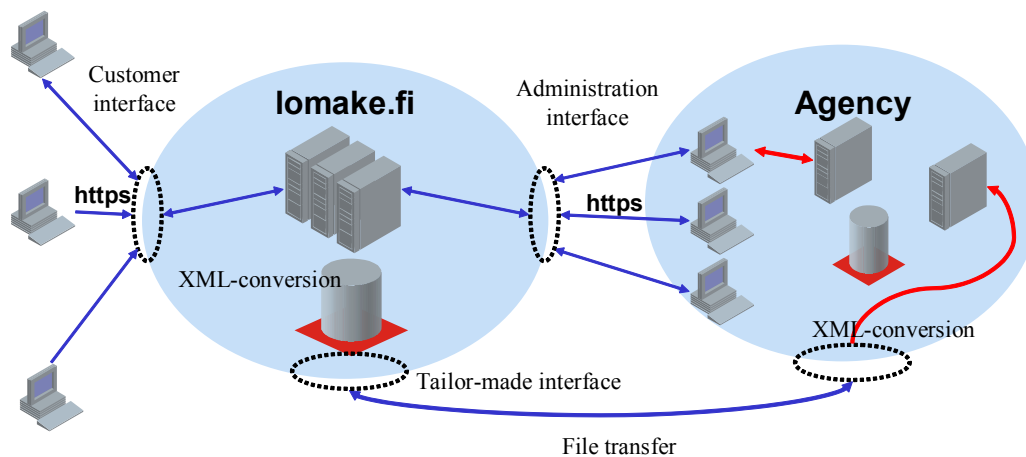
Police invested on XML-parser to receive the messages from the central lomake.fi service and convert them to web-forms, which are sent to local crime declaration email boxes. The same XML-parser can also be used in other cases so it is hard to estimate the cost to this special case. Also the whole maintenance is done by the own staff and needs seldom actions. Backups and other routines are done by the common automated routines.

Customer side tools are built on common internet standards (web-browser, SSL, TCP/IP).

The identification is not done but the validity of the Finnish PIN-code is checked with a calculation. Data integrity, logical checks, conversion to XML-file, temporary storing, timestamps and confirmation of crime declaration are done by service provided by common tools of the lomake.fi service. Only XML-conversion is customised to police administration. Actually new system has not changed the organizations working processes, the lomake.fi system has given the possibility to make the user interface and through XML-conversion it is fit to suit old system, which is not yet renewed. This has led to fast dissemination of the new service

The case was quite easy to launch because it dos not differ much from the parallel manual system and the information is same regardless of the type of the form is used. There was no need to train personal for the new web-form system. Guidance was done by sending instructions to all service points. Only new task to duty officers was 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.

5. Implementation

After the new service strategy for the years 2002 – 2010 was ready, the police decided to start with a spearhead case targeted to customers. During the strategy work one district continued to test crime declaration system pilot, which suited well with the strategy. Results of the pilot case were encouraging and with slight changes and improving the lomake.fi services it was easy to start without large dissemination project.

Because a good feedback from customers side during the pilot phase, it was easy to make the decision. Police will still check the incoming declarations, because they have been trained to understand differences between those notations

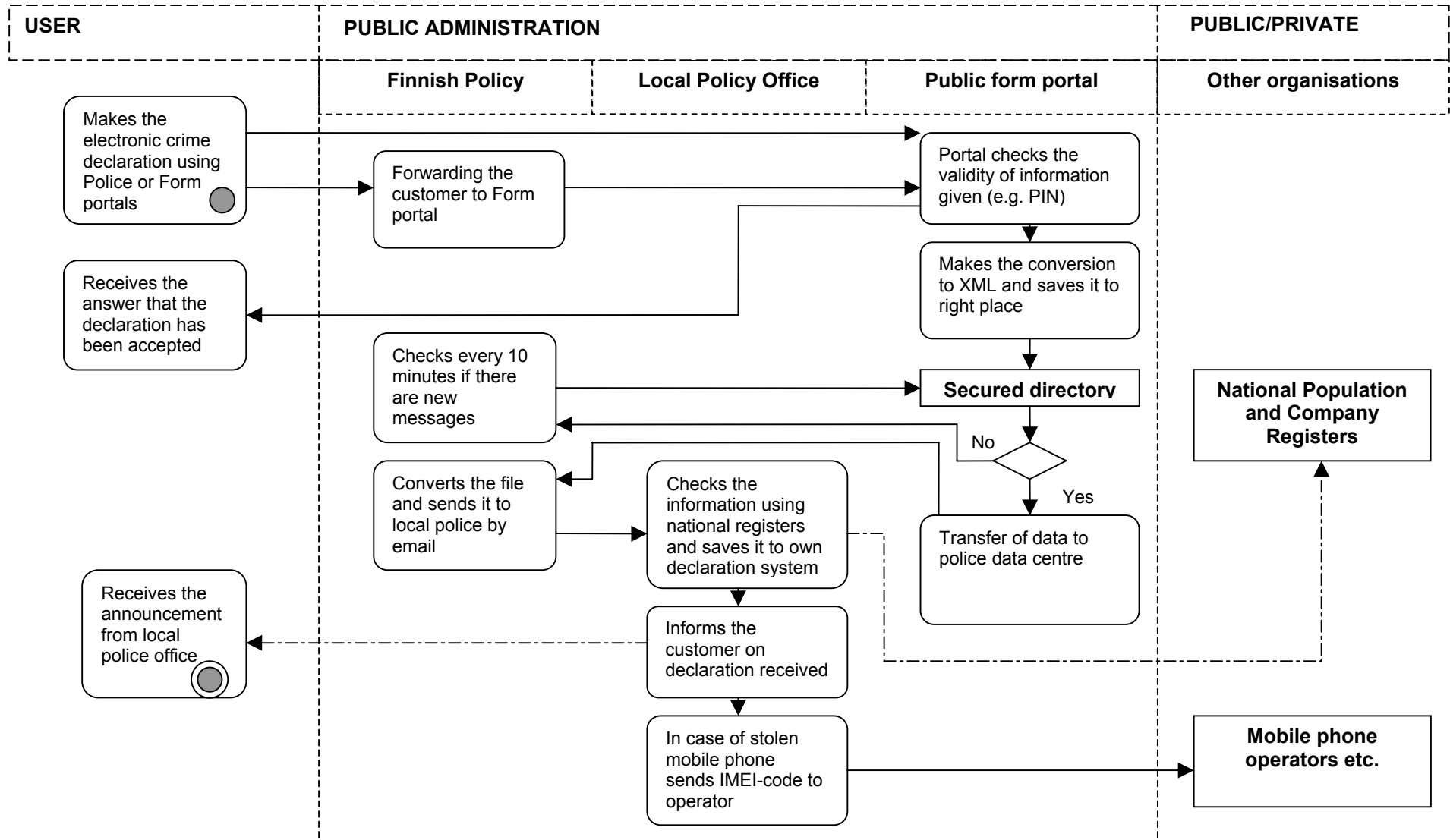**Process description of new and old system and their relations to back offices**

Activity	A1.Alternative 1 (active web-form)	A2. Alternative 2 (paper form)	Back office used
1. Search of crime declaration form	He/she logins to the lomake.fi and selects the police on the organisation list. The next step is to select the appropriate declaration type.	He/she goes to the police office to get a paper form.	A1. Common lomake.fi A2. None
2. Filling the form	Citizen fills the active www-form. The lomake.fi provides guidance for selecting the right form.	Citizen fills the paper form at police station or at home. If filled at police station, the citizen can have advice to. Possibility to fetch form from portal and fill the form at home	A1A1.Common lomake.fi where citizen fetch the active www-form with A A. A A2. Possibility use lomake.fi
4. Preliminary information check	Active form makes the validity checks.	Personal at police office can help.	A1. Lomake.fi A2. Manual
3. Delivery to temporary recording	Sent by internet over SSL protected http-connection	Leaves the declaration to police office personally. Sends the declaration by post or fax	A1. Lomake.fi A2. Manual
4. Acknowledgement of receiving declaration	Portal sends message that the declaration with timestamp that declaration has received.	Police office gives an . acknowledgement if asked.	A1. Lomake.fi A2. Manual
5. Temporary recording	Portal saves the message after conversion to XML-file to a secure directory, where only police organisations program has access.	Police saves the form temporary	A1. Lomake.fi A2. Manual
6. Delivery to handling	Police data service checks every 10 minutes through VPN connection if there is new messages in the directory. If is, it will start a FTP transfer to the police's data centre where XML-parser converts the message and checks to the right local office..	Police office sends declaration by intern post to office responsible to handle case.	A1. Lomake.fi Data centre's communication system Police email A2 Manual
7. Case handling	Officer in charge reads the email and checks the declaration and makes corrections Local police office may use VTJ or YTJ systems to check information on the form. Officer transfers the information to police case system. If it is question of a stolen mobile phone and it is allowed by the customer, the officer sends IMEI code of the phone to operators.	Officer gets the paper form. Officer checks the declaration and makes corrections. Local office may use VTJ or YTJ systems to check information on the form The officers saves the information to police case system. If it is question of a stolen mobile phone and it is allowed by the customer, the officer sends IMEI code of the phone to operators.	A1. Lomake.fi VTJ[32] YTJ[33] Police case system Telephone operators system A2. VTJ YTJ Police case system Telephone operators systems
7. Delivery of copy to citizen	Will be sent by post or fax	Will be sent by post or fax	A 1 None A2 None

Key data related standards used is the Finnish PIN-code, which enables to connect personal information between different back-offices, or the business code for the organisations. For the same purposes, also the code of the municipalities is used in the service.

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[32] The Personal Information System (VTJ) includes the personal data of the Population In-formation System maintained jointly by the Population Register Centre and local register offices.
[33] Information systems covering enterprises, corporations and foundations.

Workflow of police crime declaration Finland

USER	PUBLIC ADMINISTRATION			PUBLIC/PRIVATE
	Finnish Policy	**Local Policy Office**	**Public form portal**	**Other organisations**

Makes the electronic crime declaration using Police or Form portals

Forwarding the customer to Form portal

Portal checks the validity of information given (e.g. PIN)

Makes the conversion to XML and saves it to right place

Receives the answer that the declaration has been accepted

Checks every 10 minutes if there are new messages

Secured directory

No

Yes

National Population and Company Registers

Converts the file and sends it to local police by email

Checks the information using national registers and saves it to own declaration system

Transfer of data to police data centre

Receives the announcement from local police office

Informs the customer on declaration received

In case of stolen mobile phone sends IMEI-code to operator

Mobile phone operators etc.

Technical standards which enable solution are TCP/IP networks, HTML presentation standard, HTTP and SSL protocols, VPN standard for secure transfer and XML in data recording.

Number of declaration during seven first month was 13 200 which is about 10 % of the potential selected seven crime types:
- 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

Ministry of Interior made a general agreement with the broker in charge of the lomake.fi service and is also paying the costs of the service. Selected services are given both in Finnish and Swedish. There are also printable electronic forms in English.

Management of ICT was easy, because 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.

One of the risks recognised already during the online service strategy work was that the electronic crime declaration will be an easier and faster service not only for the ordinary citizens but also for the misuse because of the missing identification. The police had anyway clear goal to create an easy and fast service without using a methodology that exceeds the interface of the traditional service.

The service was easy to market because media was keen to write on it. At the same time also Ministry of Finance was marketing the lomake.fi service.

The case is innovative at least on the national level. The main innovative features are:
- Large scale back office integration inside the police organisation
- Structure ready to support the implementation of big changes in the future
- Use of the existing infrastructure (like lomake.fi) and the service of a private company
- Easy and fast way for citizen to make the crime declaration without any needless features

6. Results

The results in relation to users

Main result was a solution, which helps citizens and organisations to make the crime declaration easy and fast way anytime and anywhere. The people do not have to know the address of the right police office, the name of municipality, where the crime took place, is enough.

Also the threshold to make the declaration is lower online and, based on the first experiences, the police is receiving more declarations, where the value of stolen property is relative low, comparing with the old system. Even that do not necessary help to get back a stolen bicycle, it is anyway good for the sense of justice that all the crimes are handled similar way. An quantitative information is first available after some months.

The number of the electronic crime declarations during the seven first months, 13.200, is anyway much more than estimated.

One of the main societal objectives was to provide better services there, where the next police station is far away. In the Finnish situation, this distance can be hundreds of kilometres. This objective has been reached, in principle.

Of course the service saves time of the customer, especially the travel time. In the manual process it is quite common that the customer do not have all the needed information at the police station, like IMEI-code of the mobile phone or serial number of a certain property. In this cases the customer must visit again the station or give the information by phone. 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 policy station.

The results in relation to back-offices

The police is 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 also small crimes can be part of a 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. This, on the other hand, increases only the validity of the statistics.

Mischievous declarations have not been a problem.

The working time needed to handle the crime declarations has decreased when the desk service has disappeared. Also the main part of the recording work is now done by the customer. More important result is that the local offices can work with these relative small crimes, when there is nothing going on with higher priorities. It provides better use of always limited human resources.

The ICT investments done are scalable and have multipurpose functions. The new structure allows to add new services with relative low costs. All the technical parts in the process are independent; XML-parser can be used for different purposes and the electronic form service provider can be another one.

The wanted separation of front and back office has also been successful. The coming changes in the police organisation do not cause the need to make changes in the electronic crime declaration.

All in all, the new structure makes the step by step development much easier.

Also the lomake.fi service is on the good way in achieving the objectives. One of the problems is that the electronic forms of the local administration (except two cities) are not available in the portal. The natural reason is that in the state government the development work around a certain service is centralised, but in the local government every municipality has more or less the same services.

7. Learning points and conclusions

Because the service has existed only seven months, the lessons learnt are still quite few. Especially the important question *What would have been done otherwise?,* can not yet be answered.

The customers find the service useful. The main evidence is the active use of the service as well the result that the misuse is not a problem at all. The service is easy to use and fast with a lot of similarities with a good e-commerce service. It has not an interface of bureaucratic or frightening police administration.

Development of a fully integrated back office system is a huge task and it takes 5-10 years to make it, at least in this case. This period is too long to be predictable especially concerning the technology, the structure and tasks of the public administration and the needs of the customers. One big and integrated development project covering all parts of the process and service is not reasonable.

The Finnish Police has created a structure that allows good possibilities for a step by step development with separated front and back offices. Future steps can be done in relative small projects.

The final step in the process, in the local office from the received electronic declaration to the investigation system, has not been automated. This has been a consciously choice. And based on the experiences also a good choice. Every declaration has its own individual nature, which must be sufficiently studied by a human brain and with a good knowledge of practice and legislation. This kind of flow of information is also good for the development of this kind of knowledge management. There is a danger that too automated process can decrease the level of expertise.

Organisation models of the police are quite similar in many countries and probably also the daily problem in the local police stations, how to prioritise the use of human resources, is common. Especially the small crimes are as well investigated on the local level and in the place it was made. In principle the Finnish electronic crime declaration is directly transferable.

The opinions on the need of identification might vary. The use of PKI is also possible in the lomake.fi service, but there has been a clear will to avoid any obstacles in the use of the service.

The case is following more one service – multi stage model, but it has also some multi service features in the back office, e.g. the local police station informs the mobile phone operators on the IMEI-code of a stolen phone.

8. References and links

Portal of the Finnish Police http://www.poliisi.fi/

Electronic Crime Declaration in Finnish http://www.poliisi.fi/poliisi/home.nsf/suomi/rikosilmlomake

Electronic Crime Declaration in Swedish http://www.poliisi.fi/poliisi/home.nsf/sv/brottsanmalan

Finnish public administration form portal www.lomake.fi

Finnish public base registers www.rekisteripooli.fi/PDF/FIN_Base_registers.pdf

User's guide to online public services in Finland http://www.asiointiopas.fi/asiointiopas/english/first_page/

Portal for public services in Finland http://www.suomi.fi/english/immigrants_and_emigrants/

Finland

Case 11
Citizen enrolment in higher education:
## Enrolment in the University of Helsinki

1. Executive summary

The main administrative information system in the university of Helsinki is called Oodi. The core of Oodi consists of tree parts: Information on students, teachings and studies. Student information system includes information on the students, on their personal rights to study, on their study attainments and on the enrolment. Teaching information system covers the information on the scopes of the degrees and lectures and seminars provided by the university.

The last part, study information system, includes the administration of courses, registration of the study attainments, credits, credit transfers and study plans.

WebOodi is the browser-interface of Oodi. For the students WebOodi provides the possibility to
- enter for an examination
- register for teaching events
- update own personal information
- enrol to the university and pay the students union fee.
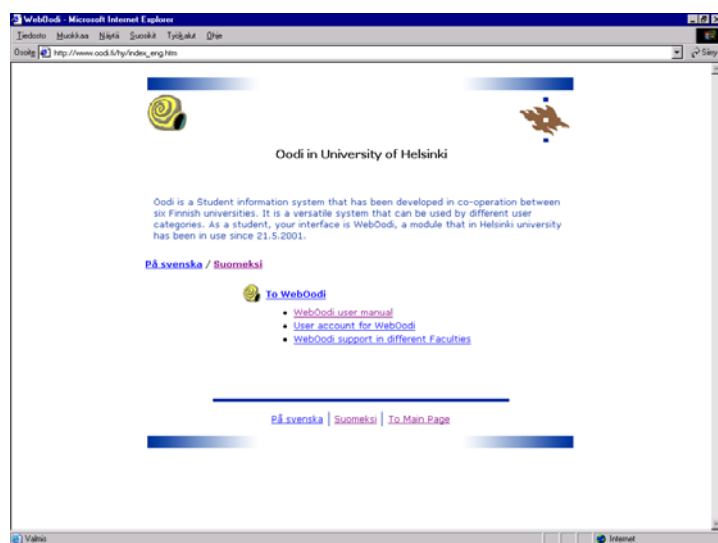
WebOodi also includes a feedback system for students and the possibility to manage the personal study plan.

The users of Oodi/WebOodi are the students, administration and the whole teaching staff. The update of the information is decentralised to faculties and departments.

The main external back offices in the digitalised process are:
- 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 at the office in the university. This was an extra trouble especially for those students that were living far away and were going to enrol as an absent student. The enrolment also accumulated to few days and caused long queues. Because of the lacking back office integration the students were forced to go with all kind of certifications to have different services. In some cases also the low digitalisation level caused delay in services, e.g. getting financial aid for studies.

Manual update of the same information caused also double and triple work in the administration. Extra resources were needed to help in the enrolment queues.

This case is a clear multi service – multi stage process (Model D). The interactions are also fully digitalised (3).

The case was chosen on the national best practice list because of the wide digitalised back office integration and because of the benefits for the users and administration.

2. Background

The starting point of the service was the need to renew the study and student register systems and the need to decentralise the work done with those registers. Because also other universities had similar needs, a group of five (later six) universities started the 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.

The consortium enlarged later to cover 12 Finnish universities. The current consortium covers 56% of the students in the universities.

University	Students 2002	Electronic enrolment service in use	Share of electronic enrolments and payments %
University of Helsinki	37.685	X	40
University of Oulu	15.346	X	?
University of Joensuu	7.158		
University of Vaasa	4.860		
Helsinki University of Technology	14.763		
Lappeenranta University of Technology	5.035	X	60-70 (First year 2003)
Helsinki School of Economics	4.170	X	50
Swedish School of Economics and Business Administration	2.390	X	65
University of Art and Design Helsinki	1.717		
Sibelius Academy	1.514		
Theatre Academy of Finland	395		
University of Lapland	Starting 2003		

WebOodi is the student interface to Oodi. WebOodi is a natural continuation of the student register development in the consortium.

The enrolment for the next study year must be done in the university of Helsinki between the beginning of the Mai and Mid-September. This is the main legislative rule behind the enrolment process. The universities have the freedom to chose the details in the implementation.

3. Specific Objectives

Before the year 1995 the universities participating in the Oodi-consortium had already information systems for the students and partly also for studies. The main problems were the loose integration between the different applications,

delays in the registration of examines, the validity of the information (mainly only examination book was including all the studies) and double work.

Some technical issues also speeded up the development like Y2K and character based interface.

Also the existing information systems supported mainly administrative processes and not very much studies and teaching.

One driving force was also the change in the role of the universities. The funding received from the state budget is now based on the results of the universities. The main result is the number of the examinations and evaluation of the research and teaching is encouraged. This changed also the role of the study and student information system from administrative to more strategic one.

The participating universities are different and they use different technologies and procedures. That is why one of the important objectives was to create not a joint but a flexible system, which can be implemented in every Finnish universities.

One of the objectives has been also to support the co-operation of the universities in the student and study administration.

4. Resources

The key tools in the development of the Oodi system have been Uniface application generator, Oracle database and Oracle Reports. In the web service the main tools have been WebLogicServer application as well open source Apache server. The communication is secured with SSH software.
In order to pay the enrolment fees at the same time, the student must have an netbank agreement with one of the following banks: Nordea, OKO or Sampo. WebOodi has also wap and SMS interfaces for the mobile phone users.

The link between WebOodi and netbank is based on general ePaymentService-interface, which has been developed by the banks. The same interface is used in many Finnish public and private services. After giving the basic data for enrolment the WebOodi gives the student possibility to choose the own bank. The next step for the user is to login to the bank system with the normal procedure (the student enters his or her user ID and a changing password). PKI/digital signature is available in the web services of the banks.

The system has already shown that is scalable. It is used in the universities, which differ by size and functions. The application is also running in many different technological environments.

The Oodi has multiple access interfaces; WebOodi is mainly for the students and the administration has own interfaces.

For the user authentication WebOodi users must have user account in the network of the university. This means that the first year students can not enrol using this service, but anyway their enrolment process differ very much with the process of the "old" students. Login to WebOodi is made with the same usernames and passwords as to the network.

The development and operation costs of the Oodi-consortium have been during the last four years totally 750.000 euro. One third has been funded by the Ministry of Education and the rest by the participating universities.

5. Implementation

The electronic enrolment service is based on the development work of the six Finnish universities. The consortium started in 1995 with the task to create, in the close partnership, an new information system for students, studies and teaching in the participating universities.

Because of the Y2K-problem of the old system, the Oodi was taken in use in 1999 in the University of Helsinki. The existing information was converted and transferred to the new database step by step. Unfortunately the application was not yet ready and there were some technical problems to overcome. The use of the student interface, WebOodi, started in the University of Helsinki and in the Lappeenranta University of Technology 2000.

The implementation was based only on a quite short project plan. It included a basic description on the process. The service itself was created with the help of the demo JSP-pages and writing an user manual at the same time.

The faculties update the information on the teaching events and studies in Oodi. Digitalised links Oodi has among others with the staff register, phone book and email directory of the University. Oodi also receives information from the national application and study rights information system (HAREK). The personnel information is updated digitally using the common interface of the National Population Register. The information transfer is based on the use of the national PIN-code. Every Finnish citizen has this own unique code as well the foreigners living in Finland at least one year.

First year students can not use WebOodi in enrolment. Their enrolment has a different function and they do not have the needed ID's and passwords.

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.
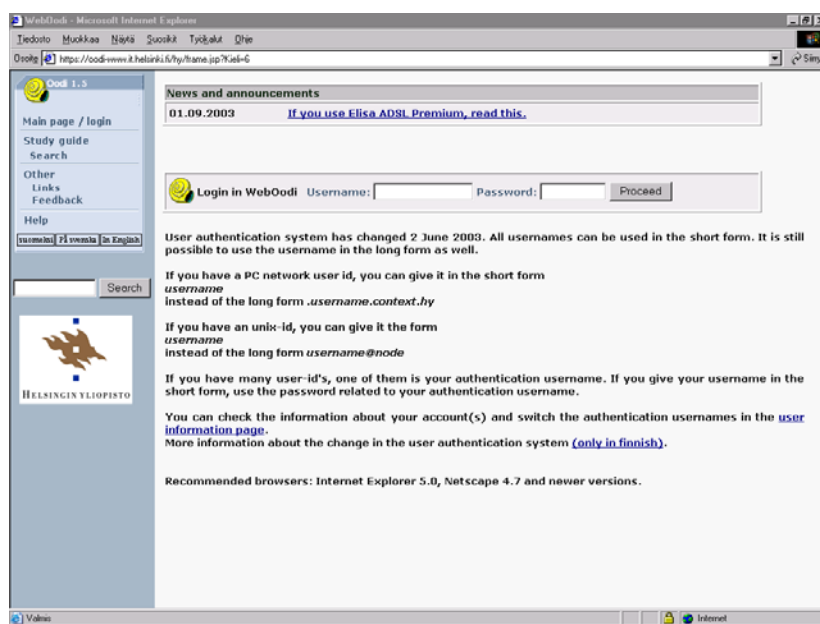
Part of the services are also available with the mobile phone (wab, SMS).

The students has the following choice in the main menu (text in italic is from the English user manual):

1. CHECK YOUR PERSONAL DATA
As a student, you are responsible for your contact information and other personal information to be correct. You can change the data with Modify. If there are errors in sections you can not change, please contact the Information and Counselling Office.

The basic personal information includes:
Name
Date of birth, PIN-code, student number
Language, nationality
Start of the studies, enrolment information
Membership of the student union and study associations
Assignment information on personal data

Other personal data consists of
rights to study (content, time, reason)
study attainments
examinations and degrees, also in the other institutions

2. REGISTER FOR TEACHING EVENTS
As a search criteria you can use name, a part of the name, code, type, teaching organisation or time interval, or any combination of these. You get to the search page by clicking Search under Study guide. To search for teaching events you should use the search button Search teaching events.

Search results are shown on the same page. If you want to sign up for a event, click Register. You will be shown information about the teaching event, and at the bottom of the page you should mark the Reg. -checkbox and then Save registration. You will get a notification about your registration attempt, with a success/failure message.

3. CHECK YOUR REGISTRATIONS
On this page you will get a list of your actual registrations. These can be sorted by code, name or time schedule. By clicking on the Code link, you will get information about the study module, for which the teaching event has been arranged. By clicking the Type -link, you will get information about the teaching event and your registration.

Add study/register takes you to the registration page (see Register for teching event).

Show hidden shows the registrations you have earlier hidden. Hide hides this registration. Remove deletes registration. This can be done only if the teaching organisation has decided to allow removals, and if your registration still has not been approved at the department.

4. CHECK YOUR CREDITS
Here you can see your credits in real-time. You can sort your credit by code, name and date. At the bottom of the page your total amount of credits are shown..

Add study/register takes you to the teaching event registration page (Register for teaching event).

5. STUDY PLAN
Here you have the possibility to schedule which studies you are going to take and on which semester. This is mainly for your own information; the planned studies are not utilized by other systems. You can sort your planned studies by code, name and time schedule.

You can add a study by clicking Add study/register. In the search formula that opens, you can search by code, name, and date. You search with the button Search study module. The search result is shown on the same page. With Add study you add the study to your own planned studies. Under Planned can you later on change the schedule.

6. ORDER TRANSCRIPT
Choose language and click Order. An unofficial transcript will be sent to your your.name@helsinki.fi -address within 2 hours. You can check your email information in Personal data. Please note that you can only order one transcript per day and language.

7. ENROL IN UNIVERSITY
You can choose to register yourself as attendant or absent in WebOodi. In order to pay the fees, you need to have a Internet bank.

Click the link Enrol in university. The link is visible only if you are allowed to enrol through WebOodi, and if you have not enrolled already. If you duo not see the link after logged in, you can contact the Information and Counselling Office.

Enrolment is done in four phases with page-specific help files. On every page you will also find embedded text advising you. After you have completed the enrolment, you can check your status under Personal data.

8. GIVE FEEDBACK ON COURSES
This module is used only by students at the Faculty of Medicine. The module has its own help file.

In the enrolment process the first task of the student is to check the personal information. This includes also the wanted status (present/absent) of the studies during those semesters enrolment concerns.

After approving the personal information the student must choose the fees[34] 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 the work in the developing countries). After making these choices, WebOodi is providing on the screen the total sum looking as a normal giro transfer.

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[34] The University of Helsinki itself has no tuition fees. But all undergraduate and graduate students are required to pay the annual student union membership fee. The membership fee includes a health care contribution that entitles the students to inexpensive health care. In addition, student meals, inexpensive travel options, and some other discounts are available to students upon presentation of a Student Union membership card.

The student starts the payment phase by approving the sum and choosing his/her own bank. The interface between WebOodi and 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. More common way is to use ID, fixed password and a changing password together.

The change from WebOodi to banking system is after login automatic. In the service of the bank the payment is done like in normal use of telebanking. After successful payment the user is guided back to WebOodi, where the student can print a receipt.

The share of the students using WebOodi enrolment and integrated payment is 40 – 70 % depending on the university.

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 online services (mobile phone, phone, Internet, automates etc.).

The information on payment is transferred automatically from bank to university. This period varies from some hours to tree days. The transfer is faster if the student and university are using the same banking group.

After having the information on payment the university approves the enrolment and the status of the student in the personal information of Oodi is changed. The university is taking care of the transfer of the money to the final destination, to the students union. Part of the fee is transferred to the Finnish Student Health Service.

Oodi has digitalised interfaces for outgoing information with the following systems:
- Social Insurance Institution (KELA). The institution is in charge of the financial aid of students. The information coming from Oodi is used to control the right for this aid.
- Statistics Finland. For the collection of the university study statistic.
- Students Union. Mainly member information.
- Finnish Student Health Service. Information on the students having the right to use the health services. The precondition of that right is the enrolment and the payment of the student union fee.
- Centre for International Mobility CIMO. It is a Finnish governmental agency operating in the field of international mobility.
- Ministry of Education
- Contact information systems of the university
- Other universities, e.g. in the case of the change on the university

The aim of the consortium is to make further development in the student approach like:
1. the integration of the personal study plan and the mentoring system
2. the support for the mobility of the students between the universities

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 the enrolment. Other back office relations has not changed very much because of the new systems, because main part of the interactions were already digitalised or at least the question of digitalisation was not depending on the renew of the system.

After the Finnish Personal Data Act[35] every personal register must have a public declaration, which includes
- the name and address of the controller and, where necessary, those of the representative of the controller;
- the purpose of the processing of the personal data;
- a description of the group or groups of data subjects and the data or data groups relating to them;
- the regular destinations of disclosed data and whether data are transferred to countries outside the European Union or the European Economic Area; and
- a description of the principles in accordance to which the data file has been secured

In this declarations the universities describe their own privacy practices (without detailed security issues). The external use of the student register information is mainly based on the legislation. In all other purposes (e.g. public contact information systems, other universities or recruiting information for employers), the student can allow/deny the transfer of the personal information..

The university of Helsinki, as also many other universities, has the WebOodi in tree languages; Finnish, Swedish and English. The bilingual versions include also user manuals.

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[35] http://www.tietosuoja.fi/uploads/hopxtvf.HTM

Workflow: Enrolment in the university, Finland

STUDENT	PUBLIC ADMINISTRATION			
	University	**Agencies**	**Student's union**	**Bank**

Receives the ID and password on the university

Logins for enrolment

Studies and exams

Oodi information system

Updates the personal information

National Population Register

Receives the membership information

WebOodi

Information concerning on student grants

Social Insurance Institution

Student Health Service receives the information on payments

Ask for the payment

Sends the student and study statistics

Accepted payment

Telebanking agreement — Yes

ePayment service

No

Information on university applicants

Statistics Finland

Goes to bank or uses online services

Contact information

Ministry of Education

CIMO

Receives the payment

Receives information on approved enrolment

Change of the university

Other universities

The highest body in the consortium has been the monitoring committee consisting of the rectors of the participating universities. During the latest phases the committee has not anymore gathered. Instead the rectors have received reports on the development.

The members of the steering committee have been the heads of the study offices and also the representative of the Ministry of Education. This committee has approved the action plans, the budgets and the reports.

The project group consists of the IT-staff of the universities, 1-3/university. Different subgroups have been in charge of the development work during the maintenance period. The user group handles with the needs of the users and goes also through the reported bugs. Web group develops the student interface. DW-group works for the DataWarehouse-reporting and the technical development is coordinated by a technology group.

The whole consortium is coordinated by the University of Helsinki. This task includes among others project manager, enlargement of the consortium and operation services for some users.

The new members wanting to join the consortium must pay admission and membership fees. These fees give the possibility to use and develop the software for the needs of the own organisation and to participate in the development of the application. The membership in the consortium brings also support services.

The WebOodi is innovative thinking
- the wide range of available student services
- back office integration
- save of the work in the administration
- implementation of the electronic payment in the public administration
- the consortium

The user feedback on the enrolment service has been very positive, from the students as well from the administration.

6. Results

Results in relation to students

The student can enrol everywhere and without the need to travel to the university. This is a big benefit especially for the students that enrol to be absent and maybe living abroad.

Because of the faster enrolment process and back office integration students get some services faster. This is especially true with the students grants coming from the Social Insurance Institution. They can also use earlier the health care services provided by the Finnish Student Health Service Foundation.

WebOodi gives the student the possibility to manage better way the studies. There will also be more study-oriented services like integration of the mentor system with the personal study plan.

There is also less work needed when changing the university. In the future it will be possible to make some of the exams in the different universities keeping the whole information in one place.

Back office integration allows better front office services. In the old system it was not only question of queueing in one place; the student was forced to stand in a queues in the several places showing the same papers and receipts in many offices.

Results in relation to users in the administration

The self-service of the students has decreased the work of the administration especially in the enrolment process. Alone in the University of Helsinki this means so far roughly 16.000 annual desk visitors less. Together with the preparatory work it is at least equivalent amount of the working hours less.

Thinking the changing role of the universities, the information that has important strategic nature and has big effects on the financial decision-making, is more valid and updated faster. This gives also better possibilities to plan the use of the resources available.

The main benefits of the partnership have been
- lower development costs in general
- the use of the joint experiences
- better integration of the activities in the future

It is difficult to estimate but probably the savings in the information technology costs have not been notable.

Results in relation to the back-office

One of the winners has been the students union. More than half of the fees are coming without any extra trouble. This means less work with pre-printed invoices and in other administrative tasks.

Another winner is the banking sector, where the 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.

The co-operation of the universities and the mobility of the students will be easier in the future.

Also other back offices receive better information but that is not necessary direct result of the new system.

7. Learning points and conclusions

Electronic enrolment together with the integrated payment is a good example on very focused e-government service. Among the students, access and use of Internet is not a problem. They are also use telebanking services. In that kind of focused service it is possible to receive quite high utilisation rate without remarkable marketing efforts or extra lures like having lower fees in the electronic payment.

Partnership of the universities has made many things more complicated but is has also had clear advantages. One of the main advantages is that only the consortium was able to receive the funding from the Ministry of Education.

The universities participating in the consortium have also learned that they compete in the research and studies but not in the administration.

In the development of Oodi and WebOodi it was not very much question of reengineering the processes. At least, it was not discussed very much. The finished result, with many possibilities, has expressed the need of that kind of discussion.

The work of the consortium as well the results are mainly transferable, especially if the universities are working under similar conditions and legislation. European harmonisation of the universities gives more place for transferability.

After the project manager, there have been also some things that would have been done otherwise if it would be possible:
- The consortium started with too ambitious task trying to renew the all main information systems at the same time
- A project group clearly in charge of the practical results was not defined in the beginning. This led to the situation that nobody knew who really was in charge and leading the project.
- The cooperation takes time. It must be time for feedback and other comments and the possibility to prepare for slow development cycles.

This case is a clear multi service – multi stage process (Model D). The interactions are also fully digitalised (3).

8. References and links

Oodi main page with the links to the services of the participating universities http://www.oodi.fi/index.html

Oodi documents in Finnish http://www.hut.fi/Yksikot/Opintotoimisto/Oodi/

WebOodi User Manual in English http://www.oodi.fi/hy/kayttoohje6.htm

Finland

Case 12
Business environmental-related permits:
TYVI service and environmental pollution announcements

1. Executive summary

The main purpose of this report is to describe the system which allows different organisation to electronically transfer the environment pollution information defined in the environment permits to the environment administration and what are the back offices effects of this system. The report also covers the environment permit application process and the TYVI-concept used in the Finnish government for electronic data transfer.

In the mid-nineties, the Finnish Ministry of Finance developed the so-called TYVI-concept to boost the use of electronic data transfer. Today, this platform covers many important Finnish electronic data transfers in the B2G, G2B and G2G relations.

The main player between the information supplier and the information receiver is the TYVI operator (broker). Today, there are five private companies having this role. The operators make an agreement on electronic data transfer with an information supplier as well as with an information receiver. Information receivers are mainly organisations representing the public government but also private associations, trade unions, pension insurance companies and even the Finnish Evangelical Lutheran Church.

TYVI operators take care of the connections, security issues, data transfer and information conversions. In some certain services the database located in the TYVI-operator can also be part of the service process itself.

All important financial and pay-roll software products in Finland already have a TYVI-interface for data transfer, which helps especially smaller organisations to join the service. Roughly 60 % of the Finnish public and private organisations are using the service. The annual number of the information units transferred electronically through TYVI is at the moment 3.5 – 4 millions.

TYVI portals of the operators are bundling together many services and many back offices. From the viewpoint of the information receiver the current services are:

1. Tax administration
- Monthly announcements of employers on paid wages and tax withhold (from employers)
- VAT control announcements
- VAT announcement on European trade
- Request for tax rate for an employee (from employers)
- Annual announcement on paid taxes, other advantages and tax withhold for the personal income taxation (from employers)
- Tax declaration of a company (from companies)

2. Custom
- Domestic export and import announcements

3. Mutual Pension Insurance Companies (7 companies)
- Wage and employer announcements (from employers)

4. Employer associations
- Wage statistics (from members)

5. Trade unions
- Trade union fees (from employers)

6. Statistics Finland

- Statistical annex of the company tax declaration (from companies)
- Statistics of the educational institutions and schools (mainly from local government)
- Statistics on the municipal finance (from local government)

7. Environmental administration
- Environmental permits and pollution information (from permit holders)
- Use of the land in the municipalities (from local government)

8. Church Council
- Employment information (from parishes)

9. Accident insurance companies
- Information on accidents and occupational diseases (from employers)

In certain services and with certain TYVI operators (and as a customer of a certain bank) it is also possible to use telebanking services and make the payment at the same time when giving the information.

TYVI operators are in charge of the management of their own portals.

The main change in the back office chain has been the TYVI feature that allows one report from the customer side be re-used in different parts of the government.

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 world an external electronic data transfer service with standard interfaces to both directions of the back office process is a critical success factor.

The case has been chosen because of its big effects on the B2G relations and its potential to change the back office activities and improve cooperation.

2. Background

Environmental permits in Finland

The Finnish environmental authorities are 446 municipalities, 13 Regional Environment Centres and 3 Environmental Permit Authorities. The two last ones are part of the state government. All together they have roughly 30.000 customers which are divided as follows:

Municipalities	25,000
Regional Environment Centres	5,000
Environmental Permit Authorities	500

An environmental permit is required for activities which may cause environmental pollution. The permits of the local authorities are the smallest as well the easiest ones. To the same extent, the Environmental Permit Authorities take care of the widest and most complicated issues. This structure also corresponds to the need of information; national environmental permit authorities need a lot of information about the cases they deal with but on the local level the amount of information is relatively low.

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 made by the state government.

The duties of a company or another organisation are expressed in the permit. This includes the limit values, which should not be exceeded. The decision can also include basic and desired values. If the permit holder permanently exceeds the limit values, the environmental legislation gives the authorities different tools starting from warnings until the decision to stop the total operation immediately.

Pollution announcements of the customer are an important part of the monitoring system of the permits and their limit value conditions. The duty to make regular monitoring pollution announcements of the pollution varies by company or customer. The current number of customers within the framework of these announcements is 4.000. It has been forecasted that it will increase clearly in the future. Some of the customers must make the announcement annually, some monthly.

Today the most common way is to make the announcement once a year. That is why the number of announcements is only slightly higher than the number of customers. But there will be a fast increase of monthly announcements, and there are also plans for even shorter monitoring periods.

One customer can cover several decisions, which are all under different kinds of rules. Every decision can consist of several different monitoring points (e.g. a chimney, a waste-bin etc.). Also a certain customer and his decisions and monitoring points can have (and also have) different monitoring periods. Moreover, the environmental permits often use other classifications of the places of business than e.g. the official statistics. This makes it quite difficult for a company to manage the information and environmental permits.

VAHTI information system

The pollution monitoring system of the environment (VAHTI) is one part of the environmental information system. VAHTI collects the information on the environmental permits and on the environmental pollution effects of the permits on air, water and the wastes. VAHTI also includes the decision and document management.

The main purpose of VAHTI has been to help 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 must regularly make pollution announcements. It has been estimated that, in future, most environmental permit holders must also make similar announcements.

VAHTI includes information since the 1970ies and provides the possibility to monitor changes in the environmental pollution over a relatively long period of time.

3. Specific Objectives

The TYVI service was developed by the Ministry of Finance late in the nineties, and already the first experiences were very promising. The information suppliers as well as the receivers are very satisfied with the services.

The main objectives of TYVI have been:
* To decrease the number of different point-to-point solutions in the electronic data transfer
* To provide a single interface for customers as well as for the information receivers and develop all-in-one reports
* To support the development of the software used by the customers to provide the needed information for reports automatically
* To decrease the costs of electronic data transfer in all parts of the process

The main objectives in the development of the environmental information system VAHTI (especially the pollution monitoring part) have been:
* To allow direct connections for an unlimited number of customers. The administration took a new version of VAHTI in use at the beginning of 2002 that has a different structure than the old version. Electronic data transfer system was prepared for the old version and it was estimated that a) data transfer system would need major changes and b) the Finnish Environmental Institute which issued the user names and passwords would have big difficulties to administrate bigger amount of users.
* To reduce the cost of data transfer
* To remove manual work between different parts of the back office
* To adapt with the increasingly complex environmental legislation situation and with continuous changes in it
* To make possible better use and re-use of environmental information.

4. Resources

Since 1996, the Ministry of Finance has spent roughly 200.000 euros for establishing and promoting TYVI.

The total budgeted costs of VAHTI (including the pollution monitoring system and TYVI service) have been 650.000 euros during the last three years.

Year	VAHTI administration	VAHTI development	VAHTI external service
2001	110.000	85.000	45.000
2002	100.000	70.000	52.000
2003	110.000	42.000	35.000
Total	320.000	197.000	132.000

Speaking of the human resources, the environmental administration has had 1-2 application developers and one project manager. The development and operation costs have been paid by the state environmental administration.

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 made by the special service operators.

The data transfer is made mainly on the application-application level, but some Internet forms have also been developed for smaller organisations or low volume cases.[36]
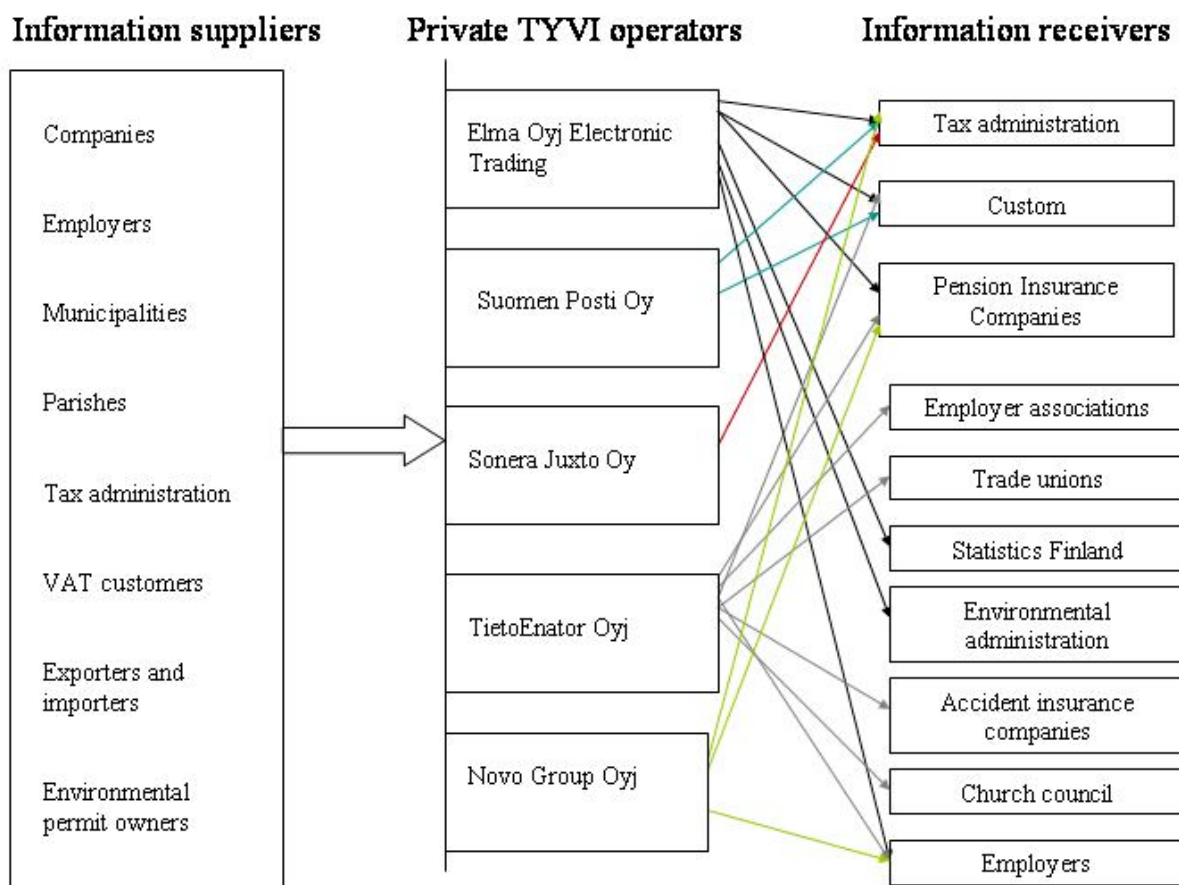
TYVI concept and the services of the TYVI operators

There are at the moment five private companies working in the role of the TYVI-operator. As seen in the picture, no operator is taking care of everything. For example, if a company wants to make everything electronically, it must be a customer of at least two TYVI operators. Also the software used in the organisation can have some influence on the most appropriate TYVI operator. Anyway, this kind of engagements is decreasing all the time.

The most operational applications in the administration have more or less automated interfaces with the TYVI-service.

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[36] Another way of reporting should have started 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.

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 TYVI operators. Of course quite often also the information suppliers have internal costs, when they produce information in the format needed in the TYVI service. TYVI operators provide some chargeable added value services related to the data transfer.

TYVI is a flexible solution combining different technologies and different organisations. Almost all possible common standards are used:
- The messages between the applications, and especially between the big users, are mainly based on EDIFACT-standard, but the use of XML is increasing. The data interchange between the TYVI-operator and VAHTI information system is done with XML.
- The data transfer is done over the common network connections of the organisations, which today are mostly TCP/IP.
- In some connections FTP and email are also possible transfer tools.
- In Internet the connections are mainly encrypted (SSL and SSH).
- TYVI-operators provide connections secured with PKI. Also the authentication with the telebanking IDs - quite popular in Finland - and passwords certified by the banks can be used in several TYVI services.
- The first services with the possibility to pay the public fee, associated with the data transferred, using integrated telebanking solution was implemented in the year 2003. This is, like most other services in TYVI concept, a general feature and not planned for a certain electronic interaction only.
- The increasing use of web-forms provide better possibilities for electronic data transfer in small organisations.

TYVI-operators have also developed web-applications for their customers, e.g. to check the validity of the data before sending it to the administration.

The VAHTI information system is based on SQL-Server database. The development of the user application was made with VisualBasic.

The Finnish environment administration uses TYVI-service also to collect physical planning/land use information from the municipalities. TYVI has model agreements used between the customer and TYVI operators. These agreements include chapters on the confidentiality of the information and on information security.

Privacy has been one of the discussion issues. Based on the Finnish legislation, all the documents (on paper) as well as the detailed information in the permits and announcements are public. Anyway, a company can ask to keep certain information non-public, if the application or other document is e.g. including very detailed information on the production process. The decision itself should be formulated so that those business secrets are not included.

In the case of the electronic information system, the question of openness is more complicated compared with the paper forms. The customers are not willing to make it too easy for competitors to collect information on their pollution announcements. The customer already partly has access to his own information, and that right will be extended. Also the municipalities will have access to the more detailed information in the beginning of the year 2004. For other users, including the citizens, there will be a new service database providing more general and summative information on the environmental pollution in a certain geographical area. This information will be formulated by the environment administration.

5. Implementation

The VAHTI information system of the environment administration has had three different development phases:
- The first VAHTI was introduced in the year 1996. It was used only in the internal network of the environment administration without any external services. Transfer of information between the organisations was made with the paper forms, and the forms were updated manually in the regional environment centres. During the implementation phase of the system, the new legislation was already under preparation and the need to make changes in the system became clear quite soon.
- The next updated version, based on the new legislation but on the first version, was taken in use with a quite short estimated life cycle (until the end of the year 2002). In the year 2000 the system was updated with the external electronic interface. This allowed customers to give the information with the web-forms.
- The third step was made by taking in use the TYVI-service in the beginning of the year 2003 (VAHTI2003).

VAHTI is an internal information system of the environment administration. The only external interface is via TYVI-system.

2	**Environmental Permit Authority (EPA)**	**Regional Environment Centre (REC)**	**1.1**	**1.3**
3 Municipality				

Customer applies for environment permit

I.

municipality related permits ("easy" issues)

EPA-related permits (complex issues)

Issue of permit

3.1.1 REC

Checks form, opens file, generates and signs application	Checks form, opens file, generates and signs application	Inspector checks form, opens file, generates and signs application, enters permits into

(1) (1) (1)

II.

Customer receives the permit with the obligation of monthly or annual pollution reports

(1) (1) (1)

Permit(s) with the pollution threshold levels

(3)

Authentication

(3)

(3)

(3)

(reminde

Officer wants to get information (about a customer or emission data)

(3)

VAHTI Environment Information

(3)

(3)

(3)

Data registration

(3)

Authentication

Customer receives an email notification if report is rejected

(2)

Validity of data

(3)

Inspector receives email notification if report is

(3)

Authentication

(3)

TYVI Data Storage

Customer wants to use own information

III.

Report process finalised

Report (environmental pollution) (XML)

Information on customers and permits

(3)

Authentication

(2/3)

Information delivery according to international regulations

(3)

Environment Information System (YTJ)

(2/3)

Citizens, NGO's etc. want to access environmental information

Environmental permits

The application process of the environmental permission is not digitised. The customer fills in the forms (also electronic forms are available) with the needed annexes and sends the application to the environmental administration (local municipality, regional environment centre or environmental permit authority, depending on the case). The administration takes a decision and sends it to the customer.

In the back office, regional environment centres or environmental permit authorities include the information on a new customer and decision in the production database. The municipalities must send the information still manually to the regional environment centres. The new local government interface will be available in the beginning of the year 2004.

Information on the decisions and customers is transferred with FTP from the production database to the database of the external TYVI operator to provide the basic platform for the pollution announcements.

Monitoring announcements

A company or other organisation obligated to make the monitoring announcements as a condition of an environmental permission can make it themselves or mandate e.g. a consultant to make it on behalf of the customer. Quite often there are consultant companies that are taking care of the pollution measurements.

The first step is to login to the TYVI-service. The authentication can be done with normal IDs and passwords but also with PKI. One of the accepted public authentication methods in Finland is also the use of telebanking IDs and certification of the banks. All methods are possible, and the appropriate one depends on the services of TYVI-operator as well as on the needs of the customer.

So far, only one[37] of the five private TYVI-operators has an agreement with the environmental administration. All Finnish official authentication methodologies (PKI and telebanking) as well as user ID with password can be used in the case of pollution announcements.

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 announcement 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 announcement to the inspector in charge of this customer. If the announcement 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.

After receiving the email, the inspector logs in to the TYVI-service using the same alternative technologies as the customer. The inspector checks the announcement. After approval the information will be transferred to the environment information system.

It is not mandatory to make the announcement on the web. The alternative way is to send the paper form to the environment authority. In this case, the announcement will be saved by the administration. At the moment 1.300 customers are using the electronic announcement, which is 33 % of all the customers who must make the announcements. The use of the electronic alternative is increasing fast and is almost complete among the big customers.

If the needed announcement has not been made in time, the reminders and instruction are sent directly to the customer from VAHTI without using the TYVI-services.

The basic and most common TYVI-service is to transfer the information directly from the customer's application to the system of the administration (as well as to the opposite direction). The first project with this technology concerning pollution announcements of one big company in the forest industry is going to start soon.

So far, the main digitalised back office chain is inside the state environmental administration including the organisations Ministry of Environment (1), Finnish Environment Institute (1), Regional Environment Centres (13) and Environmental Permit Authorities (3).

The customers do not have to pay for the announcement. It is even possible to link a TYVI report with telebanking services, in this case there is no need for that.

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[37] Elma Oyj Electronic Trading (http://tyvi.elma.net)

VAHTI is also editing information for national statistics as well as for other systems like the European Pollutant Emission Register.

Next steps in the back office process

As a next step in the development of the service, the customers will have new and better possibilities to use their own information in VAHTI. The companies can e.g. receive reports based on that information. They will also have the possibility to look at the information of other customers on a certain summative level.

In the beginning of the year 2004, the interface and access for local authorities (municipalities) will be available. They are going to have the same user rights as the environment administration of the state government and the login with the TYVI alternatives. This will be a very important step, because more than 80 % of the municipalities approve of the environmental permits, and the new interface will help the local authorities to have a comprehensive picture on the environmental pollution. Of course also the state government will have the same benefits from bottom-up.

The environment administration has already started a public procurement process to develop an open access interface for citizens. The basic idea is to build a new service level on the databases of VAHTI. Also in this case it will not be possible to see detailed information of a certain environment pollution point. But also in general citizens are interested in this kind of information and especially concerning the own community.

The Finnish environment administration uses VAHTI not only for monitoring purposes but also for the environmental statistics and own research activities. There have been several discussions on the wider re-use of the information and to connect more back offices:
- The Finnish Forest Industries Federation is collecting statistical information from its members for its interest work purposes. It has already been agreed that important parts of that work could be replaced by using VAHTI with TYVI service. Before the final decisions the association must agree with its members and with TYVI operators. This procedure would be outside the normal use of VAHTI.
- Statistics Finland. There is the problem that especially concepts like "place of business" and "point of business" have a different classification in environmental statistics in general and in the environmental permits. The harmonisation must be done on the European/international level.
- The Energy Market Authority needs information on the implementation of Kyoto Protocol.
- Custom authorities liked to use VAHTI information on the environment permits decisions to increase the efficiency of the control work concerning the payments of the waste taxes.
- Ministry of Agriculture and Forestry would like e.g. a better management to control the implementation of permission obligations for animal stables.

None of these discussions has yet reached the implementation phase but it is clear that within one year there will be remarkable changes in the re-use of VAHTI information.

The Ministry of Environment has a project to develop a management system of environmental information (HERTTA). Main parts are ready and in the final phase it will combine all the important information related to environment with a map interface.

Management

TYVI has a steering group, which consists of
- Authorities and other organisations receiving information through TYVI
- TYVI operators
- Confederation of Finnish Industry and Employers
- Federation of Finnish Enterprises
- Central Organisation of Finnish Trade Unions SAK

Environment-related information is widely demanded, and the number of organisations participating in the production of this information is big. Also the demand of a fluent back office process requires that all the important organisations are involved in and committed to the system. The organisations participating in the steering committee of VAHTI 2003 are:
- Regional environment centres (as project leader and main user group)
- Ministry of Environment
- The Confederation of Finnish Industry and Employers representing the industry as permit customer and user

- Association of Finnish Local and Regional Authorities representing the whole Finnish local and regional government mainly in the role of a permit authority but also as a permit customer and user
- Environmental Permit Authority.

In the environment administration, the development has been managed by the West-Finland environment centre.

The project has created special commitment strategies and plans for different user groups (like industry, local government).

The number of users in VAHTI in the environment administration is over 600.

Innovativeness

There is no doubt that the TYVI service is a forerunner and innovative also on the European level. The main obstacle to do the same in other countries might lie in the structural differences, under no circumstances in the differences in ICT. The main innovative feature in VAHTI is the use of TYVI.

6. Results

Results in relation to users

The direct costs of the data transfer have decreased. This is true especially in the case of big customers, which will in the future have more benefits when using direct from application to application data transfer. In the old system, the information supplier paid the main part of the transfer costs regardless of the way it was made.

Also the working time for the pollution announcements has decreased. 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 with a much more complicated future on the field of environmental pollution monitoring.

For the customers VAHTI-TYVI has also increased the transparency of the environmental administration instead of the existing tree-level structure.

Results in relation to back office and agencies

Also the costs in the administration were reduced. There is much less need to save the information, which also means big savings on human resources. So far, there are no close inquiries on the savings.

More automatic data transfer means less mistakes in the information itself and less critical manual saving phases.

The administration can in principle now deal with all customers electronically, which solved one of the main problems in the old environmental monitoring system where the number of customers was very limited.

The environmental administration has a better capacity to adapt to the coming changes in the legislation. Not all of the changes are easy to forecast. This result was valued very high among the staff of the environmental administration. Clear benefits will be visible after several years.

The use of the existing TYVI-concept and service made it possible to make a big change without great investments. This has allowed the administration staff to concentrate on organisational and content questions instead of the data transfer technology and applications of the customers.

The new system has also decreased the amount of manual work between different parts of the back office. The next important development point 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 working with the 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.

In general, the new system also means a better re-use of the information in the administration. One of the main obstacles is still the difference of the classifications used in the environmental monitoring and environmental statistics. A further important feature is the possibility to develop risk management. Better quality of data and faster data transfer (together with wider pollution monitoring in the future) help to recognise the risk targets and areas and give the possibility to concentrate on the critical points in the environmental pollutions. This will also help to exploit the human resources in the administration in a better way and to plan preparatory activities for certain areas and problems.

Thinking of the whole society, faster availability and better quality of the environmental pollution information is also important for a sustainable development.

7. Learning points and conclusions

The main technological experience is that in a world of increasingly complex environment legislation the time of stable information systems is over. The system must be flexible and scalable not only with the changes in the legislation but also with the changes in technology and participating organisations. An electronic data transfer solution deeply integrated with the basic databases is in the most multi-organisation cases no reasonable decision anymore. One of the best and strongest features in TYVI service is that it works with an unlimited number of technical and organisational combinations.

TYVI has reached the main objectives by providing a low-cost and simple solution easy to implement also in new connections. The main critic concerned the role and services of the operators and a more or less loose coordination in the beginning.

It is self-evident that every TYVI operator wants to have an as profitable business as possible. This limits in a certain sense their will to cooperate and provide more integrated services. A TYVI operator can never be chosen only on the basis of the price of the service. The main limitations are:
- There is no TYVI operator who has the whole palette of available TYVI services.
- The software and technology used by the customer also limits in some cases the number of alternatives.

On the other hand also the TYVI operators found in the follow-up study of TYVI that the role of the coordinator was too invisible in the late 1990's, which also made the cooperation more difficult. After the study the role of the Ministry of Finance was clarified.

If the public administration wants to be successful in having 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 in the pollution announcements clearly brings benefits to 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 process or feedback from the administration and later deadline of the application or announcement. Inside the Ministry of Environment there have been some discussions on the possibility to have a fee for pollution announcement and then have two different categories; cheaper or totally free solution for electronic data transfer.

But 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 together thousands of different applications and organisations. Another important aspect is that the IT-companies, working directly as TYVI operator or developing interfaces with TYVI, have a better touch than the public administration with the daily problems of their customers.

Public funding has been used in TYVI mainly only to develop and start the pilot phase and later for marketing. As a result of the quite good leverage effect it is financially almost independent.

Concrete plans to develop back office integration around VAHTI sound very promising and in one year the situation will be totally different. It might be that it is a much easier task to develop the cooperation of the organisations showing concrete and existing applications than to try it from the beginning with various interested parties. On the other hand, it also may not happen too late in the process; it looks as if, in general, the Finnish environment administration has managed to choose the right cooperation timing in order to reach sufficient commitment among different parts of the back office and with the customers.

The environmental pollution monitoring system VAHTI itself is transferable, because it is based on common technology, international classifications and European legislation. Most countries probably 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 more or less similar with TYVI. It is still a long way to go until the standardisation can provide a unique solution for all levels of the electronic data transfer.

8. References and links

TYVI-service (in Finnish and Swedish) http://www.tyvi.org/

e-Government in Finland OECD 2003 http://www.vm.fi/tiedostot/pdf/fi/43111.pdf
TYVI case pp. 131-135

Environmental administration http://www.vyh.fi/eng/welcome.html

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France

Case 13
Citizen income tax:
French income tax declaration

1. Executive summary

The service covered by the case on hand concerns the French income tax (1). Since 2002, citizens, who have filed their income tax returns in the past, can file and pay them online on the websites created to this end:
http://www.impot.gouv.fr and http://www.telepaiement.cp.finances.gouv.fr/.

The **declaration** was enabled due to an electronic signature system. In order to file his/her income tax return online, the user has to be in possession of an electronic certificate, which is delivered online and free of charge by the general direction of taxes (DGI) (duration of validity: 3 years).

The user receives a proof of reception immediately after the submission of his/her declaration.
Payment of taxes can also be made online and the mode of payment can be chosen electronically (once a month or all at once).

On the impots.gouv.fr- site, the users find access to different services. They find four types of taxes: income tax, property tax (taxe foncière), inhabited house duty (taxe d'habitation) and business tax (taxe professionnelle).

The site thus bundles various fiscal declarations, reusing the information submitted for the income tax declaration for other declarations.

Users who have decided to file their income tax returns online, benefit of an additional period for declaration compared to the traditional declaration.

In the past, income tax returns had to be submitted by post. Globally spoken, the digitalisation project for public electronic services was decided upon at the end of 2000. Since then, the public administration constantly improved its electronic services to users. Since February 2003, the Ministry disposes of a new and more ergonomic version of its Internet portal. In addition to the online declaration and payment, the portal enables citizen to electronically order fiscal documents.

With the income tax declaration 2002, the electronic signature became a reality.

The basic principle of income tax declarations did however not change with this digitalisation. 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.

Neither did the back office situation change drastically. Civil servants were trained with respect to the new information systems. A lot of data capture work is simplified today due to the automatic capturing by the online service. However, the same back offices remain involved and no significant staff turnover was noticed.

This case represents model D (as defined in the project methodology), since it is multi-service/ multi-stage. A service combined with the income tax declaration is the inhabited house duty.

The degree of digitisation is 3, since we find a complete automation of processes.

The complexity score (stages * back-offices) is at least 12 (4*3), and possibly more (if there are errors, which results in a creation of additional stages). A different directorate general is responsible for the declaration and the payment, two processes completely unrelated to each other. The DGI is in charge of declaration issues, while the DGCP is in charge of payment. Involved back-offices are shown in the workflow diagram. Thus each process involves a minimum of 3 back-offices.

2. Background

Evolution of eGovernment in France
One has to understand that the economic weight of the public sector is extremely important for the French economy. It constitutes one million employments and 6% of the GNP. Recent technological innovations, the internationalisation of the economy and the increasing demand for individualised service offers by professionals and private users forced network operators to evolve to a more efficient management.

At the end of 2001, the French administration counted over 675 000 micro-computers and 4 500 public Internet sites (local communities, universities, central administrations, ministries, ...). Today, almost the entire span of government services are available online. In December 2002, France counted 194 online services which can be categorised as follows :
- 162 for individuals, 32 for enterprises,
- 145 for local authorities and 49 at a national level,

Currently, the government is engaged in two main areas: "Internet for all" with the objective to connect at least 10 million French households to high-speed Internet before 2007 (~ 40% of all French households); and "sharing and diffusion among users", which puts the emphasis on awareness raising of the French population for Internet issues and the use of new technologies.

A governmental commitment
Despite the change of government in June 2002, the issue of electronic administration remains a priority of the French Government. The previous government, with M. Jospin as Prime Minister, had implemented government action programmes with important investments. The change in government merely resulted in a change of the way of implementation. In order to realize its eGovernment goals, the current Government has set a number of clear priorities:
- To offer online services to its citizens,
- To improve those services in the long run.

The creation of the MTIC[38] in August 1998, which was followed by the creation of ATICA[39] in August 2001, has concretised the commitment of the Government in this field. Finally, in March 2003, the ADAE[40] was created. This agency is the focus point of the digitalisation of public services today. It is an interdepartmental service attached to the Prime Minister, managed by the Minister in charge of the State Reform. It supports the development of the electronic administration and defines its rules.

The commitment to the enforcement of an electronic administration is linked to the Government reform issue, which aims at bringing citizens and administration closer together. The political crisis following 21st April 2002[41] has resulted in an increased willingness to give more transparency to the administrations and institutions.

In the context of an improved service for users, four main arguments are to convince the administration of the necessity of setting up digitalisation processes:
- To improve public services
- To maximise realised gains
- To avoid mistakes
- To include France in an international evolution.

The major citizen portal, provided by an inter-ministerial committee is the www.service-public.fr. This portal provides information and gives access to several other government sites. The portal can be read in several languages. By 2007, this portal will be customized by the setting up of www.mon.service-public.fr. This new version will provide an individualised account to each user.

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[38] Mission interministérielle pour les technologies de l'information et de la communication dans l'administration (inter-ministries mission for information technologies and communication in Administration)
[39] Agence pour les technologies de l'information et de la communication dans l'administration (Agency for information technologies and communication in Administration)
[40] Agence pour le Développement de l'Administration Electronique (Agency for the Development of an electronic administration)
[41] On 21st April 2002, the first round of the Presidential elections took place: the extreme right party achieved a very high score, revealing a crisis of the administration and of the perception of institutions by the French citizens.

The French Ministry of Economics, Finances and Industry (MINEFI) is one of the first Ministries to provide online services to the citizens, the French Ministry of Defence being the most advanced concerning online public procurement. The MINEFI being one of the biggest Ministries,recently set out four goals to be achieved by the "Bercy en mouvement"-reform (part of the State Reform):
- To better execute its services
- To put the user at the centre of the Administration
- To promote a results-driven culture
- To recognise the professional competencies of its civil servants.

3. Specific objectives

Before the on-line income tax service, tax return forms are sent pro-actively to about 30 million income tax-payers per post. Those have a dead-line for returning them per post to their local tax office, in general five weeks. Each local tax office is responsible for collecting data and for dispatching it to the central MINEFI system. This process has three major disadvantages:
- A high number of civil servants is needed to accomplish the work.
- Mistakes cannot be avoided in the data capture and entry phase.
- The postal dispatch of forms is cost-intensive and not environmentally friendly.

A direct web data entry by the user eradicates all those inconveniences. Therefore, the MINEFI has developed two main applications with digital signatures in the areas of tax-filing. The first one being the "Télé-TVA", the online declaration and paying of VAT[42]. The second one is "Télé-IR", which is the online declaration of personal revenue. This service was opened in March 2002 for the 2001 National Revenue Campaign. The registration and the delivery of an electronic certificate are done online and are free of charge. More than 150,000 certificates were delivered since the service was opened, and more than 120,000 individual tax-payers filed their income tax return online during the 2001 National Revenue Campaign. In 2003, the objective of 500,000 online income tax declarations was largely achieved (601,025). 10.5 million connexions to the fiscal portal (http://www.impots.gouv.fr) were registered during the five week 2002 National Revenue Campaign.

However, it has to be underlined that even though 16% of the French use Internet in order to obtain information on public procedures, only 6% use online forms and less than 1% file their income tax return online.

The service targets the entire population of income tax-payers, who already filed income tax in the past. Even income generated abroad can be filed online using a specific form.

In spite of the changed process brought by the digitalisation, the MINEFI chose to basically use the same back office organisation as in the time of paper flow. In fact, the users could choose between the two options (paper and online) to file their income tax returns. The increasing success of online submissions confirms the rising interest of citizens in electronic fiscal services (which are part of the Ministry's action plan for modernisation).

4. Resources

In a global context, the digitalisation process for public services was desired by the French Government.

With respect to the income tax declaration, the DGI (direction générale des impôts) initiated the process. After detailed cost-benefit analyses and feasability studies, a specification phase has been implemented in the MINEFI. Three people have mainly handled work management during this phase. Subsequent phases have included up to eight people. Operational services were put in place (mainly inside the programmes specifically created in order to enhance tele-tax returns, such as Copernic). Besides these newly created functions, no main hirings or re-organisations of management and organisational chart were put in place. Mainly IT personnel and agents in direct contact with users benefited from training measures, which were carried out in order to ensure a full understanding of the online procedures. User groups were merely involved in the testing phase.

Concerning back-office implication, we can state that basically the same back-offices are involved as before. Overall management has not changed with the implemenation of tele-declarations.

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[42] By the end of 2002, more than 45,000 VAT-payers were using Télé-TVA.

With respect to ICT resources, mainly new software and databases had to be put in place in order to handle online declarations. The BO database is filled in directly from the online tax returns completed by the user. This database recognises the tax return and processes it automatically. However, human intervention is still sometimes necessary. Institutions such as the ADAE supervise all online government services and hence ensure the technical interoperability within and between government agencies.

The major innovative feature of the tele-return of income tax in France is the electronic certificate/ signature and payment. The digital signature is more than a signature, it is an authentication through the declaration of the previous year. The certificate is equivalent to an electronic identity card and an associated signature.

In order to guarantee full security of personal data, those are only accessible by local civil servants and users. Other civil servants have to receive a special authorisation to access user data.

The second version of the site (online beginning 2005) will further improve the service provision to users. For instance, it will make online tax returns accessible even for citizens who file their tax return for the first time. Furthermore, it will automatically take into account life events such as marriage.

With regards to financial resources, the sums spent for the case seem to be quite important, but no details were given, due to confidentiality.

With respect to the electronic payment of income tax, a call for tender has been launched concerning the setting up of the technical infrastructure and the development of the required software. The infrastructure includes two mirror servers, firewalls and uninterruptible power supply. The MINEFI used new tools, such as UNIX and FORTRAN (instead of cobolt).

Simoultaneously, an internal team was trained for a period of 18 months, who then re-wrote the software. One engineer was recruited. No personnel was laid off. The project team at SATELIT[43], programme responsible for the realisation of online payment, was composed of 4 to 5 people. 20 people were in charge of the development, integration and exploitation. Financial resources for the initial preparation and implementation amounted to about 6 Mio EUR. The user can use this service at no cost, if not the connexion to the Internet.

The digital signature is provided rapidly and at no cost, and no special software is required.

5. Implementation

No basic change in service

In the previous chapters, we outlined the political background accompanying the digitalisation of public services. We also enumerated the resources used by the MINEFI in order to achieve the objectives set out by the Government and the respective administrations. Generally speaking, we can state that the digitalisation was an unavoidable process to be undertaken in order to satisfy the user demand and to keep up with international standards.

The main objective, namely to provide the possibility of online income tax declarations and payment to users, was fully achieved.

Processes/ Work flow

Tele-declaration
The work flow and exchange of documents between users, ministry back-offices is illustrated in the diagram below. To summarise, the user submits his revenue tax data to the DGI via the website, which then treats and stocks the submitted data. The user receives a personalised number electronically, with which he/she can consult the status of his tax return 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 return (by traditional post) an "avis d'imposition" to the user. The required documents to be submitted online do not include all of the documents which are required when the user files his tax return traditionally.

Electronic payment

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[43] SATELIT is explained more in depth at chapter 5 "Implementation - Process/Work flow - Electronic payment".

The work flow for electronic payment is completely disconnected from the one for tele-declarations[44]. They are of course interrelated, but each one is managed by a different DG: the declaration depends on the DGI (Direction Générale des impôts) and the payment on the DGCP (Direction Générale de la Comptabilité publique). The implementation of the electronic payment was realised by a programme inside the Ministry called SATELIT. SATELIT is an Internet interface, via which the user can undertake the following three operations. He can:

- adhere to monthly or one shot payment
- modify the characteristics of his contract (e.g. amount of monthly payment) or his bank details
- immediately pay his income tax online.

The diagram below illustrates the flow of information and documentation between the concerned parties, both with regard to traditional and electronic payment. To summarise, the user connects himself to the Internet or Minitel (a tool proceeding Internet, widely used in France before the spreading of the www) interface called SATELIT. He determines his mode of payment, which is transferred by SATELIT to the REC or, in case of electronic payment, directly to the PSAR (both institution have existed well before digitalisation). SATELIT knows the amount of taxes to be paid, which was calculated by the MEDOC, with whom SATELIT is in close connection. In case of electronic payment, SATELIT retains the sum to be paid until day J. In case of traditional payment, the REC transmits the information to PSAR, which is in connexion with the National Bank. In both cases, the National Bank debits the amount from the user's bank account mentioned on the SATELIT interface. The debiting however only takes place if the user has given an authorisation to his bank.

The entire process is free of charge for the user. The whole service is treated internally by the MINEFI, nothing is sub-contracted.

In terms of performance, the system is capable of treating 5,000 connexions at the same time with an answer time of 1 second. For the year 2004, 15,000 to 20,000 possible simultaneous connexions are planned. By that time, the number of electronic payments is expected to have increased drastically. The target group of users expected to switch from traditional to electronic payment are those who currently pay via cheque, as opposed to those who pay monthly or via an automatic debiting.

The security of the application is ensured and certified by the certification authority of the Ministry. Unfortunately, this certification is not recognized by the Navigator. Therefore, the user systematically receives a pop-up alerting him of the imagined risk. SSL 128 bits as well as firewalls are used as language of encryption.

Two entries are required from the user in order to identify himself: his fiscal number and the number of his/her "avis d'imposition". Those two numbers are usually only known by the tax payer himself and his account can therefore not be misused by any third person.

In spite of the high degree of digitalisation, human intervention is still necessary to supervise and correct possible errors.

For the sake of some statistical precision, 700,000 operations of registration and modification were undertaken by users in the year 2002.

Involvement of and acceptance by users and back-offices:

Tele-declaration
Users were involved in two phases. Working groups with users organisations such as SOFRES & IPSOS were established in order to discuss matters such as ergonomics and the sort of prototype to be put in place. Users also helped finalising the product. On the whole, this first large-scale public use of digital certificates was well accepted by the population due to the screen and navigation simplification and security guarantee.
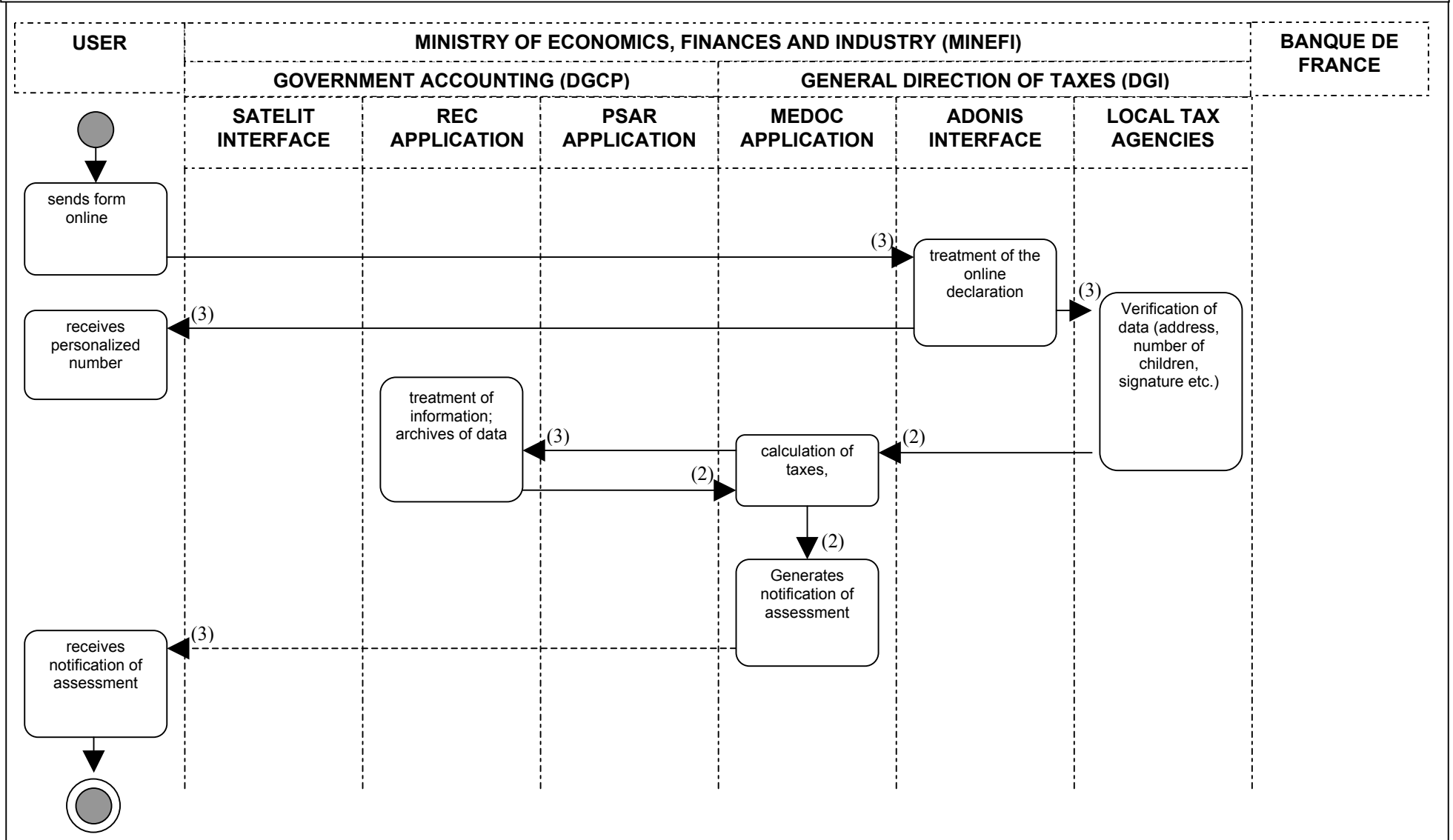On the side of back-office members, that is civil servants involved in the treatment of tele-tax returns, acceptance of the new processes was quite positive, mainly due to the reduced work concerning data capture. The most repetitive work was eradicated and replaced by more challenging tasks related to new technologies and user contacts.

Electronic payment
In the case of online payment, no tests were undertaken including users, since the use was very straightforward and easy. With over 1 million online transactions, only about 300 reclamations were registered so far. In the beginning, some double-payments were noticed, but this problem is now solved and does not reappear.

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[44] There is no human interface, only a transmission of the tax amount to be paid by the user from MEDOC to REC.

France: Workflow of the declaration of income taxes:

USER	MINISTRY OF ECONOMICS, FINANCES AND INDUSTRY (MINEFI)						BANQUE DE FRANCE
	GOVERNMENT ACCOUNTING (DGCP)			GENERAL DIRECTION OF TAXES (DGI)			
	SATELIT INTERFACE	REC APPLICATION	PSAR APPLICATION	MEDOC APPLICATION	ADONIS INTERFACE	LOCAL TAX AGENCIES	

France: Workflow of the payment of income taxes:

USER	MINISTRY OF ECONOMICS, FINANCES AND INDUSTRY (MINEFI)						BANQUE DE FRANCE
	GOVERNMENT ACCOUNTING (DGCP)			GENERAL DIRECTION OF TAXES (DGI)			
	SATELIT INTERFACE	REC APPLICATION	PSAR APPLICATION	MEDOC APPLICATION	ADONIS INTERFACE	LOCAL TAX AGENCIES	

handles payment online

payback / demand of taxes. Mode of payment by user (3)

treatment of information; archives of data (3)

calculation of taxes, (3)

treatment of online payment; archives of data (3)

Generates notification of assessment (3)

receives notification of assessment and payback resp. pays additional income tax via electronic banking

Payment (payback / pays additional income tax) (3)

real payment (2)

- DGI: Direction Générale des impôts (Tax Authority at a National level) Perception : tax office at a local level depending on Direction générale de la Comptabilité publique (DGCP) (government accounting).
- Direction Générale des impôts and Direction générale de la Comptabilité are both part of the MINEFI. The role of the Direction Générale des impôts is to collect taxes for the Trésor public (for payments of the government to municipalities).

The percentage of users paying their taxes online is expected to increase by about 20% per year. Today, users who wish to pay online have to register 10 days before the deadline for payments. This delay should be reduced to 3-4 minutes by the year 2004, since it represents a burden to the use of the online payment service.

Web-sites created

Tele-declaration
For the sake of the tele-declaration, a website was created by the MINEFI, bundling several services, all related to various tax returns. This website is easily understandable and very user-friendly.

Electronic payment
As mentioned before, the interface for electronic payment is different from the one for declarations. As explained in section 4, it was realised by SATELIT with the technical support of the successful tenderer, and was re-written internally.

Management Activities

As previously mentioned, the basic management strategy and structure did not change fundamentally due to the digitalisation process, neither concerning tele-tax return nor tele-payment. However, some new functions were created, mainly for the work management of the inception phase and the co-ordination of steps (Copernic, SATELIT, etc.). SATELIT was actually the first project of the COPERNIC programme. More globally, the newly created agencies such as the ADAE were only necessary in the light of a continuous increase of a public willingness to raise the number of electronic public services.

In this context, the private sector played an important role as a quite advanced and good example to be followed by the public sector. The Government was mainly inspired by private sector developments. Furthermore, some private sector organisations were involved in certain preparation and implementation phases of the project, for instance, in the development of software and information systems for the tele-payment.

Politically, the priorities were quite clear, independent of which Government ruled the country. There was a strong commitment to enhance electronic public services and all major policies and directives attempted to foster this overall objective.

All in all, there was a major campaign making the new online tax return public and raising the awareness of the large population. Apart from that, no real promotion was undertaken to foster the use of tele-tax return. The only direct incentive given by the ministry was the additional delay in submitting declarations.
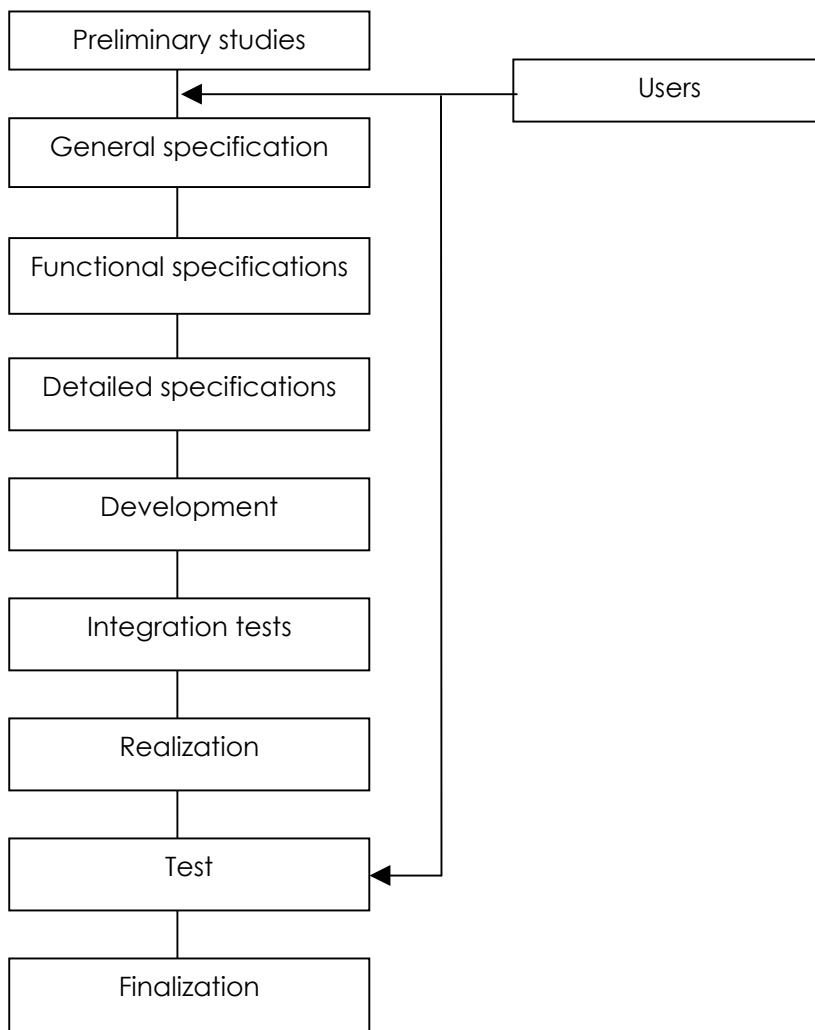
With respect to electronic payment, no internal or external promotion was undertaken when the product was first launched in 2001. This was mainly due to the socially and politically delicate context resulting from the "project of reform mission 2003". At the time, neither the citizens nor the civil servants were aware of the possibility of electronic payment, since SATELIT preferred to make its appearance rather discretely. Today, as the political situation is more relaxed, the MINEFI has planned to launch some major publicity campaign. Overall, the electronic payment is very well perceived amongst civil servants and users.

Implementation processes

Tele-declaration
The first online tax declaration took place in 2002 and concerned the income tax of the year 2001. The decision was taken in mid 2000, aiming at opening up all information for the user and at providing better services to the user. The development of all necessary information systems was realised with contractors via open tender. Before implementing the project, costs and benefits were carefully estimated.

The following steps preceded the final implementation of tele income tax return in France:

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┌─────────────────────────┐
│   Preliminary studies   │
└─────────────────────────┘              ┌─────────────────────────┐
            │◄─────────────────────────── │          Users          │
┌─────────────────────────┐              └─────────────────────────┘
│  General specification  │
└─────────────────────────┘
            │
┌─────────────────────────┐
│ Functional specifications│
└─────────────────────────┘
            │
┌─────────────────────────┐
│  Detailed specifications │
└─────────────────────────┘
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┌─────────────────────────┐
│       Development        │
└─────────────────────────┘
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┌─────────────────────────┐
│    Integration tests    │
└─────────────────────────┘
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┌─────────────────────────┐
│       Realization       │
└─────────────────────────┘
            │
┌─────────────────────────┐
│          Test           │◄──────────────────┘
└─────────────────────────┘
            │
┌─────────────────────────┐
│       Finalization      │
└─────────────────────────┘
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As can be seen from the diagram, users were involved in two phases: 1) working groups with users organisations such as SOFRES & IPSOS were established in order to discuss matters such as ergonomics and the sort of prototype to be put in place; 2) users also helped finalising the product.

In spite of the significant change in the process of tax return and its wide consequences for users and civil servants, the service itself did not change. The principle of income tax declaration remains the same, even if tax-payers now have the opportunity to file their tax return online without any paper support and much less evidence to provide to the tax office.

Electronic payment
Concerning electronic payment, the implementation has started in late 1999/ beginning 2000. As explained before, the political situation was extremely difficult in 2001 when the product was to be launched. This is the reason why no advertising was made, neither internally nor externally. Today, a communication plan exists, aiming at informing mainly the agents at the concerned positions at the agencies and the users. External communication support were mainly posters and booklets.

Problems faced

Electronic signature/ certificate
One of the major problems the Ministry faced was the lack of understanding by users of the functioning of the electronic certificate. Users had to learn how to handle the concept of electronic signature, which is in fact an electronic certificate. However, sufficient explication and communication eradicated scepticism.

Digital signature in fact includes three digitised elements:
• tax number

- online declaration number
- income revenue.

An evolution of the electronic certificate is planned. As for the VAT web site, an external certificate is envisaged that could be equally used for other administrative purposes. The electronic certificate was inspired by "Télé-TVA", "Télé-FC" and from an experience in Spain.

An additional difficulty concerning the electronic signature is created by the French law, which requires two signatures on a tax return form of two related people (husband and wife, for example). Up to now, one certificate comprised these two signatures. In future, two certificates might be necessary.

Information flow
Another major difficulty is linked to the character of the flow of information. The nature of the service and the behaviour of French tax-payers results in a concentration of most of the declarations during the last few days, even though the overall time span for sending the tax return form is about five weeks. Consequently, the net information flow has to be overestimated in order to be able to handle the concentration at the end of the declaration period.

Confidentiality
French citizens, as well a other Europeans, are inclined to be very sceptic about the securtiy of online transactions, particularly online payment and the submission of personal data. In order to satisfy this high demand of security, only local civil servants and users have acces to the personal data.

Technical obstacles
SATELIT, responsible for electronic payment, faced some technical problems concerning the Internet and Intranet applications. Another major issue of discussion was and still is the use of Minitel. In fact, the Minitel is less and less known by developers. Therefore, the MINEFI has less and less competencies to manage Minitel development. The question is therefore, whether this application should be maintained or abandoned. It was decided that in future a telephone service will be put in place in order to replace the Minitel. Thus, in about 3 or 4 years, there will be no more Minitel access to income tax payments.

6. Results

Benefits for the user

Tele-declaration
The possibility to file your income tax return from your PC at home or at work is extremely time saving. The fact, that forms no longer have to be sent by post also saves money and paper.

One of the additional advantages to the user is that with the new online declaration he is no longer obliged to provide the appendix sheet to proof his status and activities (e.g.: charity donations), which was obligatory with the previous paper tax returns. However, the user has to keep all proof in case of control.

In order to facilitate the tax return for the user, the Ministry installed a help desk for questions for the first online tax return in 2002.

Furthermore, the online tax-payer benefits from a prolonged delay of reply.

The future will bring further advantages 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.

Electronic payment
With respect to electronic payment, the major advantages for users are the time saving aspect (no filling out and sending of cheques).

Benefit for the authorities:

Tele-declaration
The major benefit for the administration and its staff is the decrease in data to capture. This saves a lot of time and money. Furthermore, the work is paperless, which is on the one hand more cost-effective but also more environmentally friendly. With regards to quality at work, the civil servants are nowadays liberated from a lot of repetitive paper work,

which is more or less replaced by a 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. were completely replaced.

Electronic payment:
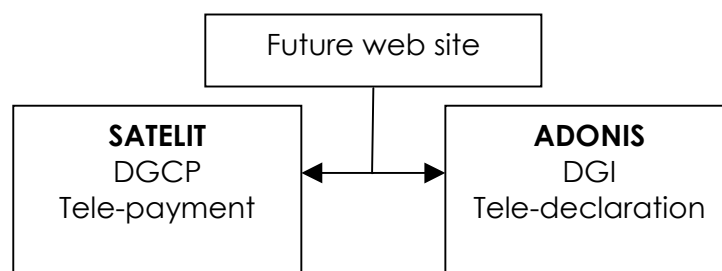Main reasons for the implementation of an online service for income tax payment were the following:
- wishes of the Prime Minister that all Minitel services are transformed into Internet services
- internalisation of applications, since the former externalisation was not satisfactory
- avoiding mistakes during data entry
- saving time for the administration (no processing of cheques).

All these objectives were met, and therefore the process was a success for the administration.

Long-run sustainability:

In the long-run, one can imagine that there will be one unique electronic certificate to be used for various tax returns and public services. This possibility is currently explored. The users will get more and more used to using the Internet for their transactions with the Government and in the long-term, this new culture and awareness will save a lot of paper, time and money.

The two distinct web sites for tele-declaration and tele-payment will be merged into one in the long-run. The Ministry (Copernic) envisages a unique interface, which will be even more user-friendly, clear and efficient. It will regroup tele-tax return and electronic payment. In this context, no major laying off of staff is planned, even though it can be imagined that the increase in efficiency and productivity might result in a decreased need of personnel.

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                    ┌──────────────────┐
                    │  Future web site │
                    └────────┬─────────┘
         ┌───────────────────┼───────────────────┐
┌────────┴─────────┐         │         ┌──────────┴────────┐
│     SATELIT      │         │         │      ADONIS       │
│      DGCP        │ ◄───────┼───────► │       DGI         │
│   Tele-payment   │         │         │  Tele-declaration │
└──────────────────┘                   └───────────────────┘
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7. Learning points and conclusions

Tele-declaration
On the whole, the case of tele-tax return for income taxes was a success for the administration. Most citizens were highly satisfied by this new service, and the number of users is expected to increase in the coming years.
During the interview conducted with the responsible person at Copernic 4, we realised that the case, due to its experience and success, has some advice to give and some lessons to share with other administrations planning to implement a similar online service.

First of all, according to Copernic, the success of such an action directly depends upon whether a coherent study of the past was accomplished. Furthermore, processes ought to be simplified as much as possible for the user. Online forms and their filling in should be kept very straightforward and easy to explain to the entire population.

In terms of transferability, one can say that all European countries are more or less facing the same issues and problems. Therefore, it is crucial to learn from each other by comparing our experiences. Apparently, in only very few cases, technical barriers were the crucial ones. Most of the time, the main limits are linked to cultural handicaps and to corporatism. In other words, the human factor is still determining the success or failure of a project such as the tele-tax return of income tax in France.

In order to foster productivity and improve the relationship to its users, European governments can and should also apply lessons learnt from the private sector. Following this path, the basic idea is to take the most repetitive tasks away from the employee in order to charge him with more personalised user relations.

Electronic payment:
SATELIT did not rely on past examples from other agencies or countries. They undertook a solid and detailed study before launching the tender, in order to get a good idea of what theoretic approach they wanted to follow. Once the various offers had been submitted, they chose amongst them the one that seemed most interesting.

For future undertakings, they would be interested in learning about good practices in other European countries and in benefiting from an international technological monitoring. They are convinced that exchange with other administrations will be beneficial for the future of European eGovernment.

Since the SATELIT interface works so well, the French Government is even thinking about installing online payment for public penalties.

The case could be easily transferred to other French public services, involving payment (e.g. the payment of fines). The case could also be applied in other countries, provided the legal framework allows for it.
The case illustrates quite well the model D to which it is allocated, since a high number of back-offices are involved without the user being aware of it. The whole process is digitised.

8. References and links

Relevant web-addresses:

http://www.impot.gouv.fr
http://www.telepaiement.cp.finances.gouv.fr/
www.service-public.fr.
http://www.adae.pm.gouv.fr/spip/
http://www.fonction-publique.gouv.fr/ministere/organisation/adae.htm
www.axa.fr *(preparation and simulation of tele-declaration)*

Literature, studies, other related evidence:

Article: "La France et l'administration électronique" – Interview with Henri Plagnol May 14th 2003; Article published in the "letter", the journal of the CSC (numéro 3, mai 2003)
SERVICES PUBLICS, QUESTION D'AVENIR: Rapport du Groupe présidé par Christian Stoffaës
Plan pour une République numérique dans la société de l'information (RE/SO 2007)
Décret n° 2003-141 du 21 février 2003 portant création de services interministériels pour la réforme de l'Etat NOR: PRMX0300005D
Les Echos - www.lesechos.fr

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Case 14
Citizen certificates:
Bremen birth and marriage certificates

1. Executive summary

Bremen offers the possibility to apply for certificates of birth and marriage including payment fully electronically. The service is used by citizens who have to authenticate their birth or marriage to institutions or firms. In general, the citizens have four options to request certificates: personally, by phone, online by using the digital signature and online without using the digital signature. However, certificates may only be given to authorised persons, i.e. the person concerned, close relatives, or lawyers. The office has to check authorisation, and the person concerned has to sign the application. Therefore, the citizens have to go to the office personally at least once, if the digital signature is not used. Otherwise, the certificate is sent to the applicant by mail.

In case of requesting the certificate for official use (i.e. statutory pension insurance), the service is free of charge; for private use the citizens have to pay a fee of about 7 EUR. The take-up of the service in Bremen is about 50 cases per day. This figure includes the requests by other offices, so the requests by citizens are about 20 a day. Before the online service was available, certificates were requested by telephone or personal appearance and had to be picked up by signing the application form and paying the fee. According to the directives of this office, it was not possible to order by telephone and have the certificates sent by mail. In 2003, two of the 20 are requested online without using the digital signature and picked up later, while twice a month an online request is made using the digital signature. Most of the requests by citizens (about 90 %) have to be paid because they are for private use. When using the online service with digital signature, the applicant does not have to make another application besides the online request. The certificate itself has to be issued by the staff in paper form and is sent to the applicant by mail. Authentication and ensuring the payment of the fees take place by using the digital signature. The peculiarity and the very innovative part of this service is the integration of the payment function in the local SAP-System. (So the relevant cases are the requests of certificates that have to be paid.) Integration of the payment function means that the working steps between the registration office and the cash-desk are no longer necessary. Moreover, the loss of that part of the overall workflow by integrating the fully automated payment function could be exemplary for other services as well. So any other public service that has to be paid by users could benefit from this development. The combination of authentication by digital signature and payment in a direct relation ensures the traceability of each administration file and is therefore transferable to other public services that have to be paid by the users.

Two back offices on the same administrative level: the registry office and the cash desk, are involved in the overall workflow of the request of certificates. The cash desk is in charge of the state level (Bundesland Bremen, state of Bremen) and the registry office is local, but because of the special circumstances in Bremen (city-state of Bremen), the back-offices count as same-level agencies (but nevertheless as two back offices).
To carry out the service fully electronically the applicants have to use their own digital signature smartcards. Users of this smartcard could use other services as well without typing in their personal details again. Beside this re-use of data, no other service can be carried out at the same time for other purposes (bundling of services). All in all, the service corresponds to model C: one service, multi-stage with the complexity score 2. The service is chosen as good practice because of the highest possible degree of digitisation and its high value regarding the transferability of the integration of payment respectively the connection between digital signatures and payment.

2. Background

The online request of certificates including the fully automatic workflow of the payment of the fee is part of the local eGovernment-programme. The City of Bremen is one of the three final winners of the federal competition MEDIA@Komm. This competition was introduced by the Federal Government of Germany (Federal Ministry of Economics) in 1998 to push the development of eGovernment technologies and applications in the public administrations. The local German governments were called up to present concepts for and develop eGovernment services using qualified electronic signatures of the highest level as determined by the European Commission and the

German Government. Due to this competition, Bremen was awarded 10 million EUR in 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. So after a long planning and implementation time, in October 2002 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 accounting. The workflow of the online request of certificates is rather simple because only a few interactions between user, registry office and cash desk are necessary. As mentioned above, the most difficult part was the integration of the payment function in the local cash system via SAP. The aim was to test the integration in a less complicated service to transfer the experiences to other - more complex – services.

Besides, the forceful development of eGovernment in Bremen is one factor to stimulate the local economy. While transitioning to an information society, Bremen's wealth and strength in the future will rest on the 'e-aptitude' of its citizens and business.

3. Specific objectives

Because of the e-government strategy of Bremen, the service is part of a wider supply of online services mainly based upon the use of a special transaction platform. The platform was developed in public-private partnership between the City of Bremen and a newly founded company (Bremen Online Services). The prime objective of this company is to develop E-Government services for intermediaries, business and citizens as fast as possible. In 1998, more than 120 services were analyzed and 80 of them were scheduled for delivery by the end of the project in 2003. One of those services is the online request of certificates with the combination of authentication and payment.

The online service 'request of certificates of birth or marriage' is relevant for citizens who have to confirm their birth or marriage to institutions or firms. They have to submit them to receive benefits, e.g. in case of statutory pension insurance, income support or pension office benefits (therefore the request is free of charge) or to confirm birth/marriage, e.g. in case of claims to an inheritance or to enrol a child at the kindergarten. Certificates for private use have to be paid. The fee is 7 EUR for one certificate and 3.50 EUR for each further certificate.

Before the online application including the use of the digital signature was offered online, the user had to go to the registry office to file the request or call and pick it up. This was required by the law; the applicant has to confirm his entitlement. Moreover, the applicant had to pay the fee in cash. Today, all applicants not using the digital signature have to go to the registry office to authenticate themselves as well when picking up the certificate.

On the other hand, the registry office either had to collect the cash from the applicant and had to forward it to the cash desk manually, or the cash desk had to inform the registry office if the fees were paid by the applicant.

As a first step towards the digitisation of the service, the request of certificates was offered online without full automation of the payment. The user's debit declaration was sent via 'bos'[45] and secured by OSCI to an interim backend server of the cash desk. There, the debit declaration was encrypted and sent by secure mail to the mailbox of the cash desk. The data from the email were then manually typed into the local SAP system. This was of course not a sufficient solution for the office, and further improvements were therefore necessary.

The aim of integrating the payment is not only to replace the manual workflows between the public offices and the cash desk by a more efficient electronic way; it is to relieve the public offices from the payment workflow. Therefore, the specific aim is to integrate the payment function in the local resource planning system (SAP).

As a precondition for transferability to other services, the user has to authenticate himself by a digital signature. Without this, the traceability of the payment cannot be definitely related to the applicant. This is important mainly in

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[45] bremen online services GmbH, the intermediary institution responsible for the secure online transmission of data and documents

case of mistakes or for the audit division. The functionality of this integration was first developed for the less complex service 'request of certificates' to learn from the problems that arose from that integration.

In a further step, the payment function will be integrated in other payable services by using the same workflow. All online services in Bremen are to be delivered via a common online transaction platform, capsuling transmission, signature verification, encryption and payment. This platform needs to be implemented using open standards, to achieve platform and application independence. It also has to answer 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).

The long-term goal is to restructure public administration 'from the outside in'. Better and faster services will be the result of the use of electronic technologies and the necessary reorganization of workflows. By delivering these services in public-private partnership, the city administration will benefit from a reduced workforce as well as from a decreased operating budget.

All modules within the framework are developed using standards to guarantee the deployment within administrations, citizens and business locally and internationally as well.

Against the background of the administrative reform, the city administration of Bremen has introduced the common enterprise resource planning system SAP. This software was introduced in October 2002 to enhance the administrative workflows. The use of the system will be extended systematically to more efficiency within the public administration. One of the aims of the use of this software is the efficient flow of cash data by reducing other ways of payment flow. Therefore, it is a regular target of the city administration to concentrate the workflow of the overall administration on the use of SAP.

4. Resources

ICT: The main functionalities characterizing the online service are the use of an architecture for digital signatures and the integration of the payment function in the local enterprise resource planning system (SAP). SAP is the commonly used software within the administration, and most of the proceedings will be conducted to that system by special interfaces. The use of digital signatures will be made available by the eGovernment architecture 'Governikus'. All the interfaces of this architecture are described by an open communications protocol, OSCI (Online Services Computer Interface).

Encoded and signed online transactions using electronic signatures according to the signature law are made possible by this system. The architecture also conforms to W3C at all levels and uses near platform-independent technologies such as Java and XML. Open source products are being used as far as possible. The platform also ensures the independence of communities and citizens when making decisions about external products and systems. 'Governikus' implements transport layers from OSCI for Internet-compatible applications by using middleware products. The client-enabler links card-reader, smartcard and software certificates on the user side. It interfaces with various PKIs. All the commonly used German and Austrian PKIs are already implemented. The preferred standard for PKI is ISIS-MTT. This means that electronic signatures of the level 'qualified' are supported (as specified in the EU directive on electronic signatures). Privacy features for electronic signatures and encoding are also provided by the system.

In the office workflows, the tasks regarding the digital signature will be handled by an intermediary enterprise (bos; see next point: PPP). Therefore, less additional hardware and software resources to treat the requests were necessary. PPP: 'Governikus' could only be developed through close interaction between the public and private sector. For this purpose, a public-private partnership called 'bremen online services' was founded in 1999 and is owned by the city-state of Bremen and industrial partners. Together, these partners invested 10 million EUR in the development of eGovernment between 1992 and 2003 (about 5 million by the private sector). Because Bremen was one of the winners of the MEDIA@Komm competition (s. above), the Federal Government provided additional 10 million EUR of matching funds to develop eGovernment in Bremen (not only for 'Governikus' and for the online service 'Certificates'). The company is scheduled to be profitable by 2005. Revenue is earned by marketing the special architecture to other governments throughout Germany on all levels of government and to other European governments. But not only public administrations use that platform, private companies also do.

For putting the payment online and being in charge of the service, one full-time and one half-time person were employed for two years at the cash desk. The persons were paid by the funds received from the above-mentioned MEDIA@Komm award. Afterwards the persons were regularly employed by the city administration. Especially for the

certificate service, several meetings of the registry office, the cash desk and also the unit for eGovernment with an overall amount of approx. 30 hours per person were necessary.

A precondition for the citizen to use the service is to have a digital signature of his own. To get such a signature the citizens have to fill in a special form and have to authenticate themselves personally at a special office. Further, they have to contact the relevant trust centre to register their smartcards. Besides the signature, the citizens also need an installed card-reader and special software to use the software applications. For payment by electronic purse, the user additionally needs a prepaid card from his bank.

5. Implementation

The online service for citizens was implemented by the end of 2000 while the integration of the payment function took place in March 2003. The fee for certificates generally is 7 EUR, each additional certificate in one order is 3.50 EUR. By digitising the service, the workflow has changed for all participants: citizens, registry office and cash desk. Now, the citizens do not need to go to the registry office, the registry office does not need to handle the payment (acceptance of fees and the accounting to the cash desk) and the cash desk does not need to confirm the payment and to take the fee from the bank. In principle, there are two options for users to request certificates online: with and without using the digital signature. When the digital signature is not used, the process is not fully digitised since the German law requires the authentication of the applicant. So the citizens have to authenticate themselves at the registry office. Only the request of certificates using the digital signature is therefore fully digitised. The workflow between user and back offices (registry office and cash desk) in case of chargeable certificates and using the digital signature is as follows: The citizen requests the certificate by filling in the online form and sending it, digitally signed, to the office via an intermediary institution (bos). This intermediary institution checks the validity of the signature in cooperation with the relevant trust centre. Besides, bos generates a cash desk-registration number (ID) with which the form is labelled. The date is also added.

Bos does not belong to the public administration and, besides the request of certificates, it checks all digital signatures from digitally signed documents sent to the public administration.
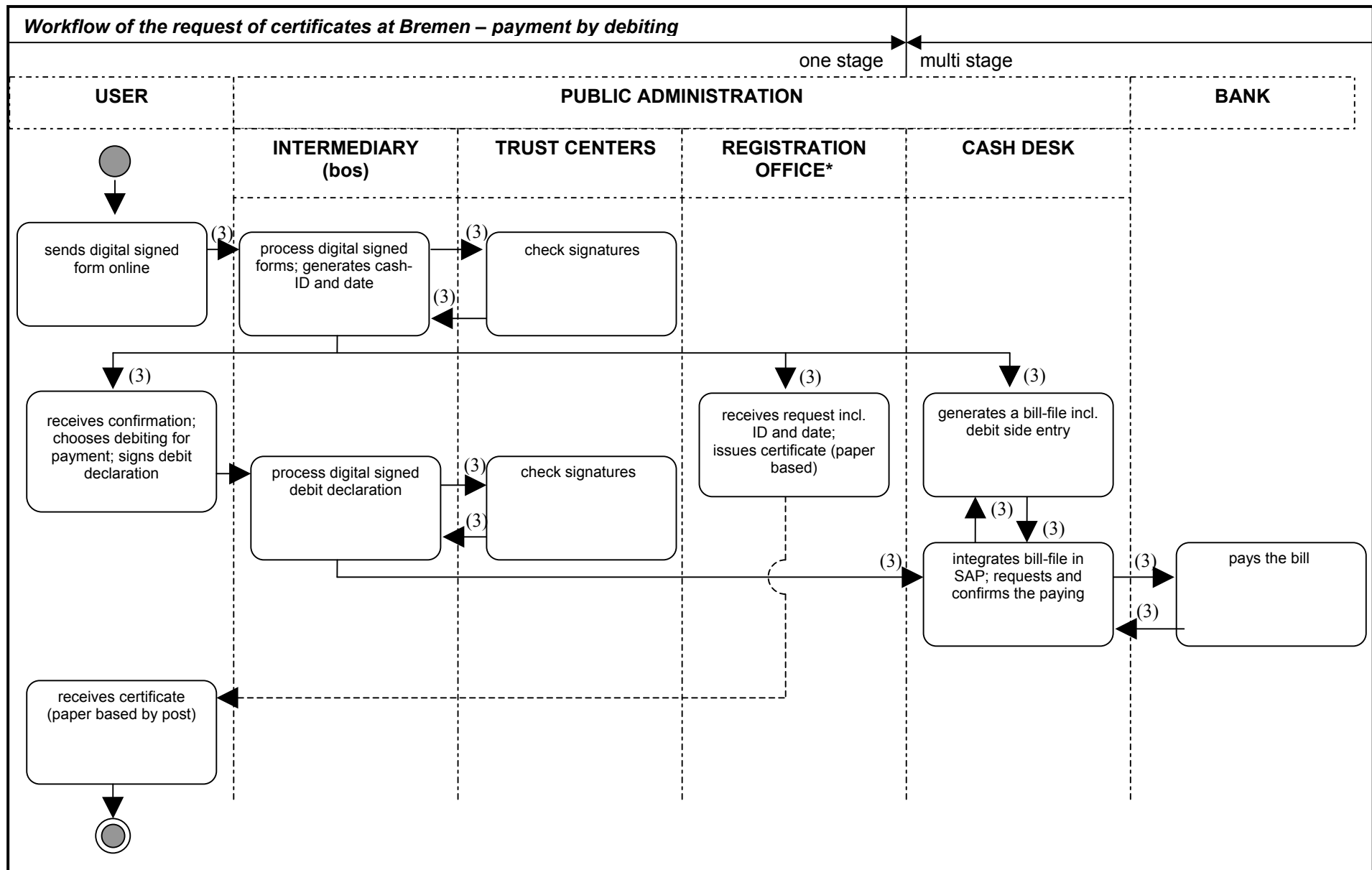
If the signature is valid, the form including ID and date will be sent securely using the OSCI-Standard (Online Service Computer Interface-Standard) to the registry office. Moreover, a debit-side related to the ID is sent to the cash desk via OSCI, and there a (debit-side) entry in the SAP will be generated. In addition, a confirmation including the cash desk registration number will be sent back to the applicant.
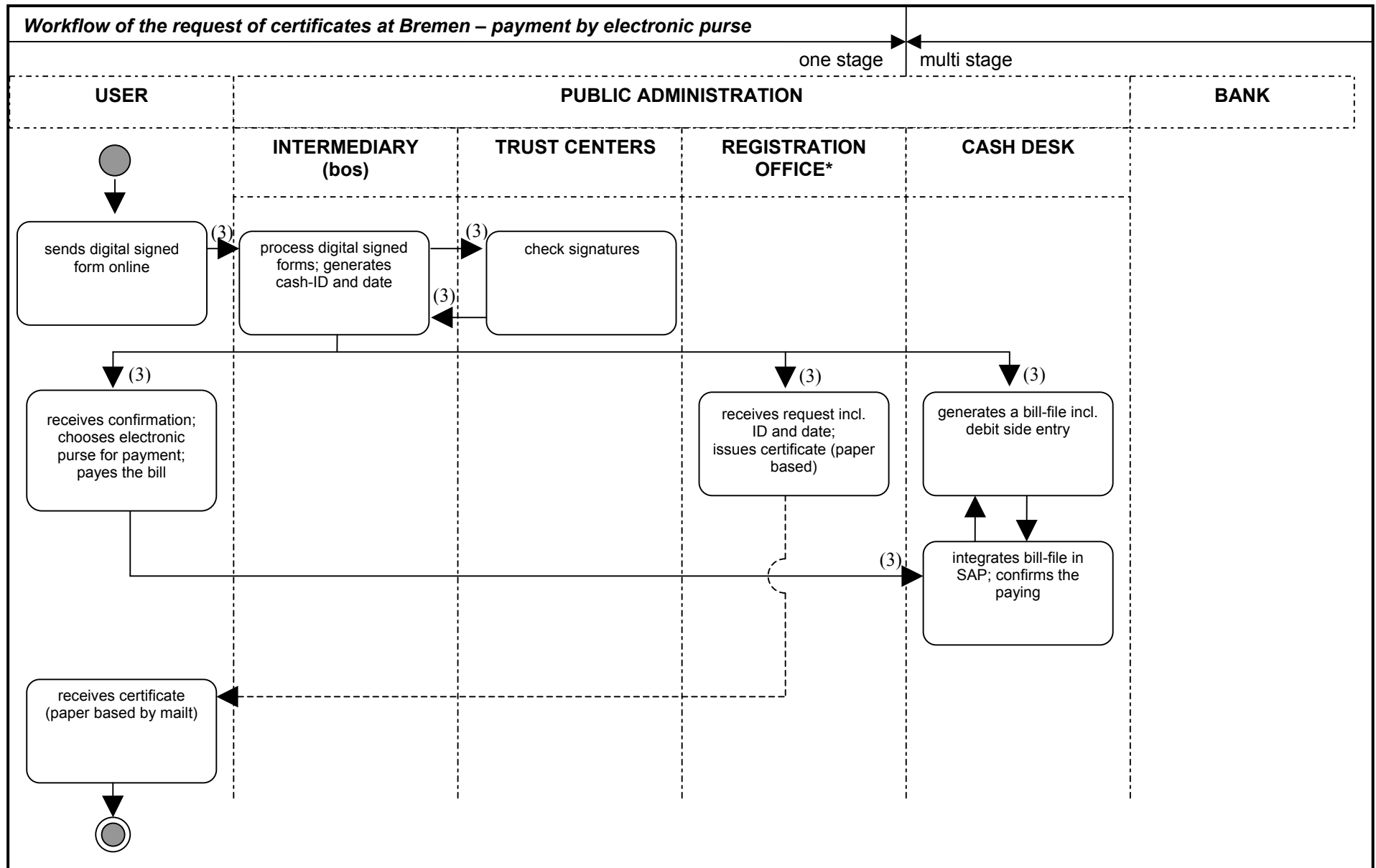
Now, the applicant can choose between three options to pay the fee: by bill, debit or electronic purse. By bill: the digitised workflow is interrupted and is therefore uninteresting for the study. By debit: the debit is digitally signed and sent back to the intermediary institution including the ID. There, the signature will again be checked on its validity in cooperation with the relevant trust centre. Then the data will be sent to the cash desk by OSCI.

By electronic purse: the user pays the fee directly by a standing order from the prepaid card. By using the electronic purse-option, bos adds the ID to the cash data and sends it to the cash desk (also via OSCI). In both cases (debiting or electronic purse), the cash data is automatically encrypted and a bill file is generated at a server located at the intermediary institution. The cash desk requests the bill files through the own firewall via ftp and integrates them in the SAP system. By the end of March 2004, the process of requesting the bill files manually will be replaced by an automatic integration. This means, the server that is still located at bos will be merged with the server at the cash desk. So at the local server of the cash desk where SAP is running, the cash data will be encrypted and the bill files will be generated as well as integrated in SAP.

In case of debiting, SAP automatically requests the fee from the relevant bank and confirms the paid fee in the SAP. If the fee is not paid, the SAP will automatically generate an email-reminder to the applicant.

Compared to that, the registry office opens the secure email received via OSCI, checks the data manually and issues the certificate (also manually). The certificates have to be in paper form and therefore to be sent to the applicant by traditional post. This is what the law requires, because the electronic keeping of such registry data is still not allowed, and certificates are only valid if they are in paper form. So the digitisation has to be interrupted at that stage of the process. Meanwhile the process has started to change the rules so that in the near future such registry data could be held electronically.

Workflow of the request of certificates at Bremen – payment by debiting

one stage | multi stage

USER	PUBLIC ADMINISTRATION				BANK
	INTERMEDIARY (bos)	TRUST CENTERS	REGISTRATION OFFICE*	CASH DESK	

sends digital signed form online

(3)

process digital signed forms; generates cash-ID and date

(3)

check signatures

(3)

(3)

receives confirmation; chooses debiting for payment; signs debit declaration

process digital signed debit declaration

(3)

check signatures

(3)

receives request incl. ID and date; issues certificate (paper based)

generates a bill-file incl. debit side entry

(3)

(3)

(3)

integrates bill-file in SAP; requests and confirms the paying

(3)

pays the bill

(3)

receives certificate (paper based by post)

Workflow of the request of certificates at Bremen – payment by electronic purse

one stage | multi stage

USER	PUBLIC ADMINISTRATION				BANK
	INTERMEDIARY (bos)	**TRUST CENTERS**	**REGISTRATION OFFICE***	**CASH DESK**	

sends digital signed form online

(3)

process digital signed forms; generates cash-ID and date

(3)

check signatures

(3)

(3)

receives confirmation; chooses electronic purse for payment; payes the bill

(3)

receives request incl. ID and date; issues certificate (paper based)

(3)

generates a bill-file incl. debit side entry

(3)

integrates bill-file in SAP; confirms the paying

receives certificate (paper based by mailt)

To state clearly, the treatment of the request and the delivery of certificates by the registration office is independent of the payment workflow. These are parallel and separate workflows which are started both at the same time when the user files a request. There is no feedback from the cash desk to the registry office about the payment of fees. If mistakes occur, e.g., the certificate cannot be produced because the relevant person was not born in Bremen, the proceeding has to be interrupted and solved manually by the staff.

The described workflow is autonomous for itself but also part of a wider supply chain that will be continuously digitised by the administration. Therefore - for example in case of birth - before the (first) certificate of birth is made out, the hospital has to send the announcement of birth of a baby to the registry office. Then the registry office has to enter the data of the baby in the local register of birth, marriage and death (until now paper-based but in the near future electronic), and produces the certificate of birth. Afterwards, the registry office has to announce the birth of the baby to the compulsory registration office (Meldebehörde). The process to digitise the first step of the supply chain has meanwhile started, and the hospitals are digitising the process of the announcement of birth. But the digitisation of the other processes, also regarding other certificates (marriage, death etc.) will be started later.

The digitisation of the service 'request of certificates' is, as mentioned above, part of the local eGovernment-programme in connection with the MEDIA@Komm competition. Therefore, special staff with special computing skills were employed at the cash desk, respectively engaged from the intermediary institution (bos)[46].

To handle this special service, trainings of the local staff were not necessary because there were no great changes for the staff. Quite the reverse, working steps were reduced both at the registry office and at the cash desk. However, the staff had to be trained in SAP. But that was not part of the special service, but rather the reform of the whole public administration.

In short, the great innovation - where Bremen is a forerunner - is the integration of the payment in SAP on the one hand and the possibility to transfer this digitised payment workflow to other services in the same public administration as well as to other administrations.

6. Results

The main benefits for the citizens are that it is no longer necessary to go to the registry office personally and to advise the bank to pay the fee. 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 including the card-reader. Other users without digital signature have to go to the office like before. 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 on the Internet.

Benefits for the public administration are the reduction of the working steps regarding the accounting entry of the fees. In addition, each request will automatically be marked with an ID, so all transactions done are quickly traceable. In case of mistakes, the relevant data can therefore be found very easily and efficiently.

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 low respectively negative.

But 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 widespread, the acceptance will of course increase.

In addition, owners of the digital signature smart card can also use further services provided on the transaction platform. The platform will be improved step by step and the supply continuously extended. Moreover, so called 'multipliers' can use the platform as power users. A 'multiplier' is a person or company who acts for citizens or businesses. So each multiplier carries out several transactions for his/her customers. That 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 aspects since with power-users, the return on investment can be reached earlier.

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[46] Not to forget; this institution was funded in public private partnership in the framework of the MEDIA@Komm project Bremen.

7. Learning points and conclusions

The digitisation especially of payment workflows is accompanied by many barriers that have to be overcome. There are several German rules and other security demands that influence the status quo of the workflow like it is now and make the digitisation difficult:

- There is a demand for high-level data security during the online transaction phase. This means that only the applicant and the relevant office is allowed to take a look on or rework the form.
- The law demands that the registration office has to check that the applicants are entitled to request a certain certificate. The law does not state how the entitlement has to take place. So the entitlement is defined by the head of unit of each of the registry offices. In general, the applicants have to authenticate themselves personally at the registry office. In case of the online service, the registry office could only ensure the entitlement by using a personal key infrastructure (PKI). The PKI with the highest level of security is the qualified signature used in the public administration in Bremen.
- There is no law demanding a digital signature for direct debit authorisation. However, customers might contradict a given declaration and the office would have to prove entitlement. In order to reduce this risk, Bremen has decided to use digital signature for direct debiting. But the digital signature is not very well accepted by the citizens because the overall benefits of this smartcard is low until now, but the expenditure is huge (e.g. costs, hardware and software installation, know-how). So the use of the digital signature is a question of the security concerns of the local authorities. The authorities have to weigh the risk of deception against the complexity of the service provision. Therefore, it is necessary to provide both options to the different offices depending on their security demands - service with and without using digital signatures.
- Overall, there is no common direction in Germany concerning the use of digital signatures so the administrations avoid implementing infrastructures for such signatures. The implementation requires high financial efforts, but the benefits are not really clear. Therefore, the administrations are waiting at the moment.
- The public accounting system in Germany demands the double entry bookkeeping with debit- and credit side entries in the cash system. This demands a double interaction between the cash desk and the applicants, respectively in this case the intermediary institution.
- All proceedings have to be traceable afterwards. This is necessary to solve problems that could occur in case of mistakes while dealing with requests. Moreover, all requests that had to be paid for have to be made transparent to the audit division.

To sum up, the development and the integration of the online service is very complicated, not so much because of technical difficulties but rather because of legal rules and other demands on the system. But to put the service online respectively to make the digitisation of the workflow possible, the public administration had to take care of these demands.

However, the demands on online-payment are nearly the same in the other public administrations. So the development of the service is of course of high value because the proceedings are similar. Moreover, the integration of the electronic purse by using the special sum field of the smartcard to enter the cash desk registration number for the bookkeeping is an exemplary solution of high value as well. The transferability of this service is therefore ensured, on the one hand within the same public administration and on the other hand to other public administrations.

Another lesson learned is - because of the low acceptance of digital signatures by citizens - to shift the attention to the development of online services that can be used by multipliers such as lawyers or traders. Those multipliers have to use special services much more often than common citizens and therefore benefit more from the use of the digital signature.

The online service 'request of certificates' serves one demand under inclusion of mainly two back offices: the registry office and the cash desk. One back office is local level while the other back office is state level. Nevertheless, because of the special situation in Bremen (city-state of Bremen) the cash desk also counts as local level. The service is supported by the auxiliary services of digital signature and payment. Special for Bremen is the intermediate institution that serves the administration in case of checking the validity of the digital signatures and in case of encrypting the digitally signed documents.

All in all, the online service exactly illustrates model C: one service, multi stage.

8. References and links

http://www.bremen.de/onlinedienste.html: overview, general information and online service 'request of certificates'

http://www.mediakomm.net/index.phtml: general information about the project MEDIA@Komm
http://www.bremen.de: Homepage of Bremen

Contact persons:

Interviewed persons:
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Registrar of the registry office,
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Germany

Case 15
Citizen building permission:
Esslingen application for building permission

1. Executive Summary

The City of Esslingen offers the possibility to apply for a building permission via a virtual construction platform fully electronically. All relevant files - documents as well as geographic plans and others - relating to the planning procedure will be uploaded to the central platform. The public administration gives access to the platform via username and password to the relevant participants (customers, architects, agencies as well as other institutions and offices). But not all participants are allowed to access all files, so access will be routed via a special directory by the public administration.

In general, the planning procedure in Germany is in charge of the municipalities. However, the organizing of the building permission depends on the law of the German states (Länder) which are different from each other. Stipulated by law is that the planning procedure in the whole of Germany has to be carried out in paper form until now. But to handle the building permission procedure online without simultaneous paper work, the courts in the German state of Baden Württemberg[47] have started to change the law. So, from spring 2004 on, the law in Baden-Württemberg will allow to treat the application for building permission fully digitally. However, documents signed with a digital signature are legally binding. Until now, four building permissions have been processed online (parallel to the paper-based proceeding).

Before the service could be processed online, all files had to be printed out several times (around seven times) and sent to the relevant participants of the planning procedure by in-house post (records) or traditional post. There, the participants had to check and handle the file and had to send it back to the public office. Now, the files do not need to be printed out, but are available on a central platform. Moreover, the single working steps could be handled more quickly because the delivery time of the documents between the participants and the offices is much shorter. The principal change for all participants lies in the continual availability of the relevant files via the online-platform, the abolition of routine work like printing and postal services and in cost savings in case of less printings and postage.
The actual back office organisation has not changed drastically by putting the service online; rather the service organisation has changed. Also, the building permission software is still the same as before. The peculiarity of the new online service is the digitised workflow among all participants with access to the virtual construction platform. Involved in such planning procedures are about 40 back offices - internal agencies like, e.g., offices for environment or historical monuments as well as external agencies like, e.g., non-governmental organisations or churches - relating to the complexity or kind of planning.

According to the project methodology, the service corresponds to model C: one service, multi stage. Until now, the online construction platform is - because of legal conditions - not allowed to deal with building permissions without the paper-based complement. But the platform is used in real planning procedures and shows its functionality. On the initiative of the MediaKomm Project, from spring 2004 on, the law will have been changed and no simultaneous paper-based work will then be necessary. The kick-off to the change of the law and the 'integration' of the several back offices by giving them access to the relevant documents on one construction platform are the main reasons why Esslingen is a forerunner regarding online building permissions.

2. Background

The online application for a building permission in combination with the virtual planning department of Esslingen is part of the local eGovernment-programme. The City of Esslingen is one of the three final winners of the federal competition MEDIA@Komm. This competition was introduced by the Federal Government of Germany (Federal Ministry of Economics) in 1998 to push the development of eGovernment technologies and applications in the public administrations. The local German governments were called up to present concepts for and develop eGovernment

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[47] The City of Esslingen is on the territory of Baden-Württemberg.

services using qualified, e.g. the highest level of electronic signatures as determined by the European Commission and the German government. Due to this competition, Esslingen was awarded 10 million Euros in matching funds to develop specific applications for various user groups.

Against the background of the MEDIA@Komm competition, the *organisation* "MediaKomm Esslingen" was newly founded. This organisation is a partner in the cooperation *project* "MediaKomm Esslingen". This project consists of ten partners from industry, science and the public administration. The organisation is funded half by the state and half by the City of Esslingen and functions as mediator between the individual partners.

The developments at MediaKomm 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.

Besides, an objective of the E-Government strategy of Esslingen is the combination of existing components towards an comprehensive service solution. In case of the construction platform, an existing platform that could be used for several purposes and which from a technical point of view still was developed, was fitted to the demands of the planning department and equipped with a special user directory. The actual building permission software has not changed but is connected to the platform and is used in the same manner as before. With this concept of combining existing components, and, including private enterprises with workable operating models, a sustainable usage of the modules is aimed at. With the help of public private partnerships - i.e. the connection of public services with private offerings - Esslingen's aim is that the developments in the framework of MEDIA@Komm are sustainable for the region of Esslingen, respectively also guarantee the economic wealth of Esslingen.

The main problems that still hinder the comprehensive use of the construction platform are the law and the lack of standardized data descriptions. Thus, on the one hand there is the regulation, e.g., to do the construction planning paper-based and on the other hand there is no common rule in Germany for data description in the building permission software. So the first problem prevents the sole use of the online platform without the paper-based copy, and the second one impedes the development of a common interface between platform and building permission software (XBau). The use of the construction platform in other planning departments is therefore possibly not feasible. But both problems will be solved with the changes in legislature till spring 2004 and with the implementation of the common interface (XBau).

3. Specific objectives

As mentioned above, MediaKomm Esslingen develops several online-services on the way to a comprehensive virtual town hall. A prerequisite is, as far as possible and useful, the use and combination of existing components to a working module which could easily be connected to existing software-systems.

Before the service was available online, the users had to deal with the application at the local offices. In general, the users commission an architect to do the application, so the architects are the main users of this service and therefore have to deal with the planning department. The public office then had to participate the relevant offices and organisations whose interests are concerned by the planning procedure. This happened by sending them the documents and plans by in-house post (records) or traditional post. Therefore, several copies (about seven) of the files had to be made and sent around. So according to the complexity of the planning, huge paper work was necessary. Supported by the construction platform, it is mainly aimed to reduce both, face-to-face contacts and paper work. On the way to this aim, two other objectives have to be reached first:

In case of the building permission service, a problem in Germany is the variety of existing software systems in the public administrations. So a specific objective of the project was it, to initiate a working group with members from representatives of the German states as well as representatives of the most used building permission software firms. The task of this working group is the development of a standardized common interface with a standard data description. Till spring 2004 - is expected - the working group will have developed this open standard called XBau. Then the construction platform could be compatible to all building permission software which are able to work with the common standard XML and which correspond to the German building permission proceeding. Therefore, until now, Esslingen cannot use a XML-interface. There is only the interface to the building permission software realised that is used in Esslingen (and many other planning departments in the south of Germany as well).

A further specific objective regarding the construction platform lies in the reworking of the concerned legal rules towards the possibility of a fully electronic building permission proceeding. Until now, several rules prevent to process the permission fully online. Beside others, the construction plan has to be - for example – paper-based on lightproof paper and folded to a special format (DIN A4) in several copies. The German states are in charge of the law regarding the building permission. In the case of MediaKomm Esslingen, the law is governed by the state 'Baden Württemberg' and therefore it is aimed to change this law first. The rework of this law regarding such regulations is still in progress and will be finished by spring 2004. Then the application for a building permission can be treated without simultaneous paper work. Provided that - to be legally binding - the relevant documents and plans are signed. Therefore, the construction platform has still integrated the function for signing the files by a digital signature.

Another aim of MediaKomm Esslingen is the sustainable use of the platform. Therefore, a workable operation model will be elaborated. Some models under inclusion of commercial partners are still worked out and seem to have a promising future.

4. Resources

ICT: The main functionality characterising the online service is the use of the construction platform with integrated function for digital signatures. As mentioned above, the construction platform consists of existing components - mainly an online-platform, an Internet-based document management system and a function for the digital signing of documents/plans.

The construction platform is conducted to the local building permission software by a XML-based interface. Against the background of the specific objectives of MediaKomm Esslingen (cf. 'specific objectives') a working group was initiated to standardize the data descriptions in case of the building permission software used in German planning departments (XBau). So the construction platform can be conducted to those building permission software systems that are able to work with XML and is therefore independent of software and platform.

For the provision of geographic information, a geographic information system (GIS) was integrated in the planning platform. This geographic information is made available to the users by a Standard Open GIS Interface and can be viewed by a special CAD-Viewer, also provided on the platform.

The signature function used is an integral part of the intelligent file management system called 'AllSign' and was also developed in the framework of the project MediaKomm Esslingen. 'AllSign' is a solution by the 'Cross Section'-module which provides services for the other five modules developed by MediaKomm Esslingen (remember: MediaKomm Esslingen is divided into five modules, each with different contents, and a module called 'cross-section' which is in charge of developing the (signature) technology and providing it to other modules - cf. 'background'). 'AllSign' is designed for mass application. All data formats can be signed electronically with its help. The data filled in by the users are processed in the digital workflow, i.e. they are transferred on the server into a PDF form. This makes it much easier for the users to fill in forms. Then they are electronically signed. Another advantage is that the user sees the form he/she is used to on the screen and can print it out for his/her personal records. At the same time when the data filled in by the users were transferred into a PDF form, the data are also transferred in a XML document. This document is OSCI compliant (Online Services Computer Interface - an open communication protocol) to specialist or web applications and will automatically be forwarded to the respective administration department, e.g. the planning department. 'AllSign' supports, beside others, the common certificates used in Germany, those of 'SignTrust' and 'TeleSec'.

The modules could only be developed through close interaction between the public and private sector as well as the science. For this purpose, a *project* called 'MediaKomm Esslingen' was initiated. Different offices, companies and research institutions attend to this project. Further, an *organisation* called 'MediaKomm Esslingen' was founded. This organisation manages the project and mediates between the individual project partners. The organisation is funded half by the City of Esslingen and half by the Federal Government. Because Esslingen was one of the winners of the MEDIA@Komm competition, the Federal Government provided 10 million Euros of matching funds to develop eGovernment in Esslingen (not only for the development of the construction platform, but for the E-Government services as a whole). Because of the complexity and volume of the whole project, the financial efforts for putting the application for a building permission online, cannot not be stated. However, the platform consists of existing standard components. New developments were mainly necessary in case of the interfaces between construction platform and local software systems and in case of the digital signature. But both developments serve overriding aims: the standardisation regarding building permission software systems in general and the development of a 'cross-section'-module which can be used for other online-services as well.

To use the construction platform, no further hardware, with exception of card readers, had to be purchased. Short training lessons for staff and potential clients (architects) to use the platform functionalities were held. To use the platform functionalities in a more comfortable way, the staff will get 21" monitors.

A precondition for the citizen, respectively the architects, to make the online building permission service legally binding, is to have a digital signature of his/her own. To get such a signature, the citizens have to fill in a special form and have to authenticate themselves personally at a special office. Further, they have to contact the relevant trust-centre to register their smartcards. Besides the signature, the users also need an installed card-reader and special software to use the software applications. No other special hardware or software is necessary to use the construction platform; neither by the citizens/architects nor by the public administration. A special viewer for all kinds of documents and plans is still integrated in the platform, so in this respect, further installations are unnecessary.

5. Implementation

The construction platform model consists of three pillars which are under the umbrella of the virtual planning department.
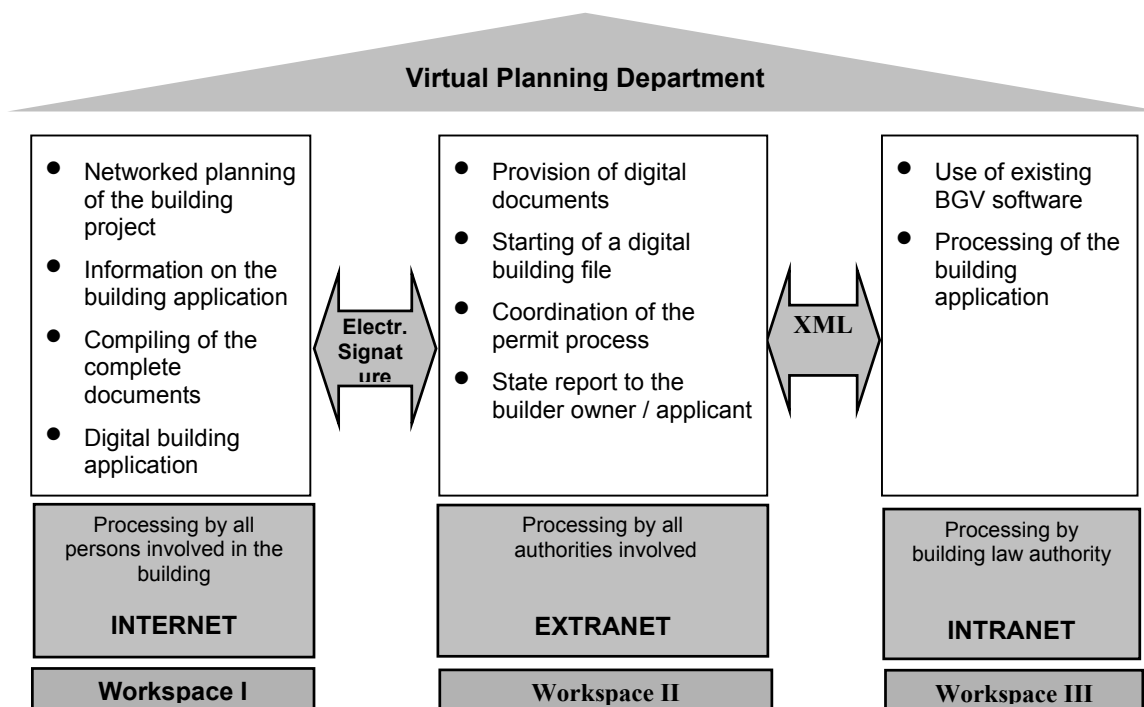

Diagram 1: Model of the building platform

The first pillar is workspace I. The user (architect) orders the workspace I at the planning department and puts his own planning work on it. For example, he communicates there with his/her planning partners and contractors to prepare the official application. The architect can also use the workspace I for further planning tasks. Workspace I is not an absolute condition for the use of the online application for building permissions ('nice to have' - not a must). The architects could make their planning preparation another way or on their own (virtual or not) workspace as well. The communication respectively the access to workspace I takes place via Internet. Access to the platform is in any case (using workspace 1 or not) available by digital signature or username and password. However, transactions via username/password are not legally binding in contrast to the transactions via digital signature.

The second pillar is workspace II - the extranet. There are the relevant documents and plans for the planning procedure available. The planning department and the clients as well as the other involved participants use workspace II to deal with the official application proceeding. This is mainly carried out by a special file and document management system with user support functions ("AllSign") which is an integral part of the building platform. Moreover, this file and document management system provides functions to sign not only emails but also documents. Therefore, it is possible to transmit emails and documents that are legally binding when they are signed by a digital signature. The planning department uploads the relevant files into workspace II just as the clients upload their documents and plans to that workspace II. The communication between pillar I and II is secured and only possible by using the digital signature.

The platform offers also - besides the file and document management system - an additional CAD-viewer, which can deal with different data formats. So, for example, the viewer could show plans of main systems in the underground, of buildings or the aerial picture of the area of the binding land use plan.

Pillar III is the PC-based building permission software system on the intranet of the planning department. There, the planning department deals with the application by using the existing building permission software. Via workspace II, other offices that have to be involved in the permission process like, e.g., the fire brigade or the office for historical monuments, get access to the digital building permission file. This means the responsible planning department invites all concerned offices to the virtual (planning) workspace II of the planning procedure in question. These offices receive the planning-related information by a special project-mail with regard to the workspace II. Therefore, the involved offices are always informed about the ongoing planning procedure. The statements regarding the planning of each office are put in the archives on the planning platform in the file and document management system. The planning department gets an automatic notification if a statement was received by the directory. However, not all offices or participants are allowed to have access to all files, so access will be routed via this special directory (AllSign) by the responsible planning department. In addition, the rights to view the statements of the participating offices by themselves can be adjusted by the planning department. This leads to a more transparent planning procedure within the involved offices as well as for the applicant. Also the applicant is provided with special access rights to trace his/her application. All plans like cadastral plans, zoning plans, binding land-use plans etc. of Esslingen are digitally available on the building platform and included in the local geographic information system (GIS). This GIS offers the users different functions for an interactive use of the plans. The plans can be viewed by the users via a special CAD-viewer. This CAD-viewer is also integrated and comfortably available at the platform.

The communication from pillar III to II takes place via a XML-interface. Until now, the communication from pillar II to III is not standardized by XML. From spring 2004 on, the working group for standardisation in case of the application for a building permission will have developed the common standard (XBau, s. above). Then, the communication from pillar II to III will also take place via XML.

A main advantage of the construction platform is that the files do not need to be shifted from one office to another. Moreover, parallel and simultaneous reworking of the files is possible. All participants have access to the files via their standard Internet browser. In addition, the participation of residents and neighbours including the filing of an objection is feasible via the virtual planning department.

Before the service could be carried out online, all planning files and documents had to be printed out several times and sent to the relevant offices and participants of the planning procedure by post. There, the offices respectively participants had to check and process the files and documents and had to send it back to the planning department. Now, the files need not to be printed out but are available on a central platform. The principal change for all participants lies in the continual availability of the relevant files via the online-platform and the abolition of routine work like printing and postal services.
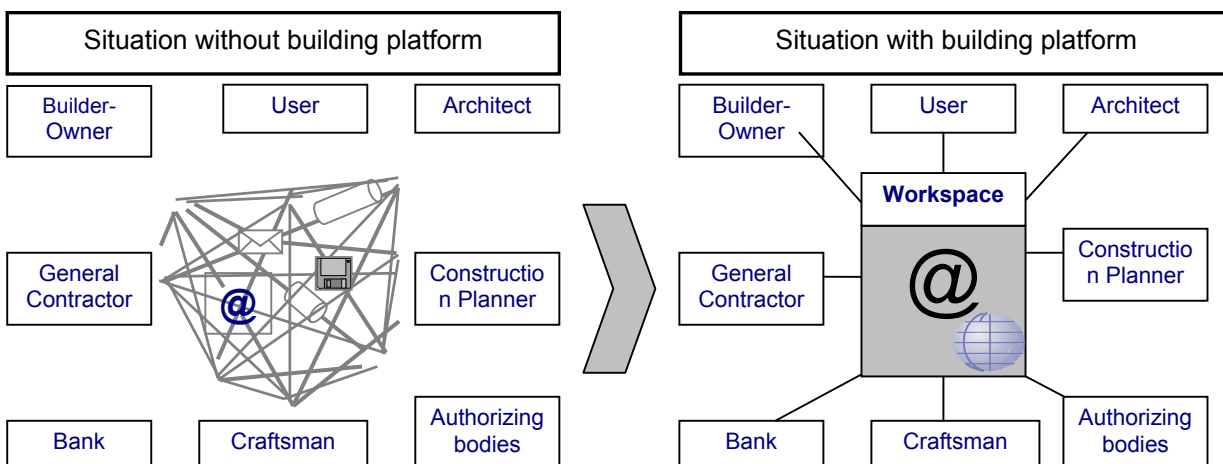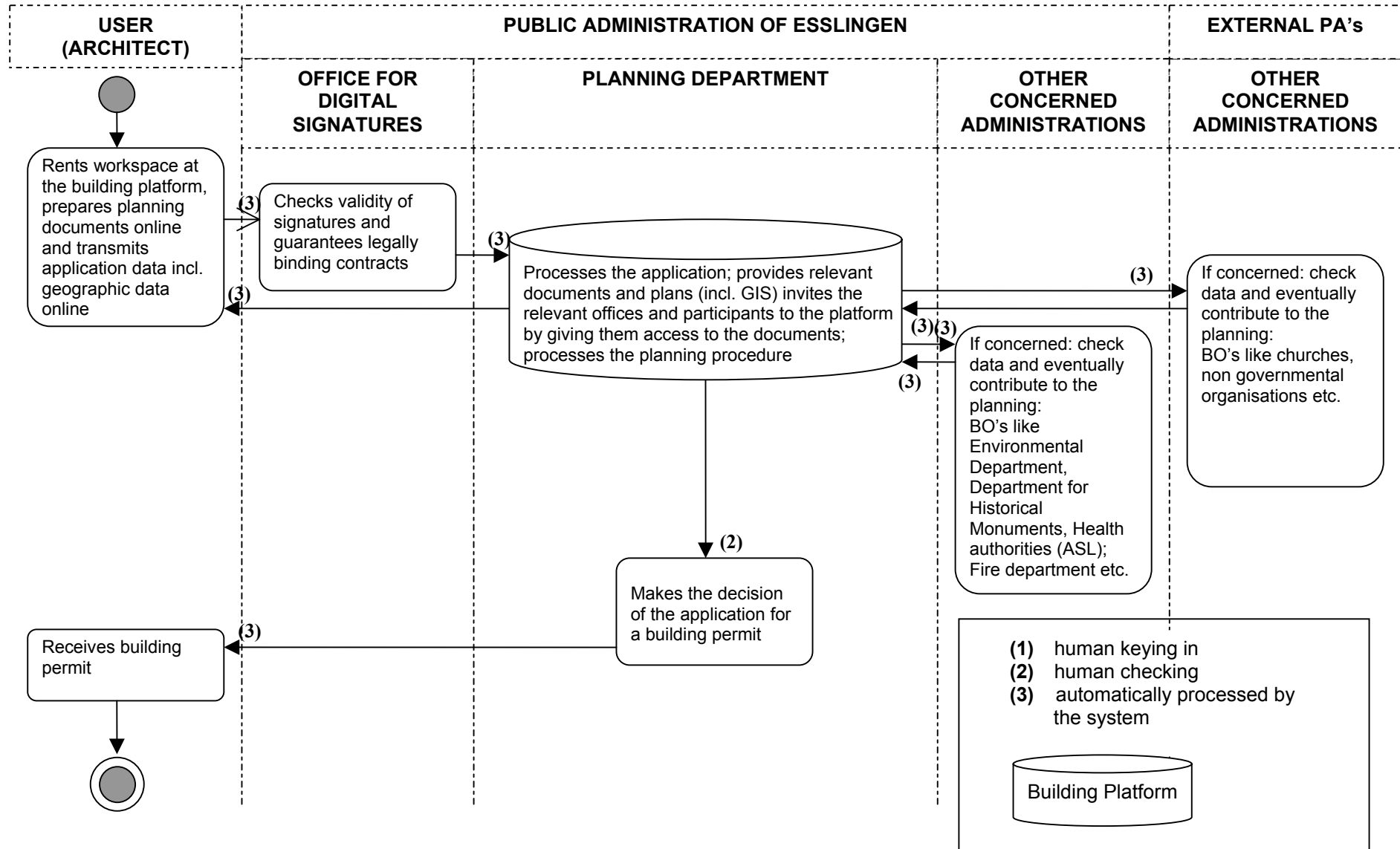

Diagram 2: Workflow organisation before and after the building platform

Workflow of building permit ESSLINGEN:

	PUBLIC ADMINISTRATION OF ESSLINGEN			EXTERNAL PA's
USER (ARCHITECT)	**OFFICE FOR DIGITAL SIGNATURES**	**PLANNING DEPARTMENT**	**OTHER CONCERNED ADMINISTRATIONS**	**OTHER CONCERNED ADMINISTRATIONS**

Rents workspace at the building platform, prepares planning documents online and transmits application data incl. geographic data online

(3) Checks validity of signatures and guarantees legally binding contracts

(3) Processes the application; provides relevant documents and plans (incl. GIS) invites the relevant offices and participants to the platform by giving them access to the documents; processes the planning procedure

(3) If concerned: check data and eventually contribute to the planning: BO's like churches, non governmental organisations etc.

(3)(3) **(3)** If concerned: check data and eventually contribute to the planning: BO's like Environmental Department, Department for Historical Monuments, Health authorities (ASL); Fire department etc.

(2) Makes the decision of the application for a building permit

(3) Receives building permit

(1) human keying in
(2) human checking
(3) automatically processed by the system

Building Platform

The construction platform was implemented in July 2002. In the first year since the platform is available, the planning department processed four applications for a building permission. Until now, the platform is mainly influenced by the above-mentioned problem of the necessity to deal with the application by additional paper-based work (double work also for the architects). Technical problems mainly arose by the missing common interface with a standard data description (XBau). One interface was developed for the connection of the building platform to the building permission software at Esslingen. However, to promote the platform nationwide, a common standard is a precondition.

To handle this building permission service online, special trainings of the local staff mainly regarding the use of the file and document management system at the planning department were necessary. In addition, special trainings with the architects to use the whole system were carried out. These trainings included not only the usage of the file directory to do the application but also the comfortable features of workspace I to do the planning preparation online via the building platform that can easily be integrated in the application procedure.

The digitisation of the service 'application for a building permission' is, as mentioned above, part of the local eGovernment-programme in connection with the MEDIA@Komm competition. Therefore, special staff with special computing and legal skills were employed at the new founded *organisation* "MediaKomm Esslingen". Moreover, within the *project* "MediaKomm Esslingen" there are several private and public partners with specialised skills involved like, e.g., the Fraunhofer Institute for Industrial Engineering IAO, the advanced technical college of Esslingen FHTE, several companies from the computer and communication branch and others. All these partners contribute to a professional and conclusive service development with their special skills and their combined infrastructure.
Since the transferability and spreading of results and applications in the electronic government is a main aim of the whole MediaKomm project, the organisation makes high efforts to market their products and experiences. MediaKomm Esslingen is therefore still present and agile in the public and in media when competence in electronic government is in demand.

The functionality of the mandatory submission of statistical data to the statistical office of Baden Württemberg will also be integrated in the platform. This functionality will also be fully automatic available by spring 2004.

6. Results

The customers of the building platform 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.

Because of the very low uptake to date, statements about time- and cost savings within the public administration are not possible at the moment. Therefore the cost-benefit effects are low respectively negative. However, the main advantages of the building permission platform are to recognize 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). Other benefits 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.

Besides, via the planning platform, the offices get closer together and build a network of relevant offices for planning-related tasks like the building permission proceeding.

Besides savings by the building platform, there are also savings regarding the above mentioned standardisation process. This process allows the compatibility of planning related data across the borders, since several different data formats are

in use. So, the financial savings by standardisation aspects regarding the common interface with a standard data description (XBau) are estimated by one percent of the whole planning volume in Germany, i.e. 3.75 million Euros per year in Germany.

There are still several problems affecting the building platform: Since the law regarding the regulation for paper-based building permissions has not changed, the online permission procedure has to be carried out simultaneous to the paper-based one[48]. This means double work for both, the customers (architects) as well as for the involved offices. Another problem is the restricted use of the platform for projects in Esslingen, since the XML-interface is missing until now. So there are still architects who are interested in the use of the platform, but cannot use it since they have no project in Esslingen (and outside of Esslingen, the platform can rarely be connected to the local building permit software). In addition, the infrastructure in the municipalities, especially the smaller ones, is often not so efficient that the planning platform could be used in a comfortable way, so adjustments have to take place that will meet the demands of such municipalities. A further problem is that there is still a concept missing for an appropriate cost-model for the use of the platform; on the one hand for the use of workspace I for the architects and on the other hand for the distribution of the building platform to other municipalities/authorities. Further, a payment function has to be included (and is still being developed) in the platform to enhance commercial benefits for providers and users.

A common problem of all online services requiring a digital signature is the low diffusion of signatures in Germany (as well as in other countries). So the uptake of the service is directly dependent on the legal regulations regarding the use of digital signatures.

Nevertheless, the overall results brought by the application of an online building permission at Esslingen have to be seen under the unsteady conditions of the current rules. So in the long run, if digital signatures are accepted by users, the infrastructure in public offices is widespread, and online applications are independent from the paper-based ones, the acceptance of the service will of course increase.

7. Learning points and conclusions

The application for a building permission is one application of several services and modules (also "cross-section modules") developed against the background of the MEDIA@Komm competition at Esslingen. Since the developments at Esslingen are still an ongoing process up to date, the full potential of the individual applications are not completely exploited, this also applies to the case of the application for a building permission. So, the learning points have to be seen under these conditions and therefore with view of the sophistication of the services that will be realised in the (near) future.

Since the real time to rework the application for a building permission does not change by carrying out the service online, the time span of the procedure does not change, too. However, the loss of time resulting from sending the documents to the involved agencies/participants as well as from the adoption of the changes in the planning documents by the planning department can be cut down. Therefore, the reworking-time of applications for a building permission can be reduced by a faster flow of the records. But this effect will only be remarkably reflected at the planning department by a high uptake of the online service. If only few applications are carried out online, the time saving aspects will make no difference.

A complex service with many involved back-offices and participants like the application for a building permission can only be realised if there is a common attentiveness and cooperativeness to develop and integrate this service. Therefore, all involved offices and participants have to be motivated and willing for the implementation of the service and the change of service delivery which results from the new online provision. At Esslingen, special staff circles were built up to actively involve the relevant staff in the development and integration of the service.

The integration of a building platform in the application for a building permission requires besides a skilled staff who can operate such a platform, also a stable and well-performed technical infrastructure. Besides the technical conditions for the use of the digital signature, also other technical equipment is required or would be comfortable. E.g. the computerisation of all involved back offices which have to use a common communication standard or the availability of plans and charts in a digital format are a precondition not only for a comfortable use of the platform.

Another lesson learned is, that public administrations and companies developing software have to work closer together. This is essential especially for standardisation aspects, since the more different software solutions for a special application are available on the market, the more interfaces are necessary and the clumsier the harmonisation process is.

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[48] E.g. there is still a need for a contract that must be drawn up in writing, documents must be on lightproof paper, and the plans have to be folded to a special format (DIN A 4)

If the public users of the software together with the private companies developing this software collaborated more, the standardisation process in a country would boost.

The basis of the Esslingen building 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 secure connection. There, documents can be saved in a structured manner, and information can be shared among 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 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 improved communication within the involved participants.

Up to date, the digital signature is not very well accepted among the citizens because the overall benefits of such a signature smartcard are small, while the expenditure to get and use one is huge (e.g. costs, hardware and software installation, know-how). So the use of the digital signature is a question of the individual value/benefit for the users to get one. If the effort for users to get and use a digital signature is higher than the benefit, the authority should also provide different options to use the system: with and without using digital signatures.

In addition, there is no common direction in Germany about the use of digital signatures so the administrations avoid implementing infrastructures for such signatures up to now. The implementation requires high financial efforts, but the benefits are not really clear. So the administrations are waiting at the moment.

Therefore, a lesson learned is - because of the low acceptance of digital signatures by citizens - to shift the attention to the development of online services which can be used by multipliers such as architects. Those multipliers have to use special services much more often than common citizens and therefore benefit more from the use of the digital signature.

The online service "application for a building permission" serves one demand under inclusion of several, from case to case varying, back offices (dependent on the complexity of each planning procedure). Certainly, mainly involved and therefore the primary back office is the planning department. The planning department operates and organises the building permission procedure and is responsible for the involvement of the other back offices from which statements regarding the planning are required. The back offices involved are internal as well as external and therefore from different stages. So, regarding the project methodology, the online-service "application for a building permission" at Esslingen corresponds to model "C" (one service, multi-stage). The service is supported and available also by the use of digital signature as an "auxiliary service". Since the service could be fully operated via the online platform but the law demands also paper-based contracts and documents, and in case of very complex planning procedures, visits at the office are unavoidable, the digitisation score is level "2".

8. References and links

http://www.esslingen.de: Homepage of the City of Esslingen
http://www.bauen.esslingen.de: Homepage of the virtual planning department with the application for the building permission
http://www.mediakomm.esslingen.de: Homepage of the organisation 'MediaKomm Esslingen'
http://www.mediakomm.net/index.phtml: Homepage of the MEDIA@Komm competition.

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Greece

Case 16
Business VAT:
E-oikonomia web portal

1. Executive Summary

Continuous evolution with regard to electronic service delivery is the general picture of the General Secretariat of Information Systems (GSIS) of the Ministry of Economy and Finance resulting from the overall study of the case. Already in 2000, it was the first public agency to provide advanced on-line services in the country and since then it has gained considerable maturity, by means of constantly upgrading available services and incorporating new ones. Four different stages can be distinguished in this evolution process:
- An initial stage following large-scale modernization of internal processes and workflows of the Organization through the introduction of the TAXIS Integrated Computer System and the launching of the TAXISnet website,
- Fully operational TAXISnet website providing on-line two popular services (VAT declaration and income tax declaration) with remarkable numbers of user uptake,
- The recent development of the e-oikonomia web portal, including previously available TAXISnet applications and incorporating new services and tools mostly internally developed,
- A new major upgrade already in progress (approved to be financed by the national Operational Plan for the Information Society in Greece and currently at Call for Tenders for its implementation stage) that will provide on-line one stop services aiming to cover the totality of citizens and enterprises' needs regarding transactions with the tax system.

At its current stage, the e-oikonomia portal comprises a set of services addressing both citizens and enterprises. These are:
- **on-line VAT declaration service:** e-filling and submission of the periodical VAT declaration (addressing enterprises and professionals) and payment through web banking,
- **on-line income tax declaration service**: e-filling and submission of the Income tax declaration (addressing citizens),
- **e-K.B.S.:** electronic submission of the summary list of customers and suppliers invoices (addressing enterprises and professionals),
- **e-Vehicles:** enables users to access the vehicle records of the GSIS and update information or correct possible errors encountered (addressing citizens and enterprises),
- **e-VIES:** on-line submission of VIES declarations (addressing enterprises that trade with other countries within the EU),

These services together with a number of on-line tools are all accessible from the same entry point (http://www.e-oikonomia.gr) and users are directed to the former TAXISnet website to use on-line VAT declaration, income tax declaration and e-VIES services. These services have been outsourced by the Organization and the first two of them, being the earliest and having a significant number of users, present the highest level of maturity. All electronic services provided in the framework of the e-oikonomia web portal involve different back offices of the Organization both at central and local level. On-line VAT declaration service involves also a considerable number of banks, while the e-Vehicles service involves also an external back-office (Ministry of Transportation and Communications). The Electronic Services Group – TAXISnet, a special group established under the GSIS of the Ministry of Economy and Finance has the responsibility for portal management. Users have to register once and when they receive their username and password they can access the services to which they have registered, while their personal data are already filled in when they access a new tax declaration.

Electronic service delivery by the GSIS of the Ministry of Economy and Finance has been a major success, having until now more than 800.000 registered users, in a country with relatively low computer and Internet penetration numbers, where most e-government projects are still at pilot stage. It has as a result significant benefits for users, since it reduces considerably time and expense necessary to carry out transactions with the tax system, while, at the same time, it has important impact on the productivity of the Organization, 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 Organization, 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 Organization to the electronic service delivery.

2. Background

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. The development of TAXIS (Taxation Information System), the Integrated Computer System of the Organization, was then initiated financed by the Operational Programme "Kleisthenis" for the Modernization of Public Administration (1994-1999), under the second Community Support Framework (2nd CSF). The aim was:

*   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.

TAXIS Information system, based on a 3-tier data and application architecture over a virtual private network and serving both central tax authorities located in the capital (Athens) and approximately 300 local tax offices (Public Financial Service Offices). located throughout Greece as well as the total of taxation transactions carried out in the country, has proved extremely successful with regard to simplifying internal processes of the Organization. TAXISnet, the name of the system for electronic service delivery through the Internet, was the result of the political will at central level at the end of the nineties to extend the functionality of TAXIS to end-users. On-line service provision through the relevant website (www.taxisnet.gr) started in the year 2000, the first to provide advanced electronic services in the country, initially to professionals and enterprises (e-filing of VAT forms) and gradually to citizens as well (e-filing of Income Tax forms), together with a set of electronic tools (information for Income Tax assessment, delivery of tax certificates through the use of fax). Nowadays, after four years of successful implementation and a considerable number of users, on-line service delivery by the Organization has passed to a new stage, reflected in the renaming of TAXISnet to e-oikonomia (e-economy) and the recent development of the web portal (http://www.e-oikonomia.gr/), enhanced by an increasing number of web-based applications, aiming to gradually respond to all tax related needs of citizens and enterprises of the country. This is the first step of a major upgrade already underway by the Organization under the 3rd CSF (the relevant Call for Tenders has already been published) and its implementation aims to make use of experience gained in order to achieve a more effective and integrated electronic service provision.

The above procedure has been supported by the on-going adaptation of the legal framework, which allowed the adoption of advanced technological solutions and possibilities and their evolution into reliable electronic services.

3. Specific Objectives

As already stated, extensive use of IT and initial electronic service delivery by the GSIS of the Ministry of Economy and Finance already since the beginning was aiming at providing faster and better services to citizens and enterprises of the country, through the continuous improvement of services provided, the elimination of bureaucratic procedures and of the need for paper work and, finally, the progressive introduction of alternative forms of services. The experience gained from the deployment of TAXISnet, the upgrade of the maturity level of the Organization with regard to electronic service provision and the positive results achieved with regard to both user uptake and the simplification of internal processes have progressively reoriented the strategic focus to the development of an electronic tax office (a 24/7 available one stop shop) that will gradually bring on-line all services provided by the different back-offices of the Organization in order to efficiently cover all tax related needs of citizens and enterprises of the country. To this end, the Organization has elaborated an integrated plan, already approved to be financed by the national Operational Plan for the Information Society in Greece (under the 3rd CSF) and currently at Call for Tenders stage that aims:

*   to further improve service provision to taxpayers (citizens and enterprises),
*   to increase the degree of electronic interaction between taxpayers and the tax system,
*   to save up time and money for both the taxpayer and the Ministry,

- to increase the operational effiecency and effectiveness of the Ministry, and
- to contribute to the development of the digital economy.

Furthermore, in the framework of the aforementioned Call for Tenders, the Organization has set the following objectives with regard to its internal operation:
- the optimal exploitation of its valuable operational resources (operational data, know how),
- the systematic upgrade of the operational capacity of the GSIS for the provision of new services and the improvement of those already provided,
- the systematic development of new channels of service delivery (e.g. C2G, G2G),
- the exploitation of the core expertise developed internally by the scientific staff of the GSIS,
- the reduction of the complexity and of the total cost of ownership (TCO) of the infrastructure, and,
- the reinforcement of the self-reliance of the Organization with regard to development and maintenance of large scale IT projects

Finally, additional targets of the Organization constitute the provision of electronic services through public access points (PIAPs) and in a later stage, their integration with other national and European e-government services.

4. Resources

For the provision of the electronic services, interconnection between the TAXIS integrated computer system developed at central and local level and web applications and databases is necessary. TAXIS' environment is composed of RDBMS Oracle 7.3.4, TP Monitor Tuxedo 6.4. and UNIX operating system, while for the development of applications they have been used NatStar 2.15, COBOL and C languages and PL/SQL. TAXIS enables interconnection between central and local level of the Organization. Local tax offices communicate on-line with the central system through the use of the TP Monitor Tuxedo. Update of the central database by local databases is achieved though the combined use of Tuxedo and a replication mechanism based on RDBMS triggers.

The development of the initial electronic services provided by GSIS in the framework of TAXISnet web site (on-line VAT declaration, on-line income tax declaration) was outsourced. They are using Windows platform, the Microsoft IIS Web Server, the relational database Microsoft SQL Server, the Cold Fusion Application Server and the Microsoft Exchange Server e-mail system.

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 Organization, 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.

Authentication of users is made through a username and a password. This system has not created any major problems in its 4 years of implementation. Alternative forms of authentication (users receiving a PIN number at a local tax office, use of smart cards) are constantly examined by the GSIS, but excessive costs for the Organization and/or end users have not permitted their implementation. Digital signatures are recognized as a future solution, waiting for the consolidation of the recent legal framework permitting their use and the development of the necessary infrastructure at national level. It is noteworthy that compatibility of PKI technologies with all applications that will be developed in the framework of the upgrade of the system is a requirement of the present Call for Tenders. With regard to electronic payment, the Organization is making use of the infrastructure and the services of the Greek Interbanking system DIAS, an initiative of the Hellenic Bank Association, which provides to its member banks automation services of banking operations. The use of the DIAS system, currently enabling on-line payment of VAT through e-banking, has been proved successful and its extension to cover other taxpayers' needs for electronic payment is planned by the Organization.

As far as financial resources are concerned, deployment of the TAXIS Integrated Computer System had an overall budget of €79.735.075, funded under the 2nd CSF. TAXISnet applications have been developed to a large extent from re-usable TAXIS application components, minimizing implementation time and costs. Subsequent improvements of the available services and incorporation of new ones, including the creation of the present web portal, has made use of the Organization's own resources, while, purchase of necessary hardware has been financed by EU programmes funding deployment of infrastructure. The new major upgrade of the system has an overall budget of €15 million, financed in

the framework of the Operational Programme for the Information Society in Greece, under the 3rd CSF. Finally, digitization of internal processes has involved large-scale and continuous training of a significant number of staff members at central and local level, provided by the internal Training School of the Ministry of Economy and Finance (SESYO).

5. Implementation

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 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.

Although, as already stated, initial TAXISnet electronic services were outsourced by the Organization, a group has been established (the Electronic Services Group – TAXISnet) within the GSIS of the Ministry of Economy and Finance, for their daily operation. The formation of the Group has been achieved through better exploitation of the skills and dexterities of the existing staff of the GSIS and redistribution of responsibilities, as no new personnel has been employed. The Electronic Services Group has been staffed by experienced and highly educated members of the personnel of the GSIS and is responsible for the maintenance and upgrade of the applications used as well as for the identification of needs for the provision of more advanced services to citizens and enterprises. Significant user uptake of the electronic services has made imperative the need for the provision of efficient help-desk services, which are also provided by the Electronic Services Group.

The first service offered, addressing a significant number of companies and professionals, was the **on-line VAT declaration service**. Users have to register first by filling an on-line form. Personal data submitted are checked by the system and if no errors are encountered, a personalized e-mail is sent in a short period of time to the user that includes his / her unique password. With their username and password, users are able to submit electronically their VAT declaration. On-line validation of data is provided, limiting possible errors. When users submit their definite VAT declaration, a register number is provided on-line (through a printable page), certifying that their declaration has been received by the service provider. Data submitted are stored in the VAT declarations database linked to the web application and, through replication of electronic files, relevant VAT sub-systems (applications) of local tax offices are updated, which in their turn update the central TAXIS computer system with information on VAT declarations submitted personally at local tax offices.

Possibility of on-line payment is also given through the use of the web site of banks collaborating with the Ministry of Economy and Finance (or through their ATMs network). On the working day that follows the end of the time limit for the payment of VAT, the Greek Interbanking system DIAS updates through an electronic file the database of the on-line VAT application (this procedure involves use of digital signatures). A module of the on-line VAT application compares the amount paid with the sum due, and if the amount paid is equal or larger than the sum due, the process is considered complete and the web application is updated, whereas the credit, if exists, is returned to the user through a bank. Users can check the status of their declaration in the Taxisnet web site through their personal web pages. If the amount paid is smaller than the sum due, users are informed through a personalized e-mail sent to them. In this case, they have to visit the responsible local tax office to pay their debt.

As the above description shows, the provision of the service, apart from the Electronic Services Group (TAXISnet) that monitors and maintains the relevant web application and authenticates new accounts, involves: a) VAT Departments of local tax offices located throughout the country responsible for all further contacts with enterprises and citizens. Relevant subsystems of these VAT Departments update TAXIS central system, and b) through DIAS Interbanking System, a broad number of banks collaborating with the Ministry that updates with payment information the database of the on-line VAT application and, subsequently, linked VAT sub-systems of local tax offices and the central TAXIS system. Figure 1 presents data flow for the provision of the on-line VAT declaration service (an analytical workflow diagram for the provision of the service is presented below).

Figure 1: Data flow for the provision of the on-line VAT declaration service
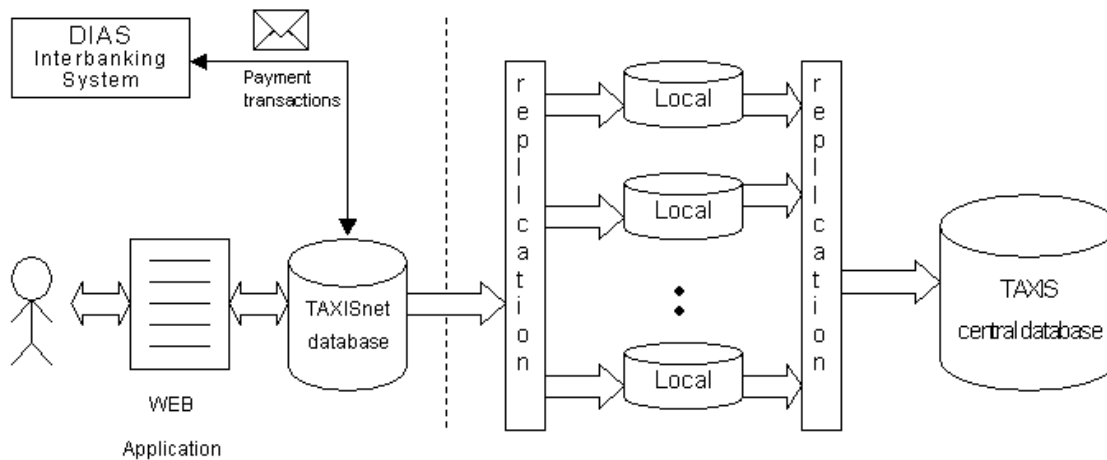

A year later (2001) followed the provision of the **on-line income tax declaration service**, addressing citizens this time. The procedure is similar to that of the on-line VAT declaration service: Users have to fill first an on-line form to register, and when they receive their username and password (registered users of the on-line VAT declaration service are using username and passwords that they already have), they are able to submit electronically their income tax declaration. Electronic service provision had as a result a significant simplification of the overall procedure, as there is no need for users to submit additional documents (income, expenditure and other relevant receipts), although they still have to keep them in their files, just in case they are later invited by the responsible local tax office for a tax compliance control. Possibility to partially submit data, store the incomplete tax declaration and later fill in additional data until definite submission is also given. On-line validation of data is provided, limiting possible errors. When users submit their definite income tax declaration, a register number is provided on-line (through a printable page), certifying that their declaration has been received by the service provider.

Data submitted are stored in a database linked to the web application and they are regularly exported through the use of magnetic means to the application of the Tax Declarations' Assessment Department of the IT Centre of the Ministry of Economy and Finance (K.E.P.Y.O.), where income declarations personally submitted at local tax offices are also collected and assessed. Through this application, tax assessment bulletins (also valid as tax compliance certificates) are printed and sent to citizens by regular mail, informing them on the amount that they have to pay or the tax return that they are entitled to. In the case that tax declarations submitted on-line contain errors, users are informed by e-mail that they have to re-submit them this time at the responsible local tax office, as no possibility of modifying on-line already submitted income tax declarations is yet provided. Finally, the Income Tax Declarations' Assessment application (part of the integrated Computer System TAXIS), updates automatically, by replicating electronic files, relevant income tax sub-systems (linked applications) of local tax offices, which are responsible for all further contacts with citizens, e.g. issuing of tax compliance certificates, upon request by citizens.

The provision of the service, apart from the Electronic Services Group, involves: a) the Tax Declarations' Assessment Department of the IT Centre of the Ministry of Economy and Finance located centrally, which has the responsibility for the assessment of income tax declarations and b) local tax offices located throughout the country. Payment, if required after the assessment of the declaration, is also done at local tax offices or through collaborating banks. Figure 2 presents data flow for the provision of the on-line income tax declaration service (an analytical workflow diagram for the provision of the service is presented in Annex A).

Figure 2: Data flow for the provision of the on-line income tax declaration service
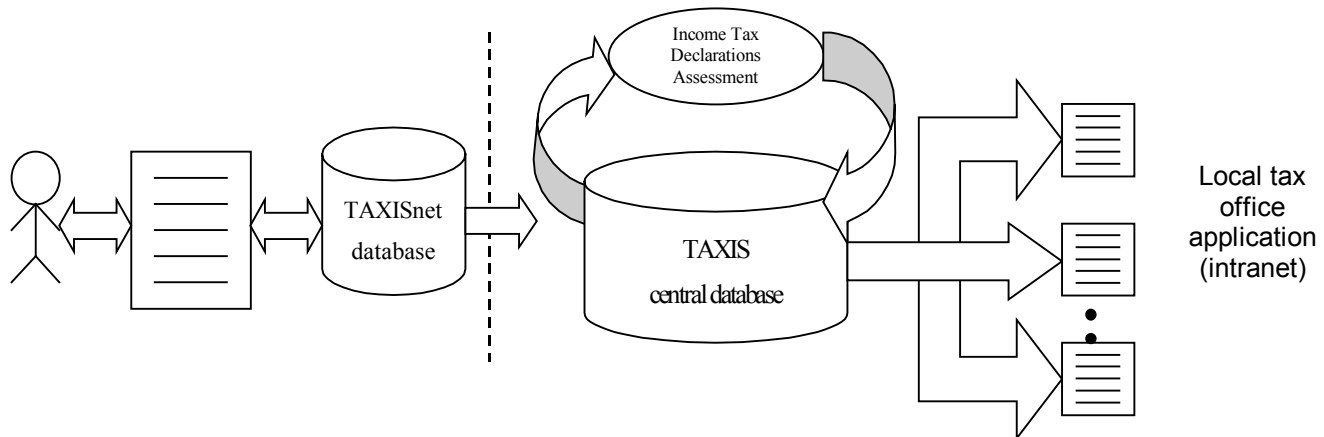
Sufficient bundling elements (data re-use) are encountered, as registered users of the VAT service can use the income tax service with the same username and password after being registered to the new service and vice versa, while personal data of registered users are already filled in when they access a new tax declaration. Aforementioned services are supported by a number of additional on-line services and tools, such as the electronic Income Tax Declarations' Assessment Search Service, informing on-line citizens if their declaration has been assessed or not and if so, whether they have to pay or they are entitled to a tax return (the service is provided to all users, without authentication, and, for that reason, data such as name of the tax payer, amount to be paid, etc are not shown on-line), the e-AFM service, offering possibility to both citizens and companies of verifying if a Tax Register Number is valid and the AFE-NET service (Automatic Tax Compliance), which enables certified agencies and professionals (public organizations, banks, notaries) to receive tax compliance certificates of citizens/enterprises by fax. Finally, extensive information is provided on a variety of taxation related issues as well as the possibility to download and print all kinds of tax forms.

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.

A first part of this evolution process of the electronic service delivery by the Organization is the incorporation of a new set of on-line services and tools internally developed, using to a large extent open source tools, and with an increasing interest on scalability and interoperability with a view to ensuring integration as well as sustainability of services. Together with the initial TAXISnet services they form part of the new **e-oikonomia portal** recently launched by the GSIS, to underline a new generation of more advanced as well as integrated services and tools:

e-K.B.S. (Department of Accountancy Books and Data): It potentially addresses 900.000 enterprises and professionals, and enables electronic submission of the summary list of customers and suppliers invoices. Registered users of on-line VAT declaration service can use it with their username and password without any need for further registration. It provides two forms of submitting data: by uploading a zipped ASCII file (extremely useful since these declarations are normally lengthy) and by filling a web form. Users are also given the possibility to modify on-line submitted declarations. Until recently, lists of customers and suppliers invoices had to be delivered either manually or in a floppy disk at a local tax office, making the exploitation of these data very difficult. The electronic provision of this service allowed the standardization of files submitted, while on-line checks and corrections of data reduce declarations containing errors and facilitate fiscal controls, through easier crosschecking with e.g. income tax declarations. Workflow is similar to that of the VAT service: When users submit their declaration, a PDF file is sent to them, certifying that their declaration has been received. Data submitted are stored in the e-K.B.S. declarations web application database and, through replication of electronic files, relevant databases of the Accountancy Books and Data Departments of local tax offices are regularly updated. The latter also update the central TAXIS computer system with data of K.B.S. declarations submitted personally at local tax offices.

e-Vehicles: The Organization keeps vehicles records and sends circulation tax payment notifications on behalf of Municipalities. e-Vehicles service enables citizens to access on-line these vehicle records of the GSIS and update information or correct possible errors encountered. It can be used by registered users of the other electronic services of the portal without any need for further registration. It aims at reducing unnecessary time and expense for citizens resulting from erroneous data included in the payment notifications as well as improving the quality of the available information for internal reasons (better fiscal controls). It is noteworthy that the workflow for the provision of the service includes an external back office (Ministry of Transportation and Communications), the relevant database of which updates once a month the vehicles database of the GSIS, through the use of magnetic means. Common data structure to allow compatibility of these two databases has been guaranteed by a legislative provision (ministerial decree). Through an export and import procedure, which involves human intervention for its activation, the GSIS vehicles database updates the database of the web application. In its turn, the web application's database updates automatically the GSIS vehicles database, with new data submitted on-line through an application developed for this purpose, which also performs data controls and crosschecking. The overall procedure is presented in the following figure (Figure 3):

e-VIES (VAT Information Exchange System): The service, which has been outsourced by the Organization, is fully available from the 1st of October 2003 after a period of pilot operation, addressing those companies who trade in other countries within the EU (equivalent to the summary list of customers and suppliers invoices' service at European level). On-line submission of VIES declarations is obligatory and aims at providing to the European Union services easier access to relevant files. The workflow of the service follows that of the VAT service: Data submitted are stored in the e-VIES declarations database web application and, through replication of electronic files, relevant databases of local tax offices are regularly updated. Since modifications of VIES declarations can only be submitted at a local tax office, these also update the central TAXIS computer system, by which the Central Liaison Office (CLO) is informed.

e-F.M.A.P. (Tax of Real Estate for big properties): An on-line tool that enables calculation of tax to be paid by those citizens that have the legal obligation to submit tax declarations of Real Estate for big properties. It permits also printing of an indicative tax assessment bulletin. Its aim is to eliminate unnecessary visits of citizens to the local tax offices. Upgrade of the tool to support the actual submission of the e-F.M.A.P. declaration is planned by the Organization.

e-A.P.A.A. (Objective System for the Determination of Value of Real Estate): A downloadable tool that enables calculation of the taxable value of real estate, addressing citizens as well as professionals directly related to real estate value (accountants, lawyers, notaries, etc). It is a spreadsheet programme based on Microsoft Excel that digitizes 15 paper documents of the existing Objective System for the Determination of Value of Real Estate, permits insertion of data, performs calculations and, when printed, it can be submitted with other necessary documents at a local tax office. The GSIS continuously improves the tool to respond to users' needs and there are plans for its upgrade to an on-line service.

Aforementioned services and tools are the first step of the next major upgrade of the system currently underway, aiming at exploiting experience and know-how gained by the Organization. Basic characteristics of this new advanced stage, as described in the present Call for Tenders, are:
- progressive incorporation to the system and the on-line provision of all tax declarations covering the totality of citizens, professionals and enterprises' needs for transaction with the tax system,
- possibility of requesting and receiving on-line all kinds of tax related certificates and tax compliance bulletins,
- possibility for citizens, professionals and enterprises to monitor on-line the stage of their application,
- possibility for users to modify on-line all personal data stored in the Tax Registry of the Ministry of Economy and Finance,
- fully automatic communication between web databases and TAXIS central system databases that until now, for security reasons, require human intervention to trigger the data transfer applications,
- creation of a central integrated users authentication and administration application,
- full interoperability between applications to be developed as well as with the existing system

From the above it is made evident that the GSIS, by identifying needs and addressing past weaknesses, has now the required maturity and has ensured the necessary human and financial resources for the provision of a new generation of one stop services through the Internet. An example of this new stage is the internally developed **e-income service** that will replace existing TAXISnet on-line income tax declaration service. The new service, until recently available on-line for a trial period and already tested by 22000 users, is significantly improved, incorporating the income tax assessment application and at pilot stage enabling printing of an indicative tax assessment bulletin (when it will be fully operational, it will permit also printing of a valid assessment bulletin as well as of a tax compliance certificate. It provides also the possibility to those users that have to submit additional income declarations (such as income coming from real estate) to do it at the same time with the main income tax declaration (currently users are given the possibility to submit on-line such additional declarations but at a later time).

Figure 3: Data Flow of the e-Vehicles service
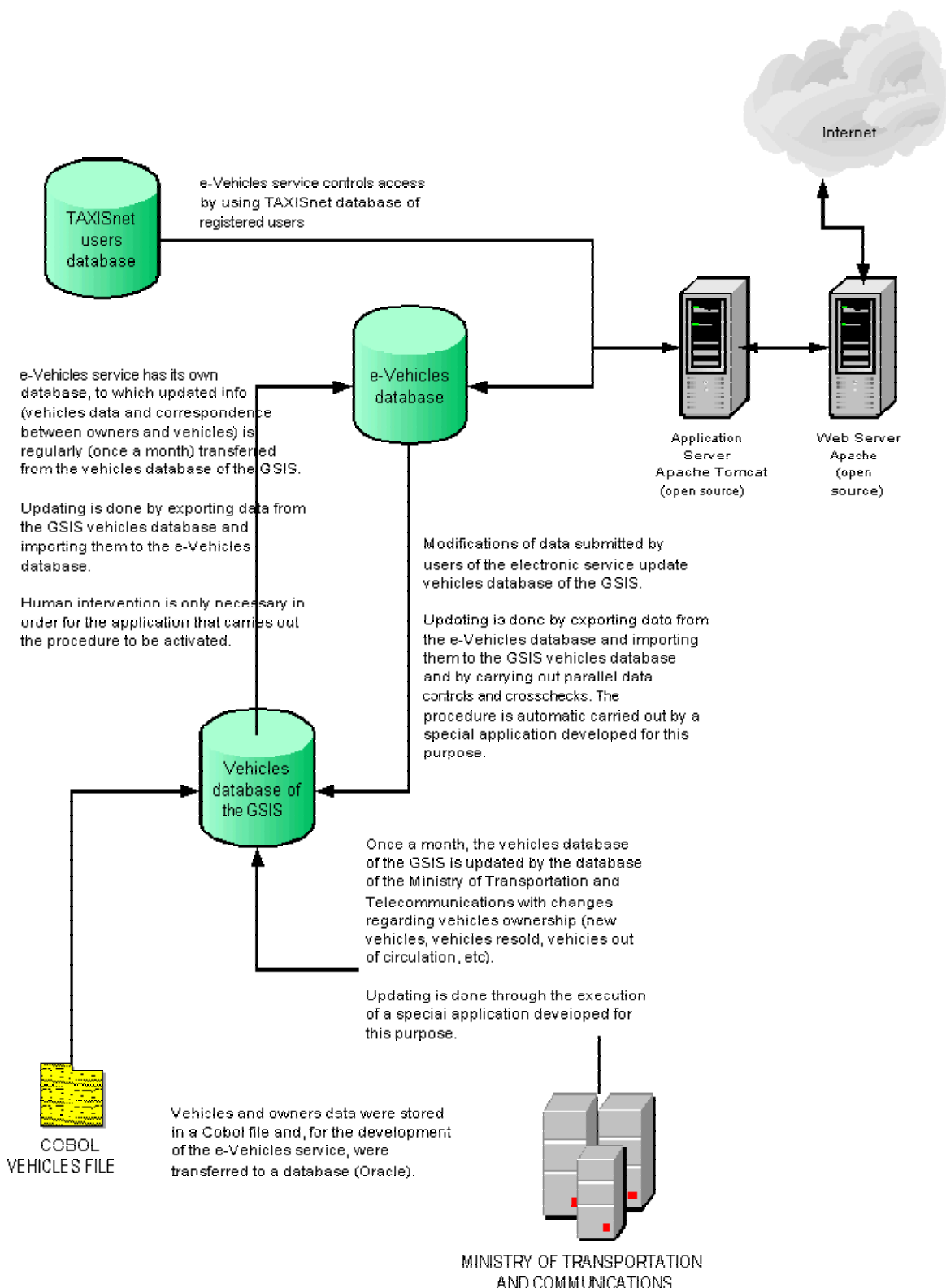
6. Results

Electronic services provided by the GSIS of the Ministry of Economy and Finance have achieved a significant level of user uptake in the first four years of on-line availability, especially taking into consideration relatively low computer literacy and Internet penetration percentages in Greece. Since they were the first advanced services to be provided on-line in the country, they have played a significant role in the "education" of both citizens and enterprises on the use of electronic means in order to interact with the public sector and their operation without major problems is continuously contributing to the elimination of the image of public agencies as bureaucratic organizations.

Uptake figures are higher among business users and professionals directly related to the tax system (e.g. accountants), since they are normally more familiarized with the use of computers and the Internet while possibility of on-line tax declaration obviously removes a significant part of their workload. It is noteworthy that on-line VAT declaration service has currently (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. The largest the size of the company, the highest the use of the electronic service (large companies are only given the possibility to submit VAT declarations on-line), as shown in the following figure that represents fiscal categories:

Figure 4: Percentage of professionals and companies
that submit VAT declarations on-line (data: July 2003)
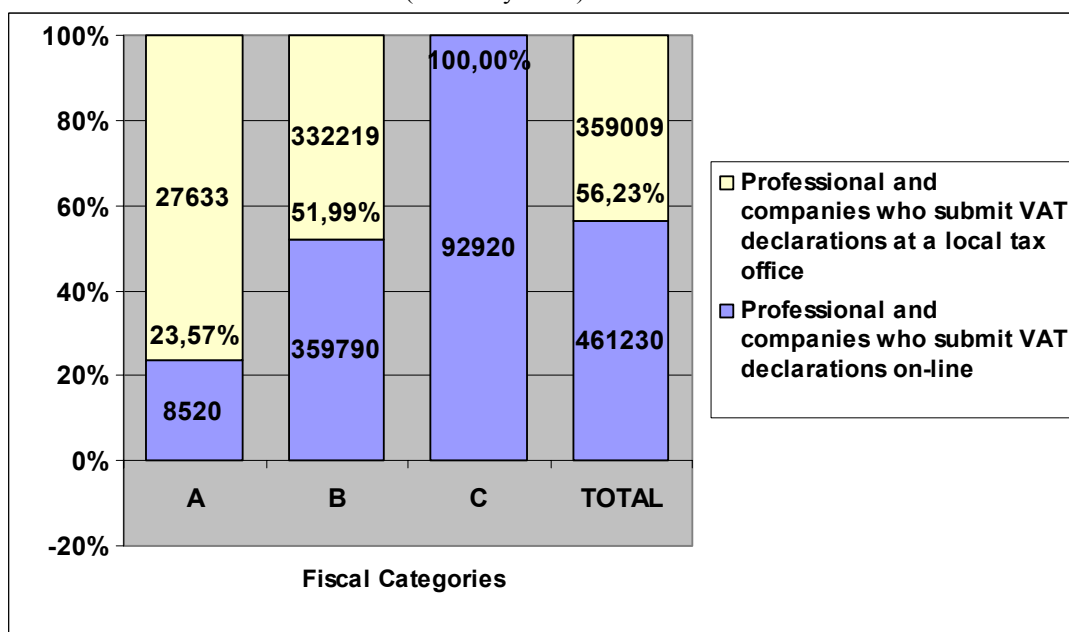
With regard to citizens, although numbers are obviously lower, uptake and usage figures are increasing at a fast rate. Income tax on-line declaration service now in its third year of availability has currently (October 2003) 404.852 registered users out of approximately 4.500.000 persons that have the legal obligation to declare income tax. The number of persons that actually submitted on-line their income tax declaration has increased from 30.000 persons in 2001 to 142.000 in 2003, as shown in the following figures.

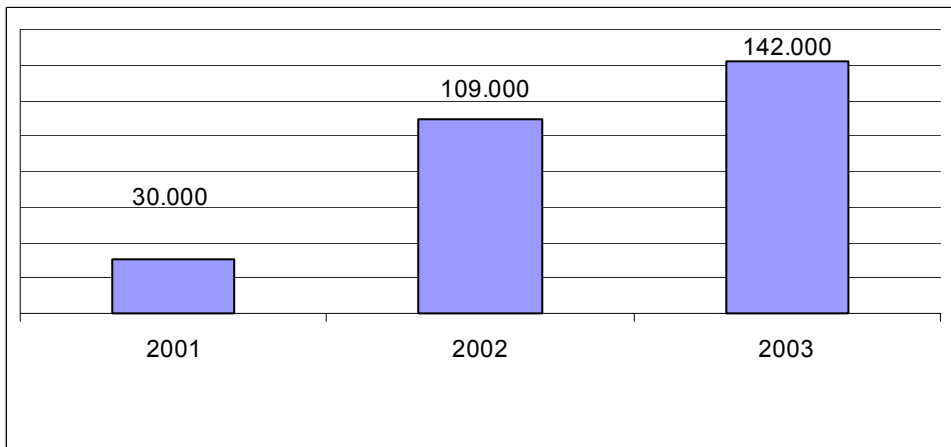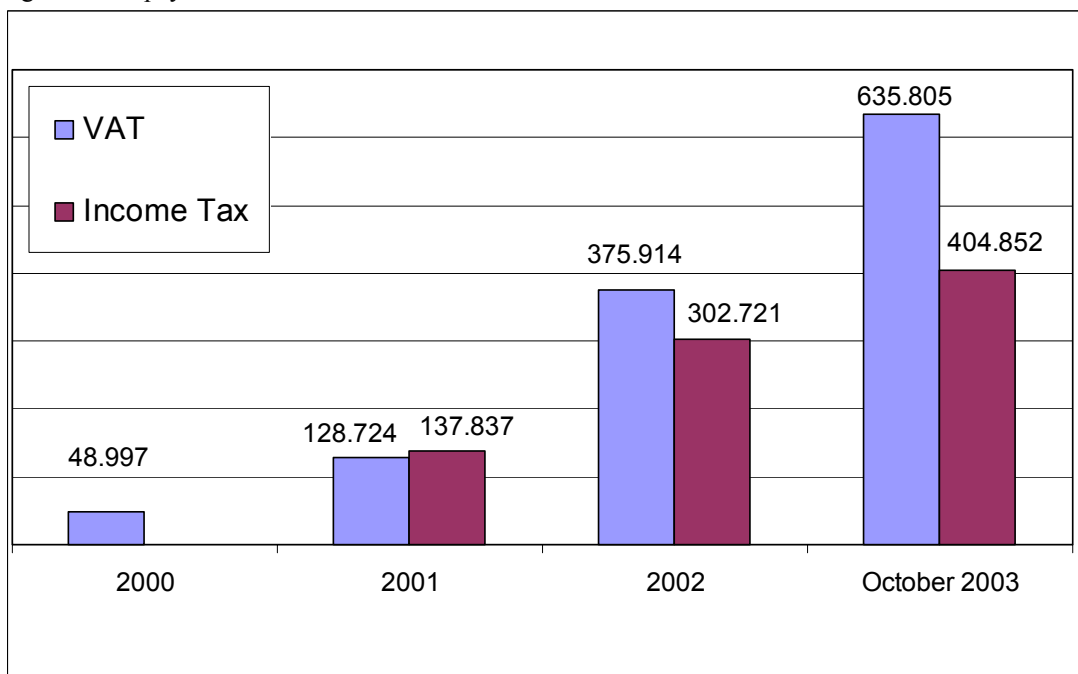Figure 5: Income Tax declarations submitted electronically

Figure 6: Taxpayers subscribed to TAXISnet services

In addition, new services provided on-line in the framework of the e-oikonomia portal, despite their limited time of availability, show remarkable figures of user uptake, a fact proving that they respond to real needs of taxpayers and that the Organization has achieved a critical mass of end users. It is noteworthy that GSIS has already received almost 80000 on-line e-K.B.S. declarations, while the new service "e-vehicles" has had 10.188 users, of which 321 have modified on-line data concerning their vehicles in the period July 15th to September 30th 2003.

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.

Electronic service delivery had also significant benefits for the internal operation of the Organization, since releases the congestion in local tax offices, disengages available human resources and, consequently, improves the quality of the services offered. In addition, significantly less time is necessary for the assessment of tax declarations received electronically. As a result, the productivity of GSIS steadily increases over these last years, as shown in the following figure (Figure 7).

Figure 7: Assessed income tax declarations until the end of July of each year
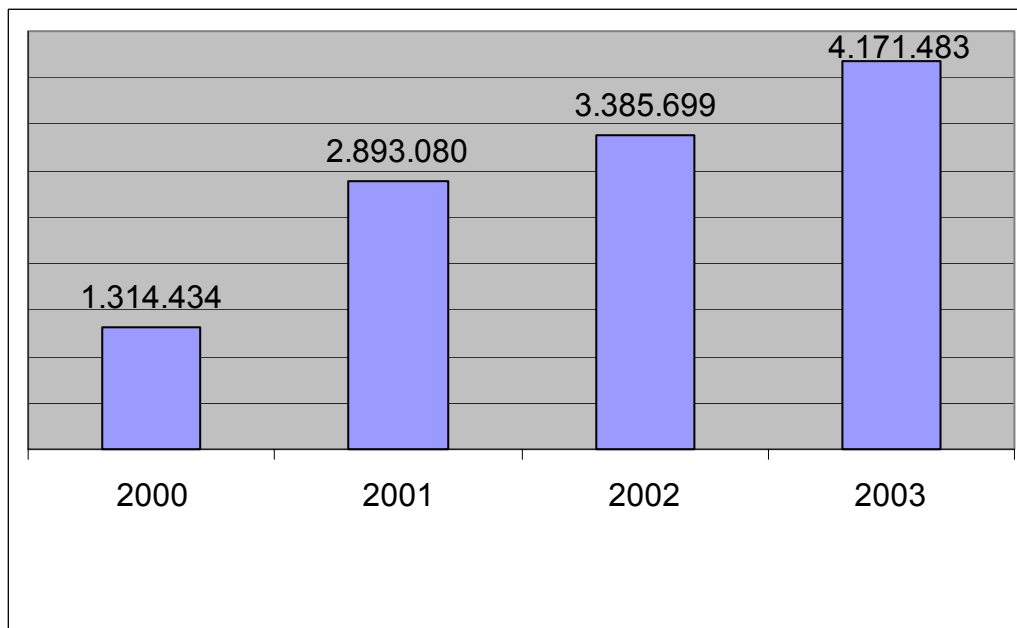
Furthermore, continuous improvement of applications and of the control procedures of received declarations (e.g. declarations submitted through the Internet are crosschecked and validated on-line indicating to users possible errors), has as result improvement of the quality of the assessment process and a remarkable reduction of tax declarations containing errors over the last years, as shown in figure 8:

Figure 8: Income tax declarations containing errors
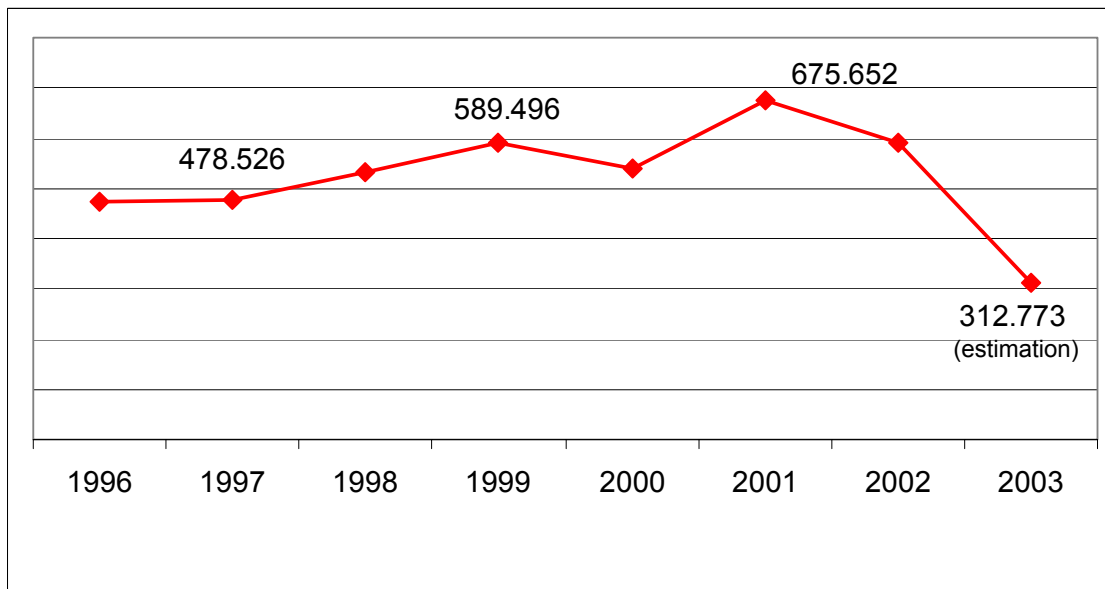
Finally, electronic service delivery had significant benefits on the improvement of the quality of the overall records of the Organization, providing upgraded possibilities for carrying out more efficient fiscal controls. By taking into account the above, the Organization gradually simplifies and improves procedures and eliminates certificates to be submitted, reducing workload for its employers and facilitating citizens and enterprises' transactions with the tax system. This contributes to the development of a two-way trust relationship between the Organization and the Citizen.
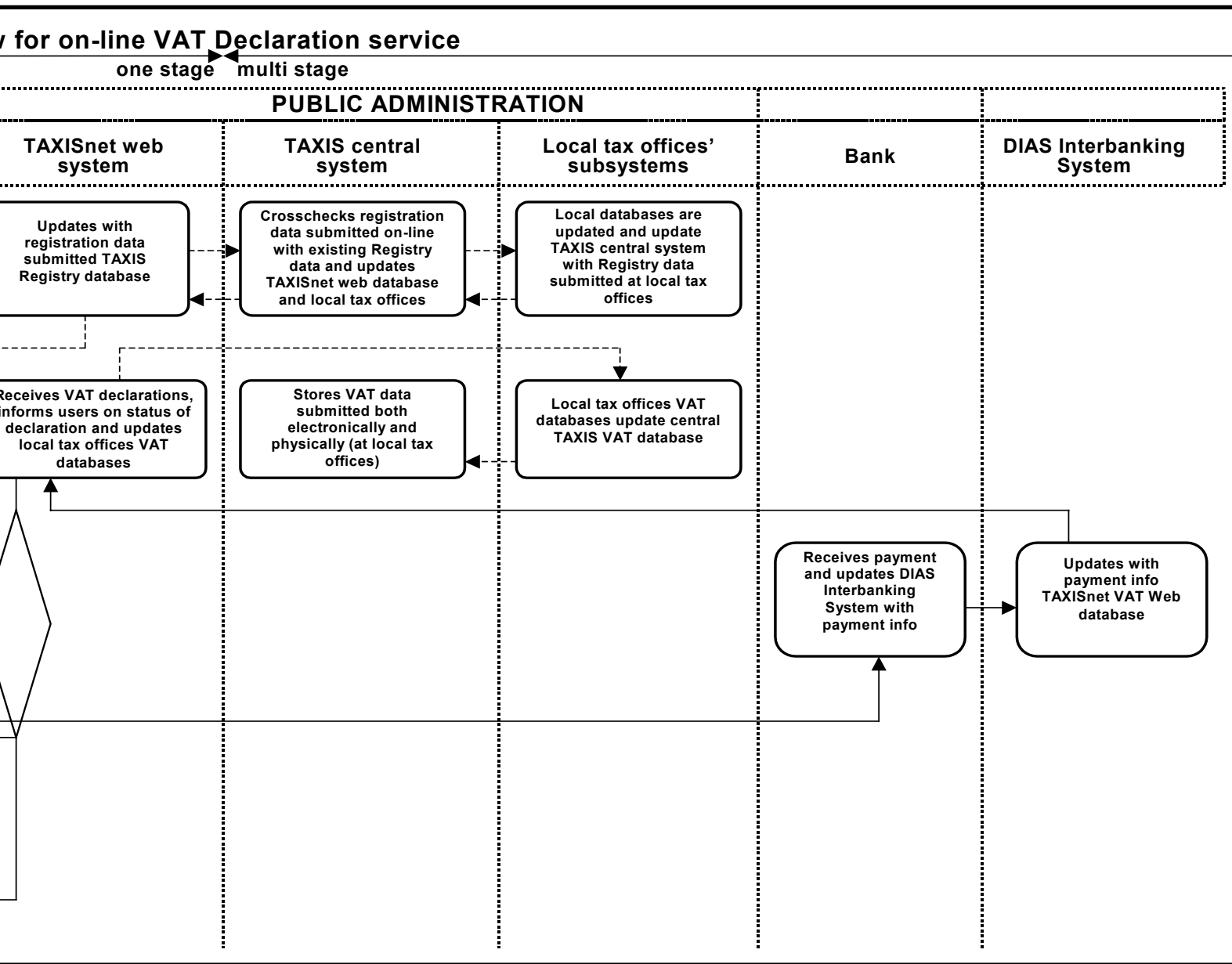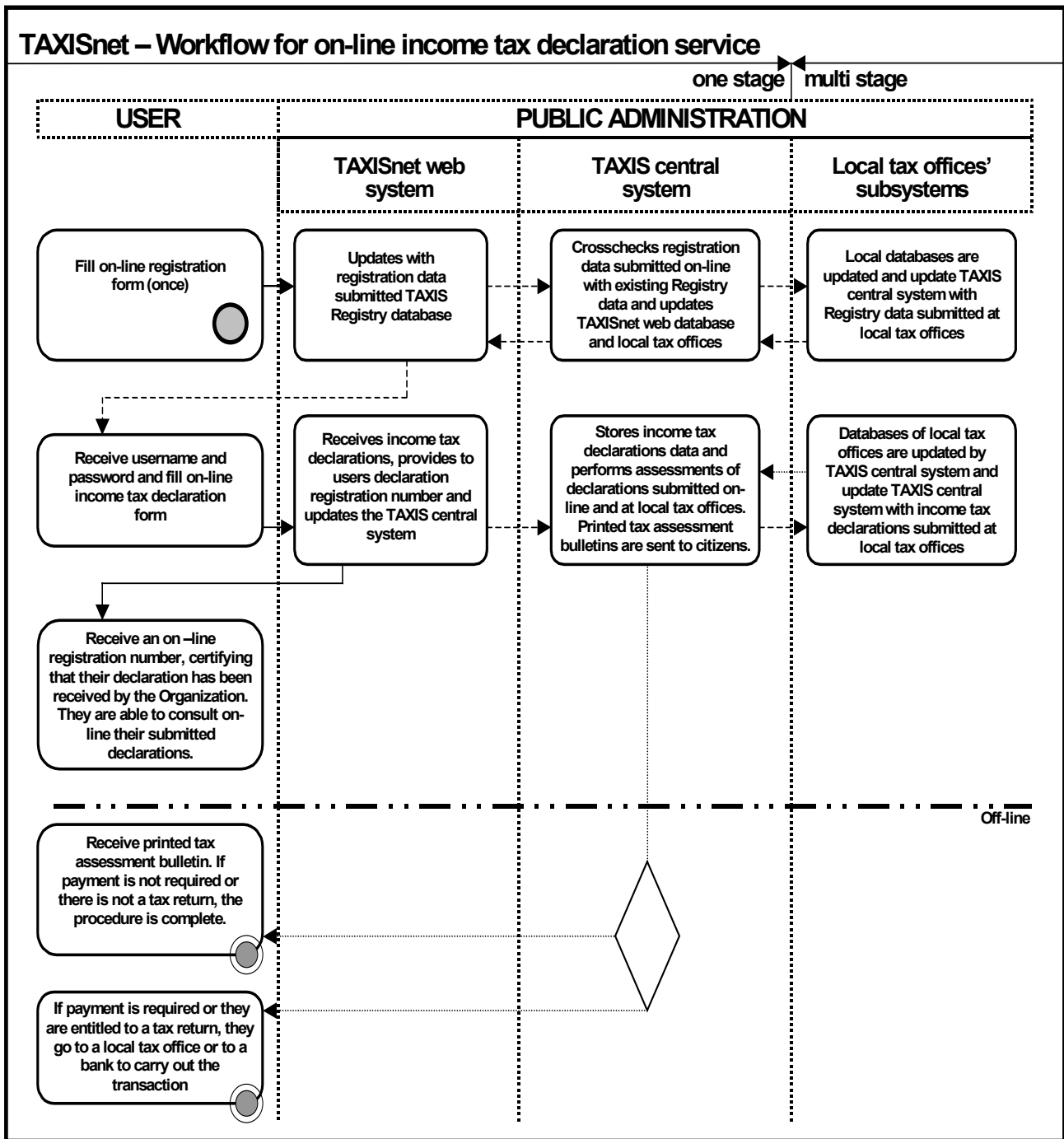
7. Learning points and conclusions

The most interesting aspect of the electronic service delivery by the GSIS of the Ministry of Economy and Finance is the evolution process of the Organization for the provision of the electronic services and the interrelation of this evolution process with the re-organization of its internal work processes and flows. With a view to providing direct benefits to citizens and enterprises, electronic service delivery started as an extension of the functionality of the large scale IT infrastructure previously developed in the Organization. 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. Experience and know-how gained through the daily operation of these applications, weaknesses identified and a remarkable rate of users uptake have made obvious to the 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.

Four years of experience in electronic service delivery have pointed out, as stated by Mr. Kostas Papadimitriou, General Secretariat of the GSIS of the Ministry of Economy and Finance, **the importance of creating the necessary procedures/mechanisms** within the Organization for the support, monitoring and improvement of services provided on-line. **Outsourcing** cannot be successful, unless private companies assume full responsibility of the service (including development, maintenance, monitoring, upgrade and users' support) or mixed work groups are formed, composed of dedicated executive staff of the private company and the public agency. 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. 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. Reference and Links

http://www.e-oikonomia.gr/: online services, general information regarding electronic services as well as the overall services provided by the Ministry of Economy and Finance and statistical data on the uptake of the electronic services.

v for on-line VAT Declaration service

one stage   multi stage

PUBLIC ADMINISTRATION

TAXISnet web system	TAXIS central system	Local tax offices' subsystems	Bank	DIAS Interbanking System

Updates with registration data submitted TAXIS Registry database

Crosschecks registration data submitted on-line with existing Registry data and updates TAXISnet web database and local tax offices

Local databases are updated and update TAXIS central system with Registry data submitted at local tax offices

Receives VAT declarations, informs users on status of declaration and updates local tax offices VAT databases

Stores VAT data submitted both electronically and physically (at local tax offices)

Local tax offices VAT databases update central TAXIS VAT database

Receives payment and updates DIAS Interbanking System with payment info

Updates with payment info TAXISnet VAT Web database

TAXISnet – Workflow for on-line income tax declaration service

one stage | multi stage

USER	PUBLIC ADMINISTRATION		
	TAXISnet web system	TAXIS central system	Local tax offices' subsystems

Fill on-line registration form (once)

Updates with registration data submitted TAXIS Registry database

Crosschecks registration data submitted on-line with existing Registry data and updates TAXISnet web database and local tax offices

Local databases are updated and update TAXIS central system with Registry data submitted at local tax offices

Receive username and password and fill on-line income tax declaration form

Receives income tax declarations, provides to users declaration registration number and updates the TAXIS central system

Stores income tax declarations data and performs assessments of declarations submitted on-line and at local tax offices. Printed tax assessment bulletins are sent to citizens.

Databases of local tax offices are updated by TAXIS central system and update TAXIS central system with income tax declarations submitted at local tax offices

Receive an on –line registration number, certifying that their declaration has been received by the Organization. They are able to consult on-line their submitted declarations.

Off-line

Receive printed tax assessment bulletin. If payment is not required or there is not a tax return, the procedure is complete.

If payment is required or they are entitled to a tax return, they go to a local tax office or to a bank to carry out the transaction

Ireland

Case 17
Citizen family allowances:
eEnabled child benefit service

1. Executive Summary

This case focuses on the eGovernment developments that have enabled the process of claiming child benefit[49] 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.

Before the new e-enabled service became available, the parent(s) of a new baby had to get and complete an application form and submit this with a copy of the child's birth certificate in order to apply for child benefit. Forms could be completed at home and posted or completed in the offices of the Department of Social and Family Affairs (DSFA), the Government Department responsible for the administration of child benefit. The application form is also available online at the DSFA's web site from where it can be downloaded and printed or ordered online for physical delivery by post if preferred. This facility will continue to be useful for customers who live in an area where the main new enabling facility (electronic notification of birth registrations to the DSFA) for the automatic claim initiation process is not yet in operation or whose children are born outside the state.

Three inter-linked developments have been central in enabling the new automatic/pro-active child benefit service to be provided. Firstly, on the DSFA side, new technology was introduced and a significant programme of Organisational Change took place in 2001 and 2002. Apart from providing many improvements in 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 the conduit for exchange of data, such as electronic notification of birth registrations, between agencies.

As of mid-September 2003, the new child benefit service has 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 is expected to be completed within 6-months to a year.

The e-enabled Child Benefit service is the first example in Ireland of e-enabling life events data for the benefit of both customers and the public service providers.   A major initiative - the Public Service Broker - is currently under development with a view to fully leveraging the potential of eGovernment in this regard.

2. Background

Child Benefit is a payment made to parents in respect of the child or children that they care for. To qualify, the child must be less than 16 years old or, if aged between 16 and 19 years, must be in full time education or training or be physically/mentally dependant on the parent. Child Benefit is currently being paid in respect of more than one million children, with more than 50,000 claims for new births and a variable number of claims by new residents every year.

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

Prior to the development of the new e-enabled service that is the focus of this case study, the customer applied for Child Benefit by completing and signing a paper application form. The form was available to customers from the Child Benefit Section, the Department's Network of Local/Information Offices, the Department's Web Site, Post Offices, Citizen Information Offices and in the 'Bounty Pack' (an information pack issued to mothers in Maternity Hospitals).

The customer had to attach a long original version of the baby's Birth Certificate to the application.   This Birth Certificate had to be obtained from the Registrar's Office in the area the baby was registered.

On receipt of the application, the DSFA's Deciding Officer first checked that it was completed properly and that the Birth Certificate was attached. If further information/documentation was required a request letter was issued to the customer. If the application was in order the Claim was registered by the Deciding Officer on the Department's Central Records System (CRS) and awarded the following day on the Child Benefit (CB) system. Once awarded the claim was then passed to Clearance section for payment.   Once the payment was awarded a Personal Public Service Number (PPS No.) was allocated for the baby overnight by the system. A payment letter was then issued to the mother. The target for Child Benefit section was to Process 90% of claims within two weeks of receipt of application.

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 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).

Department of Social and Family Affairs (DSFA)

The developments in the Child Benefit service are occurring within the framework of the DSFA's major new Service Delivery Modernisation (SDM) programme. The SDM was developed following an extensive examination of how best to deliver services in the future. It is an ambitious multi-year programme of change using modern technology and business models to achieve a transformation of processes and services.

As part of the SDM initiative, the Child Benefit system was redesigned within the new overall Expressive Naked Object Architecture (NOA) framework that was adopted by DSFA. The NOA based IT system being introduced by the DSFA is a flexible, agile and responsive platform upon which to build applications to meet business needs and is a key enabler of the SDM. A parallel programme of Organisational Change was also implemented. The project was initiated in February 2001 and implemented in November 2002. An important aspect of the redesign of the Child Benefit system was the planned interfacing with the wider eGovernment Inter-Agency Messaging and Public Service Broker projects.

Civil Registration

The General Register Office (GRO), Department of Health and Children, which was set up in 1845, is responsible for the collation and custody of records of all births, deaths and marriages in Ireland**.** The Office produces certificates for customers on request and these are required for many public services (e.g. old age pensions, passports, driving licences and child benefit). There are somewhere in the order of 104,000 life events per year in Ireland (i.e. births, marriages and deaths) of which about 50,000 are births. Approximately 400,000 certificates are produced per year, of which about 250,000 are birth certificates. Overall, there are about 1.2 million searches/queries of the records per year.

Until recently the registration of births and the production of certificates has been largely paper-based, with the manual procedures being inefficient and cumbersome and causing difficulties for the administration of the service and for the provision of a quality customer service. The Civil Registration Modernisation Programme was initiated early in 2001. It involves computerisation and modernisation of the functions of the GRO and is a key part of the overall Modernisation Programme for Government.

In Phase 1 the concentration was on improving customer service, introducing a new registration computer system, defining roles, responsibilities and authority, providing wider access to civil registration data across the Public Service and enactment of a new body of legislation. In Phase 2 the focus will be on the development of external access and services via the Internet to facilitate a wider group of customers.

Inter-agency linkages (Reach)

Reach is a key national eGovernment initiative that was set up to develop a joint coordination and consultative mechanism for e-Government projects with the ultimate aim being the delivery of services through a comprehensive "Public Service Broker" (PSB). This Broker will provide appropriate and secure multi-level access for both clients and public agencies to a common repository of relevant client information. Reach works with the central agencies responsible for the overall Irish policy on e-Government - the Information Society Policy Unit of the Department of the Taoiseach and the Centre for Management and Organisation Development in the Department of Finance.

Reach is managing the process of developing the planned Public Service Broker in Ireland. The Inter Agency Messaging Service (IAMS) was developed as an interim solution in the absence of the PSB.

3. Objectives

The specific case of e-enablement of the Child Benefit service is part of a wider 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, of a Personal Public Service Number (PPS No.) to a child on receipt of electronic notification of a birth
- automated processing of Child Benefit claims following allocation of the PPS No.
- 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 (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 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.

Each of the three agencies involved also had more specific objectives, related to their core businesses, in respect of the back-office re-organisations and/or IT system developments that contribute to this new e-enabled Child benefit service. These are outlined briefly below.

Department of Social and Family Affairs (DSFA)

The redesign of the Child Benefit system was just one part of the DSFA's new Service Delivery Modernisation (SDM) programme, which is implementing the objectives of the DSFA's Strategy Statement 2001-2004. Delivering income supports and other services, to the highest standards, in co-operation with other relevant agencies was a key goal in the Strategy Statement. The objective was to deliver continuous improvement in quality customer service by:
- placing the customer at the centre of the process
- adopting a proactive approach to customer service
- completing transactions at first point of contact
- enabling differentiated responses - personalised case management for customers with complex needs and automated transactions for those availing of services based on fixed rules and entitlements.
- allowing access to services via the phone and in person at the Local Office network
- enabling the Internet to become a primary delivery channel initially for information services but increasingly for personalised transactions
- increasing efficiency and effectiveness

- ensuring effective control of fraud and abuse
- ensuring business continuity.

These objectives were to be progressed through the Service Delivery Modernisation (SDM) by changing IT systems, business processes and organisational structures. This approach would be underpinned by significant investment in new technical architecture, providing organisational agility to adapt to changing business requirements and facilitating more customer centred services while also facilitating the e-Government Strategy.

The strategy was to apply this model to the Child Benefit (CB) scheme and extend to other schemes over a 10-year period. This strategy underpinned the goals and objectives of the IT and Organisational Change projects in CB.

The overall objectives of the redesign of the Child Benefit system (CB) were to replace a legacy system operational since 1983 with a system based on Naked Object Architecture (NOA) based IT system being introduced by the DSFA. The aim was to exploit the new functionality and opportunities for organisational agility offered by this new architecture. Specific objectives of the new CB system were to:
- maximise / facilitate the full use of the functionality of the new NOA system
- utilise the DSFA's central database as the repository of customer data
- support multi-functional team working
- facilitate more efficient work processes e.g. "One and done" claim set up, decision and payment in one transaction by one officer
- significantly reduce claim processing times
- enable personalised correspondence with customers
- enable secure certification of entitlement using officer's digital signature (PKI)
- provide online audit check facilities.

Civil Registration service (GRO)

The overall objectives of the modernisation and redesign of the civil registration (GRO) services were to improve customer service through:
- delivering on the Government's objectives of providing more convenient access to services and information
- streamlining the administration of the civil registration services - redefinition of roles, responsibilities and authority to improve the legal adequacy of data, processes and procedures
- provide an enhanced customer service by allowing for the registration of events and the production of certificates in the customer's district of choice rather than in the specific district in which the event occurred
- reduce the reliance on paper certificates for Government services purposes through the electronic sharing of life event data
- use of life event data to provide seamless integration of services across Government agencies (e.g. in the case of Child Benefit claims)
- use modern technology to radically transform the way that services are provided for the customer (e.g. browser based)
- provide a platform for external access and services via the Internet for customers
- streamline the administration of schemes/services - use life event data to trigger the review of continued entitlements under various Government programmes
- enact a new body of legislation to underpin the modernised civil registration service and process.

Inter-agency linkage and data sharing (Reach)

The IAMS was developed by Reach as an interim solution to enable inter-agency linkage and data sharing whilst awaiting the availability of the planned Public Service Broker (PSB). The ultimate objectives of the Public Service Broker are to:
- develop and implement the technological infrastructure for eGovernment in Ireland
- personalise services so that services are centred on the individual needs of the customer and his or her preferences
- provide choice and convenience - customers will be able to choose the time and place which best suit them
- reduce/eliminate the need for repeated requests for personal information and repeated form-filling by customers
- simplify the access to services and information by allowing self-service over the Internet
- enable integrated delivery of public services to the customer through a single access point, a "virtual" one-stop-shop.

The specific IAMS objectives were to:
- broker the exchange of customer-related information between agencies in accordance with standards developed by Reach
- identify architectural and interoperability issues in the context of the future Public Services Broker (PSB).
- ensure technological compatibility with the future PSB.
- demonstrate the integrative potential of a "hub architecture" for information-sharing/data exchange and ultimately, service delivery across the Irish public sector.
- develop data and messaging standards.
- identify the business issues that could arise in the future between Reach and other agencies.
- harvest the life event information being exchanged in order to provide future PSB services.
- foster communication and confidence between participating agencies and Reach.

4. Resources

DSFA systems

ICT resources
As already noted, DSFA has implemented a Naked Object Architecture (NOA) through which it expects to significantly increase its organisational agility in terms of its ability to cope with change both at macro and micro levels i.e. its ability to adopt new schemes in accordance with Government policy and its ability to change and adapt existing schemes and applications. Organisational agility includes strategic, technical and operational agility.   The first implementation of this architecture was for the Child Benefit scheme, which went live in November, 2002.

The Naked Object Architecture implements a Business Object Model of DSFA wherein everything relating to the business is represented by an "object" (e.g. customer). A class definition identifies the information associated with it (e.g. name, address) along with the functions and operations that apply to it (e.g. adding a new case for a customer).

Users interact directly with these core business objects. DSFA believes that this approach not only results in a more natural user interface, but is also critical to the achievement of the micro-level agility referred to above. Further information on Naked Objects can be found at www.nakedobjects.org.

DSFA has implemented the Naked Object Architecture in a modern, multi-tiered, client/server architecture, which achieves the clean separation of the front-end, business logic and data layers. The architecture is implemented on a Windows 2000 platform through a standard browser, using Java applets at the front end, COM+ components (written in Visual Basic) in the middle tier, and Microsoft SQL Server in the data tier.

The User Interface is implemented at the user's computer. Business objects, with their attributes and methods, are presented to the user through a standard web browser (currently Microsoft's Internet Explorer with Java2 plug-in), using Java2 applets. The web server is Microsoft's Internet Information Server (IIS) version 5 running on a 2-node Windows 2000 Network Load Balanced Cluster.

The browser communicates with the web server by sending XML text strings across HTTP. An Active Server Page (ASP) script on the web server channels XML between the user's browser and the COM+ objects in the Business Logic Layer.

The Attunity Connect product from Attunity Ltd. facilitates integration with legacy Departmental systems running on Compaq's OpenVMS platform. A separate Reports Server (Windows 2000 Server) is deployed with the "Business Objects" reporting tool to cater for all reports requirements. Further integration with central Corporate IS Services takes place in the areas of Email Services, Certificate Services and Test Services.

The functionality to facilitate the automated processing of GRO notified birth registrations was implemented on the CB NOA application during 2003. The cost of consultancy support to implement the changes was €75,020 including VAT. No additional hardware was required for this implementation.

Human resources

In terms of human resources, the project was overseen by a Project Board made up of members from DSFA and Dept. of Finance. The two parallel projects, namely, the development of the new IT system and the Organisational Change programme were managed by two project sponsors.   Project managers had responsibility for the following teams:

- Change Management team (5 team members supported by Price Waterhouse Cooper consultants)
- Training Team (comprised 4 members of the SDM data Clean-up and Change Management Teams) - over 90 staff were trained for the new CB system.
- User testing team (Supported by the Department's system developers and Fujitsu Consultants) and Data clean up team (about 17 people) which were supported by the Department's CIS unit
- Fujitsu Consultants working with staff on the development of the system and user testing.

Civil registration (GRO)

The cost of Phase 1 Implementation of the Civil Registration Modernisation Programme was €9.3 million, made up mainly of hardware, software, network, training, printing and consultancy fees.

The technical solution is a three-tiered web-based OLTP system built on the Microsoft platform. It uses leading Microsoft technologies including Windows 2000 Advanced Server, Internet Information Server 5.0, Microsoft SQL Server 2000, Microsoft BizTalk Server 2000 and Microsoft Message Queue. The technical solution also employs the Avanade Connected Architecture (ACA) (a joint venture between Accenture and Microsoft). The solution is a "thin-client" application, which has the advantage of enabling quick and efficient rollout to registration offices nationwide.

In terms of human resources, the Modernisation programme is overseen by a Steering Committee made up of representatives from various Government Departments and Agencies. The programme is managed by a Programme Management team (9 people), headed by a Programme Director and made up of representatives from the DSFA, the Department of Health and Children and Accenture, who were retained as consultants. The programme consists of four separate and interlinked projects: Legislation, Organisation, Technology and Historical Data Capture, with all projects reporting to the programme director.

The Programme Management team combines a mix of change management, project management, business and technical skills and is drawn from senior and middle management grades. Accenture, who were in the Technology and Organisation projects, provided personnel with skills in programme management, change management, process design, system development and training.

The Historical Data Capture team (about 40 people) provided skills in microfilming, scanning, database and networking technologies. The Legislation team (4 people) provided skills and knowledge in the drafting and enacting of legislation.

Also relevant in relation to resources are the systems being developed in some of the larger Maternity Hospitals to link their Patient Administration Systems (PAS) to the GRO system to enable automatic notification of births to be made.

IAMS

The Department of Agriculture and Food (DAF) hosts the IAMS at their HQ in Dublin. IAMS is a 'Service oriented Architecture' built around open standards, reliable messaging and web technologies. It consists of a core and attached channels - current channels being BizTalk and HTTP. Other channels can be added at low cost as the need arises, taking account of existing investments by agencies. The functions of the IAMS core include validation, transformation, audit, logging, routing, distribution, load balancing, security and fail over. The GRO and CIS already had BizTalk servers and access is also provided for the Central Statistics Office (CSO) using a HTTP channel.

Software involved includes:
- PropelX (Propylon product)
- Tomcat
- Jboss
- MySQL
- OpenLDAP
- Microsoft Biztalk.

5. Implementation

The 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 CB 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.

This latter aspect is the main focus of the rest of this section. The schema on the following page describes the main features of this e-enablement of the new Child Benefit service.

Within the DSFA, a variety of back-office systems are involved in making this proactive and/or automatic child benefit service possible, including the Child Benefit (CB) system and the Central Record System (CRS) that deals with the allocation of Personal Public Service Numbers (PPSNs) to customers.

The Central Record System (CRS) assigns and maintains a unique identifier, the Personal Public Services Number (PPSN), and an associated public services identity data set. On receipt of the birth registration details (from GRO via IAMS or otherwise), the CRS automatically assigns a PPSN and sets up the public services identity data set for the baby. It also links the baby with the parent(s) - the birth registration includes the parent(s) PPSN where it is provided as part of the registration process. The baby's PPSN is forwarded to the Child Benefit system and also to the GRO where it becomes part of the civil registration record. In certain circumstances parents (or others) may indicate that they do not want to receive any communication from official sources in respect of the birth of the child. In these circumstances the birth registration record is marked as 'sensitive' by the GRO system. On receipt of 'sensitive' records CRS will allocate the PPSN for the child but will not enter into any correspondence with the parent and will not notify the child benefit system of the birth.

What happens in Child Benefit on receipt of the baby's PPSN 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.
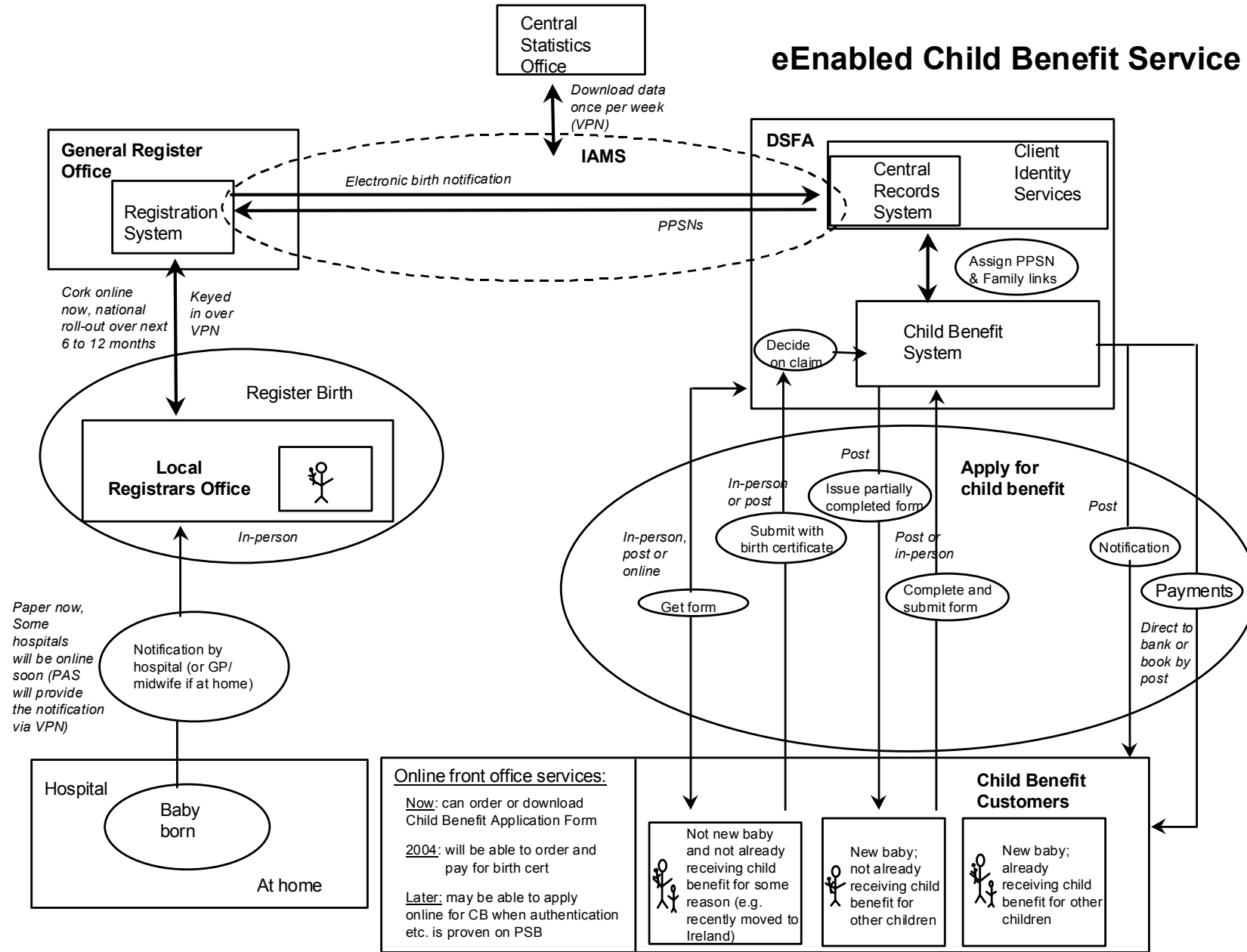
This e-enablement of the Child Benefit service also depended on developments in other agencies. On the birth registration side, the agencies and systems involved include the maternity hospitals, local Registrars Offices and the central General Register Office and system (GRO). Various back-office, digitisation and eGovernment developments are leading to a more efficient registration process.

Births are registered in a two-stage process. First, a Birth Registration Form is completed by the designated person in the maternity hospital or by a doctor/midwife in the case of a home birth. This is forwarded to the local Office of the Registrar. Some of the larger maternity hospitals will soon be linking their Patient Administration Systems to the GRO system to automate this aspect of the notification of births.
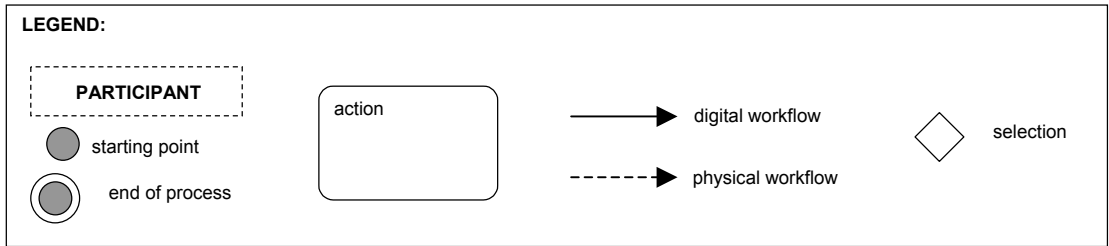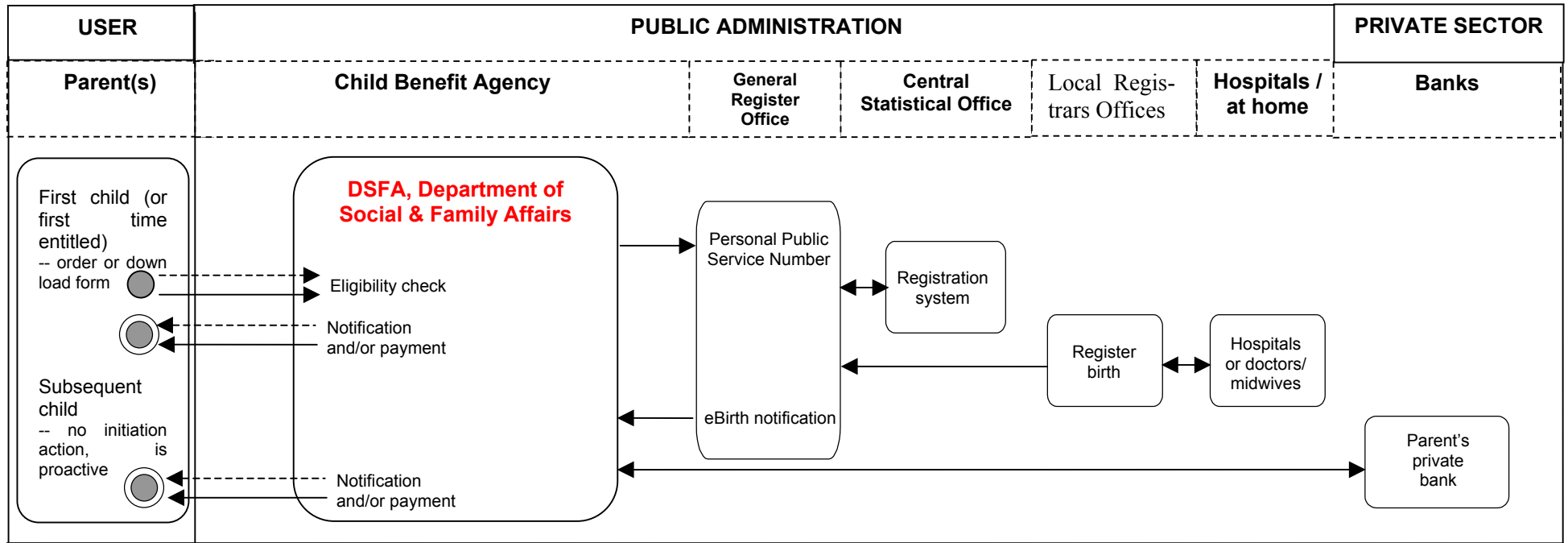
Within 3 months of the birth, the parent(s) register the birth in person at the Office of the Registrar in the locality of the birth. With the new system, the registration will soon be able to take place at whatever office is convenient for the parent(s) (this facility will be available from the first quarter of 2004 following enactment of Civil Registration Act). Digitisation has also meant that birth certificates can now be acquired at any local Office of the Registrar, as certificates can be printed off locally.

Details of the registration at the local offices are forwarded to the General Register Office in Dublin. This is now done online from the local offices over the government's VPN.

Central
Statistics
Office

eEnabled Child Benefit Service

*Download data
once per week
(VPN)*

**General Register
Office**

IAMS

DSFA

Central
Records
System

Client
Identity
Services

Electronic birth notification

Registration
System

PPSNs

Assign PPSN
& Family links

*Cork online
now, national
roll-out over next
6 to 12 months*

*Keyed
in over
VPN*

Decide
on claim

Child Benefit
System

Register Birth

**Local
Registrars Office**

Post

**Apply for
child benefit**

*In-person
or post*

Issue partially
completed form

Post

In-person

Submit with
birth certificate

*Post or
in-person*

Notification

*In-person,
post or
online*

Payments

*Paper now,
Some
hospitals
will be online
soon (PAS
will provide
the notification
via VPN)*

Notification by
hospital (or GP/
midwife if at home)

Get form

Complete and
submit form

*Direct to
bank or
book by
post*

Hospital

Baby
born

Online front office services:

Now: can order or download
Child Benefit Application Form

2004: will be able to order and
pay for birth cert

Later: may be able to apply
online for CB when authentication
etc. is proven on PSB

**Child Benefit
Customers**

Not new baby
and not already
receiving child
benefit for some
reason (e.g.
recently moved to
Ireland)

New baby;
not already
receiving child
benefit for
other children

New baby;
already
receiving child
benefit for other
children

At home

Workflow of child benefit Ireland

USER	PUBLIC ADMINISTRATION					PRIVATE SECTOR
Parent(s)	**Child Benefit Agency**	**General Register Office**	**Central Statistical Office**	Local Registrars Offices	**Hospitals / at home**	**Banks**

First child (or first time entitled)
-- order or down load form

Subsequent child
-- no initiation action, is proactive

DSFA, Department of Social & Family Affairs

Eligibility check

Notification and/or payment

Notification and/or payment

Personal Public Service Number

eBirth notification

Registration system

Register birth

Hospitals or doctors/ midwives

Parent's private bank

LEGEND:

PARTICIPANT

action

digital workflow

physical workflow

selection

starting point

end of process

The IAMS links the Child Benefit processes at the DSFA and the birth registration process (GRO).   Data on births is forwarded electronically from the GRO to the DSFA every 15 minutes and the DSFA sends the assigned PPSN and associated data to the GRO for inclusion in the child's civil registration record**.** The registration data is also made available online to the Central Statistics Office (CSO). This was previously a paper-based process but the CSO can now directly download data from IAMS over the government's VPN.

The IAMS service is an intermediate stage towards the ultimate development of a major eGovernment enabling service – the Public Service Broker. The IAMS presently provides the electronic birth notification for the DSFA Child Benefit processes. The eventual complete Public Service Broker will provide an online repository of relevant client information that will be accessible in different ways by both customers and the many different public agencies that need access to different views of the data.

The proactive and automatic Child Benefit service is now available for newly registered births in the Cork area of Ireland. Full national rollout is expected to be completed within 6-months to a year.

6. Results

Until the process of e-enabling life event data began, both the civil registration and child benefit processes required manual intervention, either by staff or customers, at most stages of the process. This included PPSN 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 civil registration processes/procedures and computer systems and the linking of these to the systems in the 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, certificates will no longer be required for certain services and, when required, can be acquired much more quickly and conveniently.

In relation to Child Benefit, 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 GRO.

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 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 client.

As SDM is rolled out in the Department, other DSFA services in addition to the Child Benefit service can also be supported by access to electronic notification of life event's from GRO, for example, widows pensions claims, bereavement grants etc.

In relation to public services more generally, there is still a requirement for physical birth certificates for many other public service purposes in Ireland. In these circumstances the new GRO system provides the customer with many benefits, including faster processing time and the possibility to get a birth certificate at the most convenient Registrar's Office. An innovation in this aspect concerns the fourteen different security features incorporated into the paper and printing process for certificates (anti-scanning/photocopying, toner lock, etc.). The GRO also plan to provide an online ordering and payment service for birth certificates in conjunction with the development of the Public Service Broker.

Also, as mentioned earlier, it will now be possible to register births in the most convenient location rather than in the district in which the birth took place. During the registration process itself data capture is of better quality

because of greater involvement of parents/next of kin and in-built validations in the computer application. An innovative aspect of this part of the process is the use of electronic pads to capture and store, as part of the registration record, the customer's signature.

The next stage of the development of the service will involve linking the larger maternity hospitals into system, thereby eliminating the manual completion of paper forms.

At the GRO end, 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 clients and the service provider.

More generally, the allocation of the PPSN as part of the birth registration process and consequent updating of the civil registration record will allow for the future linking of life events and the production of life certificates using this unique personal identifier.

The CSO 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, when the Public Service Broker provides all public agencies with online access to customer registration data, most of the current requirements on customers 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 GRO 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 GRO are currently working in partnership with Reach and DSFA to develop a service that will communicate in a timely manner the details of death registrations via the IAMS 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.

7. Learning points and conclusions

The sharing of life event data is fundamental to the design, development and delivery of integrated services for citizens. In Ireland the first example of the delivery of such integrated services is the automatic processing of Child Benefit claims by DSFA on receipt of electronic birth registrations. Although still at a relatively early stage, this e-enabling of life events data has already had significant impact and many Government Agencies are now keen to either receive civil registration data electronically or to be provided with online access. The following are some of the critical success factors and lessons from the experience to date.

Critical success factors

Project governance
Where multiple projects are involved they must be planned and developed in a co-ordinated and agreed manner, that is, there is need for strong project governance. The co-ordinating groups set up as part of the modernisation programme met on a regular basis to ensure that issues were identified and resolved on a timely basis and that the various projects were developed in an agreed manner. In this way it was possible to maintain 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.

Change Management
All of the component projects in this initiative 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. Attention to these aspects was viewed as central to the success of the initiative.

Standards
It is important that data and other technical standards are set and agreed early in the development process. This is particularly vital where inter-dependent developments are taking place simultaneously in different organisations. One organisation should be mandated to "own" the standards and ensure that they are adhered to. In this initiative, Reach were mandated to agree, set and own the data, envelope and XML message standards and this proved very successful in the development and implementation of the various strands/projects involved.

Business requirements should be the driver
A decision was taken at an early stage that the business requirements would drive the technology project rather than the other way round. This ensured that the business requirements would take precedence and that the most appropriate technology would be used to implement them.

Parallel running
The opportunity for parallel running of manual and electronic systems in a "live" environment should be taken prior to full implementation to test system functionality, validate process/procedures, training programme, user and customer acceptance. In the GRO case, for example, a four week period of parallel running was carried out and gave invaluable feedback on issues that could then be resolved before going live. This proved invaluable and raised a number of issues that were resolved prior to implementation.

Managing scope creep
As is commonly found in these kinds of projects, requirements changed 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 GRO case, 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".

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

Legislation
In areas such as civil registration, early identification of any new legislation required is essential to ensure that it can be enacted in time.

Lessons from experience

Multi-agency projects have longer lead times
Management of multiple projects 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.

Risks for early adopters
Early adopters of the IAMS system perceived 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.

Ownership
A key issue that arose for the IAMS project was "ownership". The issue was at what point did transferred data become the responsibility of the receiving agency and how would system failures etc. be dealt with. While eGovernment is intended to present an integrated, border-less view of Government to the customer, government departments still have to work within their own political, legal and accountability frameworks.

Data Conversion
The capture, clean-up, migration and conversion of historical data can be a major task. In the case of GRO, 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.

Encryption/Error Handling
In relation to agency to agency communication and data sharing, encryption processing and error handling 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.

8. References and links

"Bringing Civil Registration to the 21st century": a Consultation Document on the Modernisation of the Civil Registration Service - May 2001. http://www.groireland.ie/images/consultation.pdf

Sites:
www.oasis.gov.ie
www.irlgov.ie
www.reach.ie/iams
www.basis.ie
www.groireland.ie

Ireland

Case 18
Business corporate tax:
Revenue Commissioners' corporation tax

1. Executive Summary

This case concerns the online Corporation Tax service provided by the Irish tax authority - the Revenue Commissioners (RC). It has been selected because it demonstrates how a combination of back-office reorganisation and online "front office" services have offered a faster and more efficient service option to customers who choose the online option, a more efficient operation for the tax authorities and, as take up of the online service increases, the potential for benefits also for customers who choose the traditional offline method through fewer backlogs and faster processing times.

The online Corporation Tax service is part of the Revenue On-Line Service (ROS) that has been developed as part of the RC's overall Customer Service Strategy. ROS is an Internet-based system that allows customers to file a series of tax returns using the Internet and also to view details of their Revenue account information for each of their registered taxes. The taxes covered by ROS include Income Tax return (Self Employed Individuals), VAT, Corporation Tax, Employers payroll returns, Vehicle Birth Cert and Vehicle Registration forms (motor traders). About 10% of RC customers have moved to using the ROS service since it went live in September 2000 and 25% of relevant payments are currently made through ROS. The numbers of users and the share of payments made through ROS are continuing to increase, with the target being to have 50% of tax returns filed and 75% of tax payments made over the Internet by 2005.

Once a customer is registered as a ROS user all transactions with the RC can be done online, including assessments/declarations of taxes due and payment of these taxes. For most taxes the return form can be completed while logged into the service. Although this facility could also be offered in the specific case of Corporation Tax users have found that downloading the form for local completion and then uploading it is more convenient – the form is quite lengthy and completion takes some time.   All ROS customers have a secure ROS mailbox and all correspondence from the RC is sent there, including reminders to file returns, Statements of Account and payment receipts. A digital signature and encryption facility is used for authentication and security. 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.

With the introduction of ROS, customers now have the option either to do things the old way or do them online. In the old way, a company/tax agent submits a Corporation Tax Return to either a local or Dublin RC office by post, where the information is checked and keyed into the Corporation Tax system (part of the ITP). The RC computerised Assessment System then produces, prints and posts out the Notices of Assessment. The companies/agents then send the required payment by post either to the local office, from where they are re-directed to the Collector Generals Office (CGO) in Limerick, or directly to the CGO where the cheques are processed and a file is sent via a WAN to the clearing bank.

If the ROS service is used electronic forms replace the physical ones and there is no need for any physical posting/transfer of documentation, payments and so on, either between the customer and the RC or between the different back offices of the RC. This simplifies the procedures and the number of back offices involved in processing payments and results in a faster processing of payments. The fact that customers key in their own data and this is validated online results in fewer errors and therefore less need for clarification, which can be a significant cause of delay.

The turnaround time for processing completed Corporation Tax returns for customers using the ROS systems is in most cases a matter of minutes which can be compared with the 2 months it typically used to take for the

paper based system. 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.

2. Background

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 Revenue Commissioners (RC) are responsible for the administration and collection of taxes, levies and Customs and Excise duties in Ireland. They collect approximately €29 billion each year. In total there are 2.5 million customers, of whom almost 500,000 are companies and self-employed individuals. The RC have over 130 offices countrywide.

ROS was developed as part of the Revenue Commissioner's overall Customer Service Strategy. The first phase went live in September 2000. ROS has recently received 3 national eGovernment awards and in November 2001 it received an eGovernment label for best practices of its type in Europe.

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.

3. Specific objectives

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.

There are approximately 80,000 Corporation Tax returns made annually, amounting to about €10 billion in financial terms. The returns are made either directly by companies or by tax agents working on their behalf 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.

4. Resources

The ROS system was developed in HTML and Java and all the components deployed, including the security system, were built employing open industry standards (ETSI and EESSI). ROS users need the following ICT hardware and software to be able to use the system:
- Operating System: supports Microsoft Windows 95 and up, NT and XP, Apple Macintosh Mac OS 9x and Unix.
- Browser Versions (Microsoft Windows) - Netscape 4.7x, Microsoft Internet Explorer 4.01 and beyond, Microsoft Internet Explorer for Macintosh 5 + MRJ 2.2.4
- Adobe Acrobat Reader
- E-Mail Account

The ROS system at the RC end comprises industry standard web services facilities. The system is scaleable to cater for the peak return processing volumes and can be expanded to meet future growth requirements. BEA's WebLogic application server was chosen to meet this requirement.

ROS uses Baltimore's Public Key Infrastructure (PKI) based security system for encryption and digital signing. This ensures privacy and the prevention of unauthorised access at the customer end and provides authentication, data integrity and non-repudiation facilities for the RC.

At the RC side, overall security of the system is ensured by an "air gap" (i.e. no physical links) between the RC back-end systems and the ROS system. In addition, every year a "hack attack" is commissioned from a specialist security company, whereby the company attempts to hack into the ROS system to identify any possible security weaknesses.

The overall cost of the ROS project to-date were as follows:
- 2000 €5.7m
- 2001 €8.1m
- 2002 €9.5m

These costs include the cost of design, development, security and marketing of the service.

The Irish Government provides funding from an Information Society Fund to encourage government departments to adopt the Internet as a means of conducting business with Irish citizens and Business. The Revenue Commissioners qualified for this funding which meant that central funds were available when required for the project.

The ROS business team started with 5 people and has expanded to a current complement of 35. The business team is further supplemented by specialist teams who are assigned on a short-term basis from the relevant business area directly affected by the introduction of new functionality.

Application development is outsourced and is handled by external consultants from Accenture and Baltimore Technologies (approximately 25 – 30 people). Accenture provides a team with knowledge of computerised tax systems, the Internet, eCommerce, leading edge technologies, core systems development and security. Baltimore technologies were engaged to provide specialised input as well as their Public Key Infrastructure (PKI) product. The RC staff works with these external consultants providing expertise on the design of the online tax returns, the development of interfaces to the existing back-end systems and operations input for the set up and running of the ROS development and production environments.

5. Implementation

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.

Users of ROS are companies and self-employed people making their own returns or tax agents using the service on their behalf. One concern of prospective users of ROS was that they might become more likely to be selected for a tax audit or enquiry if they made their returns online and customers had to be reassured that tax payers using the ROS service would not be treated any differently to other tax payers in this regard.

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.

Before ROS was available a company/tax agent had to submit a Corporation Tax Return (Form CT1) to the Revenue Commissioners by post, either to the Dublin Office or to their local tax office (there are 130 of these). These forms were then checked by RC staff and keyed in over a WAN to the Corporation Tax system, which is part of the Integrated Tax Processing (ITP) system. If any error or inconsistencies were found the RC staff had to either phone or write to the companies for clarification.

The RC computerised Assessment System then produced Notices of Assessment, which were printed and posted out to the companies/agents. The notices indicate any outstanding liability over and above any preliminary tax payment that has been made, based on the figures provided in the Form CT1.

The companies/agents then sent any payment required by post, either to the local office or to the Collector Generals Office (CGO) in Limerick. Payments that were sent to local offices were then redirected by the RC staff to Limerick where all payments were entered into the computerised Collection System via MICR readers and were then updated into the companies' tax accounts. A receipt was posted to the customer from the Collection System and a file was sent electronically to the Bank of Ireland as the clearing bank for cheques. Now that ROS is available RC customers have a choice of using the online service or continuing to do things in the traditional manner by post. Registered customers can access ROS from the workplace or their home, day or night.

The first step to using the online service is to register with ROS. This involves acquiring a ROS account number and a digital certificate. Most of this procedure is carried out online but to ensure the security of the service the authentication procedure involves issuing correspondence via land mail. The initial registration and set up process typically takes around 8 working days. This only needs to be done once and the customer can then use their ROS account and digital signature to make various tax returns and queries, including those relating to Corporation Tax.

Each ROS customer is provided with a secure mailbox (ROS Inbox), which can be accessed when logged on to the ROS service. All correspondence from ROS to the customer is posted to this Inbox. Such correspondence may include reminders to file returns, Statements of Account and payment receipts. When customers log into ROS they are advised if and when there are any new items of correspondence in the Inbox that have not been viewed. Viewed correspondence is stored in the Inbox and can also be re-accessed if necessary. Copies of these items of correspondence can also be printed or downloaded if required.

In relation to completing the Corporation Tax return the original intention was to allow the form to be completed either directly online or by downloading the form and then later uploading it when completed. However, after consultation with the user groups it was decided to provide the service in the second mode only, with downloading and uploading of the form. This was for efficiency reasons as the Corporation Tax return is long and quite complex and it can take from 20 minutes to 45 minutes to complete a single return. The software for form completion can either be downloaded from the ROS site or loaded from CD. The software includes validation routines to reduce the need for further queries and checks after the form has been uploaded for processing.

The return is then processed and the completed form is posted to their ROS in-box, as is acknowledgement of receipt of the form, notice of assessment and payment receipt. Online payments can be made for any of the taxes and levies covered by ROS, including Corporation Tax, by a ROS Debit Instruction (RDI), by LASER (Debit Card) or by using Online Banking for Income Tax payments. An additional file for reconciliation of online banking is included in the daily batch transaction between the RC and the clearing bank.

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.

The schemas on the following two pages summarise the before and after situations. It is clear that the potential for major efficiencies has been introduced, with much reduced paper- and post-based transactions.

6. Results

Initially ROS was set an objective of collecting €63 million within the first year. This objective was achieved after only 6 weeks and €1.25bn was collected in the first year. In 2002, €3.56bn was made in online payments, with 77,646 payment transaction, 122,923 returns and 279,383 customer queries. Overall, between September 2000 and May 2003, a total of €7.3 billion has been paid through ROS, with a total of 140,514 payment transactions, 277,042 returns and 525,909 customer queries. The overall take-up for the ROS services is currently at about 10% of the customer base and 25% of total tax payments for the relevant areas are made through ROS.

The ROS Corporation Tax system went live in November 2001. In 2002, 650 companies (of 80,000 in total) made their Corporation Tax returns via ROS. In financial terms this amounted to €90.33 million out of a possible €10,276 million in total. This was slightly less than 1% in terms of number of returns and also in financial terms was less than initially expected. However, from January to July 2003 there have already been 2,203 returns (2.75% of the total) made online and since the main bulk of returns will be made in September, this rate of usage it is expected to increase significantly over the full year.

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.

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. Also, it is less likely that companies/agents will make mistakes keying in their own data. Customer queries relating to their returns/payments can be made online by the customers themselves, freeing up staff.
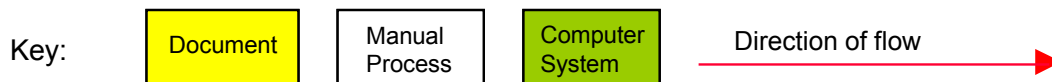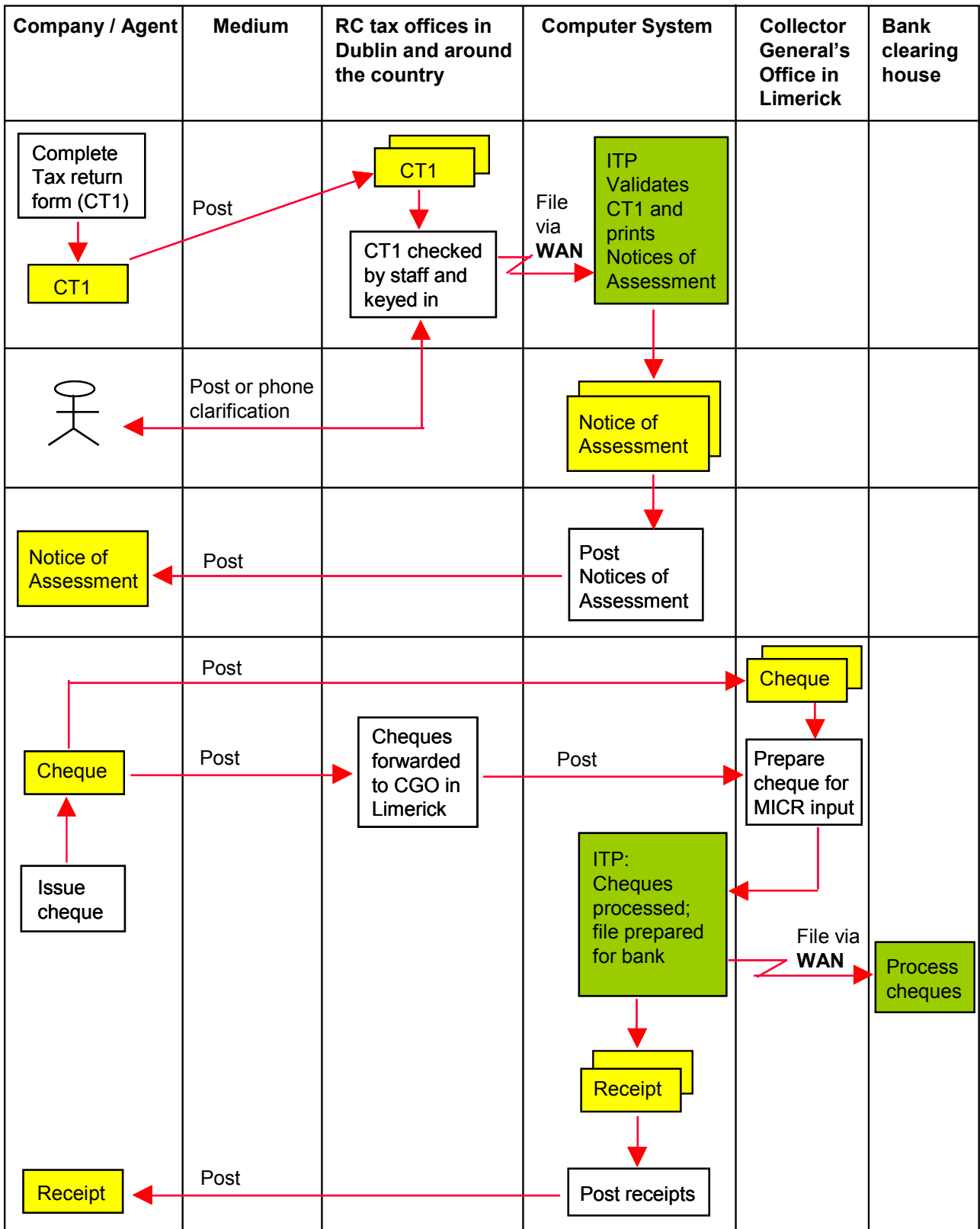
The turn around time for making a Corporation Tax return and receiving an assessment for customers using the ROS systems is in most cases a matter of minutes once the CTI form is uploaded, compared with about 2 months for the paper based system. Customers can also file early, and not have the payment amount debited from their bank account before the due date.

Other benefits for users and the RC include the elimination of the need for paper forms and posting of these by land mail. For the RC also there is now no need to key in the return data for customers using the ROS service. 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.
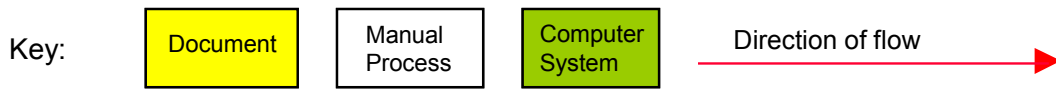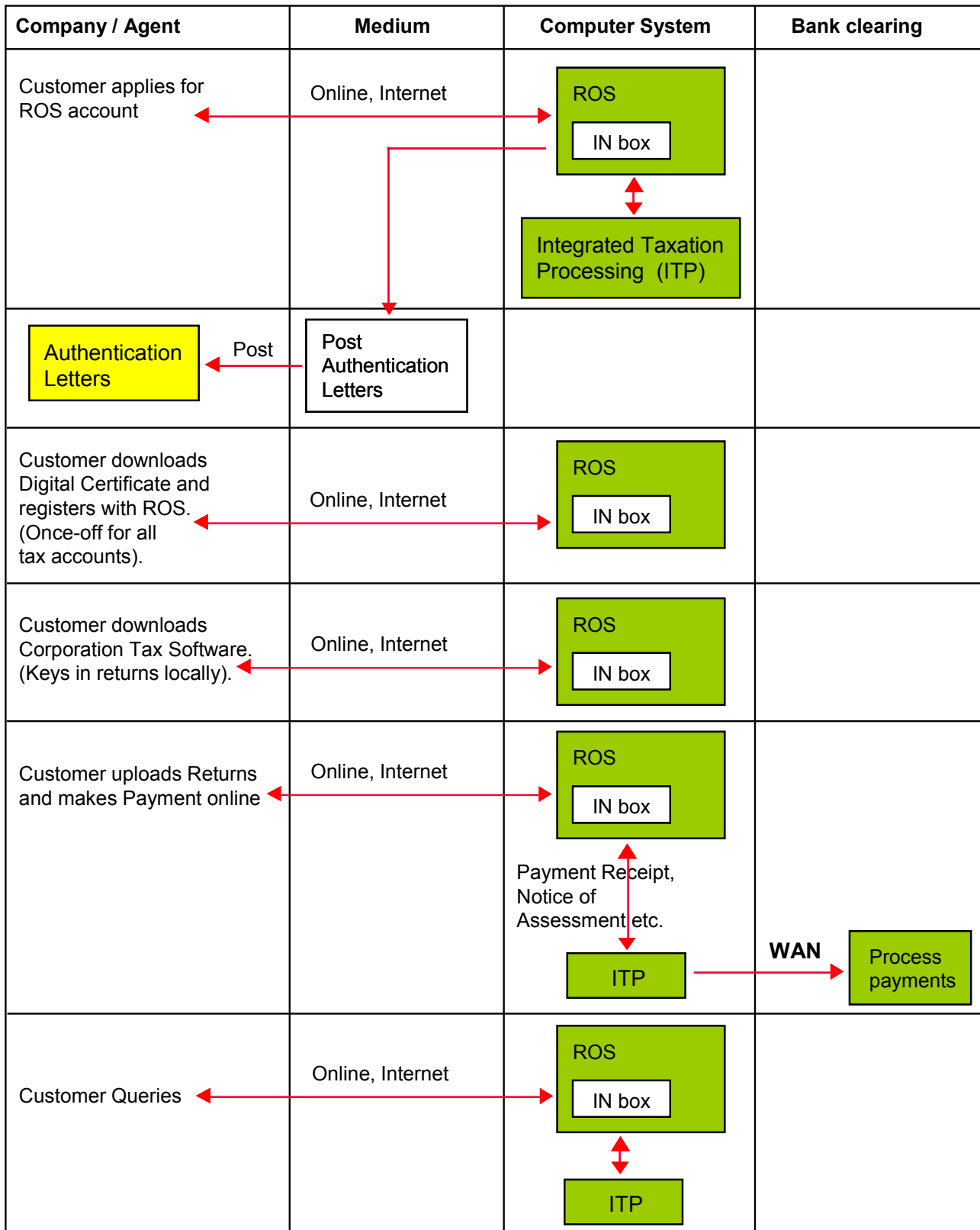
So far there have not been any major changes in functions or organisational structures as a result of the implementation of ROS. However, when a critical mass of users has moved to the online service there will be significant scope for strategic and operational change.

Finally, there have been some value added side benefits from the development and implementation of ROS. The exercise has resulted in cleaner data within the system allowing better data capture, analysis and presentation. For example, new types of risk analysis are now possible.

Corporation Tax Return Processing before ROS

Company / Agent	Medium	RC tax offices in Dublin and around the country	Computer System	Collector General's Office in Limerick	Bank clearing house

Complete Tax return form (CT1) → CT1

Post →

CT1 → CT1 checked by staff and keyed in

File via **WAN** →

ITP Validates CT1 and prints Notices of Assessment

Post or phone clarification

Notice of Assessment

Notice of Assessment ← Post ← Post Notices of Assessment

Post → Cheque

Cheque — Post → Cheques forwarded to CGO in Limerick — Post → Prepare cheque for MICR input

Issue cheque → Cheque

ITP: Cheques processed; file prepared for bank

File via **WAN** → Process cheques

Receipt

Receipt ← Post ← Post receipts

Key: Document | Manual Process | Computer System | Direction of flow →

Corporation Tax Return Processing with ROS

Company / Agent	Medium	Computer System	Bank clearing
Customer applies for ROS account	Online, Internet	**ROS** — IN box / **Integrated Taxation Processing (ITP)**	
Authentication Letters	Post — Post Authentication Letters		
Customer downloads Digital Certificate and registers with ROS. (Once-off for all tax accounts).	Online, Internet	**ROS** — IN box	
Customer downloads Corporation Tax Software. (Keys in returns locally).	Online, Internet	**ROS** — IN box	
Customer uploads Returns and makes Payment online	Online, Internet	**ROS** — IN box / Payment Receipt, Notice of Assessment etc. / **ITP**	**WAN** → Process payments
Customer Queries	Online, Internet	**ROS** — IN box / **ITP**	

Key: | Document | Manual Process | Computer System | Direction of flow →

7. Learning points and conclusions

The ROS team feel that the project development and implementation process was a successful example of the "Think Big, Start Small, Scale Fast" approach. They would do most things in the same way if they were doing it again. Some critical success factors and some aspects where lessons were learned are outlined below.

Critical success factors

Corporate commitment
A strong commitment at corporate level was essential to the success of ROS. This 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.

Prior back-end system integration
The RC had already invested significant resources in developing the Integrated Taxation Processing system. The ROS system interfaces with the ITP and thus enables ROS customer to access their various Tax accounts in a seamless manner. This development was essential prior to the provision of the ROS services.

Having adequate funding
Having sufficient finance available was also important for the project as it enabled outsourcing of necessary skills. The Irish Government provides funding from an Information Society Fund to encourage government departments to adopt the Internet as a means of conducting business with citizens and business. The Revenue Commissioners qualified for this funding which meant that funds were available when required for the project.

Effective marketing
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 directed towards the RC's customers.

Training
Sufficient attention to in-house end-user training was also an important factor in the success of the project. ROS Liaison Officers provided hands-on training for people using the system around the country.

Necessary legislation in place
The eCommerce Act 2000 was introduced in Ireland to accommodate eBusiness with all Government Departments. The act was implemented in order to transpose the European Commission's Directive on Electronic Signatures into Irish law. This provides for the legal recognition of the Advanced Electronic Signature used to authenticate a tax agent making submissions on behalf of clients.

Lessons from experience

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).

Effective resource allocation
The importance of allocating resources, as appropriate, to high impact areas (e.g. to reinforce Help Desk services at peak return filing times) was also identified as a key factor. In fact, the amount and type of support that would be needed from the Help Desk was underestimated at the beginning, as elaborated in more detail under the next learning point.

Customers IT systems and levels of IT literacy
During the implementation of the ROS system it was discovered that there was huge variety amongst customers in terms of their IT systems (e.g. system configurations, browser versions and so on) and in their levels of IT literacy (e.g. PC skills, knowledge of browsers, system configuring and so on). This led to the Help Desk being flooded with technical queries, including very basic ones from customers with little or no IT literacy.

Complexity of Public/Private partnership
One aspect of this was in relation to the development of co-operative working relationships with third party software developers. An objective of the ROS team was to get developers of accounting software for the Irish market to build in ROS compatibility as a feature of their products (i.e. be able to produce their output in the format required for ROS). These third party software companies were agreeable to this but it was a learning experience for the ROS team to have their schedules now suddenly linked to the development road maps and schedules of these commercial companies. There was a certain amount of culture shock on the RC side due to this need for adjustment to the commercial companies' modus operandi.

Another aspect of this was in relation to the development of co-operative links with the large accountancy firms. The ROS team had expected more synergy with these than eventually proved to be the case. On the IT side, there was not a great enthusiasm to make their systems compatible with ROS. Part of the reason for this was the lower level of IT support for the preparation of Corporation Tax returns in these accountancy firms than had been expected (e.g. outputs often were presented in just spreadsheet format). A lack of push from their customers was also cited as a factor in their initial reluctance. It is also likely that concern about possible reductions in fee income because of easier filing of returns was also a factor in some cases. This general lack of enthusiasm resulted in a need for more marketing effort by ROS than had originally been envisaged.

Removing human intervention gives efficiencies, but can result in new issues
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.

Online services can make back-office processes visible
Another learning point was the need to be aware that offering services in an online manner, such as in the ROS case, can make visible to customers and others what were previously invisible back-office processes. It would be prudent to give consideration to this aspect in the design and implementation of online services.

Being an example of good practice can have its costs!
Finally, because ROS has been internationally recognised as a pioneering eGovernment initiative there has been much interest from other countries to send visiting delegations. The extent of this was not anticipated at the beginning and demonstration and hospitality resources were under-resourced as a consequence.

7. References and links

www.ros.ie
www.revenue.ie

Italy

Case 19
Citizen car registration:
ACI Automobile Club Italy

1. Executive Summary

ACI (Automobile Club Italia) is the supporter and promoter of Italy's motoring and travelling community. ACI is one of the first public agencies to supply public automobile-oriented services incorporating distance payment procedures via telephone and via Internet. With the introduction of the Motoring Portal, ACI has been playing an important role in the public supply of e-services free of charge[50].

The auto e-counter service of ACI represents the first Italian example of electronic communication and interoperability between public administration and the private sector.

The services offered by the e-counter are bundled horizontally, i.e. once the information is entered, it can be used for other services, as well as vertically, by connecting to the Ministry of Transport and Infrastructure, Ministry of Finance and local Police. The certificate of ownership of the car is issued by ACI, and the car registration is issued by the Territorial Transport Department (DTT) of the Ministry of Transport and Infrastructure.

The e-counter is able to speak simultaneously with two key partners in the motoring sector: the Ministry of Infrastructure and Transport and the ACI Automobile Club Italy. It also opens up the system to a new partnership with the private sector. The organisations responsible for project co-operation are the Automobile Club d'Italia (ACI) and the Department of Land Transportation of the Ministry of Infrastructure and Transport. Points of service delivery are: Private car-related organisations (driving schools and car dealers), ACI delegation, ACI Local offices at provincial level, Provincial Offices of the Ministry. Users are the motoring citizens.

Before the introduction of the e-counter, the certificate of car ownership and car registration were issued by two different administrations in different timeframes. After the introduction of the online service, the citizen can request and receive a service tailored to his/her needs, either from one or the other P.A. and service points, regardless of the respective competencies of the administrations involved. The main features of the project are immediate delivery (in real time) of all certificates required, including car license plate in case of initial registration in order to simplify the life of the motoring community. There is a choice of access to the link channel (either within the domain of ACI or the Ministry of Infrastructure and Transport) to each e-counter which helps the production of reliable and fast updated databases in both administrations.

The online service 'car registration' follows model D with a digitisation level of "3", two auxiliary services: digital signature and electronic payment are part of the online-service. In model D, one service for citizens is involved, but there are different types of electronic interaction involved[51], including between the user and the BO and between the BO's, with a level 3 of digitisation involving human interface in both input and output.

This case was chosen as one of the best examples of effective co-operation between ACI and the Ministry of Infrastructure and Transport due to commitment and participation of concerned government bodies and as the best collaboration with private sector implemented by means of consultation with its representatives.
The back-office organisation of both ACI and Ministry offices has been started thanks to the introduction of the e-counter service, and the communication between these two agencies are managed via dedicated line on the web service model, thus the service back-up implies that any imbalance occurring in one of the two entities is immediately reflected in the other.

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[50] However, the registration service for cars is not free of charge.
[51] E.g. the registry is also used by the Police and the Tax authority.

2. Background

In Italy, there are 41.936.627 vehicles on the road, which means 688,5 vehicles per 1000 residents. More than 5000 economic agents in the automobile sector (car dealers, rental agencies, driving schools, local offices of ACI, etc.) provide services to the motoring public. There are more than 8000 car dealers and 2150 authorised scrapping centres. Thus, two public administrations have to manage more than 20 million car-related files annually: ACI, which is responsible for the Public Registry to certify the legal ownership of the vehicle, and the Department of Land Transportation of the Ministry of Infrastructure and Transport, which regulates prerequisites and technical specifications for automobile circulation.

There were some critical issues in the previous system such as complex and multiple administration procedures and a large number of visits by the citizens to Public Administration. Requests of files from the Public Register for Automobiles were handled by territorial competencies. The access to the services was limited at the provincial level and their operation was limited to the opening hours of counters of the relevant local offices (ACI Local offices at the provincial level and the Department of Land Transportation of the Ministry of Infrastructure and Transport). Services were not delivered in real time and there were also high risks related to file management, which was not simultaneous.

The first initiative to respond to this situation was the establishment of the e-counter car registration, a project which aimed at simplifying procedures for car registration, change of ownership and deletion of vehicles from the register. This was made possible by law (Decreto del Presidente della Repubblica September 19, 2000, n. 358) in execution of the Legal Act dated March 8, 1999, n. 50 ("Bassanini-quarter") on the simplification of administrative procedures. This project is one of the very first experiences that fully embody the guidelines included in the e-government plan issued by the Ministry of Technological Innovation.

The e-counter closely follows the policy guidelines on e-government as defined by the Italian government: citizens obtain service simply by accessing any administrative office or authorised front-office, with no restrictions of competence due to territorial barriers or residence requirements.

The front-office information system of any administrative office or qualified service point can locate relevant files by directly accessing the concerned Administration and entering all necessary information for personal identification of the requesting citizen.

The citizen can request and receive a service tailored to his/her needs, from one or the other P.A. and different service points, regardless of the respective competencies of administrations involved.

3. Specific objectives

The situation prior to the e-auto counter project was that the motorist or 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 immediate short-term objective of the e-auto counter project was to bypass this huge bureaucracy and time-consuming procedures by moving toward a unified e-gateway to information and services for the automobile sector. The main features of the project are immediate delivery (in real time) of all certificates required, including license plate in case of initial registration in order to simplify the life of the motoring community. The choice of single access to the link channel (either within the domain of ACI or the Ministry of Infrastructure and Transport) via each e-counter helps in the production of reliable and fast updated databases in both administrations. The user has a single graphic interface whether he is using the e-channel of ACI or the one of the Ministry. The e-application is web-oriented and the payments for the procedures are easily adapted to online processing.

These features have led to the realisation of another objective, which is the supply of comprehensive and up-to-date information to the public administration for policy and decision-making purposes, and this has also contributed to overall security by preventing delays in the registration of changes in car ownership thus making it more difficult for car thieves to take advantage of the delays in registration.

The e-counter project 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.

There is a still need for issuing two different paper documents (the car circulation permit and the ownership certificate), and the current databases of the Ministry of Transport and ACI are linked but not interactive. Moreover, the procedure to get the letter of indemnity is not part of the service.

Therefore, the long-term objective is to facilitate the transition to the electronic era of service delivery by introducing e-management in local public administration offices and private sector players.

4. Resources

ICT: e-services and e-information are directly accessible by ACI web site www.aci.it and by phone.
The co-operating e-counter is a web-based application that interacts with final users and by web service with the domain of ACI and with the domain of the Ministry of Infrastructure and Transport. Each of the front-offices is equipped with a personal computer using Windows and the Internet Explorer browser.

Security site areas reserved for payments involving the use of a credit card are secured according to the SSL3 protocol with digital X509 certification. Communication between the respective domains of ACI and the Ministry of Infrastructure and Transport is managed via a dedicated line, thus not accessible from the outside. Users are recognised by user name and password for both domains, thus dual proof of identification is required.

Standards include: Java language (J2EE 1.2) - UML language for modelling - web services (Soap 2.3) - Html - Javascript - pdf.

Equipment: The operating environment in which the e-counter product was installed is made of:
- 2 IBM Risc 6000 7017-S80, 6 CPU Power 3, 450MHz and 12Gbyte Ram
- 2 IBM Risc 6000 7017-S80, 6 CPU Power 3, 450MHz and 6Gbyte Ram.
Workstations with a memory capacity of at least 512Mb are used for the development environment.

Software Development: The users have to use the Browser technology with an HTML screen that is the same in both domains (ACI and Ministry). Then the e-counter can interact with the users of both domains through the "Web server" engine. For the browser, Microsoft software and Internet Explorer version 5.5 SP2 or 6.0 are required.

Operating System: Microsoft Windows 2000 Professional, Windows XP and Windows NT SP 6A
Server Development Environment: IBM Web Sphere

The hardware architecture coupled with the software environment allow for a high degree of vertical and horizontal scalability of the whole e-package. The e-product is business-oriented due to its wide coverage of e-services, influencing thus their reliability and accuracy in the display of information.

The following professional profiles have been involved in project management and implementation with the following number of days: Chief Technical Advisor/Coordinator: 180, Organiser: 2150, Software Specialist: 400, Analyst: 1000, Analyst for programming: 1350, System Analyst: 700, DB Manager: 400, ITC Expert: 100, Organisation Expert: 400, Trainers: 1000, Call-centre operator: 5600.

5. Implementation

A main objective is the improvement of the legal and administrative aspects of car ownership, registration and circulation. The new norms, as revised by the Legislature, legitimate the existence of diversified systems of front-offices including: ACI provincial offices, provincial offices of the Central Civil Motoring Authority and commercial agencies operating as e-counters. There was a need for access to the information existing in the databases of the Ministry and ACI to simplify file processing and administer certification. The rationalisation of the use of existing infrastructure involved a reorganisation of front and back offices.

In May 2002, a mixed project team was organised for the implementation of the e-counter project. The high level management of both administrations, ACI and the Ministry of Infrastructure and Transport, were involved. Also a round table for consultation and consensus-building purposes was organised with the representatives from both public administrations and the private sector. The key activities were to define functional characteristics and organisational aspects, to assess the impact of legislation and related requirements in the transition from a paper-based system to an e-system, to plan the budget of implementation activities and to identify common rules and procedures. The ACI team was mainly responsible for the definition of the project's technical specifications and for daily management of implementation. In terms of information and awareness raising, there was a campaign carried out on the central, regional and provincial level. 20 trainers were employed for training activities that involved 9000 target users in 50 days of training.

The analysis, electronic networks and their implementation throughout the national territory were carried out in a seven-month time period. On December 15, 2002 the system was completed and effectively put into action nation wide.

The front office is a web-based application that interacts with final users and links the web services with the domain of ACI and with the domain of the Ministry of Infrastructure and Transport, while the back office architecture is based on the model of a distributed transactions and queuing system. There is a direct link with either the e-system of ACI or with the back office e-system of the Ministry of Infrastructure and Transport. Such a connection allows the immediate processing of any request and the delivery in real time of the relevant final certificate. The link between the central system of ACI and the one of the Ministry is based on UNIX AX technology running on an Oracle application server and web sphere (IBM), and the peripheral system is based on Windows NT. It is implemented by using the web services model. Products are integrated at the level of platforms and code managed links in XML resulting in the independence and synchronicity of each transaction. The link with commercial car dealers and driving schools is implemented by using web-based interfaces and ISDN connections with IP protocol.

The activity of the ACI back office has the following functions: Validation (coherency control of the documents presented online, with respect to the current legislation) and Assistance/consultancy at the 1st level (through the internal portal where all the technical instructions are stored, presenting relevant information for the professionals operating the system).

The simultaneous processing of files reduces the risk of incurring partial or incomplete documentation, as is the case if a car dealer goes bankrupt without finalising the registration process.

STEP 1: The customer selects and buys a car and presents the relevant documents to the agency. This agency is equipped with the 'e-counter' and could be either the local office of ACI or the local office of the Ministry of Infrastructure and Transport or certain certified car dealers/driving schools. At the e-counter, the user can access the ACI or Ministry domain through the web service in order to register a car, to obtain the certificate of car ownership, to survey the PRA (Public Register Automobile) database, or to pay the vehicle tax.

STEP 2: The user enters the relevant data at the e-counter, submits it and gets back a user ID and password for all further operations.

STEP 3: At the moment the data is entered, the back offices verify the validity and coherence of the data with respect to current laws.
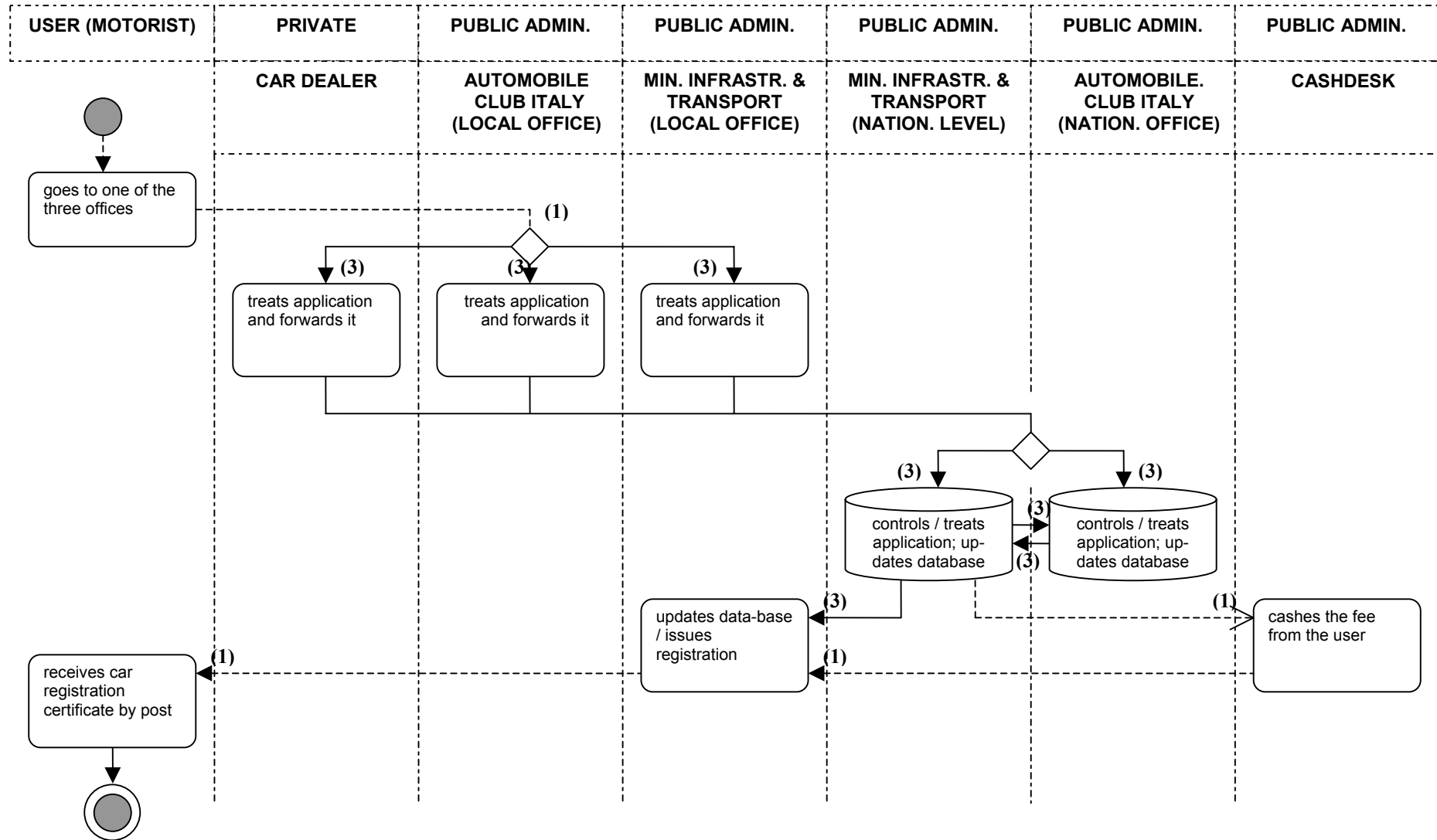
STEP 4: This validation is effected through the internal system of control, the internal assistance portal which contains all the legal documents, and the technical instructions for the professional who must issue the document.

STEP 5: After validation the document can be issued. The co-operating system has such a high degree of integration, which means that any "imbalance" occurring in one of the two entities concerned is immediately reflected in the other. Therefore, the level of system management capacity is a critical factor.

STEP 6: The two Administrations concerned can guarantee the continuity of the service also in the event of serious failure. This is due to the setting up of "non-cooperating" parallel systems of service delivery. The payment can be effectuated on-line by credit cards or by automatic bank transfer for the professionals of ACI. The digital signature is introduced according to the current legislation.

With the introduction of the e-counter, the back offices of all three types of organisations (car dealers, ACI and Ministry) were reorganised. The databases of the different back offices are connected with each other and are continuously updated.

The e-counter service is a new service that has been introduced recently, and therefore the expectations are very high, while the real functionality is not as high as was planned. Online service definitely provides more advantages than the offline service both for users and its suppliers. The reorganisation of back-offices has been completed and almost fully automated, but for some services including the payment of car tax, the paper response confirming the payment received arrives by post at the users' home.

USER (MOTORIST)	PRIVATE	PUBLIC ADMIN.	PUBLIC ADMIN.	PUBLIC ADMIN.	PUBLIC ADMIN.	PUBLIC ADMIN.
	CAR DEALER	AUTOMOBILE CLUB ITALY (LOCAL OFFICE)	MIN. INFRASTR. & TRANSPORT (LOCAL OFFICE)	MIN. INFRASTR. & TRANSPORT (NATION. LEVEL)	AUTOMOBILE. CLUB ITALY (NATION. OFFICE)	CASHDESK

goes to one of the three offices

(1)

(3) treats application and forwards it

(3) treats application and forwards it

(3) treats application and forwards it

(3) controls / treats application; up-dates database

(3) controls / treats application; up-dates database

(3)

(3)

(1) cashes the fee from the user

(3) updates data-base / issues registration

(1)

(1) receives car registration certificate by post

6. Results

The e-counter has the capacity to interact simultaneously with the two main administrative partners in the motoring sector: the Ministry of Infrastructure and Transport and the Automobile Club Italia, ACI, avoiding possible duplication of activities and wasting of resources. With respect to this, the e-service points facilitate integration of data existing in two administrations in order to simplify the access to the two main information providers.
Although it is a first step of transition from traditional public services to e-services in the automobile and motoring sector, it is also an experience of collaboration among public administrations and citizens in order to enter the modern era of e-government.

The most significant achievement of the project is the simplification of the administrative procedures, with a consequent reduction of number of necessary interactions with the P.A. by the citizen.

Through the diffusion of access points nation-wide, the service delivery has been decentralised and the service delivered in real time. The e-counter now offers the possibility of requesting automobile-related files without territorial barriers. The working hours of private e-counters have been extended beyond the opening hours of local offices (local ACI offices at provincial level and provincial offices of the Ministry) – this is a great achievement in terms of time saving. As far as the ICT part is concerned, it is important to mention that with the introduction of e-counter, information management and recording has become more homogeneous, and due to simultaneous management of files, there is an increased security of the whole system.

The e-counter has produced benefits to all categories of actors. The citizens can reach the service they desire with only one click. Before the introduction of the e-counter, the private citizen had to make an average of 5 visits to the public administration offices involved. The e-counter not only prevents the wasting of time waiting in line, thanks to the increased number of access points and speed of the system, but also provides the possibility to choose among the e-service suppliers (the ACI counters, the Ministry counters and the car dealer counters). From the initial request and data entering to the actual printing out of the relevant documents, a maximum of 15 minutes is required.
The savings in terms of hours per year are estimated at about 8.200.000 hours, which is the equivalent of 1.250.000 working days (according to the estimated time of every single access of 1 hour). This savings do not only concern car registration but also other transactions and operations.

This also contributes to the saving of fuel valued at about € 25 million per year thanks to the reduced number of accesses and the diffused presence of access points throughout the territory. These savings concern the motorist or car owner, who does not have to visit several offices.

The advantage for Public Administration is a greater availability of reliable and updated information regarding motoring that can be used for monitoring trends and making policy recommendations. Another very important advantage is the reduced risk related to cash transactions, as these are replaced by e-payments through car dealers that 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.

The introduction of the e-counter has also created advantages for car dealers and driving schools in terms of redeployment of staff trained as e-agents by the PA's training programme. Obviously, there is also a reduction of need to access ACI and Ministry of Infrastructure and Transport and the reduction of risks related to cash transactions as these are replaced by e-transactions. The offices of car dealers are spread throughout the entire national territory.

The results relevant to all categories of final users include the availability of a number of free services, time savings and improved time management due to streamlined procedures as well as 24 hours accessibility to the e-services and e-information. There are also money savings in terms of visits to offices and inter-agency collaboration and networking on-line. There is an increase of security, both in terms of standardised servicing and elimination of cash payments. Data collection and simultaneous processing and dissemination help the policy makers to define customer orientation. Growing awareness of the relevance of public-private dialogue on motoring-related issues improves the management of mobility and security. In relation to the long term sustainability, the e-solutions are conceived to optimise the use of existing skills and infrastructure; for example: rationalisation of databases and information sources existing in different government agencies, use of infrastructure disseminated throughout the national territory, development and management of an improved version of the e-services by the same team of experts and in-house training.

There is a positive cost/benefit analysis in terms of mutual satisfaction between users and operators of this sector. Reduction of time and cost is related to the access to the services.

In October 2002, the launch of the service, there were 187 registrations through the e-counter car registration. In April 2003, there were about 400.000 car registrations and even more are expected in future. In comparison, in 2002 there was a total of about 2,96 million car registrations. Altogether, in Italy there are 3.552 points of e-counter services spread in 194 offices (ACI, Ministry and car dealers).

There is an increase in the professional capacity of the operators and the high quality performance of the management.

7. Learning points and conclusions

The co-operation between public administrations and collaboration among public and private entities in order to simplify administration procedures is one of the most important developments resulting from the implementation of the auto e-counter project. Some challenges were encountered both in organisational and technological terms. Thus, the organisational challenge was recognising the importance of effective co-operation between ACI and the Ministry of Infrastructure and Transport due to the commitment and participation of concerned government bodies. It is necessary to make a clear definition of the responsibilities of ACI and the Ministry with regard to the identification of different levels of service uses. The other challenge is the co-operation with the private sector (car dealers) that is implemented by means of consultation with its representatives (professional associations). In order to cope with these challenges, 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

As far as the technology challenge is concerned, the inter-operability between different systems is made possible by the introduction of modern technology. Web-based interface and ISDN connections with TCP IP provide the link with agencies that are equipped with Windows 2000 or XP. This creates the possibility of 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 dedicated line on the model Web Services. The system regulates the permanent balance according to variations of workload. With reference to the Italian law on the simplification of administrative procedures, this project fully reflects its achievements in terms of decentralisation of public services which permitted a reduction of time and costs for the citizens. It is important to mention that ACI was one of the first public organisations providing services to public agencies and public automobile services to incorporate remote payment procedures via phone and via Internet. With the introduction of the motoring portal, ACI has been playing a key role in the public supply of e-services free of charge. The experience gained in this case is now viewed as an important example of how to supply other applications of e-solutions by the public sector.

This case illustrates the co-operation between private sector and public administration very well. The main features of the model are that there is an immediate delivery of all certifications required, that the single user may choose a single access point to interact with ACI or Ministry. The e-applications are web-oriented and thus accessible to all.

8. References and links

www.aci.it, homepage of ACI
www.infrastrutturetrasporti.it homepage of Ministry of Infrastructure and Transport

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Contact persons
Italy, ACI Automobile Club Italy, Mr. Giuseppe Cesaro (tel. +39 06049982511) and Mr. Mario Punchina, Director of Information Service of ACI Informatica. ACI has entrusted its ICT component to ACI Informatica which developed the motoring portal as an e-solution providing direct access to the world of web services (Via Fiume delle Perle, 25 ROMA, tel +39 06 52999525, email m.punchina@informatica.aci.it).

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Italy

Case 20
Citizen building permission:
Municipality of Bologna—building permit

1. Executive Summary

In the city of Bologna, it is necessary to apply for a building permit (formerly known as a building concession) in order to build new structures of a certain level of complexity and relevance, or to engage in the restructuring of existing buildings involving the creation of new units of volume or new surfaces. Initiating the process to apply for a building permit can take place online or in person; however, the user group is limited to registered professionals involved in the construction industry (architects, engineers, planners, designers, draftsmen, etc.), according to the new Regional Construction Law 31/2002 that went into effect as of 1 July 2003. Prior to the filing of a building permit application (or a DIA—*denuncia d' inizio di attività*—declaration of the initiation of activity),[52] the owner of the property must provide the professional with the authorisation to file the application and furnish required documents.

Since 1998, it is possible to begin the process of applying for a building permit online by using a digital signature. This service 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 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; but in practice very few professionals (only 50) have used the system to date. A completely new system (based on Milan's "OnlyOne®" system)[53] for online building permit applications is currently being set up, thus the online process to apply for a building permit in Bologna is temporarily suspended. It is hoped that the updated system will experience a far higher level of use among Bologna's building professionals.

Under the initial system to initiate a building permit application online via digital signature, a building professional had first to apply for and receive a digital certificate from a dedicated municipal office. He/she then used the digital signature to begin the application process, indicating the type of construction and other details on line, generating an electronic file and protocol number. The first back office (BO1) (the Construction and Enterprise Desk) receives the online application and functions as a filter, ensuring the quality of information provided and taking account of the documentation that will need to be presented. The sub-back office (the Construction Desk) then communicates with the applicant as to what is needed to complete the application. While it is possible to send some documents in digitised format to the BO1, in most cases the relevant paper documents have to be presented physically in the municipal offices located at the same address. The communications relative to an individual application are then transmitted via e-mail to the other back offices involved in the process with the responses returning to BO1, which then provides a response (or a "silent assent" in the case of some DIAs) to the user.

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). A building permit applicant can now request the relevant simplified paper form from the "office for the issuance of documents and management of revenues of the Construction Desk" (*ufficio rilascio atti e gestioni contributi dello Sportello Edilizia*) (or download it from the municipal website) and the completed form is presented to the main Construction Desk (within the same building) along with the necessary documentation (which in the past was not always known beforehand). The Construction Desk is responsible for requesting missing documents and communicating the result of an application. While the process may

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[52] The projects covered by DIAs as well as those not requiring any formal notification have expanded, thus also lightening the load of the public administration.

[53] Only One® is a software used by the Municipality of Milan which furnishes a single point of access to municipal staff and professionals incorporating an innovative and effective mode of managing building procedures. It facilitates the work of municipal officials in managing the workflow of proceedings, deadlines, and monitoring, research and statistical functions. It also allows external users, professionals and citizens, to research the status of applications or building projects, and as of December 2002 allowed the online compilation and sending of questions and applications as well as setting up an appointment with a municipal technical office in order to present the project. Bologna is now in the process of adopting the same software.

be initiated in a paper-based mode, users may send messages via e-mail to request or cancel appointments to review plans; to ask for copies or to look at building applications with a protocol number; to request a brief look at previous cases in the building archives; and to issue a request for generic information on technical-administrative issues and procedural questions regarding building. The Construction Desk is now oriented toward e-mail based communication both with users/applicants and with other back offices.

While between 1998 and November 2002 over 1500 digital signature holders have used the online municipal system for various requests, according to municipal sources, the number of building permit applications presented to the Municipality for "pre-acceptance" was only around 50, with 64 external users authorised to use the system. Since the system is not in operation at present, it has not been possible to make any estimates of growth trends. The users comprise a specialised class of individuals who tend to be quite familiar with digital processes (used in design and planning offices) and thus have a higher rate of uptake for online municipal services than the citizenry at large.

The introduction of the new online building permit system is foreseen for beyond 2003. The "Only One" system will manage the workflow to facilitate cooperative work and integration between the various back offices, including those outside the municipality. This new application will be the basis of new services for both business and building activities that are routed through the joint Desk for Construction and Enterprise (BO1).

In theory, the Bologna building permit case follows Model C, with level 2 of digitisation: one service is involved, but there are two or more types of electronic interaction, including that between the user and the first back office (BO1) and between BO1 and other back offices involved. The number of back offices involved is determined by the type and complexity of the project. The online process can only be initiated via digital signature. The complexity score increases as more BOs are involved: Stage 2, Stage 3 and beyond are possible, with the score ranging from 4 (2+1+1) and up.

Construction, in particular renovation or restructuring, is a highly dynamic sector in the city: in fact, Bologna was the leader in Italy in terms of renovations, which are covered by 36% tax breaks. The service "application for a building permit" was chosen since it incorporated a digital signature and Bologna is one of the few cities in Italy to offer it. However, until now, the system has not been as digitised as it could be; the system will be much further digitised once the "OnlyOne" system goes on line. While Bologna was a pioneer in e-government in Italy, and it is a system that continues to produce benefits, some of the municipalities that have followed Bologna's lead (Milan, for example) have introduced more advanced applications. Nevertheless, Bologna was chosen since it has longer experience with the digital signature and the online building permit application process.

2. Background

Two main background elements play a role in the introduction of the online building permit application and other online services in the Municipality of Bologna: first, the socio-economic-cultural fabric of the city and its region (as discussed below); second, the Bassanini Law (art. 15, L n° 59 of 15/03/1997). 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 introduction of the online building permit process was a pilot case begun in 1998. At first, it was possible to use the system only to announce the intention to apply for a building permit online and supporting documents had to be presented in the relevant offices. The online system has not evolved much beyond this situation, as it was mainly the municipal reorganisation of the back offices that contributed to improvements; however, the new "Only One" system to be introduced will represent a substantial improvement and far better integration of back offices involved in the building permit process. The general goals behind the introduction of the online building permit application system include improving services and facilitating multi-channel access to citizens, facilitating and streamlining administrative procedures, and helping citizens and businesses save time and money; thus, facilitating the building permit process will also stimulate the construction industry (or at least free up resources for other activities).

Improving the integration of back and front offices and allowing better communication and relations with citizens and businesses active in the local economic fabric are the underlying principles behind the case. Administrative streamlining and increasing transparency (governed by Act 241/0 on transparency) have also contributed to a reduction of paperwork, as citizens were no longer required to carry documents from one office to another, and there was reduction in the number of certificates and documents required to undertake certain administrative procedures (under Act 127/97). The digitalisation of Bologna has in fact reflected the reform of the Italian public administration in general: a move by

recent governments to streamline, simplify and make more effective the bureaucracy, which in the past was notorious for its complexity, non-transparency and excessive amounts of paperwork.

The municipality of Bologna has made a major investment to put certain municipal services online and approaching a "whenever/wherever" situation for delivery. The objective is to move toward multi-channel availability of municipal services: maintaining the traditional format while introducing new services online. New services will also be made available through WAP, UMTS and SMS as well as Voice over IP in the future.

As Bologna offers more services online, one of the biggest challenges has been the digital and functional integration of the different parts of the administration, in particular the old parts with the new parts. The main problems involved aggregation of certain functions and movement of staff to different offices and into different roles. While in general staff were positively inclined toward the new services, there was the burden of developing new working groups and relationships within the public administration.

Back in the 1960s, Bologna was the first city in Italy to adopt computers in order to automate parts of its administrative infrastructure. The 1990s initiative "Bologna digital city" was aimed at improving the efficiency and quality of services produced and delivered by the Municipality and other Agencies, thus leading to a *"positive cascading effect on the socio-economic make-up of the city and its cultural environment in general"*. This policy led to substantial investments in technological innovation and human resources in order to develop and improve not only the functioning of the public administration, but also the city as a whole. An important element of this policy is the Bologna Civic Network Service, *Iperbole,* which was activated in January 1995 and provides the backbone of all online municipal services. Iperbole also provides free Internet access to city residents and institutions and links Bologna to the surrounding municipalities of the metropolitan area (A2A). Now the city, in cooperation with the Emilia-Romagna Region, is investing in broadband capability and services (IperBO) to be provided via an optical fibre net eventually extending more than 1500 kilometres.

The city has an official population of only 372,000 inhabitants (2002 census), but it has a metropolitan area with around 900,000 inhabitants and numerous individuals come to the city for work or to study at Italy's oldest and best-known university. As the administrative capital of the Emilia-Romagna Region, Bologna is an important economic centre and the main hub of the road, rail and telecommunications network in Italy. The city enjoys an unprecedented position as a crossroads of commercial, intellectual, transport, technological and administrative activities and is one of the leading cities in Italy in terms of production capacity, technology, quality of life, infrastructure and services as well as per capita income. In 1999, it was estimated that about 25% of the population had access to Internet; by November 2002 this figure had risen to 40%. Internet penetration in the Emilia-Romagna Region is about twice the national average.[54]

On an international level, Bologna participates in the Telecities network and the Global Cities Dialogue, and thus has been able to share its experiences with other municipalities not only in Europe, but also in other parts of the world. It is also involved in the European e-democracy projects, EDEN and DEMOS. In this sense, the city has contributed to the transfer of experiences both within Italy and to other countries.

The municipality of Bologna has a long tradition of building civic networks and working to improve communications with citizens and social and economic players, according to the concept of participatory government. This has also been the basis for the incorporation of ICTs as a valid instrument for defining relationships between government and citizens: digital technologies were first used to provide information (via website), engage in communication (via e-mail) and now also to engage in transactions (via interactive services). Some of the highlights of the Bologna experience are the DIMMI[55] automated tellers for certificates and payments, the CUP2000 public health service appointments system, and Iperbole, the civic network service. The application system for building permits was the first online service offered via Internet. More recently, Bologna introduced online services for paying property taxes on buildings (ICI) and the rubbish removal tax (TARSU). A next step is to put the DIMMI service on the Internet, so that certificates can be printed out from home or the office. There are also efforts to put the CUP appointments services on Internet—up to now, they have been available only via computers located in USL (public health system) offices or in participating pharmacies.

Digital Signature

The Municipality of Bologna began experimenting with the digital signature on 30 June 1998. The nearby communities of Casalecchio di Reno, Castelmaggiore, Zola Predosa and Argelato also participated. The pilot case was conducted in cooperation with the Italian Ministry of Public Functions and the AIPA (Authority for the Informatics of the Public Administration). The company Società BNL Multiservizi provided technical and organisational support. The Municipality acts as the certifying entity, using asymmetrical keys, and the rigorous certifying procedure is similar to

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[54] From "Iperbole Civic Network & connected community", Leda Guidi, April 2002.
[55] The DIMMI system provides automated teller machines (ATMs) where citizens can request certain types of certificates (birth, marriage, residence, civil status, etc.) and documents and undertakes some payments (of traffic tickets or other fines).

that used for the release of an identity card. The resulting electronic certificate guarantees the authenticity of the user by validating the correlation of the identity of the owner of the certificate and his public cryptographic key. In moving towards "digital citizenship", the Bologna digital signature is intended to guarantee a "certified digital identity" for its citizens. All adult citizens (even non-residents) within the Municipality of Bologna may obtain a digital signature, which allows users to perform a variety of activities, including:

- applying for a building permit (limited to building professionals).
- registration via Internet for a place in public nursery schools
- access via Internet to the general municipal protocol system
- e-mail communications of the ending and starting dates for construction projects
- renewal of an elevator licence
- downloading the technical cartography of Bologna of the SIT system
- information on ICI (property tax on buildings) (in Summer 2003 it became possible to pay this tax online)

The digital signature is being integrated into the new Italian identity card, the "Carta del Cittadino" (citizen's card) that was introduced in 2002, but has not yet seen wide distribution. The municipality hopes to distribute several hundreds of these cards by the end of the year. Bologna is one of the first Italian cities to test it.

3. Specific objectives

The main idea behind the online building permit service is "disintermediation." The objective not only behind this service, but for all online municipal services is to eventually change the nature of the relationship between citizens, professionals, and businesses and public administration and allow a significant share of transactions (licences, authorisations, concessions, applications, etc.) to take place online via a normal PC and a simple Internet connection on a 24/7 basis every day of the year in a quick and efficient mode. The online building permit service allows a building professional to begin an application for a building permit as well as to monitor the status of advancement of the application within the system while maintaining the necessary prerequisites of privacy and security.

The entire structure of Bologna's municipal public administration was reorganised in the period February-April 2002: this reorganisation has had a very important impact on how services are offered and coordinated by the respective back offices. The reorganisation took place according to "macro thematic" areas, designed 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: a new area known as "communication and relations with the citizenry" (*Communicazione e Rapporto con la Cittadinanza*).

With respect to building permit applications, the most important change brought on by the reorganisation was to integrate two formerly separate back offices into a single back office: the "Sportello per edilizia e imprese" or unified Desk for Construction and Enterprises, designed to serve as a joint interface shared by building and business activities. These activities were subordinated to the above-mentioned area "communication and relations with the citizenry". Also under this area are the sectors "citizenry" (incorporating the citizens' registry and the DIMMI certificates system) and "security." Prior to the reorganisation, the back offices dedicated to building and business activities were separate and under different departments. There remains some overlap of the competencies of the different sectors.

The building permit application was the first municipal service put on line with the specific purpose of testing the use of the digital signature. Given the importance of construction (especially renovation and restructuring) activities in the city, putting the service online was seen both as an experiment with a new mode of application (experimentation was continued through this year) and a way of streamlining a process that was notoriously slow and cumbersome in the past.

4. Resources

Bologna has invested significant technical, financial and human resources in its digitalisation. The area of "Information and telematic systems" is one of the largest expense areas, covering municipal computer equipment, management and development of information systems, telecommunications expenses, and planning and development related to ITCs. As only general figures of the municipal budget were available,[56] the costs of individual initiatives are not presented. In 2002, the municipality spent 8.5 million Euros on information and telematic systems, of which technologies comprised 2.5 million Euros and planning and development represented 5.7 million Euros (the balance of the costs is comprised of management, administration, and coordination). This is down from a peak of 9.1 million Euros spent in 2000. While availability of revenues for new projects and initiatives is always a problem in any public administration, the amounts

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[56] CONSUMI SPECIFICI: Serie Storica Riclassificata Consuntivo 1997-2002. From Bologna Municipal website, 2003.

dedicated by Bologna to ITC-related expenses were far higher than what was spent on the municipal police and most other services, except for street and infrastructure maintenance, culture and family and social services.

The information systems of all municipal back offices are located on Iperbole. The network consists of several linked LANs connected via a backbone that is now being converted to optical fibre. Until June 2002, Iperbole was run by Cineca, but now Acantho (owned by HERA, the regional multi-utility service provider) has the service contract. At present, the municipality is the only content provider for Iperbole, but in the future, there will be other content providers with the municipality retaining oversight. Since 2000, the costs for the Iperbole project and other initiatives involving communication and relations with the citizenry were listed separately, with Iperbole costs peaking in 2001 at 626,000 Euro. In 2002 Iperbole and other initiative costs were only a third of those in 2001 at 205,000 Euro.

The municipality has around 3,500 computers for its staff linked via Iperbole. Recent IT upgrades included the introduction of SAP and Lotus Notes, requiring extensive on-location staff training. Specialised programming is undertaken by outside IT contractors which send specialists to work on location for longer periods of time. One of the new services is an automatic electronic messaging system known as *CSS Customer Satisfaction Service* in which electronic messages addressed to the public administration are routed to the relevant offices on the basis of advanced Natural Language Processing tools defined on a set of keywords linked to specific activities. This system routing is based on Lotus Notes, which has been customised for Bologna.

In its programmes and systems, the municipality uses both open standards (ensuring the potential for transferability) and dedicated software that has been specifically developed for it. An example of a transferred system is DIMMI, which was also adopted by Modena and Carpi, two smaller nearby cities in Emilia-Romagna. There are also initiatives to improve the technical interoperability within the municipality and with other government agencies that are involved in municipal matters on a regular basis. The various municipalities of the Bologna metropolitan area have a high level of interoperability due to their sharing of the Iperbole system and certain administrative functions. These municipalities are able to offer the same online services to their residents that are enjoyed in the regional capital.

The resources to develop the initial online building permit application service were both internal and external. The municipality has engaged in the policy of choosing "partners" (outside IT service contractors) to develop personalised services, as there are very few internal programmers on the municipal staff. The contractors engage in very close collaboration on an ongoing and fixed basis; but the municipality retains the option to request the ability of different professionals based on need (i.e. body rental). The use of specialised ITC personnel under contract provides maximum flexibility for the municipality and ensures that it gets the competencies it needs at a far lower cost than entailed by either training internal staff or hiring personnel on a permanent basis. Cooperative relationships with suppliers have been quite successful. The applications for the Bologna Municipality's online building permit process were developed by outside suppliers—the earlier system was developed by "Engineering", the new system is being developed by CORE.

Bologna engages in ongoing staff training initiatives so that its personnel can continue to work with the evolving administrative system which is constantly being upgraded. The roles and responsibilities of staff members have changed due to the recent reorganisation as described above. The overall reorganisation of the municipal administrative structures applied the cross-sectoral approach aimed at bringing better service and communication to the citizen/customer. The area "communication and relations with the citizenry" (*Communicazione e Rapporto con la Cittadinanza*) plays a strategic, rather than implementation role: its most important functions with regard to the online building permit service were definition of strategy, planning of actions and project management. The Construction Desk has cooperated closely with the IT partners to ensure effective implementation of digital processes.

As mentioned above, the Bologna Digital Signature applies the Banca Nazionale di Lavoro standard and the municipality itself certifies the digital signature. The municipality chose BNL Multiservices, a company within the BNL group (Banca Nazionale del Lavoro) as its technical and logistical capacities also allowed connection with the type of security system used in banking. The technologies and systems enabling data protection, security, trust, privacy, confidentiality and freedom of information include a dual asymmetric key system (1024 bit) and a banking security system. The system runs on a remote server on a 24/7 basis and the MultiCERTIFY software provides a channel of secure communication between two entities via a protocol SSL version 3.0. The minimum technical requirements for home or office use of the multiCERTIFY software allowing the implementation of the digital signature include:

- Operating system: Windows95, Windows 98, Windows NT4.0 or Windows 2000 (or more advanced versions)
- RAM: minimum 16MB
- Available space in memory of hard drive: 10 MB
- CD-ROM
- Browser: Explorer 5.0 or Netscape 4.0 or higher
- Access to Internet

Bologna has a distinct advantage in having an excellent university, thus providing access to highly educated and motivated human resources. The municipality has not had trouble in attracting highly educated and qualified human resources. Furthermore, though various networks and international and national projects, Bologna has access to knowledge networks and knowledge resources throughout Italy and the world.

5. Implementation

The path below describes the previously available process to apply for a building permit online; however, it is important to remember that the real operation of the system undergoes many variations and at present it is not active, pending the new system. The description of the new system also follows.

Step 1:
Before beginning the online process to apply for a building permit, a user must apply for and receive a digital certificate which permits executing a digital signature from the designated municipal office (Registry Office) upon furnishing the required credentials. The individual presenting the request for a building permit must be the professional responsible for managing the project as well as a member of the relevant professional register.[57] The digital signature has a dual function in that it identifies the user and can be used to sign documents.

Step 2:
 From a remote location (office, home), the user begins the application online by using his/her digital signature to enter the system and inserts the relevant data regarding the his/her personal data, the characteristics and location of the proposed construction project, clicking on the relevant fields, *thus generating an "electronic application."* The system asks the user to verify the data, then to sign with the password of the digital signature. The "electronic application" is automatically assigned a protocol number and transmitted to the municipal Desk for Construction and Enterprise (BO1), i.e., its sub-back office, the Construction Desk. The data that was entered goes into an archive, thus for repeat users it is not necessary to provide personal information again.

It is important to remember that under the "experimental system" to submit a "pre-application for a building permit", the formal application was not activated until all required documents were made available.

The important change is that instead of the user filling in a paper form with data, which then had to be entered 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.

Step 3:
The application is received by the Construction Desk, which functions as the "single interface point" for users. This office collects the application data and transfers them into the application used for the management of the workflow, automatically sending the user an e-mail message that the data were 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. Under the previous system, it was necessary for the professional to call the relevant office (during very limited hours) or to go to the office personally and wait to speak to one of the Construction Desk staffers.

Step 4:
The user must then go to the Construction Desk at the scheduled appointment time to present the documents and answer any outstanding questions. The documents[58] that must be presented to initiate a formal declaration of initiation of activity DIA or application for a building permit are the following:
- Declaration by owner/initiator of construction authorising professional (i.e. user) to undertake activity
- Cadastral plan and/or extract of the map and/or cadastral certificate with the identification of the parts that are subject to the activity as of 18/07/86 (can be a copy)
- Blue print (1:100 scale) showing current state, proposed project, the interventions (highlighted in red and yellow);
- Technical description of activity including the calculation of the existing surface and of the planned project and methodology for the activities as well as the disposal of the material from the building site;
- Declaration of conformity that respects all urbanistic and building norms, as well as norms of the penal code.

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[57] 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.
58 While it is possible that some documents are in electronic format, most of them are still paper-based and must be presented in person.

- Photographed documentation of the current state of the building, showing adjoining buildings and also pre-existing vegetation, in colour and in a format not smaller than 15X10 cm.
- Proof of payment to the secretary. It is not yet possible to pay on line or via credit card (only cash or bankcard).

Step 5:
Upon satisfaction of the documentary and other requirements, the application which was started electronically is "formally" activated. The application file can now be sent by BO1 to other back offices, depending on the type of construction activity. The online requests are routed electronically by BO1 to different back offices (B02 by necessity, BO3 if required) and are subject to review by staff in the other BOs (human interface).

Presentation of additional documentation in paper format might be required by the other BOs; however, the BO1 remains the single interface (*representing a major improvement over the previous multiple interface system*). In the case of very simple restructuring requests, it is possible to undertake the application process by submitting only electronic inputs respecting, however, the new document requirements (see above). Yet, human judgement is always present in the evaluation of the validity and feasibility of the construction projects.

The geographical data necessary for the process is available to users as well as the municipal staffers on the online "SIT": The municipality has a full set of geographic data online in the "*Sistema Informazione Territoriale" (SIT)*, which includes all relevant information regarding restrictions, zoning variances, power lines, and water lines: thus, the user must only indicate the exact location of the property. In some cases, for example, a simple renovation of an apartment, the geographic data is not really necessary. This online system represents a distinct improvement over the past situation in which a user had to present this data.

The two primary back offices that are involved in making the decision on whether an application should be accepted are the **Construction Desk BO1** (within the unified desk for construction and enterprise under the sector Communication and Relations with the Citizenry) and the **Construction Office BO2** (of the sector Territory and Urban Requalification). The extra-municipal back offices that may be involved include the Province of Bologna, the AUSL (Health authorities), ARPA (environmental protection) and the *Vigili di Fuoco* (Fire Department), among others.

Step 6:
A user may check on the status of the application online by using the digital signature or the protocol number. Previously, this required going to BO1 and requesting confirmation, which was not always easy, since it was not always immediately known where an application was within the system. Often numerous phone calls and trips were necessary.

Step 7:
BO1 receives the relevant responses from the other BOs via e-mail.
Previously notification took place via surface mail or fax, which required paper work and also left the possibility for this paper document to get lost or be misplaced and thus delayed.
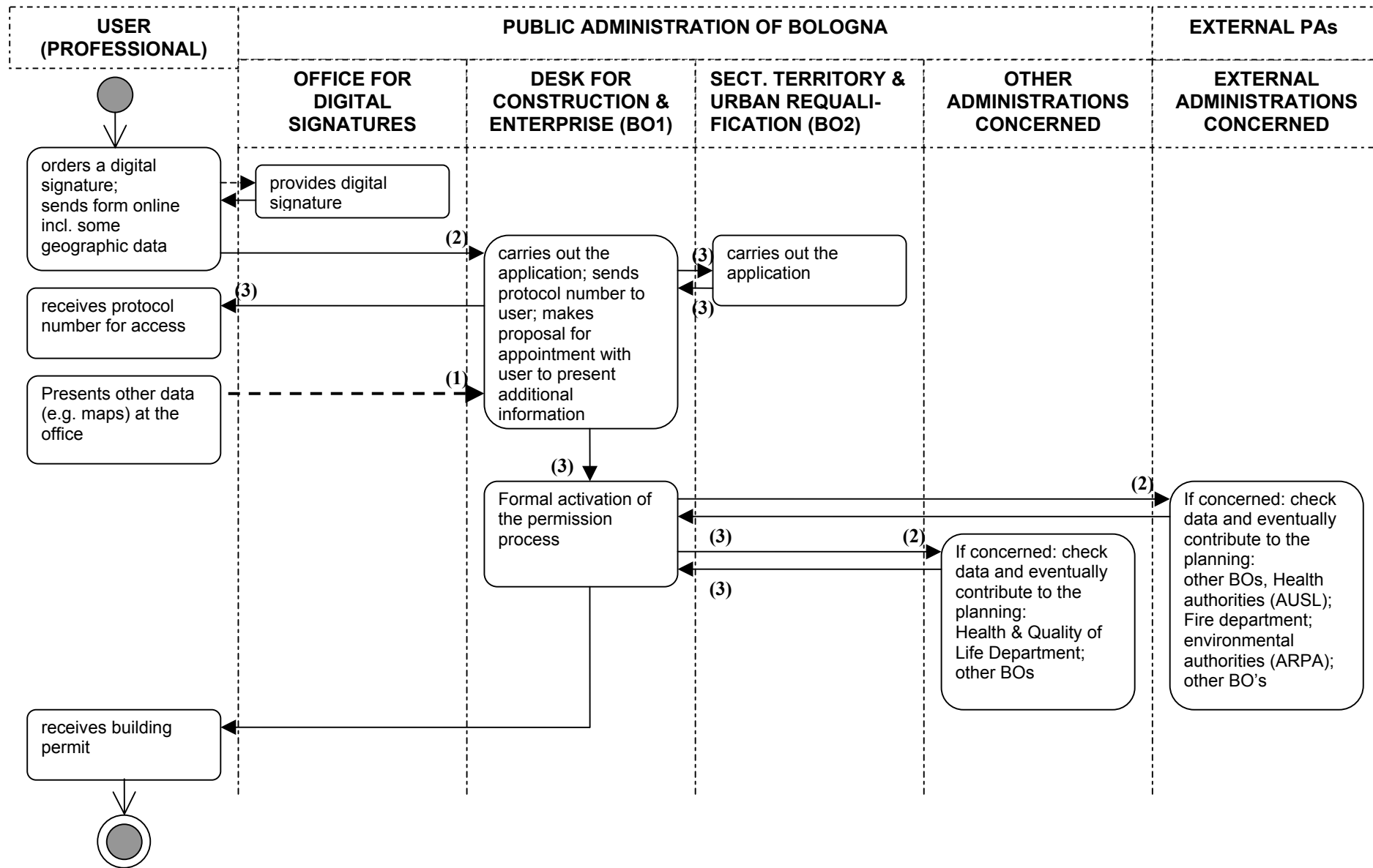
Step 8:
Depending on the judgement of the other BOs, BO1 provides notification of approval, denial or "silent assent" via e-mail. The formal building permit can be issued in paper or digital format, and users can also check this online. Previous building permits were all in paper format. Now it is possible to issue an electronic permit, completely eliminating the paper document. This permits electronic storage of this important record, which can be copied, forwarded and consulted in a far easier mode than in the past.[59]

Only One
The new "Only One" system as introduced in Bologna will represent a higher level of integration between the back offices, reusing already registered information, serving as a more sophisticated tracking and messaging system. For example, the request for a permit to build a food store or restaurant would be routed automatically to the AUSL. *Only One* as it currently operates in Milan allows professional users to 1) electronically compile and transmit the application form for a building concession or authorisation or the form for the DIA; 2) to set up appointments to present project materials to the municipal technical offices; and 3) to access information on the applications in progress and their status and location in municipal offices. It is also possible for Milanese residents to find out about private construction projects in their neighbourhoods.

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[59] Paper storage of building files is still being undertaken. In fact, the municipality recently contracted an outside firm to archive records dating from 1985 to three years ago. Remote location archivisation was introduced due to lack of storage space in municipal buildings.

USER (PROFESSIONAL)	PUBLIC ADMINISTRATION OF BOLOGNA				EXTERNAL PAs
	OFFICE FOR DIGITAL SIGNATURES	**DESK FOR CONSTRUCTION & ENTERPRISE (BO1)**	**SECT. TERRITORY & URBAN REQUALI-FICATION (BO2)**	**OTHER ADMINISTRATIONS CONCERNED**	**EXTERNAL ADMINISTRATIONS CONCERNED**

orders a digital signature; sends form online incl. some geographic data

provides digital signature

(2) carries out the application; sends protocol number to user; makes proposal for appointment with user to present additional information

(3) carries out the application

(3) receives protocol number for access

(1) Presents other data (e.g. maps) at the office

(3) Formal activation of the permission process

(2) If concerned: check data and eventually contribute to the planning: other BOs, Health authorities (AUSL); Fire department; environmental authorities (ARPA); other BO's

(3) **(2)** If concerned: check data and eventually contribute to the planning: Health & Quality of Life Department; other BOs

(3)

receives building permit

Access to the Milan system for the above services is possible via an assigned code and a password, yet via digital signature, professionals can also exchange documents with the municipality. A major difference between the Bologna and Milan system is that the digital signature makes the Bologna process legally binding under the Bassanini Law, whereas in Milan the formalisation and signatures must still be undertaken when relevant documents are presented at the appointment. The Milan system only became fully operational in early 2003 and thus is still in its introduction phase.

The main changes in the roles and responsibilities of staff member and skills are linked to the fact that the initial keying in of data is eliminated, as this is undertaken by the user. Once the relevant data is in the system, it stays there until, for example, the status of the application changes when it is sent from one BO to another or is approved or denied. This is undertaken by the relevant staff member in one of the BOs. Another change, but from an administrative point of view, is that there is a single point of access (BO1) for the user. All e-mails and requests flow through BO1 which acts as a filter in order to route the communication to another BO. The system keeps track of the application depending on the data on status typed in by the BOs. Given that relevant BO staff have already had previous IT experience (particularly the municipal staff), learning to use the new system required only minor training. Contract staff were on hand to help out permanent municipal staff with the new system.

6. Results

As the most immediately evident result, the availability of information regarding the building permit process on the Internet is a major improvement in a country such as Italy. Previously, it was a very time-consuming and difficult process to access the relevant information on construction and to find out what documents to present, where, and when. While this may be a "banal" concern in other countries, the provision of detailed information online has saved tremendous amounts of time and avoided the need for frustrating and often fruitless phone calls and office visits to compartmentalised administrators who can only provide some of the answers to questions.

A second important result (though not necessarily an outcome of digitalisation) that is particularly relevant to the building permit process is the designation of a single interface to act as front office (FO) to receive and provide an initial evaluation of the application. The mission of this front office is to facilitate and speed up the procedure from FO to BO and ensure the quality of the information provided by checking the completeness of the application information at the beginning, thus the quality of the applications reaching the BO is much higher. The option for users to communicate with BO1 via e-mail is also 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.

One of the primary benefits of the online building permit application system has been to professionals that regularly apply for building permits. Given the fact that for simple projects, the procedure could take place almost completely on line (necessitating only one appointment), this has been a tremendous time saver (not to mention the reduced need for travel in an already crowded city). Efficiency is improved by the fact that once information is presented, it does not have to be presented again (as it is archived by the municipality). However, the human interface remains important in verifying the validity of documents presented and human judgement plays a role in each BO that evaluates a particular application.

Another result is that the online application system makes it easier to begin the building application process, especially for small players--individual professionals or small firms that do not have time to wait in municipal offices. The online system (prior to introduction of Only One) served essentially as an electronic method for generating a "case file" (protocol) and starting the procedures by allowing a professional to enter relevant data: personal information about the owner of the property and the professional undertaking the project, the characteristics and location of the project, thus establishing a predetermined workflow to the relevant back offices. The territorial information service SIT allows users and municipal staff direct access to a wide range of digitised geographical information and zoning data which can be used in the permit process.

Due to the difficulties involved in digitising some inputs to the process (and the small number of firms that have a capacity to produce and send digitised documents) many aspects of the building permit application will remain paper-based for some time: the main constraints include the difficulty in imposing on users the requirement to send documents online--documents that in any case need to be carefully evaluated by relevant officials--and the lack of a capacity of most users to initiate the procedure of signing formal acts in digital format.

In 2002 over 6000 building applications were registered by the Construction Desk: of these, 4984 concerned activities that were possible with a DIA declaration of initiation of activities, 697 were requests for building concessions for expansion or new construction and 341 were requests for building authorisation to intervene in buildings subject to historical or environmental restrictions. Most requests involved restructuring or renovations. The online system for initiating the building permit process (which remained a pilot project) was only used for 50 applications, though 64 professionals are authorised to use it. This is a very small segment of the potential user base, though some users may be responsible for multiple construction projects. The results of the Only One® system in Milan thus will be of great interest to Bologna, since the municipality has chosen to introduce the same system—this choice, in fact, would imply a certain level of success of the Milanese model.

Ultimately, improved and speeded up administrative procedures for construction activities should contribute to quicker realisation of building projects and thus stimulate the development and expansion of the local and regional construction industry and related businesses and services. The time-frame for the completion of a building permit is closely linked to the nature and complexity of the particular project and can range from 15 to around 180 days, depending on whether health and environmental impact assessments are needed. The fact that many types of activities formerly necessitating a building permit are now subject to DIA has sped up certain procedures.

With the application of the Regional Law on Construction 31/2002, the time limits have changed for the "silent assent" related to the DIA: 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."[60]

Data privacy and protection aspects within the BOs are to be ensured via the digital signature that is certified according to standards used in the banking system. The system uses a dual key system which only permits access to private documents if both keys are present, one private, the other public.

Probably the main time saver for the user is the change in the law that allows DIAs to be filed for many activities, whereas the more complicated building permits are limited to only very major activities. 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).

The planned results of the upgraded Only One® system include reducing the number of trips that professionals need to make to municipal offices; increased transparency with regard to private construction projects within city limits; allowed knowledge of where an application is in the bureaucracy, whether or not it has received a response, and who is handling it and simplification of procedures. In Milan, this information is currently accessible via an assigned code and password. Transmission and exchange of documents, however, requires a digital signature.

7. Learning points and conclusions.

Prior to expressing any particular conclusion, it is important to reiterate that the process described in the case above is still ongoing and, in fact, the service will become more sophisticated and will improve the integration between back offices. Bologna is among the most advanced of the Italian municipalities in the reorganisation of its back offices to better address the needs of its citizens. The overall reorganisation begun in 2002 was undertaken to make the municipality more receptive to its constituents, thus putting all areas in which there is direct contact with citizens under one strategic direction (Area: Communication and Relations with Citizenry). Rather than having the technology dictate the structure, the IT systems and the online services of the municipality were adapted within this structure whose main objective is "disintermediation." One of the biggest problems has been that this reorganisation may in fact have created new complexities between internal back offices. Among the biggest overall challenges has been the reorganisation of the different parts of the public administration and integration of the old parts with the new parts.

New services are being introduced online all the time, reflecting the proactive and innovative approach of the city (also seen in the large budget resources assigned to ITCs in the municipal budget). The objective is to move toward multi-channel services: maintaining the traditional format while introducing new services online and providing delivery over non-traditional ITCs. A major investment has been made by the municipality to put services online and approach a "whenever/wherever" situation for the delivery of certain municipal services.

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[60] 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.

The Bologna experience emerges from a unique context in Italy, which has its roots in the city's historical, economic and cultural background. The city was one of the first in Italy to "go digital" as early as the 1960s and enjoys a privileged location and high quality infrastructure as well as an extremely high rate of Internet penetration. This socio-economic context thus means that it may be difficult to replicate the full experience in other locations, unless the municipalities have the commitment and resources to dedicate first to "experimentation" with digital applications and then providing concrete online services available to a broad range of citizens. As a "pioneer", Bologna was often one of the first to adopt certain systems, though other Italian (and certainly other European) cities have often gone farther in terms of sophistication (for example the "Only One" system in Milano).

One side of the equation is the supply of digital services (such as the building permit application process), the other side is represented by the demand for such services (which entail a certain cost for the municipality—and thus also the risk that the investment cost outweighs the concrete benefits). For such a service to have a positive impact on the greater municipal fabric, it must also enjoy a certain level of usage—which requires a user base with the requisite Internet skills and the technology as well as interest in undertaking administrative operations online. Furthermore, an element of trust is involved. The latter has been addressed by introducing the BNL MultiCERT system for ensuring a secure and private digital signature (dual asymmetrical key). 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 essentially remain limited to a specific (though quite important) sector of the local economy: construction, architecture, engineering and design firms, which constitute a fairly small group of professionals that may use the system. As seen by the results so far (only 50 online applications for building permit as of October 2003) this is a very valid concern. It will remain to be seen how use of the new system will increase.

Another consideration is how much time the new upgraded system (incorporating the Only One improvements) will save compared to both the previous version and the traditional paper-based mode (which in fact now has a digital infrastructure behind it, at least for data records, geographic information, and communications between BOs). In the current and also the upgraded system, the human interface remains both a critical factor that can slow down the digitally activated processes (since the relevant decision-makers in different back offices must make a judgement on each application and its relevant features) and one that plays an essential role in maintaining quality control and assessing the merit of a proposed activity.

The Bologna building permit case follows Model C, with a level 2 of digitisation: one service is involved but there are two or more types of electronic interaction, including between the user and the first back office BO1 and between BO1 and other back offices (some outside of the municipality) involved. With a level 2 of digitisation the service allows automatic inputs, but human interface is necessary in data response (though via e-mail message.) The number of back offices involved is determined by the type and complexity of the building project. The previously available online process could only be initiated via digital signature, and applying for a building permit is limited to registered professionals. The complexity score increases as more BOs are involved, for example for a shopping centre or hypermarket. Stage 2, Stage 3 and beyond are possible. The complexity score could range from 4 (2+1+1) and up. A higher complexity would be correlated to a longer time frame for completion of the process, particularly if health and environmental impact assessments are required.

As far as transferability is concerned, the "Only One" system represents a case of transfer from Milan; yet it is likely that other Italian cities will adopt the system if it proves to be successful in Bologna. Given the similar requirements for the building permit process in Italy (with regional variations), transferability is possible and likely (especially within the more advanced Centre-North). On the other hand, the transferability to other countries depends very much on the type of systems used in those locations: first of all, the public entity would need to have a digital signature capacity, as well as interconnected back offices that are able to work together via effective and predictable workflows. A key element in Bologna's case was the reorganisation of its municipal structure which brought together the key back offices, allowing not only electronic communication (as previously, but also physical interaction and communication if necessary—for example, joint consultation of plans and blueprints). This reinforces the mechanism to be instituted by "Only One". These background conditions are not necessarily found in other Italian cities, nor is the relative efficiency of the administrative staff guaranteed. Furthermore, Bologna has a particular socio-political history and civic motivation to make such a system work—including a very high level of informatisation of the population —this is not something that can be replicated in most other locations

8. References and links

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Italy

Case 21
Business registration:
Infocamere—registration of a new company

1. Executive Summary

InfoCamere created and operates the national system linking Italy's 103 Chambers of Commerce and 300 branch offices through a high-speed, high-security electronic network. This efficient system provides users - the public administration, firms and members of the public - with immediate access to the documents and data contained in the Chamber archives, whether for informational or legal purposes. One of InfoCamere's most significant achievements is the Business Register, which was established in 1993 (in implementation of express legislative provisions) in electronic format. This distinguishing feature was a first for Europe.

Since April 2000 InfoCamere is a Certification Authority for digital signature holders, being entered in the public list of such bodies envisaged by law. InfoCamere provides the Chambers of Commerce and central and local government departments with IT products and services, and provides government departments with access to the Chambers' databases. These are also accessible to professionals, businesses and the public through distributors who operate with InfoCamere on a contractual basis.

Infocamere has set up a Telemaco service in order to simplify the administrative procedures required by the Chambers of Commerce. This project is created in the era of the passing form the paper based application to singed electronic filling for business entities. Using this instrument, documents can be filled electronically with the Chambers of Commerce without any need to file a paper original. Digital signature is done through the Smart Card. Electronic payment is done both through the credit cards for the single needs and for the multiple operations, by the bank transfer to the accounts.

This service is linked through back-offices of different agencies to the tax declaration office service ENTRATEL in order to get fiscal code and VAT number and in that way the Chamber of Commerce don't have to deal with.
The re-use of once entered information is both on horizontal (many services of Infocamere, Chambers of Commerce….) and vertical level (Agency of Income of Ministry of Finance). Infocamere works on different tables: with users and their associations like the Chambers, many Italian associations and orders like Notary, the order of Business Consultant and with different agencies of government, in particular the Agency of Incomes of the Ministry of Finance. Some services have been developed between Registry and Ministry of Finance. This service allows to the Telemaco customers the generation of VAT code for new firms by eliminating papers, movements and delays.

The request about subscription/modify/closure of the company by the service of " online send of the documents to the business register" is also available to the other services like certificates, research by name ecc.

The Telemaco case follows Model C, with a level 2 of digitisation: one service is involved, but there are two or more types of electronic interaction, including between the user and the first back office and between the other back offices involved. The online process can only be undertaken via digital signature. The complexity score depends on the BOs involved. The score could range from 2 and up.

2. Background

All Italian firms (a total of 5.8 million) must be entered in the Business Register, which is the primary certification of the data regarding their establishment, just as municipal registry offices hold the analogous data for individual citizens. The Business Register provides detailed information on individual firms (legal status, date of establishment, company capital, tax code, sector of activity, corporate bodies and their powers of representation, number of employees, etc) and lists of firms selected on the basis of combinable search parameters (location, legal status, sector of activity). It also provides details of the most important changes in the life of individual firms (closure, liquidation, bankruptcy, variations in company officers, transfers).

Infocamere has created and operates the national system linking Italy's 103 Chambers of Commerce, Unioncamere, many Italian associations and professional orders, like Notary, business consultant, many Italian third party SW developers that have followed its open standard and Italian Association of Certification Authorities.

TELEMACO project was set up by Infocamere to enable all administrative procedures required by the Chambers of commerce to be simplified and carried out via the Web. 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. The innovative nature of he Digital Signature has made it possible to extend the range of functions provided electronically. Using this instrument, documents can be filed electronically with the Chambers of Commerce without any need to file a paper original, since the electronic version, bearing a digital signature, has the same value as the paper version.

3. Objectives

The main objective of Telemaco since 1999 is to pass completely from paper to electronic filling. By this operation many goals are achieved in order to supply better services to clients. For Chambers of Commerce this means more efficiency and cost savings. The quality and accuracy of stored data are improved. The services become faster and more transparent. Within Chambers of Commerce, there is an increase of personnel's knowledge of new technologies. For Business Entities, the introduction of Telemaco means a reduction of time for new Business registration. There is no need to attend the Chamber of Commerce in person to make reports. The fees on declarations are reduced. There is a complete transparency of registration process outside the offices.

4. Resources

This project involves many resources and many subjects: Infocamere, 103 Chambers of Commerce, Unioncamere, many Italian associations and professional orders, like Notary and Business consultant, many Italian third party SW developers that have defined an open standard for filling and developing applications and Italian Association of Certification Authorities.

Each organisation has made and is still making huge efforts both from financial and human resources engagement points of view. 4000 employees of Chambers of Commerce and UnionCamere are involved. Infocamere has about 600 employees that are involved in the project. The users are also involved in terms of training and courses, about 10000 persons are trained about new system by now.

The Telemaco service 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 it's open source. Electronic files for the Business Register can be produced using any programme that satisfies the technical specifications published in the appropriate section of the site. The digital signature can be applied to the applications and documents making up the electronic file, using any of the commercially available digital signature software applications: the software produced by InfoCamere is called DIKe and can be downloaded free form the site www.card.infocamere.it. Jorba provides integrated data searches through the Chamber of Commerce archives, enabling users to obtain information from firms' registration data (extracts of company details), firm and member information sheets (firm ownership or shareholdings by firms or individuals), information sheets on individuals, including offices held and protests against physical and legal persons, optically stored documentation held in the Business Register, financial statements, and procedures currently underway. Jorba also provides a service "Ulisse", that enables users to extract lists of firms from the Business Register, and "Stockview", a quarterly statistics system that enables tables containing information on all firms and persons holding office in them to be selected.

Technical infrastructure of Infocamere: 165 Servers HP and 71 Servers SUN, 30 Server LINUX and 93WIN NT/2000, Central memory UNIX (HP and SUN) is 195 GB, Storage Memory UNIX (HP and SUN) is 13,900 GB, Storage Capacity (central and peripheral) is 15,400 GB, Printing capacity is 15,400 GB, total printing capacity is 252,000 pp/day. ICT Network – Number and speed of lines: InfoCamere Padua: Two 155 Mbps ATM main lines, Thirty four 2 Mbps ISDN backup lines; InfocCamere Rome: One 8 Mbps ATM main line, One 2 Mbps ISDN backup line; Chambers of Commerce: 3 ATM at 8 Mbps (band 3 Mbps), 100 HDSL at " Mbps (band 1.1 to 2 mbps), ISDN backup lines are over 1000 at 64 Kbps.

Workstations are 9000 under UNIX environment. There are 3,680,000 transactions a day.

5. Implementation

Telemaco provides guaranteed delivery of files and procedures submitted electronically in accordance with Art. 14.3 of Consolidated Text 445/2000. This equates to delivered by registered mail, as envisaged by Art. 15 of Presidential Decree 581 of 1995.

Telemaco has the following functions:
- EXRACTS (by province of registration of the company) obtained through the IT "help-desk" are identical to those obtained from Chamber of Commerce offices. The following types of extract are available: Ordinary Business Register, Historic Business Register, Trades and Crafts roll, Ownership structures, Registration.
- Registration search (at province or national level) by business through company name or tax code and by person through surname, name or tax code.
- Archive of financial statements and documents: Searches on the Business Register registration system and access to the optical archive to consult the document or financial statement. The registration archive records all documents and forms submitted to the Chambers of Commerce Business Register. The following types of certificate can be obtained using Telemaco: registration with the Business Register, summary registration with the Business Register, historic Business Register, roll of craft and trade operators.

The national optical database enables users to carry out countrywide electronic searches and consultation of company documents and records filed with the Chambers of Commerce form 19 February 1996 onwards. The optical archive contains copies of documents considered to be of national interest filed by the local branches of the Chambers of Commerce. The archive also stores the compulsory records and documentation for all types of firm. These include the records of Transfers of ownership (for individual firms and groups) plus the main Business Register forms and documents (such ad receipts, etc..).

With reference to the implementation of Bureaucracy Simplification Law (Law 34 of November 2000), The architecture of the national optical database has been up-dated in order to provide guaranteed storage and management of legally valid digitally signed documents.

Company account is an optical database containing the full financial statements submitted by limited companies. The financial statements are indexed to enable users to choose whether to extract all or part of the documents (account summary composed of profit and loss statement and balance sheet or notes to the accounts), documents can be delivered by fax, priority mail or electronic file transfer. The system currently generates about 1500 statements a day.

The back office system is based on three levels: front-office web servers, business logic on java application servers and data on DB servers. It is totally based on Unix/linux system. The architecture is higly scalable, uses techniques of cluster to the level of Web server and Application server.
Once the request is submitted, many formal controls are done by Telemaco taking into consideration the fiscal code of the businesses. Once these controls are passed, the request is sent to the Chambers of Commerce of the Province of the user. In the Chamber of Commerce, the back-office is full automated by the Scriba service. The controls about the users are done both the visible ones and the informatics (to verify the digital signature, if there is enough money on the bank account).

The process is full automated and there is no necessity to conserve the data by the employee because they will be conserved in the database. The figure of the employee serves only for the automatic response to the client.
The first back-office is the Business Register and then through the Scriba service the information is passed to the second back-office Business Association in order to complete the process of digitalisation.

Digital signature: Infocamere is a certification authority for digital signature holders. The digital signature can be applied to the application and documents making up the electronic file, using any of the commercially available digital signature software applications. In April 2000 InfoCamere took on the role of Certification Authority and was entered in the public list of such bodies envisaged by law. According to law 284/2002, as of 1st July 2003 all companies (of persons, capital or cooperatives) must submit applications for registration or notifications of amendments to the Business Register- together with the relevant documents – as digitally signed attachments or on other electronic media. An online guide has been used by Uniocamere, the Italian Union of Chambers of Commerce, providing information to both Chambers of Commerce and firms on the new filling procedures which, incidentally, allow for lower administrative fees. The smart cards distributed by the Chambers of Commerce contain signature and authentication certificates. This means that the cards can be used to sign electronic documents, giving them the same legal value as

signed paper documents. The smart cards can also be used as a secure system for the authentication of e-mail messages and "strong authentication" to recognise those accessing online public services.

The chambers of commerce have devoted particular attention to ensuring interoperability to the system adopted by the different certification bodies. The standard adopted by InfoCamere is common to all other such bodies and is intended to create with immediate effect a large pool of users enabled to use e-government services.

The control on digital signature is completely automatised and highly guaranteed.

Infocamere provides a series of document management solutions in addition to its digital signature services. These cover all the document management processes required by the public administration: electronic file transmission and registration, IT protocol, management of flows of documents and procedures, record and back-up file management. These applications are fully Web-based.

Proteus PA was originally conceived as an instrument for the digitalisation of document registration procedures in public offices and has now evolved into a document management solutions that ranges from the electronic handling of paper-based documents to the production, management, filing and storage of electronic documents. Proteus PA is a modular information system. The Proteus PA application developed by Infocamere and based on a web architecture, comes into two forms: as a fee-based ASP (Application Service Providing) system. This does not require the installation of any software on the organisation's client since access is via the Internet. The system therefore provides all the benefits this entails in terms of application up-dates and maintenance, and simplicity of activation for new users. The only requirements are the presence on the client of Internet Explorer 5.5 or higher, a Windows)X/2000/XP work station and the hardware and software components required to input paper-based documents. The second form is a packaged product installed on the client. This method enables users to use their own hardware and software as long as these meet the necessary requirements.

Proteus PA is integrated with the digital signature functions and manages interoperability with the file reference registers used by external bodies. The product also manages the organisation's official mailbox for incoming and out-going e-mail using web interface that is included in the application.

Proteus PA guarantees full security and confidentiality in terms both of user authentication and access to and management of information: 1) authentication: user recognition is based on user_ID and passwords, or on smart cards (containing the authentication certificate), 2) control of access: users are divided into groups, with each user being given a set of permissions for the application and documents contained in the archive. On the basis of the user's identity and inclusion in or exclusion from these groups, the access control system determines which functions her or she may carry out. The system also examines which functions the user is enabled to carry out on each document selected (read-only access, amendments, etc.)

For electronic payment, Infocamere built up a web service for managing credit card transaction of single users and a B2B system for various organisations. Infocamere has developed a system of e-payment for the payment of the taxes due for a presentation to the Registry. This system uses bank payments and credit cards. One file involves the payment of 100 Euro on average.

6. Results

At present Telemaco is used by businesses, local authorities, professionals, trade associations and service agencies. By the end of May 2003, there were presented about 7000 balance sheets with digital signature to the Chambers of Commerce. At the end of 1998, the users were about 1.300, at the end of 1999 they were about 3.000 and by now there are about 80.000 users. By the end of August 2003, there were presented about 70000 electronic dossiers through Telemaco. By the end of May 2003, there were delivered a 596474 digital signatures and 199750 were authenticated. Daily average of digital certificates in May 2003 was 2977. And the trend is strongly increasing.

The main result imposed by Bureaucracy Simplification law is verified through more efficiency for vast and more transparent services for users, and through cost savings for users by total cancellation of the paper support.

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.

The main result is that the new technology PKI (secure authentication system) and e-filling has been carried out to the large public so that is reusable in other e-government situations. Infocamere has built up a system based on web technologies that uses digital certificates.

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.
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.

7. Conclusions

Infocamere has always been active in areas that are of particular importance to the e-Government programme, such as the modernisation of the public administration and the streamlining of bureaucratic procedures to the benefit of businesses and citizens.

Telemaco service of Infocamere has introduced many innovations in Italy. There are other similar services: for the taxes, for the pension system, for local administrations. Telemaco with legal digital signatures proposes a model for filling documents and acts valid in all the situations, thus the model is exportable to all the e-government fields in easy way. This was reached through a great effort of co-ordination and decision making in different levels.

The success of the Telemaco service is used for business registration within Chambers of Commerce as well as integration with other public agencies.

8. References

www.infocamere.it
www.telemaco.infocamere.it – main site for documents delivering
https://web.telemaco.infocamere.it – main site for e-filing
www.card.infocamere.it – certification authority web site

The Netherlands

Case 22
Citizen car registration:
Dutch Centre for Vehicle Technology and Information (RDW)

1. Executive Summary

In the Netherlands a person who buys (or sells) a new or a second-hand car, has to register the car with the correct data. In the new situation not only the Post office but also the Garages can do this registration for him. This project is essentially about the migration from a traditional, third-party front office to an electronic first-party front office, and a simultaneous change in the technical infrastructure of the back-office to ensure data is authentic and co-ordinated.

Under Dutch law, the RDW[61] is the only authority that is allowed to register changes in car ownership. It is a service for new and used cars. 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 responsibility often resulted in frustration and delays for the car owners and garages. During the 1990's the Dutch automobile branch (BOVAG) persistently began campaigning for a change in this situation that would reduce the amount of time and money that car owners and garage staff had to spend on car registrations. They wanted to bring the secure registration of car ownership under their own control, requiring a change both in the front- and back-offices of the RDW. The front-office was to be expanded to include the automobile garages as well as the Post Office. Changes in car registration would be centralised in the RDW back-office database and then made accessible to other relevant parties (such as the Police or Tax Office, checking for stolen cars or estimating bills for traffic taxes), who could rely on this data from the RDW as definitive.

RDW launched the TV[62] project in 2000 to achieve this end. By this time they had enough technical experience available in-house to address the solution themselves and were the first public body in The Netherlands to use PKI in practice. Their PKI solution uses certificates that are linked to an existing register of certified garage companies. It is a tailor-made solution that emulates the traditional procedure at the post offices as much as possible. Real-time checks are made with the Central Drivers Licenses Register (again maintained by the RDW) for purposes of verification, and overall the introduction of the new service has had little impact on RDW's work force.

The main outcome of the project has been a significant reduction of operational costs for the garage companies. A conservative estimate arrives at total annual savings of €10, 3 million. In addition, the RDW have already recuperated most of their initial investment by charging the garages an annual fee for performing the new service. The garages consider participation in the service as a hallmark of quality, and service performance at the Post Office (the 'traditional' registration route) is also improving thanks to their increased competition with the garages. In qualitative terms, the new procedure has greatly improved customer service. The entire process of registering a new car is now a one-stop procedure with instant service experience. RDW has been able to directly contribute to the development of similar systems in Europe as a result of this experience (EUCARIS[63]).

This Dutch car registration service is from model D, delivering one service for citizen - registration of car ownership - across multiple stages – car owner/garage staff to RDW back-office. Multi service takes place since the related back-offices such as Ministries, Tax Office, and Central Bureau for Statistics use the RDW back-office for their own services. The case has been chosen as good practice in The Netherlands since many different parties now have access to the RDW database and can use the definitive information held within for many related purposes.

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[61] RDW stood for Rijksdienst voor het wegverkeer or Netherlands Road Transport Department. The organisation became independent in 1996 and dropped this title. It is now known only as the RDW.
[62] Tenaamstelling Voertuigbedrijf (or TV) is the project called 'Registration by Garages'
[63] **E**uropean **CAR** and driver licence **I**nformation **S**ystem

2. Background

Traditionally, the Dutch police, the Ministry of Finance, and the RDW kept their own vehicle registers for their own separate purposes. The Police maintained a database to check on third party insurance; the Ministry of Finance maintained a separate database to check on road tax, and the RDW used their own database to track M.O.T. testing[64]. Citizens had to register their car at each register separately. Data integrity was low, with about 30-40% of the records doubled[65]. This had a significant negative effect on the operations of each of the individual agencies.

In the early 1980s the Dutch government decided to set up one central authentic vehicle register. The register was and is maintained by RDW. Although up until today most other organizations involved still keep their own (shadow) registers. The registers at RDW are the legal basis reference for tax, social security, municipalities, insurance companies and police.
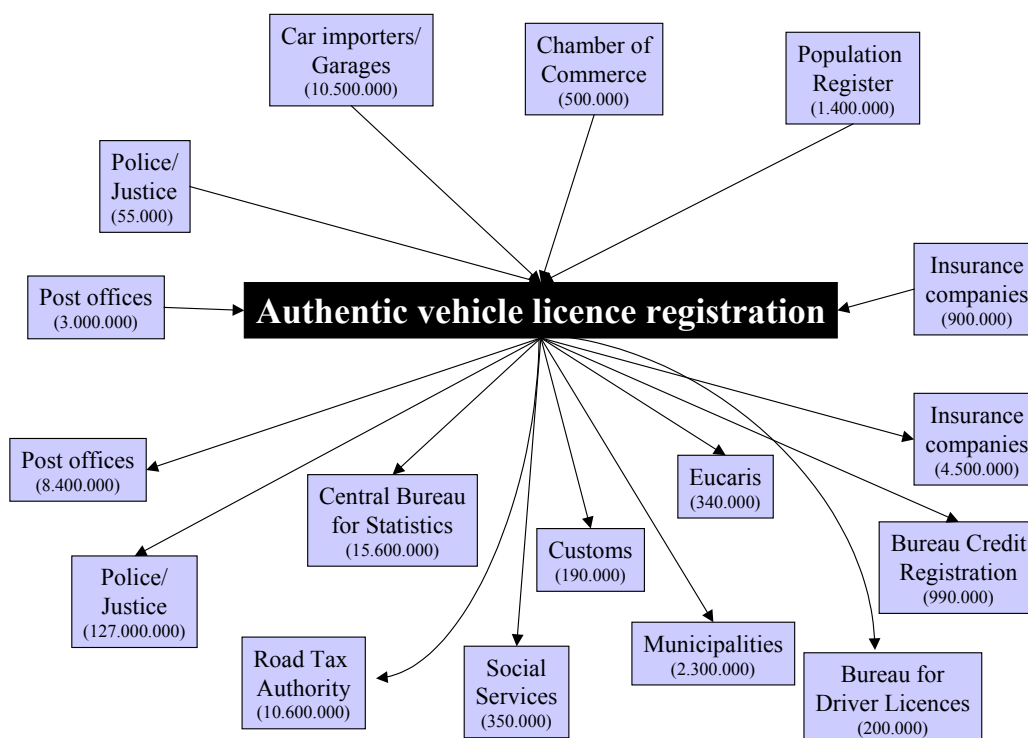
Figure 1 - Transactions with RDW register (2002)

Given the great number of parties involved, the construction of a reliable and trustworthy registration system took more than a decade[66]. Only in 1995, a new Law on Road Traffic (Wegenverkeerswet) was passed, and simultaneously the information system became operational. In 1996, RDW became an administrative body on its own right, independent of the ministry[67]. The investments in the new central registration, surrounding organisation and information systems eventually amounted to NLG 60 million (€ 27, 3 million)[68]. Benefits of the establishment of a central register are somewhat difficult to quantify[69]. According to RDW, annual financial benefits are about NLG 200 million (€ 90, 9 million) – which means the investment would be recouped in only four months.

The introduction of the central register (and the new role of RDW) had been accompanied from the start by a long-term internal quality management program which focused both on improvement of internal processes (quality of data/no human errors/more cross-checks) and (faster and easier) service delivery. In the year 2002, at the time of the

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[64] When a garage has finished the MOT-testing he registers this at the RDW-database. The RDW has to approve the registration. Between the time of registration and the approval, the RDW takes test samples by going to some garages to verify if the testing is done according to the rules.

[65] Over 9 million cars were registered in the three databases – the actual total number of cars in The Netherlands was less than 6 million at that time.

[66] The database has separate data fields on insurance, vehicle type (separate admission criteria exist for each type), car owners, vehicle properties, technical status (inspections) and tax (road tax).

[67] Ministry of Transport, Public Works and Water Management.

[68] Initial estimates amounted to NLG 72 million – hence this is a rare example of an IT project that actually did not overrun its budget.

[69] Qualitative benefits, however, include a significant reduction of road tax evasion, very strict enforcement of M.O.T. tests, faster and more effective collection of fines and reduction of uninsured cars.

introduction of the new registration procedure (see hereafter), RDW was already a full-blown professional organisation[70].

3. Specific objectives (of the particular service of in-situ registration)

Under Dutch law, RDW is the only authority that is allowed to register changes in car ownership. However, already for decades the actual provision of the certificates of ownership has been delegated to the Postal Agency. For this particular service, all post offices in The Netherlands therefore function as RDW's front office. Until fairly recently the Postal Agency was publicly owned and tightly regulated by the State. The post offices were – and are – considered as a reliable and trustworthy channel for many public services.

Ever since the establishment of the new Law on Road Traffic in 1995, however, there has been a constant demand from the Dutch automobile and travelling community to have the registration of car ownership under its own control. The prime driver for this was cost reduction. The existing procedure was rather time-consuming and generated considerable expenses for the industry. Each registration required another trip to a post office. The proud new owner of the car had to hand over his original driver licence to the garage – usually a day in advance – or accompany the representative of the garage. *In situ* registration seemed to save considerable time and effort from both the garage staff and the customers.

RDW was not particularly eager to also delegate the provisioning of the certificates to the garages. However self-evident the potential for cost saving, the vital importance of the correct registration demanded a completely fool and fraud proof solution. Given the state of technology at the time, RDW did not feel confident enough to hand over the responsibility to the garage managers. It was only at the end of the 1990's – when some of the bigger garage companies were starting to settle some of their administrative procedures (e.g., insurances) over secure Internet connections – that the responsible Ministries (Finance, Justice, Interior Affairs) decided to establish a new procedure. On the highest political level the conflicting interests of the – now privatised – Postal Agency (which received a sizeable fee from RDW for the performance of its front office functions) and of the automobile and travelling community were weighed in favour of the latter.

The official major objectives of the project Registration by Garages (Tenaamstelling Voertuigbedrijf or TV) were formulated as follows:
- Reduction of total operation costs of the registration of car ownership process;
- Reduction of work load at the garages;
- Improvement of customer service in the car sales process;
- Keeping up or preferably improving the levels of reliability of the registration process.

The TV Project was essentially about the migration from a traditional, third party front office to an electronic front office at a party that was directly involved in the process. Reliability was a key priority from the start.

4. Resources

ICT
RDW deliberately waited with the introduction of the new service until it had enough in-house experience with the technology involved (esp. Internet). Thus the project did not trigger new technical skills but rather the opposite: it was not until the organisation was sufficiently skilled that the project was started. Despite the cautious strategy some technical issues (esp. the use of PKI) still turned out to be serious challenges to the organisation.

For the technical infrastructure, existing and established technologies were used as much as possible. Data are exchanged between the garages and RDW in a two-tier architecture. The clients at the garages are connected to three approved commercial providers with a secure Internet connection that uses standard SSL/RSA technology. Communication between the three providers and the central server at RDW's computer centre takes place over a secured infrastructure using the public Internet domain.

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[70] The quality management program is divided into three phases. The first phase (1996-1997) included the implementation of a MIS and a redesign of the administrative organisation, and the establishment of user consultations. The second phase (1997-2002) included EDP-audits, employee and customer satisfaction surveys, streamlining of business processes, implementation of a planning & control cycles and the adjoining introduction of integral quality management (INK, the Dutch version of the EFQM-model). In the third phase (2003-2004) focus will be on ICT-innovation, digitalisation, knowledge management, internationalisation, and benchmarking.

The web application on the client's side was developed in-house by RDW. It is a tailor made solution that emulates the traditional procedure at the post offices as much as possible. The PKI solution uses certificates that are linked to an existing register of certified garage companies ('erkenningshouders').

For the hardware and technical infrastructure RDW makes use of its own computer centre. The volume of data generated by this particular service is relatively small and could be handled by the existing infrastructure without significant additional investments.

Scalability

The TV project revolves around the migration from one channel (post offices) to another (garages). The total number of users of the service remains constant. RDW was therefore able to size the new system corresponding to a known maximum number of users. Because all garages had to be officially certified before they could make use of the service, RDW could set the pace of the number of users. The actual growth has been around 30-40 firms a month, which is somewhat below the prior estimates. Garages that are not yet certified can still make use of the post office channel.

Because the current PKI solution uses certificates that are linked to a specific in-house register, the system is not yet exportable to other applications. In the near future, the implementation of a PKI-system with physical tokens (smart cards) is being planned, which is independent of the register. Notwithstanding the idiosyncrasies of the existing system, RDW already has a broad experience with the export of its skills and technology to various other places in Europe (especially Eastern Europe). The organization also developed the EUCARIS system (European CAR and driver license Information System) that is now widely used across Europe.

The investments in the new central registration, surrounding organisation and information systems eventually amounted to NLG 60 million (€ 27, 3 million)[71]. These are the costs for the back office developments.

Human resources

The introduction of the new service has had little impact on RDW's work force (1,300 employees). 2-3 extra people were hired for managing the issuing of the certificates to garage companies. An external project manager has been hired to direct the TV project team, although with hindsight, an internal manager probably could also have done the job. All subproject leaders were regular RDW staff.
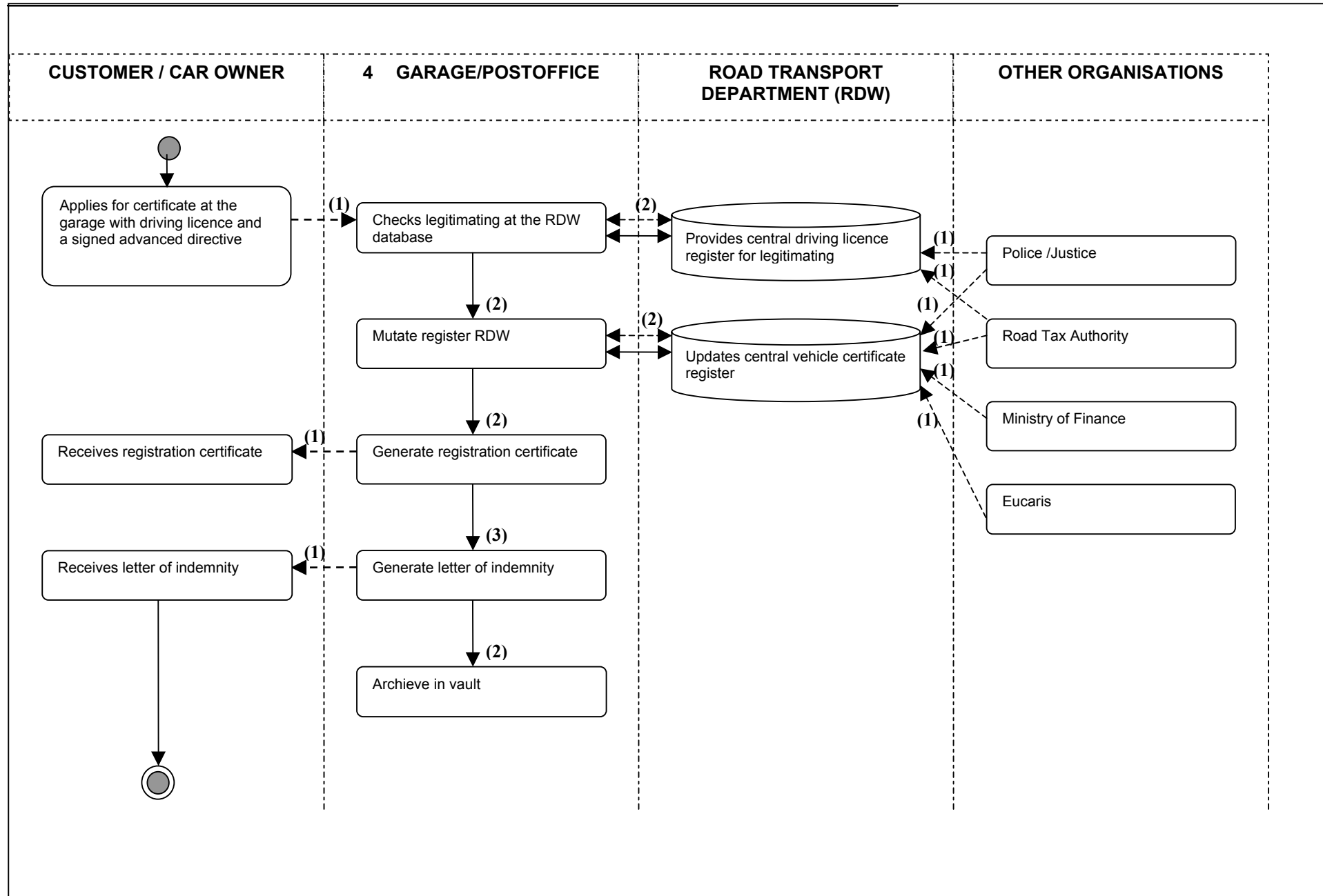
5. Implementation

Although the initial period of the project took six years (1994-2000), the actual implementation of the project was subject to a very tight time schedule. In December 2000 an integral project plan was approved. The legal date of effect was set as April 1, 2002. It was promised to the automobile and travelling community that garage companies could register car ownership in situ from that day on. During the initial high-level consultations it became apparent that the Ministry of Traffic would not permit a pilot, which meant that the technology had to work perfectly when launched. Most critical, however, was the legislative procedure. Draft and approval of a new Order in Council took over one year.

In February 2001, the project team released a memorandum that covered all legal matters such as entry requirements, reducibility of registration and administrative process at the garage companies. In March 2001, the EDP audit team of the Ministry of Finance carried out a counter expertise (an extensive testing to check whether the system met requirements). Due to the improved protection of the data traffic, an improved authentication procedure (using a real-time check of the central driver licence register) and an optimal control of the physical certificates of ownership, the team concluded that the new service was at least as reliable as the existing service. During Q2/Q3 of 2001 the web application and the adjoining administrative procedures and manuals were developed. The in-house development of the PKI-solution (and especially the fine tuning of the technical and organisational dimension) put a lot of pressure on the project team. Notwithstanding the cautious strategy with regard to (state of the art) technology, RDW turned out to be the first public body in The Netherlands that used an efficient and relatively low-cost PKI solution *in practice*. An official national PKI standard had already been developed, but it was too elaborate to be of practical use. As a result RDW (and the Tax Services for that same matter, RtV) had to pioneer the use of a more bottom-up approach in their approach towards authentication.

In the diagram below the process of integration front-office/back-office is shown.

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[71] Initial estimates amounted to NLG 72 million – hence this is a rare example of an IT project that actually did not overrun its budget.

CUSTOMER / CAR OWNER	4 GARAGE/POSTOFFICE	ROAD TRANSPORT DEPARTMENT (RDW)	OTHER ORGANISATIONS

Applies for certificate at the garage with driving licence and a signed advanced directive

(1) Checks legitimating at the RDW database

(2) Provides central driving licence register for legitimating

(2) Mutate register RDW

Updates central vehicle certificate register

Police /Justice

Road Tax Authority

Ministry of Finance

Eucaris

(1) Receives registration certificate

(2) Generate registration certificate

(1) Receives letter of indemnity

(3) Generate letter of indemnity

(2) Archieve in vault

A customer (new owner) applies for a certificate for his first or second car; a new car or a second hand car. He gives his driving license to the garage (or the post-office; in the old system this had to be done only at the post-office). The garage logs in on the RDW-database and checks if it is a legal driving-license. The garage orders a (change-of-ownership data of the) certificate. The certificate contains a combination of registration of the car and personal data. After the approval of the RDW, the garage prints a registration certificate. Also a letter of indemnity is printed for the former owner of the car. This is given to the former owner (this can be a garage, company or a natural person). From the moment the data has been changed, other organisations know the most up-to-date information of the cars and their owners. Assurance companies can view this registration digitally with use of a registration code which is part of the registration data.

Police uses the information on-line to check if a car is stolen, if a person has a driving license, or if the car is insured. Road Tax Authority uses the changed information to send changed bills of taxes to owner (taxes depends on car weight and type of fuel).

Despite the tight deadline, the TV project was delivered on time and according to the original project planning. The first official in situ registration of car ownership was done on April 1, 2002. The success of the project could largely be attributed to the project management team which carried enough weight to make decisions without escalation and which constantly stressed the importance of timely delivery. The collaboration between the public and private parties (esp. BOVAG, the umbrella organisation of the car branch) passed off exceptionally smoothly. BOVAG was heavily involved in the development of the web application and literally 'sold' the new service to its members.

The users itself (garage managers) were not directly involved in the design of the web application. A fool-proof application was developed inside RDW and presented during a road show through The Netherlands. Although the development of the web application could be characterised as rather top-down, no significant problems have occurred during the actual use of the application. The only outstanding issue concerned the printing of official certificates, for which a separate proof printing application was developed.

Because the new service was closely modelled after the traditional procedure at the post office, little adaptations were required from the end users. The steps in the online procedure were self-evident and required no extra explanation.

There are two slight changes in the process. Legitimating is only possible with a driver licence (and not with a passport). This is due to the fact that RDW also manages the register for driver licences and hence has inside access to the database. It uses the register for a real-time authenticity check. A second change is the addition of the signature of an advance directive from the customer. This is a written declaration that he or she agrees to the fact that the garage company – as a non-neutral party – performs the registration.

For the use of the in situ service the participating garage companies pay an entry fee of €480 and a yearly fee of €330. These costs are more than compensated by the savings in time (no more trips to post office):

# registrations	benefit	per registration
100	€ 700	€ 7,00
250	€ 2.750	€ 11,00
500	€ 6.000	€ 12,00

Estimates from BOVAG (July 2002)

Table 1 - Financial individual benefits use of in-situ registration service

RDW financed the project from its own budget. The fees are used to recoup the prior investments. Once the amortization is completed (3-4 years), the fees will be lowered.

In the current situation communication between the post offices and RDW is done over a proprietary, closed system (EDI-like). RDW plans to transfer this channel also to the Internet. In essence there is then no longer a difference between post offices and garage companies.

6. Results

The main result (and target of the project) has been a significant reduction of operational costs for the garage companies. A conservative estimate (based on 3.000 participating companies and 800.000 registrations) arrives at total annual savings of €10, 3 million – an average €3.250 saving per company. Total annual savings for the entire markets

(12.000 companies and 2.000.000 registrations) are estimated at €22, 6 million (average €1.884 per company). The savings will ultimately be passed to the customers.

Benefits of the establishment of a central register are somewhat difficult to quantify[72]. According to RDW, annual financial benefits are about NLG 200 million (€ 90, 9 million) – which means the investment would be recouped in only four months.

In qualitative terms, the new procedure has greatly improved customer service. Customers no longer have to hand over their official documents or wait another day for the completion of the registration process. The entire purchase is now a one-stop procedure with instant service experience.

In the next diagram one can see that the transactions per user extremely increased during the last year. This means that an efficiency of work has been reached.
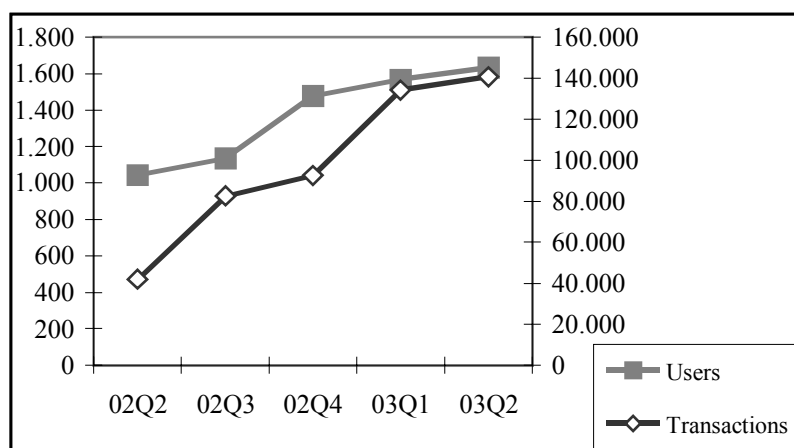
Figure 3 - Number of users in situ registration service (2003)

An interesting side effect is that garage companies increasingly consider participating in the new service (that is, being a certified registrar) as a hallmark of quality. Another side effect of the introduced competition between the garage companies and the post offices is an improved service performance of the latter. The competition also resulted in a lower price per unit for transactions performed by the post offices. Registration of car ownership is one of the biggest streams of revenue for post offices. Some offices now start to offer additional services to garage companies (e.g., free parking places). RDW itself has been able to renegotiate an attractive contract with the Postal Agency, despite the reduced volume of transactions at the post office.

The RDW-database is used by different organisations. Traditionally, the Dutch police, the Ministry of Finance, and the RDW kept their own vehicle registers for their own separate purposes.

In the new situation the Police use data from the RDW database to check on third party insurance. On the road policemen can digitally check on data from the RDW-database if the car has an insurance or the driver a license.

The Ministry of Finance uses data (which person is the owner of what car) from the RDW database to check on road tax. When a person changes his car, his taxes change automatically (because taxes depend on weight of the car and type of fuel). The RDW uses the database to track M.O.T. testing. When a garage has finished the MOT-testing, this is registered in the RDW-database. The RDW has to approve the registration. Between the time of registration and the approval, the RDW takes test samples by going to some garages to verify if the testing is carried out according to the rules.So the data of ownership and car registration which are recorded in the RDW databases are used by different organisations for different purposes. The result of this is higher quality of information and efficiency for the organisations.

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[72] Qualitative benefits however, include a significant reduction of road tax evasion, very strict enforcement of M.O.T. tests, faster and more effective collection of fines and reduction of uninsured cars.

7. Learning points and conclusions

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 experience 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).

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 ('nut- en noodzaak') of investments – a problem that plagues many decision-making processes in the Dutch public sector. Furthermore, the project was firmly rooted in the highest decision-making levels. This permitted the project management to make important decisions right away, without further delay.

The rollout of the results of a project (here: the legal permission to register ownership in situ) is a subproject in itself and also required tight management. As a public body, RDW was faced with the problem that it had to discriminate between users during the initial phase of the rollout while the automobile and travelling community (and the principle of equality before the law) demanded a big bang scenario. The dilemma was eventually solved by using the time stamp of the application.

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 registrations is over 2 million a year – a small reduction in costs per registration already adds up to a significant amount.

Since the current PKI solution uses certificates that are linked to a specific in-house register, the system is not yet exportable to other applications. In the near future, the implementation of a PKI-system with physical tokens (smart cards) is being planned, which is independent of the register.

Notwithstanding the idiosyncrasies of the existing system, RDW already has a broad experience with the export of its skills and technology to various other places in Europe (especially Eastern Europe). The organization has also developed the EUCARIS system (European CAR and driver license Information System) that is now widely used across Europe.

8. References

RDW website: http://www.rdw.nl/eng/ (in English)
BOVAG website: http://www.bovag.nl/smartsite.dws?id=7 (in Dutch)
EUCARIS website: http://www.eucaris.net/ (in many languages)

Contact persons

Interviewee: Division Manager Registration & Information, Secretary Registration & Information

Interviewer and author: Matt Poelmans, Program Manager, E-Government Knowledge Centre (ELO project), Stichting ICTU [Matt.Poelmans@ictu.nl]

The Netherlands

Case 23
Citizen student grants:
"My-IB-Group" student funds

1. Executive Summary

This case is essentially about two complementary changes to front and back office management that took place simultaneously within the Dutch student financing IB-Group. The ultimate aim of these changes was to effect significant improvements in customer services and relations over a broader range of communication channels.

The IB group is a well-established national organisation that provides financial loan services for students immediately before, during and after their education. After receiving extremely bad publicity regarding the retention of accurate data and customer relations at the turn of the century, a new organisational structure was effected that re-oriented the organisation towards the needs and requirements of its clients. This change was twofold: firstly it changed the overall structure of the organisation from separate back- and front-office functions divided by four legal areas of expertise (eg legal, financial), into thirteen more co-ordinated and efficient regional groupings which incorporated both front- and back-office aspects, including the helpdesk; and secondly, the role of the Internet in interactions between the IB group and its clients was given a far greater priority and functionality.

The service now caters for over 600,000 users. These 600.000 customers are the students in the Higher Education. The IB-group has yet 3 million remaining customers: for example the customers that make use of the Law Accommodation study expense. In total there are 3,6 mio potential users, of which the IB-group approaches yet only the 600.000 for my IB-Group. The other users will follow soon. They already interact with other applications on the website.
The service IB Group deals not only with immediate financial services, but also linked services such as eligibility for student travel cards and options for courses of study. It incorporates direct links to related databases such as those of the Tax Office, the Central Bureau of Statistics, and the Educational Inspectorate. Data exchange between the back-offices of these agencies is automated wherever possible to ensure consistency and to prevent acceptance of incorrectly entered information. Students and clients are now responsible for maintaining their own data through the 'My-IB-Group' SMS-secure portal site. The focus of the organisation has rightly shifted from its own internal processes onto the people it serves. The reorganisation and introduction of the new service has been a great success for all parties. Customer relations and services have significantly improved, as has data collection and accuracy. Employee skills, productivity and efficiency has also increased, and public perception of the IB-Group is expected to follow suit.

Both front- and back-office processes are completely digital by the end of 2003. This case is therefore classified as D. It has been chosen as a unique example of how online services (e.g. applying for a loan *and* enrolling in a course of study) can be co-ordinated and automated in a secure and user-friendly environment, and shows how the traditional roles of the front- and back-offices can be better organised to adapt to a digital environment.

2. Background

The IB-Group is a national organisation providing financial services for students and ex-students in higher education. Affiliated to the Ministry of Culture, Education and Sciences, the IB-Group gained independent status in 1994. It remains accountable to a Board of Trustees, comprised of members of the Ministry of Culture, and is thus still a government organisation.

The IB-Group is the principal National supplier of loans for students in the Netherlands. They deal with three main groups of people in three corresponding stages of service:

User Group 1: **New students**
Service: Enrolment with the IB-Group and application for a loan.

Details: This user group is at the beginning of their interactions with the IB-Group. It consists of new students who are leaving their secondary education and wish to enrol in higher education. In most cases, such students are eligible for a student loan. These students need to supply the IB-Group with information about their financial situation and predicted living arrangements. The IB-Group uses this information to decide how much money the students can be loaned each year.

User Group 2: Existing students
Service: Monthly payments of the loan
Details: This user group consists of students currently in higher education who are relying on the monthly payments of their loan by the IB-Group to finance their way through HE. Students in this group need to inform the IB-Group at least once a year about any changes in their living situation. Likewise, the IB-Group needs to reassess the eligibility of these students for continuance of the loan payments on an annual basis.

User Group 3: Ex-students
Service: Monthly repayments of the loan
Details: This user group has finished their course of HE study and members of this group need to start repaying the money they were loaned. They also need to supply the IB-Group with details of their living and financial situation, so that the IB-Group can determine the appropriate monthly repayments and collect the money.

At the turn of the century, the IB-Group had a bad reputation for the accuracy of their data and their ability to effectively deal with their customers. Co-ordination of data between the IB-Group and related institutions was problematic and little was automated. Furthermore, verification of data supplied by the student was often necessary and the process of cross-referencing was badly organised. Clients often experienced unacceptable waiting times when trying to access the IB helpdesk, and many found themselves repeating the same information several times to different organisations. Eventually, the negative public image of the IB-Group became so strong that the issue was brought up in Parliament and a project was launched to change the performance, perception, and productivity of the organisation on all counts.

The project intended to effect changes at both the front- and back-office levels. Up until 2001, the back-office structure consisted of four units, each oriented around a particular area of expertise such as legal or financial. There was one large helpdesk that serviced all telephone enquiries at the front-office level. Communication between the back- and front-offices was often sadly lacking, and there was virtually no co-ordination between the helpdesks and the actions of the back-office as they related to their clients. The two were not working in tandem and one often ended up addressing the 'mess' created by the other. In 2001, this situation changed. The front office was re-organised to give greater emphasis on using the internet as a preferred means of communication and the back offices were re-organised into regional units that each incorporated a helpdesk of their own.

This streamlining and re-organisation of services took place within the much broader context of the development of electronic government and online services within the Netherlands. The National Stroomlijning BasisGegevens/Streamlining Key Data project that ran from 2000 to 2002 is an example of this, as is the Gemeentelijke BasisAdministratie scheme for personal data within a given Municipality.

One of the fundamental changes in this case was the re-direction of the organisation's focus from its internal primary processes onto the external needs of its customers. Indeed, the prior focus of the organisation on its own primary processes had been largely to blame for the problems the IB-Group experienced. The focus had excluded customer relations and services, which were thus only marginally organised. The customers now play a central role in the maintenance of their own data and thus relations and productivity have improved, with direct benefit to thousands of citizens.

Basic facts and statistics:
- Type of agency: National
- Number of employees: approx. 1,375
- Yearly turnover: € 2,150 Million
- Population of users: 650,000
- Number of e-mails in 2002: 219,000 (in 1998 25,000)
- Number of telephone calls in 2002: 2,400,000 (in 1998 4,000,000)
- Number of website visits in 2002: 2,100,000 (in 1998 188,000)
- Number of individual portal-users: 75,000 (estimate end of 2003: 100,000). These 75.000 are customers that presented themselves on the service. These customers logged in 160.000 times to view their documents and mutate data. This number is far above the accessions on the service. This number is the critical success factor, because it points that users not only view data but also have digital interaction to mutate data.

3. Specific objectives

The main objective of the change was to improve customer services and customer relations, which would in turn lead to improved public perception of the IB-Group. The negative image and reputation of the Group was a result of its poor performance in these areas over the past years and the IB-Group 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 to control and adjust his personal data more easily. For the IB-Group, this meant that responsibility for accuracy of much of the data in their databases now lay 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 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 (unintentional or otherwise). Thus, establishing automated overnight data exchange with these third party organisations also became an important objective.

4. Resources

ICT

The IB-Group 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.]

The main technical resource required by the front office was the development of 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.

The service is widely available around the globe. Anyone with access to the Internet and a GSM phone is able to logon to the system, enabling customers to maintain their relationship with the IB-Group anytime anywhere[73]. Those who prefer to use the more traditional channels of communication, for example the telephone or a personal visit, will still have access to the same information because all channels are connected to the same single knowledge base. This ensures consistency and reliability whilst still allowing diversity and choice in how the customer/IB-Group relationship is maintained. Scalability of the service is no problem at the moment. There are approximately 50,000 users currently registered for the online service, primarily from groups 1 and 2 (as described in section 2). The IB-Group believes that the current system will cater for up to 250,000 users without problems.

Financial

The working costs of the project amounted to over 2 million euros in 2001. This figure is broken down in Annex 1 and includes management costs, communication, training and IT services. Costs of technical equipment are estimated

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[73] For example, a demonstration (including real time authentication) was successfully given in Australia.

separately and include one-off costs such as servers and complimentary software, as well as recurring cost elements such as licenses and other tools.

Investment return has already totalled more than 2 million euros (over 26 months).

Knowledge resources and knowledge management
Digital communication is supported by knowledge bases built into the overall site. These knowledge-based resources help locate answers to questions posed by users (using Case Based Reasoning), and assist in controlling the wealth of email that is exchanged through the site. The IB-Group has specifically chosen KANA software for this purpose[74].

Human resources including skills and competencies
There have been no major changes in the number of personnel. Some specialists have been recruited, but the majority of staff involved in the project were already part of the organisation. Many, such as those in PR/communications, multimedia process management and the classic ICT employees, have seen a change in the way they carry out their work. The speed at which these employees work has increased and work can be completed within a much shorter timescale than previously.

The employees in the front- and back-offices were re-trained to work in new teams with greater variety of employment skills. One of the outcomes of this increased efficiency is that some 10% of the telephone operators have been made redundant over the past 26 months. As a result of the decreasing number of counter visitors the necessity to change the region offices network arose. A model of the new situation "Vision on the region" is finished recently and will be used at the start of 2004. On this moment is just a report "region-view" rounded off in which stands which model we be to handle from 2004 considering the going down number of counter visitors and the necessity the region offices network on that on to fit.

Organisational resources
The integration of front and back office had a major impact on the demands of employees and the way they worked. There is no longer a first and second tier, because the concept of integrated customer services/relations demands that all customer services are carried out in one echelon. This is one of the main reasons why all employees need to be proficient in a broad range of different tasks.

Equipment, buildings, & other technologies
There are 13 physical information desks located throughout the country. They are overseen by a Head Office in Groningen, where telephone and email desks are also located.

User resources involved
No special resources are involved other than the resources surrounding the portal.

5. Implementation

There were two main courses of action:
1. Changing the organisational structure in order to be able to handle the customer relations better (and do better in the primary processes);
2. Setting up a wider range of communicational tools, of which the Internet medium would play a major, even critical role, to give users more choice and control over how and when they contacted the group.

A complete overhaul of the organisational structure of the IB-Group was no mean feat. 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 recognisable to the employees as someone from their own province of approximately 50,000 other people, instead of just someone from a mob of 600,0000[75] The same type of regional identification developed between the previously anonymous front- and back-office workers. . 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).

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[74] See http://www.kana.com/
[75] This is the number of Higher Education Customers; the total number of clients is 3,6 million

Next to the implementation of the IKA-teams a project plan was written to support the implementation of digital communication over the Internet. Within this plan the regular project approach includes a situation analysis (and its results), definition studies, plans, building, testing and implementation. Four phases were defined, each one a bit more complex than its predecessor in functionality and applied technology. Phase 1 for instance co-ordinated professional e-mail applications with the support of knowledge bases. This was followed by the development of a dynamic FAQ and web functionality. The final phase concerned implementation of the all-important 'my-IB-Group' portal, through which each student maintained their own data and relationship online with the IB-Group. A sophisticated, yet still easily accessible and user-friendly form of authentication was the most important part of this final phase. The phasing was based on the 'think big, start small' approach. The IB-Group wanted to be successful in one phase before carrying on to the next one

It took a year to prepare and organise enough support on both strategic and tactical levels to execute these plans. Sponsorship within upper-level management and the slow but sure method of proceeding step by step (after measurable results) eventually enabled the plans to be realised

The IB-Group has had to take major steps to effectively manage and maintain their processes because it also aimed to make its services available around the clock. In some aspects the IB-Group operates like a dot-com organisation and a few commercial organisations have even been included in the benchmark group (see Annex 2). In addition, the multidisciplinary approach demands more cooperation and quality management from all those involved.

Currently the organisation is finishing its final phase (phase 4), 2.5 years after the kick-off. The results of each phase have lived up to the expectations. Customer satisfaction is measured across all communication channels to ensure that the IB-Group continues to approach its customers efficiently and provide information on trends and developments within each user group.

The following pages present an overall schema of agents and databases that can be checked through the portal site and the most elementary processes in the interaction between customer and portal.

6. Results

Results in the relationship between customer and IB-Group

Several results have been achieved, most notably an increase in the levels of customer satisfaction. The target group, students, was perfect for an approach by digital means. They have an open mind towards new initiatives in general and new media (gimmicks) in particular. In addition, the use of GSM as an integrated means for authentication couldn't have a better group of users. Many of them already had such technology in the palms of their hands. Success in achieving this goal of improving customer relations could not have occurred on the basis of the internet developments alone: the organisational change that simultaneously took place was also essential to achieve these results.

The massive pressure that was being levied upon the telephone communication channel has gone. At the moment the availability of telephone service averages at 80%, which appears to be satisfactory to the customer. Indeed, levels of customer satisfaction in the digital media are actually higher than in the traditional communication channels. The number of visits to the physical desk has dropped, and a further restructuring of the regional offices is currently under consideration. The push from unstructured to structured customer services, from offline to online, is visible in the charts that are supplied within this document (see below). Reliable predictions can now be made about developing the usage of each channel, enabling the effective allocation of future resources and funds. The costs of communication have been reduced for both the customer and organisation. Similarly, the profitability and the number of calls to the telephone agents have improved.

The first and second group of customers (see background) have the most frequent contact with the IB-Group and overall reaction to the new service is positive. As was to be expected, the new students (group 1) are the first to make use of it because they communicate the most frequently with IB-Group. They also benefit from the extra services offered through the IB-Group portal, for example, the online matching tool the IB-Group uses to cross-reference the details the students have provided with potentially suitable courses of study. In some cases the students can also enrol into this course of study online.

As more and more of the IB-Groups' customers are discovering the service, its usage is growing rapidly.

Figure A: Process scheme "Applying for Password"
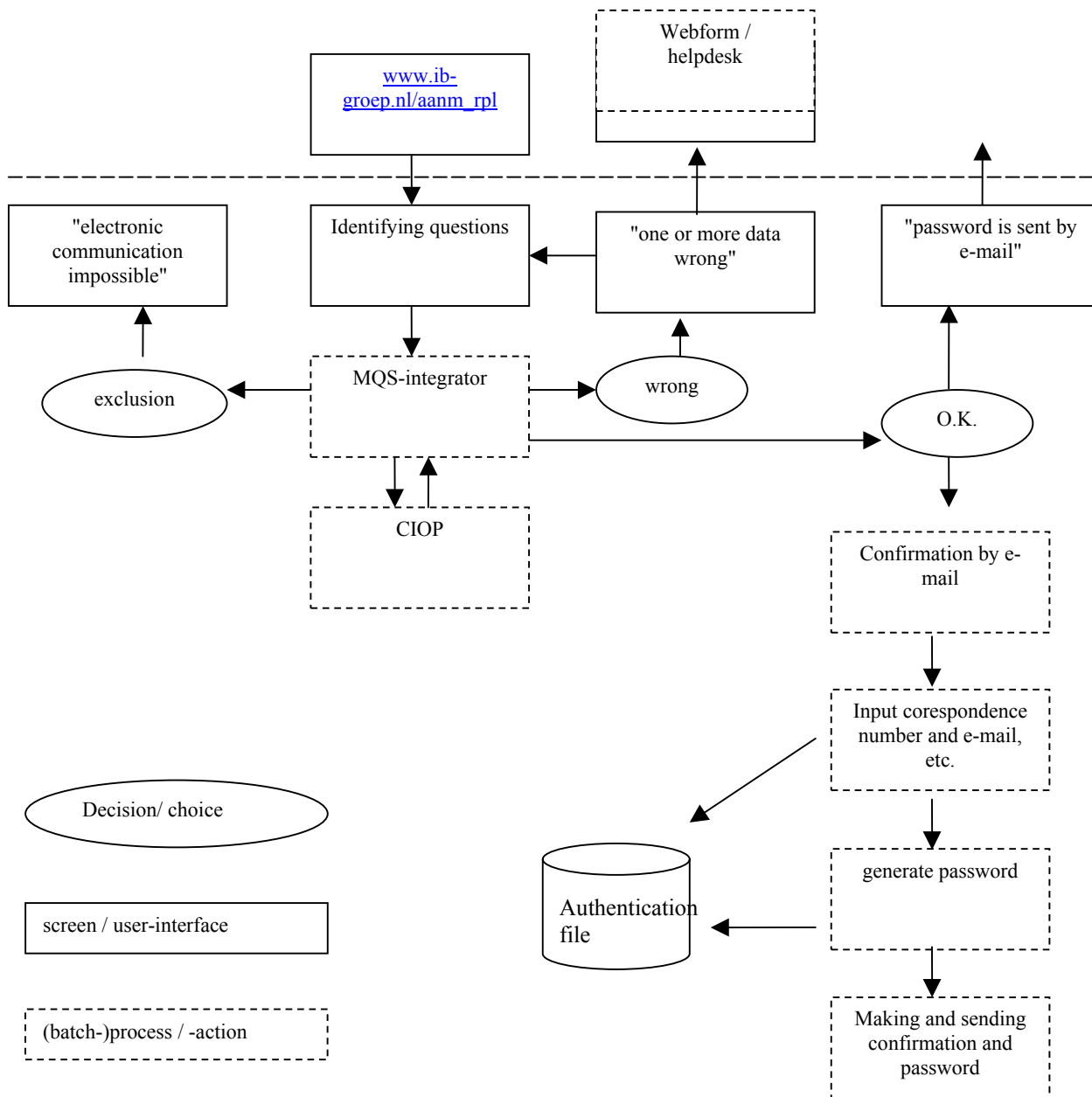
This scheme explains the process of the first login and application for a password. The student logs in and is presented a few identifying questions (e.g. 'where was your father born'). The MQS then checks the answers. If these are correct then the student receives a password by e-mail. If the answers are wrong the student gets help through web form/helpdesk or is excluded from further login.

Figure B: Process scheme "Using the secure IB group E-service"
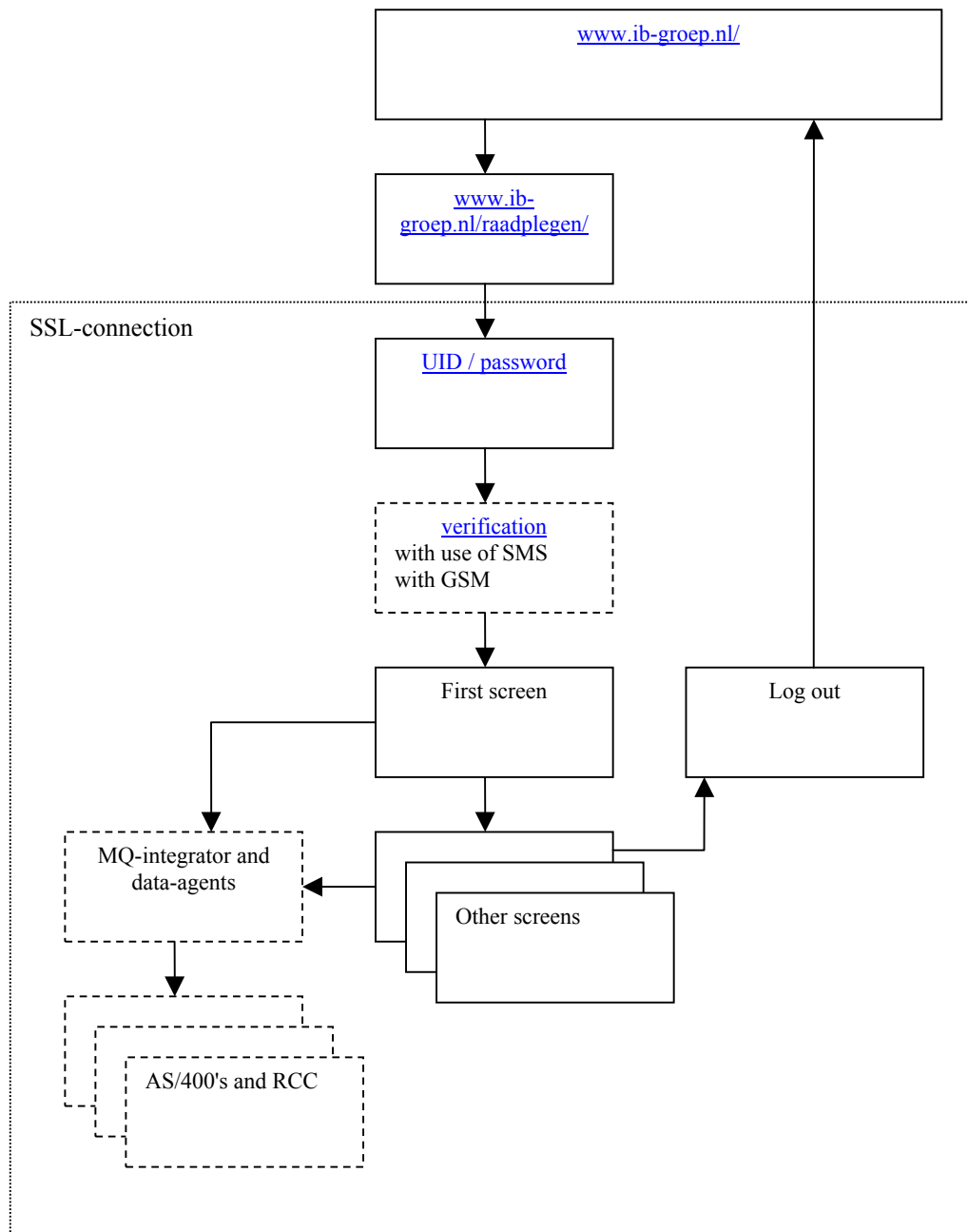
The screens within the dotted rectangle are all in a secure environment.

Figure C: Survey of agents and databases that can be checked through the portal site.
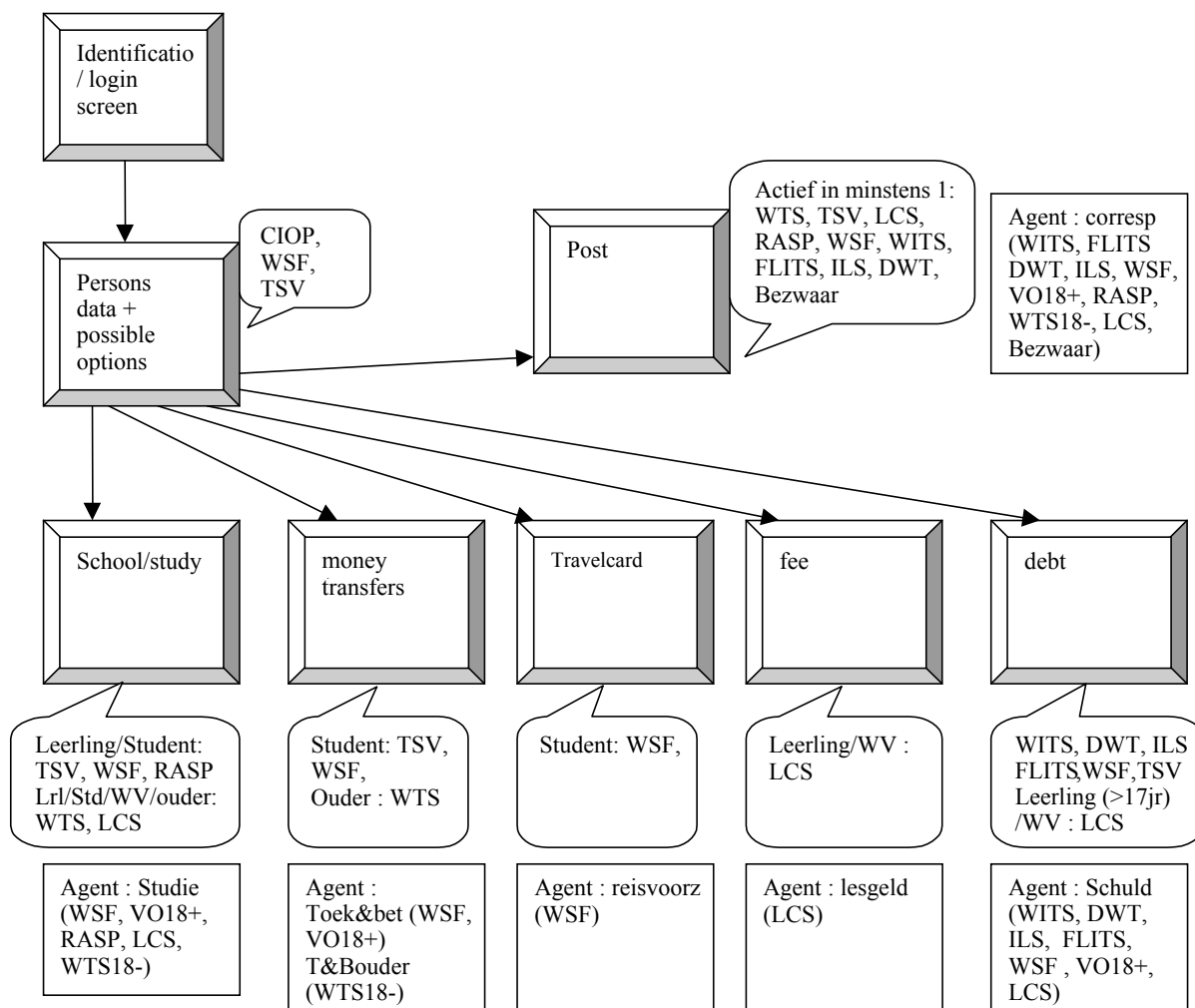
Note:
- The abbreviations above refer to the laws that are the basis for the operations of the IB-Group.
- The text in the 'button-like' rectangles are the options available once inside the portal.
- The text in the 'balloons' indicates for whom the information might be interesting (leerling/student = student, ouder = parent) and to which law the produced text refers.
- The text in the lower rectangles tells that each option has an automated agent working, again within the context of a certain law.

6. Results

Results in the relationship between customer and IB-Group

Several results have been achieved, most notably an increase in the levels of customer satisfaction. The target group, students, was perfect for an approach by digital means. They have an open mind towards new initiatives in general and new media (gimmicks) in particular. In addition, the use of GSM as an integrated means for authentication couldn't have a better group of users. Many of them already had such technology in the palms of their hands. Success in achieving this goal of improving customer relations could not have occurred on the basis of the internet developments alone: the organisational change that simultaneously took place was also essential to achieve these results.

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As more and more of the IB-Groups' customers are discovering the service, its usage is growing rapidly.

Results within the organisation

The internal relationships between back office, front office, management and supporting units have of course gone through major changes, in particular that between the front and back offices. The back offices used to be anonymous 'columns' organized 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 (IKA). 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 basic 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 in the organisation. 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 units have become redundant. The estimate cost reduction as of August 2003 is over € 2,000,000 annually. This figure is expected to grow.

Below we deal with several aspects where results of the change become clearly apparent:

Figure D: Number of telephone calls (per year)
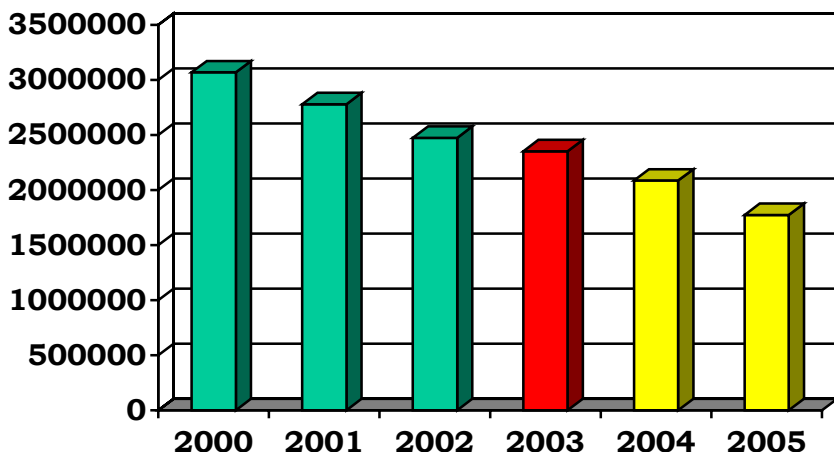
As can be seen by the graphic above, the number of telephone calls has been steadily decreasing each year. More importantly, the peaks in the number of calls through the year have also decreased. The number of people that make a repeating call has decreased; so the availability of telephone service is grown, which appears to be satisfactory to the customer and improves the image of the organisation.

Figure E: Average time on hold for a caller (minutes)
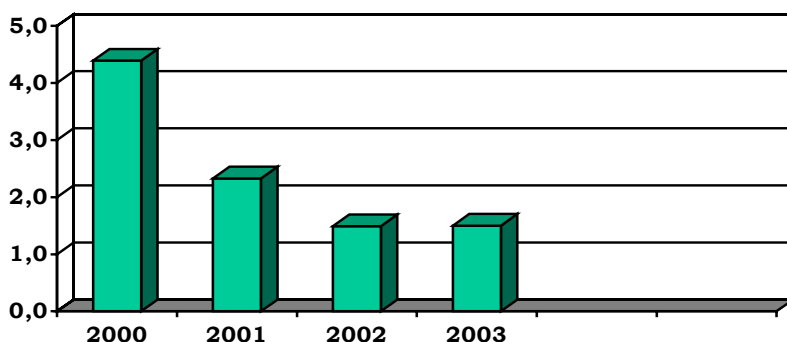
In direct relation to the decreasing number of callers and the decrease in caller peak times is the number of minutes that the customers have to wait while on-hold. As can be seen, the number of minutes has levelled out since 2002, while the number of callers still decreases and will continue to do so in the forthcoming years. This indicates the organisation has decided that an on-hold period of slightly more than 1 minute is acceptable. Accordingly, the number of telephone agents has decreased by 50 full time units since 2000. This of course results in an enormous reduction in costs (estimate € 2,000,000).

Figure F: Number of visits to physical desk (per year)
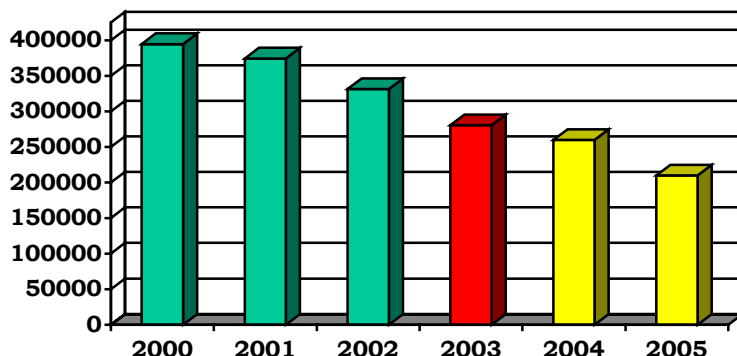
The IB-Group has 13 physical desks throughout the country. They are in cities where there are many students but are not located on the campuses. IB-Group wants the desks near the students but does not encourage visits since it prefers contact via the Internet and telephone. The desk is primarily there for cases where the students need to meet with an employee of the IB-Group face-to-face.

Figure G: Number of sign-on at my-ib-groep.nl (monthly) (for views and mutations)
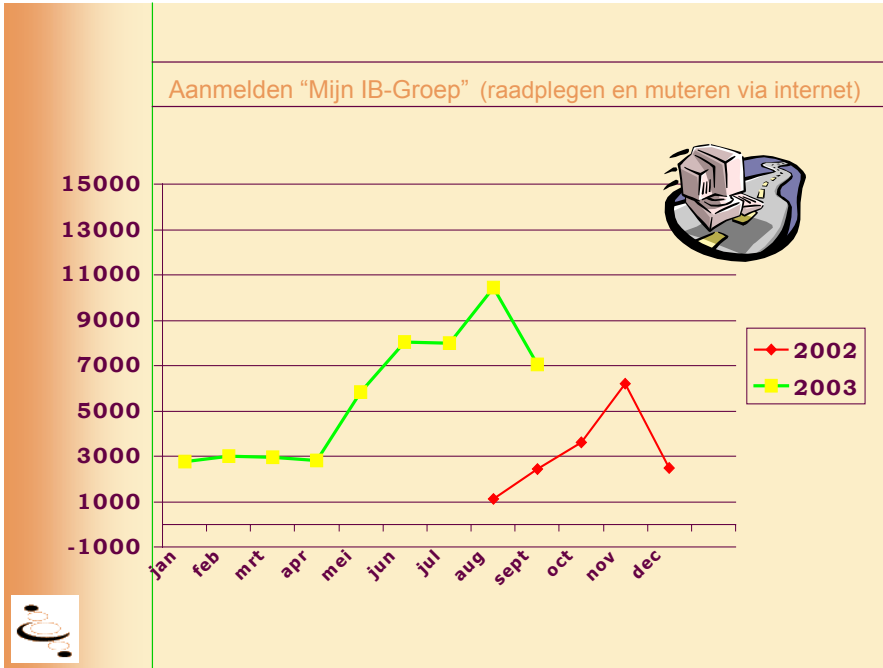
This graphic clearly shows the number of sign-on to the secured service of My-IB-group .The angle of progression that began in April is still continuing. At the moment the number of regular users is 25,000. There has been no promotion for this service other than through the usual communication with the customer. So there have been no special National campaigns. IB-Group is still unsure whether they should. As it is, with this growing speed they are able to scale up gradually.

Figure H: Number of log-ins in my-ib-groep.nl (monthly) (for views and mutations)
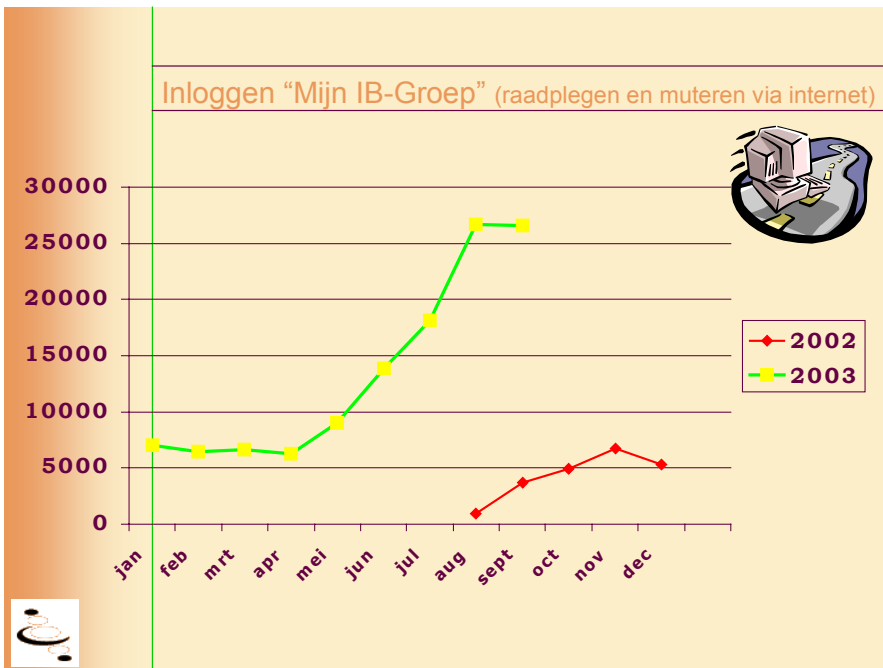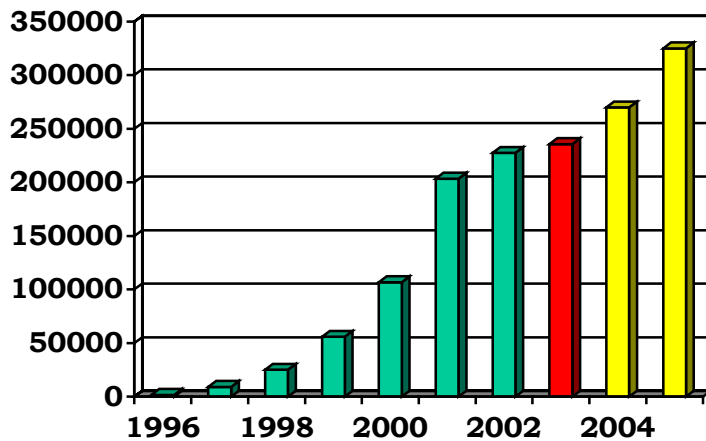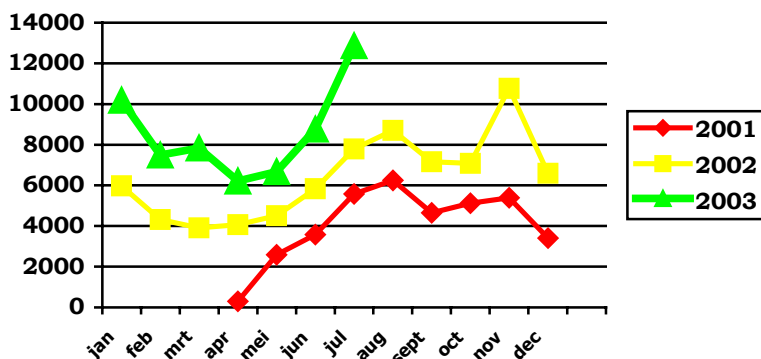
Figure I: Number of e-mails (per year)

With the growing use of the Internet the number of e-mails to IB-Group have changed. This is only natural. The IB-Group expects a steady growth for the next years, although communication through web forms is their preferred method of communication.

Figure J: Number of changes made using web forms (monthly)

This graph shows growth in use of the web forms since 2001. Again it can be seen that although a tendency of growth is visible from 2001 to early 2003, the growth has become much faster since the launch of the portal site in April 2003.

7. Learning points and conclusions

The IB-Group saw that the only way to really improve its customer relations was by changing its internal organisational structure (changing therewith in the perception of its employees), incorporating the latest technological instruments (as best suited to their target group), and having them work in a perfect balance. An organisation whose basic 'raison d'être' is servicing its customers can do much better only if it is prepared to take actions on its own behalf.

Organisational and functional learning points

This process has taken a couple of years, during which the organisational structure was changed, from a small number of columns of expertise (financial, legal, etc.) to more regional, self-regulating units with a focus on the customer. Each unit has expertise of all of the former columns but also includes people from the helpdesk. This way front office and

back office work back-to-back. The shortened internal communication channels lead to better coordinated actions and responses.

However, the structure of the organisation is of no importance to the customer, as long as he can get answers to his questions without limits of time and place. At the moment the number of registrations reaches 100 per day, some days peaking to 500+. Yet there has been no major PR campaign. The readiness is fed purely by custom public relations through the Internet site and e-mail

Customers must be able to effectively maintain contact with the group in a manner that suits them. Customer relations has become much more important to the IB-Group, which now employs as many communication channels as possible. Traditionally letters were the favoured means of communication within the organisation, but customers reacted more and more often by means of a telephone. This led to congestion in communication traffic. To address this, the organisation made a survey of the communication channels available and found out that their target group, students, made extensive use of the Internet. Using the Internet as the main channel for communication was therefore an obvious choice. On top of this, a multi-channel knowledge base was put in place to ensure that all channels produce the same information.

Technical learning points

Alternative technology alone is not always enough to improve results. The IB-Group would not have performed so much better if they had only adapted the Internet as a communication channel and for the rest had carried on with business as usual. It is the coinciding course of events whereby a major change in organisational structure, a different orientation on the customer AND the implementation of a communication tool that perfectly fits with a (rather narrowly distinguishable) group of customers which has led to these results.

It is not always necessary to go to extremes to ensure security and authentication. The solution of GSM/SMS authentication has proven to work flawlessly without any hiccups or cases of fraud. Not only is it a simpler form of authentication, but it is also easily within the reach of most of the IB-Groups' customers.

Within the discussion of PKI and smart cards, the IB-Group holds a special position with its GSM/ SMS authentication. The role of the 'token' (which is necessary for the authentication) is here performed by a mobile phone. The IB-Group considers this solution simple and cheap, with all of the management and maintenance problems (major problems in the discussion on PKI) in the hands of the customer. Also the topic of accessibility is solved. Within the contemporary developments in hardware and infrastructure development, this way of authentication has already been accepted by the citizen and therefore has the best chances for success. Not all transactions require the same level of security. The one chosen by IB-Group is considered safe enough for the purposes it serves, and the IB-Group believe that it will also suffice for many more public services.

The implementation of Internet technology in a fully operating organisation combined with the adaptation of the back office is unique within a public service. Within a year 50,000 customers have registered through the web portal to communicate in a secure environment. Figures show that these are one-time actions but that the customers also return. Secondary contact by the customer in the past few months has surpassed 100,000, whereas the classic contact frequency with IB-Group is 1.2 per year.

Technically, functionally and organisationally, the IB-Group has finished a very complicated project that it has already proven its trustworthiness and stability. The IB-Group invites interested organisations to contact them for a demonstration.

8. References and links

IB-Group website: http://www.ib-groep.nl/

See the attached two workflow diagrams, both before and after the launch of the "My-IB-Group" service in 2001.

Annex 1: investments

These figures give only an impression of the investments. All figures are in Euro.

Total costs 2nd, 3rd, 4th quarter of 2001	
Project management, control	581,877
Communication	97,736
Services/IT	979,598
Process management KS	586,440
Process management services	41,580
Total	€ 2,287,231

Estimate of other costs	2001	2002
4 extra servers.	150,000	
- directory server		
- intrusion detection		
- authentication banks		
complimentary software	100,000	
Licenses KANA I-mail	PM	
tool web statistics	25,000	25,000
certification site	2,000	600
Communication (webforms)	5,000	
Banners (webforms)	30,000	
Other communication tools	PM	PM
LET-tool		100,000
Provisional totals	€ 312,000	€ 125,600

Annex 2: Third party relations of IB-Group

Relations with which electronic data are exchanged:
- Belastingdienst (Tax Office)
- GBA (Gemeentelijke Basis Administratie – Municipal Personal Data)
- Inlichtingenburo (Information desks)
- Enschede/SDU bv. (National Publishing Office)
- Geldnet (Digital money transfer network)
- Brinks (Actual money transfer network)
- Inspectie van onderwijs (Education Inspectorate)
- CFI (Umbrella organisation for financial institutes)
- Onderwijsinstellingen (Educational Institutes)
- CBS (Central Bureau for Statistics)
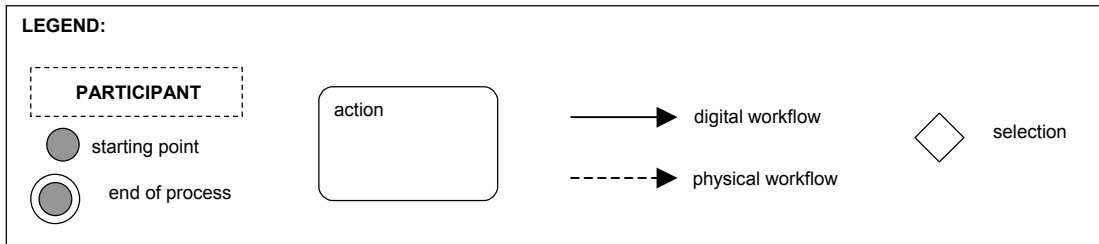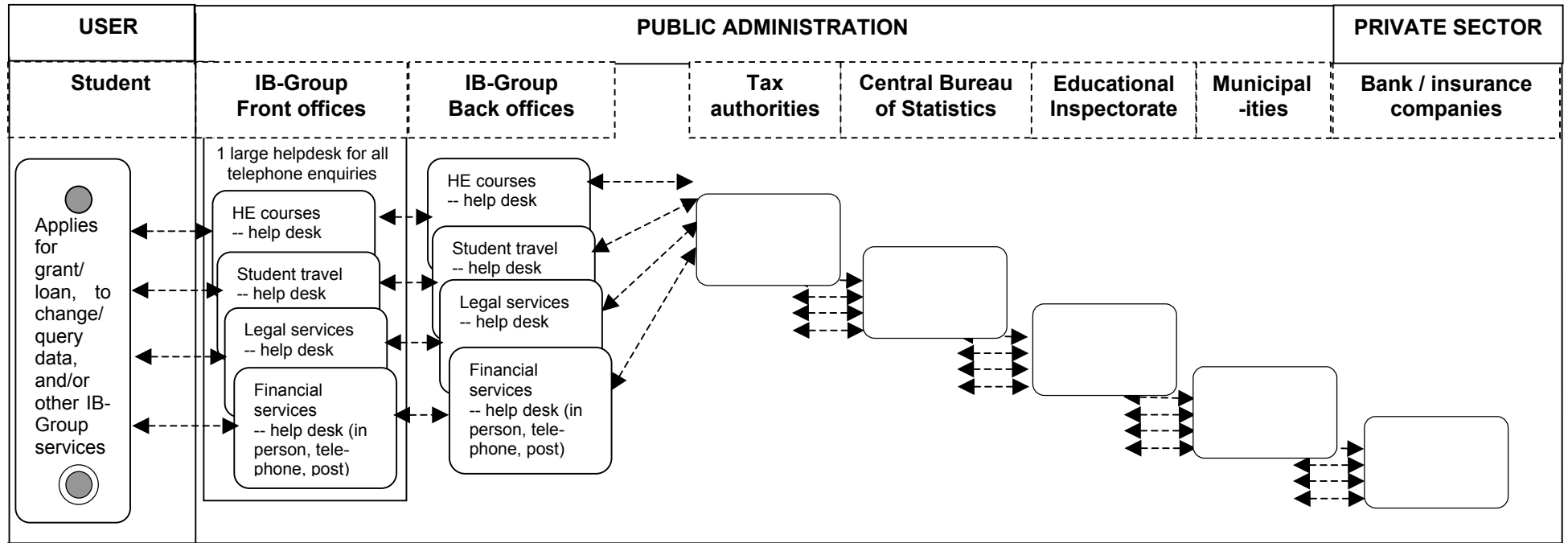- ST.Gerechtdeurwaarders (Money Collection Agency)

Manifest group:
- Belastingdienst (Tax office)
- College voor Zorgverzekeringen (Coordinates public health and medical insurance)
- Centrum voor Werk en Inkomen (National Centre for Work and Income)
- Sociale Verzekeringsbank (Social Insurances)
- Uitvoering Werknemers Verzekeringen (Employers' Insurance Implementing Organisation)

Benchmark group:
- Algemeen Burgerlijk Pensioenfonds (Public pensions)
- Bureau Heffingen (Heffingen Agency, part of the Ministry of Agriculture, Nature Management and Fisheries)
- Centrale Financiële Instellingen (see above)
- Centraal Orgaan Opvang Asielzoekers (Relief for Asylum-Seekers Central Organ)
- IB-Groep
- Kadaster (Land registries)
- Laser
- Politie Amsterdam-Amstelland (Amsterdam-Amstelland Police)
- Rijksdienst voor het Wegverkeer (Centre for Vehicle Technology and Information)
- Sociale Verzekeringsbank (see above)

Workflow of student grants ("My-IB-Group") the Netherlands – 1: prior to 2001

USER	PUBLIC ADMINISTRATION						PRIVATE SECTOR
Student	IB-Group Front offices	IB-Group Back offices	Tax authorities	Central Bureau of Statistics	Educational Inspectorate	Municipal-ities	Bank / insurance companies

1 large helpdesk for all telephone enquiries

Applies for grant/ loan, to change/ query data, and/or other IB-Group services

HE courses -- help desk

Student travel -- help desk

Legal services -- help desk

Financial services -- help desk (in person, tele-phone, post)

HE courses -- help desk

Student travel -- help desk

Legal services -- help desk

Financial services -- help desk (in person, tele-phone, post)

LEGEND:

PARTICIPANT

○ starting point

◎ end of process

action

→ digital workflow

----→ physical workflow

◇ selection

Workflow of student grants ("My-IB-Group") the Netherlands – 2: post 2001

USER	PUBLIC ADMINISTRATION					PRIVATE SECTOR
Student	**IB-Group Combined front and back office**	**Tax authorities**	**Central Bureau of Statistics**	**Educational Inspectorate**	**Municipal-ities**	**Bank / insurance companies**

Applies for grant/ loan, to change/ query data, and/or other IB-Group services

Internet, email, SMS, VRA VRSSS

In-person, telephone, post

Integrated customer services
- Financial services
- Legal services
- Student travel
- HE course

Integrated:
- **help desk**
- **back office**

For:
- **new students**
- **existing students**
- **ex-students**

LEGEND:

PARTICIPANT

starting point

end of process

action

→ digital workflow

----→ physical workflow

◇ selection

Norway

Case 24
Business submission of data:
The "Altinn" project

Note: this case is not included in the overall analysis as it is first launched in December 2003.

1. Executive Summary

The "Altinn"[76] project is a very ambitious project with the aim that a major part of the reporting from firms and persons to the public authorities shall be done in one channel, having a common user interface - and being based on a extensive (and intensive) integration of back-office systems. The "Altinn" is at the time of writing, September 2003, in its final implementation phase and will become operative for pilot testing in November. The goal is that Altinn will be fully operational from 2004. The project builds on several existing systems. The most important are mainly "Avgiver" (Abgeber, Deliverer), a system for company tax declaration and account reporting) and IDUN (statistiscal reporting run by Statistics Norway)[77].

The Altinn is from the start a huge "back-office" co-operative effort between Statistics Norway, Tax Authorities and The Brønnøysund Register Centre[78]. An important institution in the Brønnøysund Centre is the Register of the Reporting Obligations of Enterprises (ROE). ROE is the official public metadata institution. The ROE is in charge of keeping track of all information requested by the authorities from firms in order to avoid that the same information is collected by various public bodies. The ROE also try to harmonise data collection, i.e. to ensure use of common definitions etc.

The Altinn - as its predecessors has three methods for collecting data:
- Web based schema to be filled out online by the firms themselves.
- Electronic reporting from the firms own data systems (accounts, personnel etc.)
- Electronic reporting done by firms and professionals like accountants and auditors on behalf of the firm.

The Altinn project is itself a service provider an central portal and not a specific service. The Altinn team will function as consultant for the various public authorities that want to develop electronic reporting systems. The use of Altinn is not obligatory, but all public authorities are strongly encouraged to use it. Even if they choose not to do so, they have to interact with the Obligation register. That is report their data needs in order to check if the same or very similar data are collected by other public bodies.

The Altinn makes it possible for users, firms and persons to:
- get a list over the schema they have to fill out
- to have forms pre-filled with data that they already have reported to another public authority
- to have a common and consistent user interface to relate to when reporting to public authorities.
- to have one portal to relate for reporting

For the various public authorities that need data, Altinn offers a schema creation environment which ensures that the user interface is consistent in all Altinn schema. The will get assistance in enabling their system to receive data from firms and persons in a structured way by means of machine-to-machine communications.

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[76] Altinn, litteraly "All-in", means that all reporting from society (firms, institutions and persons) should be done by one integrated system.
[77] IDUN is also an umbrella, a common interface/plattform for reporting af various statistical series.
[78] The "Brønnøysund" Register Centre are managed several different national registers: The Central Coordinating Register for Legal Entities - The Register of Business Enterprises - The European Business Register - EMAS (Eco-Management and Audit Scheme) - The Register of Company Accounts - The Register of the Reporting Obligations of Enterprises - The Register of Mortgaged Moveable Property - The Register of Bankruptcies - The Register of Marriage Settlements - The Register of Private Debt Amnesty - The National Fee Collection Office - The Norwegian Register of Hunters - The Central Marketing Exclusion Register - etc. etc.

The firms creating for example accounting software are offered the possibility of getting assistance with programming modules in their program that will make electronic reporting to the authorities possible. XML and Web Services is the technological platform for Altinn.

To sum up the Altinn project serves four different user groups:
- Firms and persons directly using Altinn
- Accountants and other professionals taking care of the reporting for firms
- Public authorities that wants to have electronic reporting
- Soft-ware developers that want Altinn reporting as part of the functionality of their program.

Since the "schema-burden" on firms is mostly connected to economic/tax reporting, it is this kind of schemas that are included in Altinn from the start - together with a considerable amount of statistical reporting from the IDUN project.

2. Background

In 1999 the Norwegian government launched an initiative called "a less complicated Norway" ("et enklere Norge"), that is less bureaucratic with respect to the amount of reporting and control. An important part of the initiative was the goal that all public agencies and offices must be able to receive electronic forms, and even more important that information from the public should be requested only once.

The motivation for the Altinn project is to support all public authorities in their efforts to reach these objectives. The "less complicated" initiative itself aims not only at converting existing registration practices into electronic processing, but also intends to reduce red tape, modernize laws and regulations, and empower local authorities to make decisions. One effect has been an initiative from the Ministry of Trade and Industry and the Ministry of Justice to reduce the number of directives and regulations that govern the activities of businesses in Norway. Today the "less complicated Norway" project is continued as part of the eNorway program[79]. The strategy outlined therein gives priority to "reporting, reuse of and access to data".

3. Specific objectives.

Altinn is in the phase just befor being put into operation, and differs somewhat from other services that have been analysed in the Norwegian part of this project. The reason is of course that it is itself a *serviceprovider for public services*. The purpose of the project is as stated earlier to provide all public agencies with a solution that enables them to collect the relevant information electronically both from firms and people. The possibility to deliver some of the required information electronically already exists; in 2003 more than 4000 firms delivered their annual accounts in this way. But the majority did it the traditional way.

The main objective is of course to concentrate most, if not all, filing reuirements in one place and simplify the process of dispatching the information. In addition, it seeks to simplify the search for the forms that are required to be collected, filled out and dispatched for the users. All public agencies are as part of the eNorway initiative required to offer users electronic delivery of information by 2004. However, each agency or government service is by itself responsible for the implentation of the service. Therefore one of the main objectives of the Altinn project is to facilitate the technical solutions and even integrate these with existing software suites that are used both by users and by the agencies.

Since most of the information (taxes, wages, illness leave of employess etc.) already are registered in the firms own systems, or by professionals to whom the handling of such data are out-sourced a central objective is to enable automatic or semi-automatic reporting directly from the firms own information databases. Filling out web-schemas "by hand" is in many instances - like the current system for online, web-based VAT-declaration - something that is not considered the most efficient method.

At the core of Altinn is the use of person- and firm identifiers, especially the latter. In the seventies and the eighties there were three separate business registers (statistical, social security and VAT-based). After years of discussions the "Unity register", i.e. the integrated, unified register was established based on the three antecedents in 1995. This register in it self is a major example of back-office reorganisation, since there is a continous co-operation around the register, feeding data in, making corrections etc. The various actors have different responsibilities for adding firm specific data to the central database. Statistics Norway for example decides the NACE code of a given firm which then

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[79] See "A modern public sector" in *eNorway 2005,* published by Ministry of Trade and Industry, [online], http://odin.dep.no/archive/nhdvedlegg/01/03/eNorw040.pdf

everybody uses. The central register is then mirrored physically in the data systems of the co-operating institutions. It is a virtual, distributed database system.

4. Resources

The total resource use in these projects is difficult to measure since none of the persons that were interviewed had that kind of information about all the projects currently under the Altinn umbrella. We doubt that there exists such an overview, but there is data on resources used, mostly "hard" cost data. To take an example: the Altinn project group have consisted of 15 - 20 persons. The rough estimate is that the Altinn from October 2002 has used in the order of 15 mill. Euros. But then there has been done a lot of work in the years before in various parts of the administration in articulating the need, building the predecessor systems, summing up experiences from the predecessors to Altinn.

There is in place a system for measuring costs and benefits, but it is obvious that one have to estimate rather roughly and unprecisely a major part of the benefits on the user side, since the gross time use on reporting by firms and persons cannot be measured at a reasonable cost.

The contract for implementing Altinn was given to Accenture. It includes the responsibility for running the system in the first year. The size of the contract is not know to us. But it gives Accenture an income in the production phase that is based on the number of transactions. Accenture will then have incentives to make the portal user friendly, stable etc. The public authorities using Altinn will get lower prices as the volume of transactions increases, the unit price is markedly lower than old-fashioned handling of paper forms, so they will be keen to get the volume of their business over to Altinn.

The attitude seems to be that the benefits and savings of "going electronically" are rather obvious, both in time and money saved and in user satisfaction, so there is not great emphasis on savings in a narrow sense.

There has so far not been done a lot of training narrowly connected to the Altinn project, but there will be an effort when the system is really up an running early in 2004. In the first phase it is the staff of the Tax Authority, both central and regional offices that will be trained in the use of the schema creating tool. But as stated above, Altinn is the continuation of efforts to transform data collection routines, transform workflow by transforming the competence base in the concerned parts of public administration.

5. Implementation

The Altinn project was kicked of 1st of October 2002. Accenture was choosen to create and implement the first version and guarantee the first year of operation. The autumn 2002 was the general specification phase. The spefications were approved and further detailed spring 2003, and the actual implementation has been going on since spring-summer 2003.

First real operation date is set to the 1st of November. There is a "user council", composed of Statistics Norway, Brønnøysund Register Centre, Tax Authorities, the Social Security Authority (Rikstrygdeverket), three accountants and autditing associations, two employers associations. The major stakeholders on both public and private side are represented. This council will play a major role in shaping the system in the coming years. It will most probably be a rather pro-active body.

That means that it is not so relevant to discuss the number and levels of BO's involved, because the principle is that if a public authority needs some information - it first checks with the "Register of obligations" if the information is collected (routinely) by other public bodies. If that is the case the information will be retrieved from the database of that institution - for example in order to pre-fill out a schema. If not - then the public authority in question will be the only collector of this particular information and others bodies will request the information from it. There is in principle no limit to how many different BO's that might be involved. To protect privacy there is a system of agreements ensuring that only the strictly relevant information are transmitted between agencies, that privacy is not compromised. But the general logic of the system is co-operative. In practice it will be the time that it takes time to implement the actual data exchange, i.e. agree on the concrete formats, ensure that the data exchanged are interpreted in the same way etc. that is the major obstacle for more extensive use of pre-filling out of data, of consistency check of data etc.

The technical implementation has more the nature of a set of guidelines, a framework, of tools that can be used, but that's not obligatory. The major guiding principles are:
- There should be no down-loading of client software. If "client" software is needed it should be part of 3rd party software - as is already the case to a certain extent. That is it is integrated into accounting and personnel systems.

- All technological platforms/OS's should be accepted (Linux, Window, Mac, various UNIX dialects, main-frames) on the user side.
- User interface based on open standards like XML, SOAP, and specific XML-standards like ebXML
- The machine to machine exchange of data is done with Web Services.

The actual implementation of Altinn contains many kinds of functionalities which need careful planning and testing:
- User log-on and PKI system, integration with SMS-based services
- Users to be able to have draft-versions on web-accessed central server
- Producers (= public authorities) to be able to pre-fill schemes, i.e. to get data from other BO's and present them to the user
- Handling of attachments (for example word- and excel files, but also other formats)
- Long term storage of previously submitted data, for reference and reuse
- The consistency of electronic and paper schemas since one will not get rid of paper in the short run
- The general maintenance of the system (hard- and software, help-desk, online help etc)

All of these implementation issues merits discussion, but that is beyond the scope of the present report. But the PKI solution or more precisely – user verification is interesting. For most of the reporting a system passwords are used. When the user wants to use an electronic schema there is issued an ad hoc, "first time" password. The password might be on printed material routinely sent out, or an ad hoc pin code sent by special mail. But one expects that pin codes send by SMS will play an increasing role. First of all because it is a quicker and cheaper method, but also because it is regarded as more secure. In most cases the mobile phone is less accessible than papers send by post. If the phone is not carried by the owner, it is often switched off, which means that one needs the pin-code to get access to the stored information in the mobile phone. If the sending of sensitive information becomes more common, one might envisage that mobile phones will get screen savers that require passwords to access certain parts of the information stored. This will increase the security radically.

One of the public agencies that are going to use Altinn is the State Educational Loan Fund (Statens lånekasse for utdanning). They will test the use of smart-card solutions on a limited scale. The reason is to have a higher level of security – well aware that the experiences with smart-card solutions in other contexts have been rather disappointing. Smart-cards is offered as a method of user verification option in the current tax-reporting system "Avgiver", but have been only marginally used. The reason is that to use a smart-card you need special hardware, drivers have to be installed etc. Such systems are very often error-prone, demands a great deal of technical competence from users. And they are tied to one (ore more) computers equipped with special hardware and software. A password solution is much simpler and can be used in all contexts where the user has access to the Internet.

There is no special function for e-payment in Altinn. The reason is that in those cases where there are economic transactions, for example paying fees one will use either the traditional paper-based giro system or online banking. The receiver of a paper-giro may or may not use an Internet based banking system to pay the giro. If there is regular transactions the user and the authorities might agree on "e-invoice" (e-faktura) in which case the invoice is send directly to the users Internet/online bank. The lack of a generalized e-invoice system is clearly a drawback. In those cases where the user is reimbursed from the state, online banking is used by means of well established procedures.

6. Results

As stated above, there is – as far as we know – no data available that makes it possible to calculate the overall economic result from the applications that Altinn inherited from the "Avgiver" application and the "IDUN" project portfolio. The attitude seems to be, which also is the policy of the government, that the gains from electronic reporting are so obvious, that to use to much resources in measuring the costs and the benefits – although it is done in each individual project – is not that important. The "selling argument" for Altinn is not cost saving per se, but that there is no other alternative. Have anyone who were used to use typing machines gone back to typing machines after trying a word processing program – regardless of how primitive the first computers and programs were? And of course – sometimes when you had problems with the printer – or lost everything due to hard-disk crash – it would have been faster and safer to use a type writer. But the gains from word-processing by far compensated for such temporary problems.

In "Avgiver" and IDUN the primary success indicator has not been the net savings/gains, but the take up. The takeup of Avgiver after two years was 30% according to the Altinn team, and they hope for 40% this year. The take up is of course dependent on the penetration of Internet-connected firms and households, but that is steadily rising. There will be strong incentives to get everybody over to an electronic system, since the maintenance of two systems, one electronic and one paper-based is not optimal.

One of the most immediate effects of the electronic (including web-based) reporting is that the punching of data has been almost totally eliminated in statistical reporting. There is only left some of the more infrequent and complicated, annual and biannual surveys. But part of the picture is that scanning of schema has replaced the traditional punching in the cases where there still is a combined system of electronic and paper-based reporting. Although the scanning is rather efficient in it self, the handling of the paper schemas are still much more costly than the costs of running an electronic reporting system.

7. Lessons learnt and conclusions.

Since Altinn is not yet in operation, the lessons learned and conclusions will be based on the experiences with the predecessors – and the rationale behind Altinn, and Altinn's expected when it becomes operative.

The most interesting feature of Altinn is that its objective is:
- To have one portal/channel for all reporting from firms and persons to public authorities
- To have a common interface by means of using the same schema creation software
- To have a complete overview of information collected by public authorities by means of a special register (the register of obligations) of the information collected.
- The obligation register makes it possible to present the user with an overview of all the tax, statistical and other reporting that the state requires
- The logic of the obligation register is that data should only be collected once from firms and persons – and then shared between all back-offices that need the information.
- This opens up for system of pre-filling of schemas for control of information and to aid the user. The same goes for the fact that each user in Altinn (of the firms) will have their own storage area to keep drafts, copies of schemas delivered etc.
- To make this system work, one is crucially dependent on the use of unique, officially recognised person- and firm identifiers. The use of these identifiers have made – and will make – it possible to join together information that never was planned to be joined. This radically increases the flexibility of the total information system in society, or to put it another way: it makes it possible to – on short notice – to answer new and previously un-thought of combinations of information since the most seemingly unrelated information can be joined using the person and firm IDs as a primary key.
- The Altinn project goes beyond the framework of the (A, B, C, D) model of back-office reorganisation since it tries to be become *the* solution. If this goal will be realised is of course an open question. Although the three institutions backing the Altinn from the start are major actors, it is significant that the Social Security Authority has been reluctant to join and so far sticks to its own solutions. It is unlikely that politicians will make Alltinn mandatory, since this might easily make the Alltinn solution less user/market oriented.
- An interesting aspect of Altinn (and its precursors) is that the project does not see schema filled out online as the only method of data collection, but places great emphasis on automatic, computer-to-computer reporting. This is based on experience for example with some of the simpler statistical reporting, for example the monthly retail sales statistics. For the users it was more – or just as – convenient to just jot down a few numbers and put them in the ready-made envelope, than to go to the computer, find the web-page, log-on, fill out the few numbers. The only real, i.e. efficient alternative to the paper system is that the accounting systems routinely send these numbers with no human intervention.
- There would be high barriers to implement automatic computer-to-computer reporting if the Alltinn did not put a lot of resources in stimulating the major software houses to program Alltinn-reporting modules into their software. This makes it possible for those firms that keep their own accounts, own personnel databases etc. to interact with Alltinn, or the accountants and auditing firms to that on behalf of all their customers. This latter group of professional users is of course important for the development of the solutions since they have more varied experience than one single firm.
- The authentication solution, the PKI infrastructure is still not mature. The principle of using passwords and not any solution that requires special hardware is fundamentally sound in our opinion. But it would have been better if there was a one-stop authentication, that is that users identified themselves once by a more thorough procedure, got one password that could be used with all Alltinn schemas and reporting procedures[80]. One argument against this solution is that if this one password is compromised, the intruder gets access to all the user's Alltinn data. But as it is now there is a danger that users will choose different passwords, which they will not be able to remember, and the sending out of new passwords reduces security and consumes resources. With many different passwords or frequent password changes there is a tendency that users write them down, have "yellow notes" near the computer, and that is

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[80] One could of course have two or three such passwords, depending on the required level of security needed, so that one could have a simple procedure for non-critical information.

really endangering security. If the users consistently use only one password in all Alltinn contexts, that is in essence the same as a single authentication procedure.

- Altinn – those part that involves economic transactions are not critically dependent on a generalised e-payment system, but that would certainly have been a plus. But the solution to the e-payment infrastructure is not a task for Alltinn, that is a decision that government must take, taking into consideration all the relevant factors for the shaping of a generalised e-payment system.
- Another important feature is stable e-mail addresses. There is going to be much more focus on this as soon as electronic reporting becomes more dominant, because there is no need change of e-mail addresses for running firms, in contrast to a street address that have to change each time a firm or a person move. The present regime where e-mail addresses are tied to which ISP you use is clearly not a good solution.

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Altinn - http://info.altinn.no/CMSAltinn
eNorway - http://www.enorge.org/
eNorway – MoTI, http://www.dep.no/nhd/norsk/enorge/eNorge/index-b-n-a.html
Program for electronic casework - http://www.elsak.no/

Portugal

Case 25
Business corporation tax:
Seg-social, corporate tax declaration and notification

1. Executive Summary

This service offers the possibility for users (businesses) to make their declarations of corporation taxes entirely on line and/or to change it.

The initial process is quite simple: users do their registration on-line, receive the confirmation by e-mail and 48 hours later receive their password by post letter. After this process is complete, users are able to fill in their declarations on-line or change the declaration already submitted. After acceding to the web-page (www.seg-social.pt), users have to fill in their identification by providing their Number of Social Security (NISS) and password. Once this procedure is concluded, users are able to have access to the already submitted declarations list (none at the first access). This way, users can register themselves or modify their data (company's data) such as name, address, social security ID, phone, etc., update workers data (add or remove) such as individual social security ID, name, date of bird, salary, and the correspondent taxation, or even choose the option for submitting a new declaration. At the end, users must confirm the submission and, if the system accepts it, receive automatically confirmation and the ID number of submission in his mail box. With this ID number users can trace the status of their requests. Vertical data re-use is contemplated.
The digitisation of back-office processes within the public agency (social security) – *back-office reorganisation* –, was performed by own technicians from the IIES. Starting in the beginning of July 2001, the number of submitted declarations in this service has increased every month. The alternative to this on-line service is to do the declarations by hand-writing, every month, and introduce them in the social security database through optical reading. However, the rejection rate of this process is very high (around 40%) and in that case human resources must be affected to do it manually.

One may say that this process is highly digitised. When a user accesses the service, there is full automation, the interaction between the user and the service is fully digitised and the only need for human agent intervention is in exceptional circumstances, i.e. there is a fully automatic data input, checking and response.

All in all, this service includes correspond to model C, one service/multi stage with two back-offices: the Social Security (central) and the Cash Desk – Banks (local). If entities are not registered yet also includes the Financial Services and the SS District Offices (local). The complexity score is 4.

The telephone interviews were established after choosing the most appropriated cases. The reasons for choose this one were the following:
- the national responsibilities: IESS (Social Security), Social Security District Offices and the Financial Service Office,
- the score from the web-search (4) and also the model which was C,
- the usefulness of the front-office,
- the level of transaction achieved: there is no need for other procedures in paper.

2. Background

According to law, each entity must send every month to the social Security the sheets of salaries of their employees. Initially, the all process of corporation tax declarations was paper based. This procedure had to be done every month by more than 400 000 firms, which submitted their declarations to the regional platforms of the Social Security. 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 this 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 the mid 90's, firms started to submit their declarations by DRD and other ways such bobbins. In addition, the Law 17/2000 from August 8 founds the new basis of the social security system which foresees the introduction of a national information system based upon national databases. The implementation of this system was depending on the development of a unique national identification system of every citizen, as a contributor or beneficiary, who is related to the social security. One of the foreseen measures was the progressive substitution of the paper based declarations for other prompt supports.

In 2001 more than 3000 workers were processing more than 4 millions declarations unfolded by district and mainly paper based. The workflow of submission of these declarations is very important: they are the basis of the calculations of the amounts of contributions to social security as well as the amounts due to beneficiaries (health subsidies, unemployment, etc.). If this process becomes more prompt, other related processes are equally affected in a positive way.

In order to accelerate and provide a better control of the workflow, in April 6 2001 was approved the Law Decree 106/2001, which 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.

IEES (Computing and Statistics Institute of Solidarity) appears as a way to respond to the need to substitute the regional applications for integrated national ones. The first national application developed was internal, the Social Security National Manager of Treasuries. Afterwards, IEES undertook the development of the on-line tax declarations service – DRI. The main reasons for the development and implementation of this service were, on the one hand, to facilitate the relationship between firms and social security and, on the other hand, to reduce the social security efforts to deal with the submitted information. Before the legal framework that supports the back-office reorganization and the DRI availability, there was a lack of national integration and management. For instance, it was possible for an employee to be on sick leave in two different cities at the same time, thus receiving twice the unemployment subsidy.

3. Specific Objectives and Process Description:

Main objectives pursued

- 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.

Service description:

Each firm must be inscribed in the Social Security which occurs through a face-to-face process. To do so, a firm must be registered in the financial services and endowed with a confirming document which is a legal form in paper containing the firm's NIF (Fiscal Identification Number). The NIF is a unique number both for citizens and firms. At the end, the firm will possess an ascribed social security identification number (NISS), one for each district in which the firm operates. All NIFs and NISSs (either already existent or new) are integrated in the social security database – back-offices integration.

In order to accede to the DRI application, firms must register or identify themselves initially trough their NIF which will be confirmed in the social security database. In case everything is correct the process begins. The next point presents a picture showing how to accede to the DRI application.

Workflow of the *Corporation tax: declaration, notification*

* Next step (see 5.2)
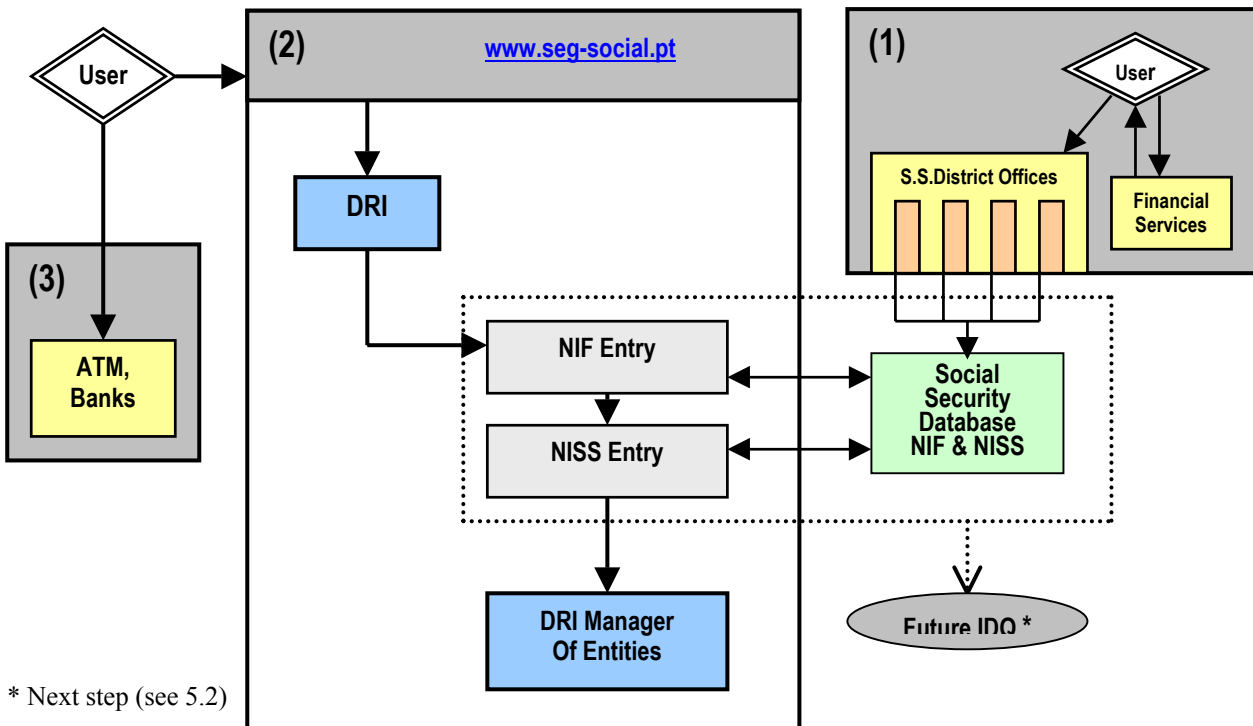
(1) Process of companies' registration: in the Financial Services and later in the Social   Security through face-to-face contact.
(2) How to accede to the DRI manager of entities (companies already registered in Social Security do not need to do (1))
(3) The on-line payment application is not available (companies must do it separately)

Once NIF is confirmed, firms must input their data.

After the registration/identification by NIF it is necessary to do it by NISS (one for each different district location). These social security identification numbers are composed by 9 figures: the first three are related to the location of the firm and the last six are the entity identification number. The NISS is automatically confirmed (accepted or rejected) through the integration with the social security database.

4. Resources

The back-office reorganization is embedded in a wide national program to improve a better public administration, namely in the social security. Similarly to most relevant Portuguese companies such as *Portugal Telecom,* IEES new and modern building (with open spaces without demarcations in order to promote interaction) is located in a Scientific and technological Park (Tagus Park).

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 organizational roles because of the new processual 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.

5. Implementation

The implementation of the DRI started with the possibility to submit firms' declarations through the use of floppy disk (DRD) and later on by internet. In order to induce firms to use DRI, social security, not only abolished the possibility to firms to submit their declarations in banks, but also made a promotional campaign concerning the easiness of DRI process. As a result, firms were obliged to submit their declarations at the correspondent social security offices, whilst in banks firms were allowed only to pay their obligations. The objective of this decision was to push the companies to adhere to the on-line service which is a much faster way to submit their declarations. Till this obligation, the helpdesk answered around 300 phone calls a day, whilst afterwards the number of phone calls ascended to more than 6000! The next picture shows the phases of implementation of the service.

Service implementation phases

1. Possibility to submit the declarations trough floppy disk (DRD)

2. To make the DRD information valid and send it through the internet

3. To compose, to manage and to validate files on-line and send it through the internet

4. Integration with IDQ information (this will be ready in 2 months and will require the substitution of the companies software)

5. In the future it will be developed one application to integrate the on-line payment

6. Results

In June 2003 the total amount of registered entities in social security with obligation to submit their declarations was 360 527. About 46% of those were registered in the DRI which means a total number of 165 129 entities. Approximately 80% of the registered entities in the DRI did submit their declarations using the on-line service. In August 2003 the amount of entities registered by NIF in the DRI was 186 340. From those, 158 755 did submit their declarations through the DRI, which means 85% of the total registered entities.

The number of registered contributors by NISS is 199 724. This number is higher than the total of NIF because of the unfolded registries by district where companies operate. From those, 166 447 did submit their declarations through the DRI which means more than 83% of the total amount of registries. The next graphic shows the amounts of registries in the DRI by month and by NIF and NISS.
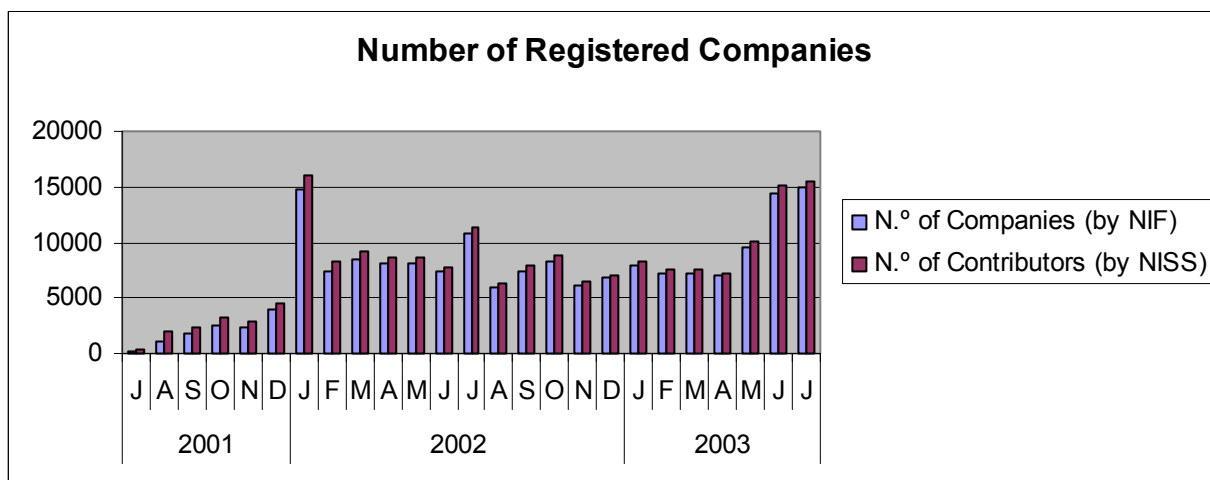
The total amount of declarations submitted using DRI has increased since the service is available. In the last two months (July and August 2003) the number of submitted declarations has reached 250 000, as shown in the next graphic.

Number of Submited DR's
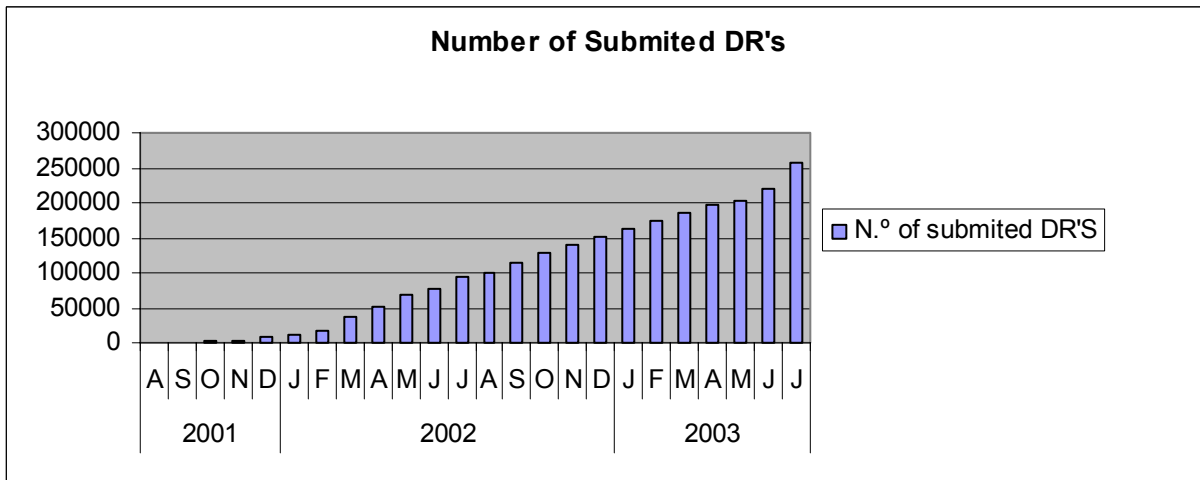
The quality of the information submitted (data acceptance rate) has also increased since the beginning has shown in the graphic bellow:

Quality of Information Submited
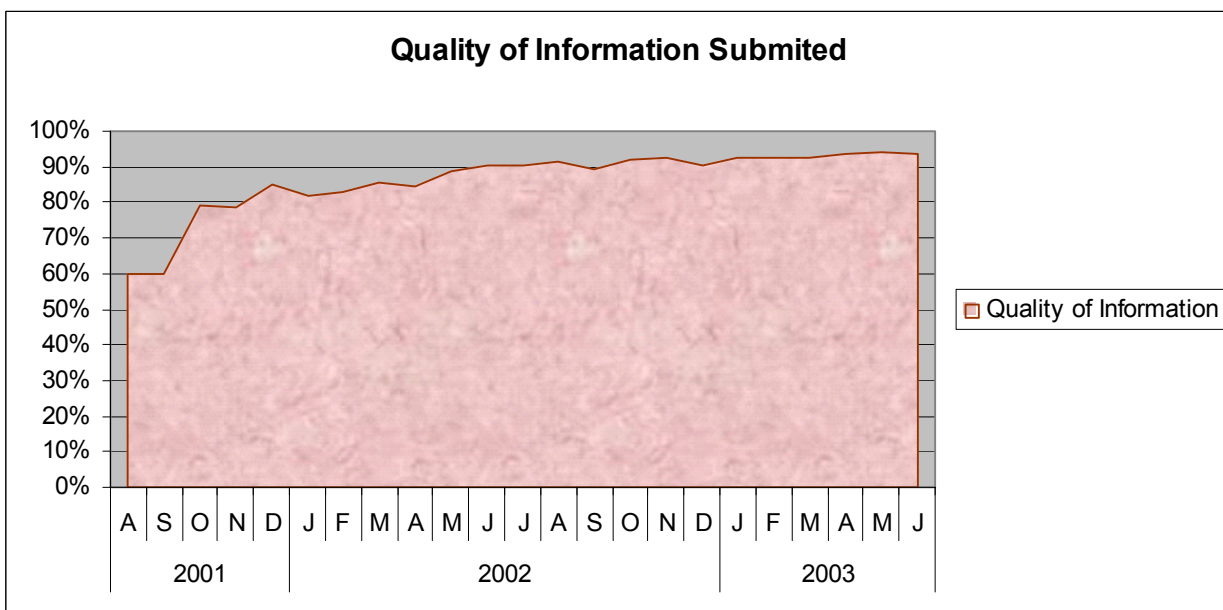
Benefits to firms are the following: it is no longer necessary to go to the social security district offices personally to submit their declarations; as a consequence users save a lot of time and, in addition, save money from related travels when they do it on-line.

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.

Next steps

The most recent application developed by IEES is a national database which identifies through a unique number (with 11 figures in substitution of the NIF and NISS, each one with 9 figures) each user with a social security number, either as firm or citizen. This application is designated as IDQ (Users Qualifying Identification) and will start in October 2003. This is a very important application for the back-office integration, namely the Social Security Central Services with the District Offices. When a user makes his inscription in a social security district office, the registry is done

directly through the IDQ and saved automatically in the social security database. After October, the information submitted using the DRI will be validated through the integration with the IDQ (see figure *How to accede to the DRI Manager of Entities* – pg. 6). Once the first registration in Social Security is completed, a firm can almost automatically do the registration in the DRI.

The main problem faced in the development of the IDQ was the data migration from local to central, because of the need of data treatment for compatibility.

7. Lessons Learnt and Conclusions

This section forms the core of the work, i.e. presents the main conclusions of the service under study. The conclusions are mentioned in the following points:

- Generally, there is a lack of knowledge and ICT oriented culture in firms towards an effective use of the DRI. More information and support can in fact induce a faster and more efficient generally use.
- 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.
- The Law Decree 106/2001 has established the possibility of delegation of work, which means that a single person can submit several companies' declarations. This implies that small firms do not need to acquire specific software or use more human resources to perform the service.
- At this time, the on-line payment is still unavailable. Users must submit their declarations in one place and pay for it in one other, which does not contribute to attract firms to adhere to the DRI.
- The network infrastructure to use digital signatures is not implemented. This is due to the fact that users identification occurs through the NIF and NISS, thus users do not need to sign any document;
- The development and the integration of the on-line service is very complicated not so much because of technical difficulties but rather because of legal rules and other demands on the system.
- This service corresponds in fact to model C, one service/multi stage with two back-offices: the Social Security (central) and the Cash Desk – Banks (local). In case firms are not yet registered, the process also includes the Financial Services and the SS District Offices (local) – one service/multi stage with four back-offices (however, these last two back-offices would not be integrated; see figure 3.2.1). The complexity score is 4.

8. References and Links

www.seg-social.pt
http://dri2.seg-social.pt/NASApp/dri/
DR-online: Guia do Utilizador
Law Decree: 17/2000, 8th August
Law Decree: 106/2001, 6th April

Spain

Case 26
Citizen income tax:
Income tax declaration

1. Executive Summary

The Agencia Estatal de Administración Tributaria (AEAT) or Agencia Tributaria (or Spanish Tax Agency) makes it possible to complete and deliver the income tax return, including payment, via its web site. Even if it is not necessary to get the digital signature provided by the CERES[81] to take advantage of some characteristics of the service, to complete the whole process through Internet is not possible without it.

Before the new system was implemented, the taxpayer was obliged to get the information, to fill in a paper form, to calculate the result of the tax return and to pay, if necessary, going to the bank to settle the debts and presenting the receipts (declaration and payment) at the AEAT office. Now, the whole process can be completed via Internet, being supported by the PADRE[82] program. This means that the user can download his/her tax information, pay and present the income tax return via Internet. All steps can be done in the Agencia Tributaria web site.

The income tax return has been implemented as a layer over a previously computerised system. This layer allows the citizens to interact with this system via Internet. It includes complementary services which allow completing the whole process online, including payment. In 2003, about 1.7 million citizens have used the online tax return service. That is about 12.2 % of all taxpayers and in comparison to 2002 an increase of 50% (1.1 million online users).

The main back offices involved in the process are the Agencia Tributaria, CERES and banks. However, many other agencies, public and private organizations provide fiscal information about the taxpayer to the agency (e.g. administrative representative's office, Treasury, etc.).

This service is offered to all Spanish citizens obliged to file an income tax return (more than 14 million).

Even if this service is studied separately, it corresponds to model D, as in the same web the taxpayer can find other services that the agency offers which use the previously entered data. Information between different services is shared and reused by others. One example is deduction for maternity, which uses information introduced for income tax return. The agency sends information in advance to the users so they only have to introduce a code to request the allowance. The complexity score achieved is 4. There are four main groups of back offices involved:

- The AEAT. It is the central back office in charge of centralising information and deals with all procedures and processes involved in the income tax declaration.
- Entities sending information to the AEAT. There are around 200.000 entities exchanging information with the AEAT. Not all of them are relevant for the declaration. It depends on the income and personal assets of the taxpayer filing his declaration. For example, if the user has only a salary, the Seguridad Social (Social Security) or the involved friendly society information is enough for the purpose of the declaration. Other declarations can involve the information sent by more entities. There are some regions in Spain having competencies on tax issues. The AEAT has an agreement with the País Vasco and Navarra to exchange fiscal information.
- CERES: organism in charge of providing digital signatures. It is dependent on the Fábrica Nacional de Moneda y Timbre.
- Banks. It includes the Banco de España (Spanish Bank) and normal banks. The Banco de España is in charge of making refunds effective. It gets the order from the AEAT, once it is validated, and makes the requested transfer to the taxpayer's bank account. Therefore, an intermediate back office is involved when refunds are needed. Other banks allow direct payment from the AEAT web site through an agreement with the Agencia Tributaria.

The user can deal with the whole declaration process through Internet, not needing other procedures on paper. All processes are automated. Besides, it allows electronic payment and uses the digital signature to identify the users.

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[81] Public organization in charge of certificates, dependent on the Fábrica Nacional de Moneda y Timbre, National Currency and Stamp Factory
[82] Programa de Ayuda a la Declaración de la Renta, Assistance Program for Income Tax Declaration

The case was chosen because it is one of the most advanced in Spain. Besides, it has been (and it is) very successful, with a spectacular growth of users in a country where the Internet penetration rate is low in comparison with other European countries.

2. Background

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, noticing a demand much higher than expected. Therefore, in its modernisation plan (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 taxpayer. From May 1999 on, the citizens can present the tax income declarations via Internet. It has been the first service of the agency based on the digital signature provided by the CERES, from which it is planned to provide the digital identity card to Spanish citizens.

All in all, the Agencia Tributaría aims to provide efficient and flexible quality services to make easier for the citizens to carry out their obligations with the tributary system and, at the same time, to develop a more efficient system to speed up the workflow.

Some problems the agency found during implementation were:
- One of the main challenges, due to the lack of experience, was security and digital signatures.
- Work shifts. The service is 24 hours per day, 7 days per week, but the turn shifts do not cover the whole timetable. The design of some applications was changed to adjust them to the workers timetable. Anyway, the availability of the services is still 24/7.
- There have been a lot of legal modifications and advances in order to make the service available via Internet. Even when the level achieved is excellent, some more changes are needed to improve the processes in the future, for example, removing the need of an administrative act (involving human intervention) when refunds are carried out.

All in all, this implementation has been part of a wider process, in which, taking advantage of a common system and development, almost all services of the agency have been implemented to be available on the Internet.

3. Specific objectives

The overall objectives are:
- To introduce new ICTs to the benefit of the taxpayers and the involved staff. This must be done in an efficient way and achieving the maximum level of security.
- To advance the Information Society development.
- To provide a quality service which leads to an increase of the demand of electronic services by the taxpayer.

By digitising and making available the income tax declaration via Internet, the agency tried to achieve two main groups of objectives:
- To improve the services offered to the citizen
- To improve the operation of the services.

To improve the services for the citizen
Before the new system was implemented, the taxpayer was obligated to get the information about his/her tax demands from banks, companies, etc (depending on what the taxpayer had to submit). The taxpayers had to fill in a paper form and had to calculate the result of their declaration. In case of refund, the taxpayer had to go the local AEAT office to present his/her declaration. Then the National Bank of Spain was advised to refund the money to the taxpayer's bank account. In case of payment the taxpayer had to go to his bank to settle the debts and had to present the receipt of payment and his/her declaration at the AEAT office.

Regarding improving the services, the main objective was to simplify the steps the citizen has to carry out to complete his declaration, even more so if corrections or other changes occur. The Agencia Tributaria wanted to make an integral offer of services to the citizens via Internet, trying to reduce time and costs. At the same time, the Agencia Tributaria wanted to increase the transparency, providing the taxpayers with the relevant tax information it already has, making it easier to complete the declarations for the users. On the other hand, the taxpayers have helpdesk to solve any problem or doubt that they could have when interacting with services offered. With the Plan de Modernización, the demand by taxpayers for a longer and more flexible timetable, avoiding journey (and its cost) is heeded.

To improve the operation of the services

The Agencia Tributaria aims to reduce the time between the presentation of the declaration and its processing by the system. The cost of saving documents (previously paper copies having the information and introduced manually) is reduced. Therefore, the quality of the information is improved because a lot of mistakes done by manual input are avoided. All things commented before allow to reduce the time between presentation and refund, when the declaration produces that result.

On the other hand, it is important that with the new system, it is possible to get the tax and economic information almost in real time.

4. Resources

A multidisciplinary team was created in the Departamento de Informática Tributaria (Tax Computing Department) to co-ordinate the development of the applications that allow the presentation and management of the electronic declarations and, at the same time, to adapt the regulation to the foreseen changes. The team was made up of staff from all divisions: exploitation, customs, planning and co-ordination etc. Because of the significance of the project, it has involved a lot of public organizations, which has contributed to develop the applications and legal changes: regional and central units for management of big companies, Collection[83], National Collection Office, regional collection sections and other delegations and public organizations. The following table shows a brief description of the calendar of meetings held divided in semesters.

	1st s - 98	2nd s - 98	1st s - 99	2nd s - 99
Contributing entities	X			
Big companies	X	X	X	
SMEs, consultants, agents, professionnel associations, buffets.		X	X	X
Agencia Tributaria personnel (collection, management and customer attention)	X	X	X	

To allow payment directly via Internet, a NRC (complete reference number) must be generated. In order to do this, the contribution of the banks and financial institutions has been necessary. When the taxpayer pays, the bank provides a NRC, which must be included when the declaration is presented. The Agencia Tributaria assigns a coded number and with this number, the bank provides a NRC per each deposit.

Before the implementation of the virtual office, some issues related to security where considered. The result of the study was a security infrastructure based on Internet standards: SSL-3, digital certificates 509V.3 and digital signature with format PKCS-7.

The technical environment has been based on the operative system Z/OS, transaction monitor CICS and data base manager DB2. Programming has been developed using Cobol and Natural, and HTML and JavaScript for client applications on the Internet. An SMIME secure e-mail infrastructure has been implemented. EDITRAN protocol is used to exchange information between some entities when information exceeds the Internet capacity.

In order to complete the income tax declaration via Internet, the taxpayers need a PC and Internet access, plus the digital signature provided by the CERES. Regarding the PC, minimum requirements for PADRE are: Windows 95/98/ME/NT/2000/XP, Pentium, 32 Mb RAM (64 Mb recommended) and 22 Mb hard disk space.

5. Implementation

It is necessary to comment that the implementation process to present the tax income declaration via Internet began with the declaration of big companies. Later on, the system was extended to the income tax declaration, working on some topics related to the procedures, mainly the taxpayer identification system.

The back office reorganisation has taken place in different phases. The Agencia Tributaria has set up a layer over the previous working application that allows entering and exiting from the Internet. This previous program (approximately installed in 1992) automated the internal management of the declarations. Now, with the new layer, applicants have the possibility to directly communicate with the program skipping human intervention.

As mentioned above, a multidisciplinary group was created. It coordinated the application development and legal changes. Meetings with the contributing organisations were held. Very important were the meetings with the financial

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[83] Local organization in charge of collecting money.

institutions, as the Agencia Tributaria wanted to guarantee the payment with the taxpayer staying on the agency page. Therefore, the generation of the NRC method was agreed. The NRC serves as a validation that the payment has been effected. This was a very important step which allows payment via the Agencia Tributaria web site and completes the process in one session.

The electronic procedure to present declarations needed legal approval. On the other hand, new regulations are approved each year to allow the electronic presentation of the income tax declaration of the previous fiscal year. In these orders, the forms, conditions and procedures and periods of time for the electronic presentation are described. Ley (law) 40/1998 authorised the electronic presentation of the income tax declaration. Annual órdenes (orders, a kind of regulation) approve the forms, periods of time, general conditions and procedures for electronic presentations.

It has been the first service of the agency using the digital signature. The digital signature was necessary to offer the service via Internet. It allows identifying the user in a secure way. The presentation of income tax declaration via Internet started to work in May 1999 (declaration of the fiscal year1998).

During the declaration campaign, the home page provides a direct link to start the tax declaration on-line. A lot of help to make the declaration on-line is also provided in the Agencia Tributaria web site.

The first step is to get the file for the declaration. This is done using the PADRE program, which can be downloaded from the agency web site. This program can be alternatively obtained in other places, such as tobacconists or CDs coming with computing magazines, etc. Of course, it is free. This program supports the declaration, even though it is not presented via Internet. This program can be used without the digital signature and produces a PDF file that can be printed and presented in an office. It uses a point code (similar to bar code, but allowing much more information) which is easily read with a laser.

This program must be installed on a PC, together with complementary programs. These programs are needed so that the PADRE works properly. Until now, the program runs only on Windows operative systems (Windows 95, 98, ME, NT, 2000 and XP). Once the program is installed, the user can introduce his/her information: personal information (name, address, marital status, children, etc) and fiscal information, together with the bank account. This year (2003), the taxpayer has the option of downloading all this information from the Agencia Tributaria web site, so that the user can use the information the agency already has about him/her. The information is automatically integrated in the PADRE program. Once the user downloads the information, cells are filled in and corresponding calculations done automatically. It does not mean the user does not have to include any tax information the Agencia Tributaria does not have, but being relevant for the income tax declaration. Once the program makes automatic calculations and shows results in the relevant cells, it produces a file including all information needed. In this way, the taxpayer is helped to finish the necessary steps.

If the declaration results in having to pay in, the indicated amount of money must be paid before presenting the declaration. This can be done via the Virtual Office of the Agencia Tributaria, using this horizontal service that allows payments. None of the payment services can be accessed without the digital signature.

To complete the declaration fully via Internet, the digital signature is needed. It must be requested in the web page of the CERES (Spanish public certification authority), depending on the Fábrica Nacional de Moneda y Timbre. A code is provided. This code is presented, together with the National Identity Card, in an accreditation office (for example, in the Agencia Tributaria offices). Once the registering is done, a new code is obtained. It is used to download the digital signature from the CERES web site. It is valid for two years, but after that time, it can be renewed via Internet, not needing the physical presence anymore.
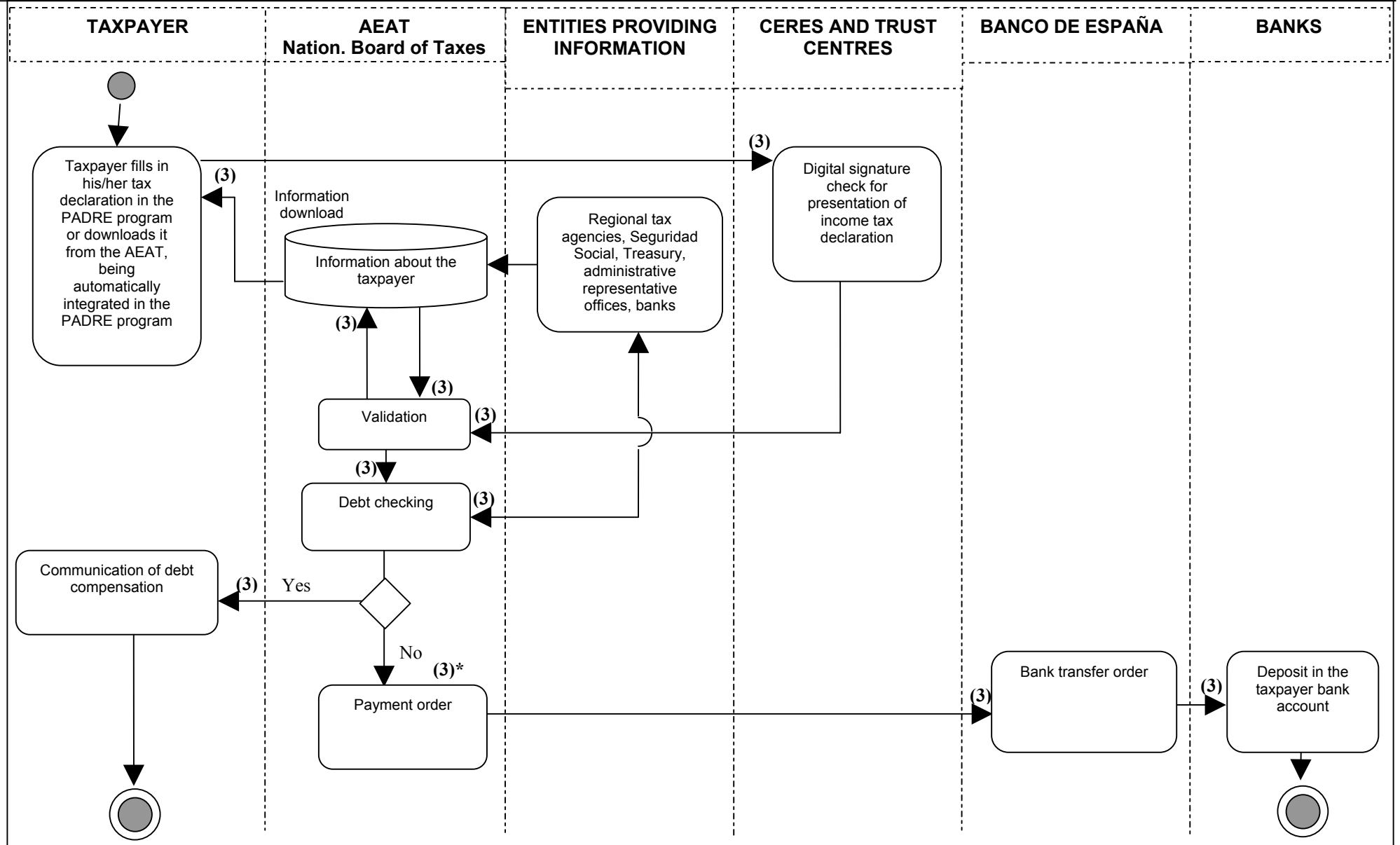
With the digital signature, the taxpayer can get access to the payment service, which allows paying the debt, independently of the user's bank. When the user has paid, a NRC is provided. This number serves as a receipt and is used to validate the declaration when it is presented, proving the payment has been effected. Without this number, the presentation cannot be presented (whenever the result is to pay in). This step is not necessary when the result is refund.

Once these steps have been completed, there are two equivalent methods to present the declaration.
- Via the Virtual Office: PADRE generates a file. This file, together with the NRC, is submitted to the Agencia Tributaria. If the declaration is accepted, the document "payment/refund" is shown in the screen, validated with an electronic code, date and time (it is recommended to print and conserve it). If it is rejected, the reasons are shown on the screen so that they can be solved.
- Directly from PADRE program. It manages the needed operations to present the declaration. The NRC is included. It also shows the document "payment/refund", validated with an electronic code, date and time.

In both cases, the declaration is signed with the digital signature and sent to the AEAT.

5   *Income tax declaration SPAIN: Result of declaration is REFUND*

TAXPAYER	AEAT Nation. Board of Taxes	ENTITIES PROVIDING INFORMATION	CERES AND TRUST CENTRES	BANCO DE ESPAÑA	BANKS

Taxpayer fills in his/her tax declaration in the PADRE program or downloads it from the AEAT, being automatically integrated in the PADRE program

(3)

Information download

Information about the taxpayer

(3)

Digital signature check for presentation of income tax declaration

(3)

Regional tax agencies, Seguridad Social, Treasury, administrative representative offices, banks

(3)

(3)

Validation

(3)

(3)

Debt checking

(3)

Communication of debt compensation

(3) Yes

No

Payment order

(3)*

Bank transfer order

(3)

Deposit in the taxpayer bank account

(3)

6 *Income tax declaration SPAIN: Result of declaration is PAYMENT*

TAXPAYER	AEAT Nation. Board of Taxes	ENTITIES PROVIDING INFORMATION	CERES AND TRUST CENTRES	BANCO DE ESPAÑA	BANKS

Taxpayer fills in his/her tax declaration in the PADRE program or downloads it from the AEAT, being automatically integrated in the PADRE program **(3)**

Information download

Information about the taxpayer **(3)**

Regional tax agencies, Seguridad Social, Treasury, administrative representative offices, banks

(3)

(3)

2nd: digital signature check for presentation of income tax declaration **(3)**

Validation **(3)** **(3)**

NRC validation

7 NRC

1st digital signature check for payment

(3)

Payment service **(3)** **(3)**

NRC

(3) **(3)** Payment from the taxpayers bank account

Once a person has presented the declaration, the Agencia Tributaria offers the possibility of checking its status. The status of payment can also be consulted. Fiscal information of the taxpayer can be consulted or downloaded. In this way, data is automatically integrated in the declaration. Information download is an integral part of the system, which is used for both helping to fill in the declaration and consult personal tax information.

Concerning back office reorganisation and digitalisation, all transmissions and procedures are automated. The process is started by the taxpayer downloading the program and filling in the declaration form. It produces a file showing the amount that must be paid or the refund. As mentioned before, this year (2003) fiscal information can be downloaded. In this way, the form is filled in automatically by the Agencia Tributaria. This is the information the AEAT centralises, coming from many sources, and previously used to validate declarations. Now the agency makes it available to help the user to complete the income tax declaration. It is possible that the taxpayer has to include additional information the agency does not have, but it is still an improved characteristic of the service.

The AEAT cooperates with banks to deal with payment electronically. The AEAT is in charge of validating the user via CERES and trust centres, and offers the user one interface. The AEAT is connected with banks and transmits orders to make payment effective. The banks send the NRC to the AEAT, which provides it to the user. When the user introduces the NRC, the AEAT validates the number and, therefore, payment, with banks. This back office organisation makes it possible to pay electronically through one interface, regardless of the bank where the taxpayer has his account. Therefore, if the result of declaration is paying in, the user can use the payment service provided in the Agencia Tributaria web site or pay by other means. If this is done through the web site of the agency, the service checks the digital signature with the CERES and trust centres. Once it is validated, it directly connects with associated banks through the interface provided by the AEAT in its web site. The same interface is shown for all users. The back office organisation is in charge of submitting the validated request. Then, the transfer is done from the bank account of the taxpayer. Once the payment is done, the bank submits the NRC to the user, also via the AEAT web site, which is shown on the screen. The NRC is also provided if any other way of payment is chosen and the user still wants to send the declaration through Internet.

Once payment is done, the declaration is sent via Internet. The taxpayer submits the declaration, including the NRC and signed with the digital signature. Both things are necessary for the form being accepted by the system. The Agencia Tributaria checks the validity of the NRC with the banks and the digital signature in the same way that payment service does (CERES and trust centres).

If the declaration results in refunding, back office reorganisation changes slightly. This time the user does not need to access to payment service. The AEAT back office is in charge of managing refunding. Before starting the refund process, the system checks the taxpayer's file, where all information is stored. It includes possible debts the user has with the Spanish Administration. If the user has debts, the refund is used to pay them. If not, the system sends the information to the Refunding System (standard system), where the process to refund the money is started. The agency is connected with the Banco de España. The payment order is sent to the Banco de España (Spanish National Bank). The Banco de España, connected with banks, is in charge of making effective the transaction to the taxpayer's bank account.

In any case, the system validates information submitted by the taxpayer cross-checking it with the information the agency already has. Information comes from a lot of public organizations and other institutions. The number of entities presenting information to the AEAT is around 200.000. A lot of them contribute information useful for the income tax declaration. It is not possible to describe all of them here. Some examples are: Seguridad Social, Treasury, Dirección General de Tráfico (Traffic General Head Office, it is to check ticket debts), administrative representative offices, banks, associations (for example, agricultural associations), etc. Depending on the entity, information is sent electronically or not. Electronic means are EDITRAN (information transfer protocol) and Internet, depending on the amount of information. Related to this, there are maximums to send information through Internet. Other entities use computing mediums, like diskettes, cd-roms, etc. With more than 25 registries, it is obligatory to use computing mediums or electronic exchange. On the other hand, there are agreements with País Vasco and Navarra (regions who have competencies on tax management) to exchange fiscal information. Besides, the Agencia Tributaria saves information introduced for other services or previous income tax declaration. Each taxpayer has a file where all information is saved and updated as necessary. Therefore, the agency has personal information, such as address, bank account, etc. and fiscal information, such as income, deductions, and other information relevant to tax issues. This information is used to facilitate income tax declaration and other services if necessary or relevant (for example, maternity deductions) and to validate data introduced by the taxpayer.

The Agencia Tributaria centralises all this information and uses it to help taxpayers to complete the declaration and to validate declarations presented. The amount of information the agency deals with is immense. All efforts towards telematisation and digitisation are contributing to a more effective use of information and fast processing.

All processes are digitised, but because of legal obligations, an administrative act is mandatory for payment. This is an act where a responsible person must authorise the payment, then the action takes place. It is even published in the BOE (Boletín Oficial del Estado, Official Bulletin of the State). This process could be automatic, but the law demands this procedure. The Agencia Tributaria is trying to change this, so they do not need it and can change and automate this step. Despite of this, the transmission, reviews and other answers are automatically managed by the system. The system generates statistics about the processes and procedures to get feedback about declaration campaigns.

Therefore, back office reorganisation can be divided in four main groups:

- The AEAT: it is the organization with which the taxpayer interacts. It is the central point of back office organisation in relation to tax income declaration. It centralises information coming from other entities, using it as necessary. Various subsystems are in charge of validating information, validating digital signature and to manage payments and refunds.
- Entities providing fiscal information to the AEAT. More and more entities are electronically connected and provide relevant information to be integrated in the system. This information is shared by all services and used as necessary.
- CERES and trust centres to check digital signatures. This is an important part of the service, which guarantees to identify the taxpayer and interact with the AEAT web site in a secure way.
- Banco de España and other banks to deal with payment and refund. This is a horizontal service shared by all services including payments and refunds. Organisation for payment and refund varies. The Banco de España is involved in refunds, receiving the order from the AEAT and making transfer to the taxpayer's bank account effective.

A representative can present the income tax declaration of a third person. It can be done by entities, which have an agreement with the Agencia Tributaria and professionals registered or associated to collective agreements. The digital signature is necessary to act on behalf of this third person. The process is the same but the income tax declaration is presented by the representative. The digital signature of the representative must be authorised by the Agencia Tributaria. Using this method, municipalities and Comunidades Autónomas (regions) can install public Internet access points so that citizens can go there to submit their income tax declaration. The Agencia Tributaria receives a number of declarations using this way, but precise statistics were not available.

The taxpayer is supported by the Agencia Tributaria to complete the process. Help and technical support are available on the web site and by telephone. On the web, there are different documents explaining the procedures. Technical and legal support and information is also provided. Saving banks have services to make the declaration on behalf of their clients, so they were interested in some kind of support program. They agreed with the Agencia Tributaria to develop an interactive program to teach how to carry out the income tax declaration. This interactive program is now available on the AEAT web site. All this support helps the user to get a more compact service that improves the user satisfaction.

The personnel received courses to learn new functionalities, but no special training was needed, as they already worked with a digitised system and have the needed computing skills. The difference was the new layer working on the Internet, payment and digital signatures, which mainly concern development and maintenance.

The income tax declaration has been the first service offered by the Spanish Administration using digital signature. The service can be completed in one session thanks to the inclusion of a flexible payment service. The users can deal with transfers, no matter where they have the bank account. All in all, the Agencia Tributaria has managed to offer a compact and flexible service to all citizens obligated to submit the income tax declaration each year. At the same time, the Agencia Tributaria has achieved a more effective and complete management of information, which allows to process declarations faster and, in the end, to offer a better service to the taxpayer.

6. Results

The income tax declaration is an integral part of services offered to the citizen via Internet. The possibility of presenting it via Internet has offered some advantages to the taxpayer. The benefits for the taxpayer are the possibility of completing the income tax declaration without having to go to the office. All procedures can be completed remotely saving costs and time needed to go to an office. One important point is the availability of the service, which now can be accessed 24 hours per day, 7 days per week. It provides more flexibility to the taxpayers to carry out their obligations.

Concerning the difficulty of dealing with the declaration and satisfaction degree, the agency provides a questionnaire that can be answered via Internet. Until now (August 2003), 2842 taxpayers have responded to the questionnaire. It is important to know that this sample is made up of people who voluntarily decided to answer the questionnaire online, but it is important to show the results, as they are interesting for our purpose. The results can be consulted in the following tables:

DIFFICULTY DEGREE				
	Low	Medium	High	DK/DA*
Getting PADRE program	83,71 %	9,71 %	2,74 %	3,84 %
Making the declaration	47,85 %	40,92 %	8,37 %	2,85 %
Getting ready the declaration	59,15 %	28,29 %	6,69 %	5,88 %
Digital signature application	38,92 %	39,20 %	18,33 %	3,55 %
Digital signature installation	51,13 %	31,74 %	13,12 %	4,01 %
Tax payment	10,38 %	5,42 %	5,14 %	79,06 %
Declaration sending	66,26 %	15,97 %	6,79 %	10,98 %
AEAT approval reception	65,83 %	11,54 %	7,74 %	14,88 %

*Don't know / Don't answer

In the table above, it can be observed that the difficulty level of the steps required to complete de declaration via Internet is more than acceptable. Most of the respondents consider the difficulty of the different steps low or medium and very few find it highly difficult to operate with the system. The great exception is payment, where almost 80% answered Don't know/Don't answer. It is possible that these users do not trust the payment via Internet and prefer to go to the bank to make the transaction, but there is not precise information about this issue.

81,38% of the respondents are satisfied or very satisfied. Therefore, the level of satisfaction achieved with the service can be considered as very good. Results are shown in the following table.

SATISFACTION	
Very satisfied	48,87 %
Satisfied	32,51 %
Not very satisfied	7,74 %
Not satisfied at all	7,18 %
DK/DA	3,69 %

How successful the service has been can be seen in the evolution of the service usage by taxpayers. The following table shows the progress of the last 4 years.

Year	Taxpayers presenting the declaration via Internet
2000 (declaration of 1999 fiscal year)	115.224
2001 (declaration of 2000 fiscal year)	496.381
2002 (declaration of 2001 fiscal year)	1.150.000
2003 (declaration of 2002 fiscal year)	1.717.049

The number of user has increased each year. The progression is exponential. The number of declarations presented in 2003 (2002 fiscal year) has been 14.065.430. Therefore, the declarations presented via Internet are 12,20% of the total amount. This is an important data in a country with a low Internet penetration rate.

It is necessary to compare the number of declarations reached this year with the number of digital signatures, which are around 300.000 in Spain. This means that a lot of declarations are presented on behalf of third persons. These declarations are presented by administrative representative's offices on behalf of their clients or using PIAPs (Public Internet Access Points) installed by municipalities and Comunidades Autónomas (regions).

It is also important to pay attention to the PADRE program. This software is used to present the declaration via Internet, but, even though it is not presented electronically, it serves as support program to fill in the forms and make the proper calculations. Further, it produces a PDF file that can be printed. The printed document includes a point code that simplifies the procedure. The point code is similar to the bar code, but uses points and provides information that is more complex. Using a laser reader, information is automatically introduced in the system. This method helps to speed up the procedures when a paper declaration is presented.

The agency has improved the procedures for completing declarations. It has the information submitted by the taxpayer in real time, even before this information is transmitted by another agency or institution. The quality of information has also been improved, which is validated during the process, helping to present declarations with no errors or gaps. The

digitalisation has allowed shortening the time to make refunds effective. Refunding to the taxpayer, when necessary, has been shortened from approximately 90 days to around 25 days (around 70% less).

The agency commented an interesting fact. The elimination of a big amount of paper to present the declarations has helped to save time and space, just as problems coming from the custody needed during the campaigns. The more income tax declarations are presented via Internet, the more effect has this fact.

In the end, the Agencia Tributaria has delivered a new service for the citizens, which allow them to deal with this annual obligation in a very flexible way and getting some important advantages. The implementation and back office organisation, based on previous ones, has allowed the agency to provide this e-service to the citizens and improve the management of the declarations.

7. Learning points and conclusions

This is the most successful e-service offered by the Spanish Government to the citizens. More than 1,7 millions of declarations have been presented through the Internet in 2003. Some changes in the previous system were needed to provide a useful and complete service. It allows carrying out all procedures and delivering the income tax declaration fully through the Internet. Using new Information and Communication Technologies, a complete and flexible service is available for millions of taxpayer who must present the income tax declaration each year.

Back office organisation has allowed to change the way in which the service is offered to the citizen. The system deals with all parts involved in the whole process. It automatically processes all steps necessary to complete procedures inside the Agencia Tributaria. The digitalisation of internal processes and electronic exchange of information allows a faster and more effective use of information and, therefore, management of declarations. It speeds up the workflow, reducing, for example, the average time for refunds from 90 days to 25. Other processes that take advantage of digitalisation and telematisation are validation and debt checking, which are automatically managed by the system.

The agency has made good use of previous implementations. The new layer on the Internet has allowed the users to interact directly with the AEAT computing system and therefore, to complete the declaration processes electronically, avoiding human intervention of the agency personnel. On the other hand, previous implementations carried out for companies have been used to develop income tax declaration via Internet. The system is quite similar to those previously implemented; taking advantage of those implementations that already solve needed tasks. Electronic payment, developed as a horizontal service, allows an easy integration with other services that need to use it. Taking advantage of these previous implementations, it is not necessary to redevelop it from the scratch, reducing time and costs involved.

Concerning electronic payment, to allow a flexible service, a new system was developed so that it was not restricted to classical credit cards system, usually on the Internet. The Agencia Tributaria wanted to provide more flexibility (in a secure way) to the taxpayers choosing the Internet to deliver their income tax declaration. To overcome this issue, the generation of the NRC number was designed together with banks. It 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 done. The AEAT checks this code when the declaration is presented. It solves the whole payment process. This back office organisation allows more flexible services which share the same mechanism and can be fully provided via Internet. This system can be easily implemented by other services needing electronic payment which does not involve only the credit card system used on the Internet.

From the user's point of view, the NRC allows payment through the AEAT web site not having to disconnect. This system allows completing the service in one session, which was one of the objectives of the agency before implementing the service. The user does not need to have online service with his/her bank, use a credit card or go to the bank office. The back office organisation deals with it. The digital signature is enough to complete this step. Having it, this horizontal service offers electronic payment from an only interface. The user introduces the information and the back office transmits the information and carries out the transfer of the needed amount from the bank account specified. The NRC generated will validate the operation. This system has been developed together with the banks and still works very well.

The income tax declaration has been the first service (provided online) of the agency that has used the digital signature. There was no official and common digital signature in Spain by the time the project started to run. The digital signature responds to the need of a secure way to identify the taxpayer and to authenticate data and documents sent via Internet, such as declarations. It is essential for any service which demands electronic transmission of sensible data. Its use has been quickly extended to other services of the AEAT and the Spanish Administration.

The possibility of a representative presenting the declaration on behalf of the taxpayer has allowed achieving an impressive number of declarations presented via Internet. With 300.000 digital signatures, more than 1,7 millions of declarations have been delivered. This possibility has allowed a lot of people not having the digital signature to present the income tax declaration using this new way. It seems that digital signature is still an obstacle for lot of people using e-services. Without this system, the number of declarations online had not been so high. Using this method it is possible to reach a larger number of citizens.

On the other hand, to allow secure exchange of information, the AEAT web site uses SSL 128 bits encoding when the user accesses the Virtual Office. It guarantees confidentiality and security exchanging information for both, the user and the agency. This has been one of the main objectives when Internet services were designed.

The AEAT collects all possible information to help taxpayers and, at the same time, to validate the information introduced by them. The Agencia Tributaria obtains information from a large number of entities, from public organizations to different kinds of associations. The Agencia Tributaria accumulates all fiscal information in the system. Therefore, the agency aims at making it easier for the organizations concerned to provide that information. Even if it is not possible to get all information electronically, the effort to get it this way has been important and the option is open for everybody. The agency provides as much flexibility as the systems of today allow. For electronic transmission, the entities can use EDITRAN (information transfer protocol) or Internet. The Net has still some limitations depending on the size of the files. When it is over a certain number of registries, the AEAT demands to use EDITRAN. The Agencia Tributaria dynamically changes these limitations as Internet and servers of the AEAT allow broadband connections. Internet does not need an important infrastructure so it is ideal for small organisations. The agency is trying to increase the amount of information (registries) that can be sent via Internet to facilitate electronic collection of information. The amount of information the AEAT manages is immense. Therefore, the more information is obtained through electronic ways, the more efficient its management is.

The information download for taxpayers is possible thanks to digitalisation and centralisation of information. This recent possibility has been a step forward for this service. It has been implemented this year. It does not mean that taxpayers do not have to include additional information if it was necessary but it is useful anyway and a lot of users can take advantage of it. For example, for those who only have a salary, the information downloaded and integrated is enough. This automation simplifies the declaration for the taxpayer. Besides, it avoids the need of papers provided by companies with the last fiscal year information (salary, quote, etc.). At the same time, it is used as an informative service, where the taxpayer can consult months worked, how much he/she has quoted and other kind of fiscal information related to him/her. This is a very good example of how back office organisation, as well as improving internal processes, can improve a service offered to the citizen.

We think it is important to mention that the PADRE program itself has been a successful tool for taxpayers, independent of Internet delivering. It helps users to deal with declarations. The income tax declaration can be a complex process for non-experts. The program supports the declaration, making it an easier process, helping to complete it and avoiding a lot of mistakes. At the same time, the Agencia Tributaria saves a lot of time and resources to correct them, getting a better quality of information. Thanks to the point code and laser readers, it is very fast to get the information from the paper. Nowadays, most of the taxpayers use some kind of support program, mainly PADRE, to deal with the income tax declaration.

The availability of the service has been extended to the maximum. This improves the classical limited timetable of the offices, where the taxpayers must go to present the declaration. Now, with no time restrictions, the users have the flexibility to complete the procedures and present the declaration at any time. The users have plenty of help and information that support them to finish the process satisfactorily. It is very important that the user is supported by the AEAT, as new technologies and associated procedures can give new problems the taxpayers are not familiar with.

Regarding development, the Agencia Tributaria has made a great effort to co-ordinate all measures necessary to offer the service via Internet. Cooperation with other agencies, institutions, etc. is a must for this kind of services and the Agencia Tributaria has stressed it. All organizations that were affected by changes were involved in the project. Their participation has been essential to bring income tax declaration (and other services) to the Internet.

All in all, the agency, taking advantage of new technologies, offers a new method, which improves the service for the citizen, who obtains important advantages through the new system. On the other hand, the Agencia Tributaria itself improves information and declarations management, becoming a more efficient organization carrying out its functions. Nowadays, the Agencia Tributaria is the vanguard of e-Government in Spain.

8. References and links

Agencia Estatal de Administración Tributaria (AEAT): http://www.aeat.es/
Autoridad Pública de Certificación Española (CERES): http://www.cert.fnmt.es/

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Abbreviations
AEAT: Agencia Estatal de Admisnitración Tributaria o Agencia Tributaria (Tax Agency)
CERES: Autoridad Pública de Certificación Española (Spanish Public Authority of Certification).
EDITRAN: Information transfer protocol based on EDI system. EDITRAN converts data from various sources to EDIFACT and sends it to the recipient using secure MIME over the Internet or VAN.
FNMT: Fábrica Nacional de Moneda y Timbre (National Currency and Stamp Factory)
PADRE: Programa de Ayuda a la Declaración de la Renta (Assistance Program (software) for Income Tax Declaration).

Spain

Case 27
Citizen family allowances:
Tax deduction for maternity

1. Executive Summary

The Agencia Tributaria offers deduction for maternity to mothers who work (registered in the Seguridad Social or a benefit society) and have children up to 3 years old, whenever children live with them. Adopted children can get this benefit in the three flowing years after the adoption. The amount that can be deduced is up to 1200 euros/child/year, this is, 100 euros/motnth.

This services was not previously provided by the Agencia Tributaria. Deduction for maternity is a new allowance offered at national level and the Internet implementation was done together with the legal development. Children allowances has taken advantage of the previous infrastructure and implementations of the Agencia Tributaria.

It corresponds to model D, as in the same web, the taxpayer can find some other services that the agency offers. The Agencia Tributaria uses nformation coming from these other services to provide or check this service, this is, information of different services is shared and reused by others. Information coming from other agencies and institutions is also integrated in this service. The complexity score is 4. It provides payment and uses digital signature to identify the users.

The main back offices involved in this service are the Agencia Tributaria, CERES, Instituto Nacional de Estadística (INE, National Institute of Statistic), Seguridad Social, friendly societies and banks to allow the allowance payment.

The case was chosen because it is one of the most advanced of those found in Spain. It has managed to offer a new service directly via Internet as soon as the allowance was available. The back office organisation, including back office of other public agencies, has allowed to offer a very flexible and efficient service to the targeted population.

It is well known the sending of letters including the needed information to apply for the allowance to those women who can take advantage of it, so it suggested automatic use of information that the AEAT already has. This a new service which has been implemented shortly after this kind of child allowances were legally approved, even when the regulation was being developed. It achieves the best possible level of transaction for this kind of service, allowing payment and being integrated with other services of the AEAT.

2. Background

The background of this allowance is related to two lines. One is reduction of direct tax followed by the Spanish government. On the other hand it is included in the Plan Integral de Apoyo a la Familia 2001-2004 (Family Support Plan 2001-2004) which target different issues. The aim is to help mothers to make compatible children and work. Therefore, this measure aims to help them to integrate in the labour market.

Children allowance has been a special deduction of the income tax declaration. It is the first time a deduction is paid before the income tax declaration is done. It has been a novel service from the legal and development points of view.

The main problem the Agencia Tributaria found during the development of this service was that developers must work together with legal responsibles as the regulations were developed. Besides, the time between political decision was made and the date to have the service available was short. All this has made co-ordination, integration and implementation of the normative a hard work.

On the other hand, information necessary to provide children allowances was scattered among other public institutions, such as INE, Seguridad Social and friendly societies. Here is where back office reorganisation has been worked on, centralising all information available to offer this service via Internet, requiring from the beneficiaries the less possible

effort and steps. Therefore, the Agencia Tributaria obtain information which allow it to know what taxpayers can apply for the deduction.

This service started to run in January 2003, and was possible to apply for the benefit via Internet since the children allowances were legally approved.

3. Specific objectives

The final aim of deduction for maternity is to stimulate the inclusion of women to the labour market and to compensate the social and labour costs caused by maternity.

The implementation of this service aimed to offer the taxpayer the possibility to apply for the benefit in the most flexible way, providing several methods to complete the procedure. The final aim was to reach all possible applicants. The operational objectives were as follows:
- To obtain all needed information from the potential taxpayer in order to previously know who can take advantage of the benefit and validate information provided by applicants. This involves what information must be obtained from other agencies and organisms and information the agency already has, mainly from tax income declaration, and periods of time to get and cross them.
- Implementation of different methods to apply for the allowance. It includes: paper, telephone and Internet. Concerning Internet, the service was planned to be accessible with and without digital signature to facilitate procedures to the users.
- Mailing campaigns targeting those taxpayers who, after crossing the available information, fulfil the requirements to obtain the deduction.
- Installation of payment by the Agencia Tributaria to pay those applicants that fulfil the requirements.
- It is important to note that the implementations has taken into account the legal rights of appeals, as the regulations provide for, in case of rejection or exclusion.

4. Resources

Children allowances service has taken advantage of the technology already implemented for previous services by the Agencia Tributaria. The security infrastructure is based on Internet standards: SSL, digital certificates 509V.3 and digital signature with format PKCS-7. The technical environment has been based on the operative system Z/OS, transaction monitor CICS and data base manager DB2. Programming has been developed using Cobol and Natural, and HTML and Javascript for client applications in Internet. An SMIME secure e-mail infrastructure has been implemented.

At the same time, the Agencia Tributaria has taken advantage of implementations already done which allow to transmit and receive information from other agencies, for example, the Seguridad Social. It includes horizontal services, like bank transactions. Other institutions have had to be involved in order to provide this service. In this last group we include the friendly societies. A lot of meetings were held in order to co-ordinate the development and its contribution to the implementation, just as the information they must send in order to make available the deduction for maternity.

The Sub. Gral. de Información y Asistencia Tributaria (Tax Information and Assitance Department) and the Gabinete de Prensa (Press Cabinet) have been in charge of publicity for this service. They have targeted the most important media: newspapers, radio and TV. On the other hand, leaflets are included in the posts sent by the agency to potential beneficiaries to inform taxpayers about the deduction requirements and possibilities.

5. Implementation

Orden HAC/16/2003 (legal order) approved the model 140 to apply for the maternity deduction and communicate changes which affect the advanced payment of this deduction. It was published in the BOE 13/01/2003 (Boletín Oficial del Estado, State Official Bulletin)

In the following paragraphs, the implementation phases are described. Please, note that the two last ones have not been developed yet. They are the planned phases that must be finished before the next income tax declaration campaign (year 2004 for fiscal year 2003), as it will affected by this benefit.

Phase 1: previous letter sending campaign.

In the first phase, information about birth from year 2000 (coming from the Instituto Nacional de Estadística), information from friendly societies and income tax declaration of year 2001 were crossed to send the potential beneficiaries letters. Two kind of letters were sent:

- Personalised letters: including all information necessary for the applications. The users only had to confirm it. The number of this kind of letters sent was around 200.000
- Informative letter: including information about the deduction. Around 300.000 were sent.

The development of this phase was between November and December of 2002. The sending was in January of 2003.

Phase 2: data entry

It was developed at the same time the phase 1 was: November and December of 2002, with final implementation in January of 2003.

Some different methods were offered to potential users, so they introduce the needed information to get the benefit or confirm the information sent by the Agencia Tributaria. The methods can be seen in the following table:

	Needing
Letter confirmation	Reference number
Letter confirmation with changes	Reference number
Application	Digital signature

The reference number is provided in the letters by the Agencia Tributaria. This number, only known by the receiver of the letter, is used to confirm the information and, therefore, to obtain the benefit. However, if any data is wrong, for example, because the address has changed, it is possible to modify it and then, confirm the application using the reference number (see phase 4 below). Even when it involves non online steps (letter sending) the steps commented in this paragraph are done via Internet. The application is a different way, in which the user starts the process using the digital signature. Then, the beneficiary fulfil all requested information using the model 140.

Phase 3: Receipt of external information. Crossing and payment

This phase included:
- Monthly reception of information about birth and deceases (from the Instituto Nacional de Estadística)
- Monthly reception of information about quotations and days quoted (from the Seguridad Social and friendly societies).
- Application crossing with previous information to resolve the payment appropriateness.
- Payment process.

The development of this phase was done between December of 2002 and January of 2003. The implementation was introduced in February of 2003. The first payment was done on 15th February of 2003.

Phase 4: Updating of changes to the applications

Each taxpayer has an only file in the system, to which changes communicated by the user are added: bank account, address, etc. The development of this phase was done between January and February of 2003, being installed in March of 2003.
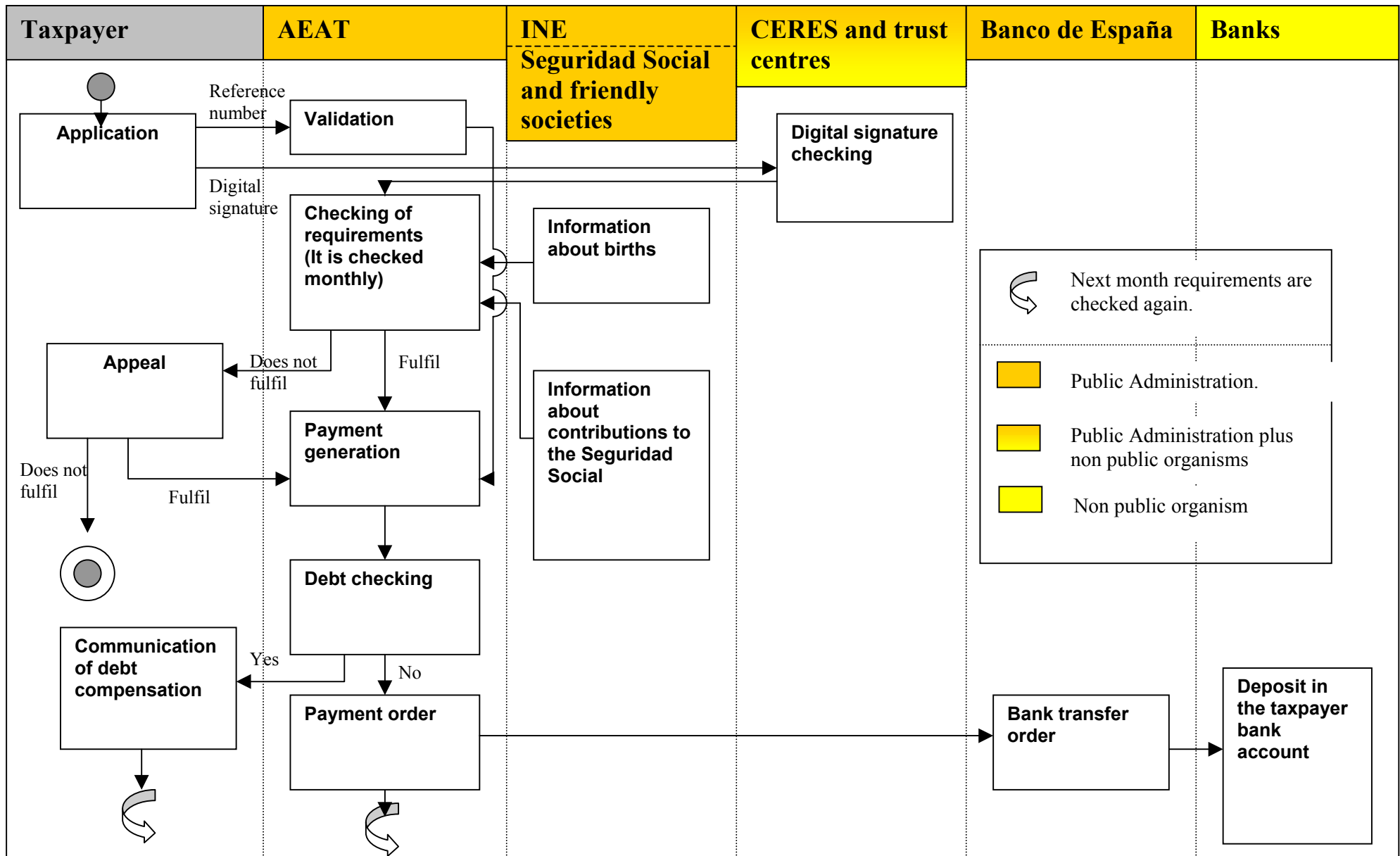
Phase 5: Appeal against exclusions of the system

This is a necessary step, as the user has the right to appeal in case its application is rejected. The development of this phase was done in March of 2003, being effective in April of 2003.

Phase 6: High Court hearing

This phase is closely related to phase 5. The difference is that in the previous one, appeals can be presented in case of rejection. This phase tackles with exclusions of the system after the user has taken advantage of the allowance. Again, the taxpayer has the right to appeal and this must be considered by the system. The development has taken place between May and June of 2003 and it is being implemented in September of 2003.

The following phases concerns to future developments of the system.

Taxpayer	AEAT	INE	CERES and trust centres	Banco de España	Banks
		Seguridad Social and friendly societies			

Application

Reference number → **Validation**

Digital signature → **Digital signature checking**

Checking of requirements (It is checked monthly)

Information about births

Appeal

Does not fulfil / Fulfil

Does not fulfil / Fulfil

Payment generation

Information about contributions to the Seguridad Social

Debt checking

Communication of debt compensation

Yes / No

Payment order → **Bank transfer order** → **Deposit in the taxpayer bank account**

Next month requirements are checked again.

Public Administration.

Public Administration plus non public organisms

Non public organism

Phase 7: Annual closing of the advanced payment

Children allowance is a deduction from the income tax declaration. Therefore, advanced payments of year 2003 must be interrupted before the beginning of the tax income 2004 campaign (2003 fiscal year), to be able to perform the corresponding settlement. The development of this phase is planned between October and November of 2003, being applied in February of 2004.

Phase 8: Regularisation of income tax declaration (fiscal year 2003).

The taxpayer, having the right to get the deduction for maternity, can choose between advanced payment or deduction from the tax income declaration. In case of having obtained an amount over or under the money the taxpayer has right to, the situation must be regularised during the income tax declaration. Therefore, the corresponding crossing of information must be done in order to regularise the situation of all affected files. The development of this phase is planned between January and March of 2004, being applied in March of 2004.

In the previous paragraphs it can be understood that the implementation process has been very dynamic. The agency has managed to adapt to fast legal changes that affected the service in a short time, even when the service was already working. A lot of meetings have been held to co-ordinate with other institutions, specially with friendly societies.

It is still an ongoing process which needs some additional implementations before the next tax income declaration campaign.

As it has been noted before, this is a new service, so there is no changes in comparison with a non existing previous stage. The implementation has taken advantage of previous technology and implementations the Agencia Tributaria did within its Modernisation Plan. The service has been included in the web site of the agency, from which the potential users can access to the various methods and additional services offered.

The process can be completed in different ways, involving back office organisation in a slightly different way. Without digital signature, the Agencia Tributaria gets periodically (and therefore knows) all information about women who can get the benefit. The agency crosses the information and then generate proposals for the request. These proposals are sent by post to targeted women so they can confirm via Internet the request. They need the NIF (Número de Identificación Fiscal, Fiscal Identification Number) and the reference number included in the letter to submit the confirmation. To complete the application the taxpayer only these two numbers. Therefore, in this case, the procedure is started by the Agencia Tributaria, taking advantage of the back office organisation which allows the agency to know who can obtain the deduction or not. It is possible for the user to change the information, such as the bank account, address, etc., during this process. This information is updated for other services.

Using the digital signature, the taxpayer accesses to the 140 form and fulfils the cells with requested information, including a bank account to perform the monthly transference. Then submits the on-line form. The AEAT validates information submitted, crossing it with the information it already has thanks to automatic information transfer with other agencies.

The application status can be consulted through Internet at any time, just as payments already done, so the user has the possibility of being aware and enjoys a more transparent procedure and service.

In any case, the Agencia Tributaria checks and validates again the information each month. It allows to update each file, knowing if the user can still get the benefit or not and to include new beneficiaries in the system if they fulfil the requirements.

Concerning back office organisation, the Agencia Tributaria centralises information coming from other services and other agencies, using it to automatically process this service. Concerning public agencies the Agencia Tributaria is telematically connected with:
- CERES. It is the public organism in charge of certificates, dependant on the Fábrica Nacional de Moneda y Timbre. Digital signatures (Certificado CA-2) is checked with the CERES and trust centers.
- Instituto Nacional de Estadística. It is the main public body in charge of the big statistic studies, social indicators, census, etc. It provides the Agencia Tributaria with information about births and deaths (which come from the Register Office, dependant on the Ministry of Justice).
- Seguridad Social and friendly societies. They provides 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 paying deductions, and other banks (private), in which the users have the bank account.

All information provided by these organisms is crossed. It is used to start the procedures by the AEAT, so the user only has to confirm the application (when a letter is sent) or it is only necessary to validate information provided by the applicant. 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 into account by the system, which waits for the resolution. If it is definitively rejected it is excluded and the payment or deduction is not done till requirements are fulfilled again. If the resolution favours the taxpayer, the system proceeds with the next step.

Before any payment is effective, the system checks for debts of the taxpayers. If any debt is found, the amount is used to satisfy the debt and it is communicated to the user. If there is not debt the system performs the payment. The order is given to the Banco de España. This entity makes payment effective in the taxpayer bank account.

All transmission and procedures are automated. However, it is important to note that because of legal obligations an administrative act is mandatory to make payment effective. This is an act where a responsible must authorise the payment, then the action takes place. Once the payment is authorised the first time, it works automatically, not needing further authorisations. This process could be completely automatic, but the law obligates to this procedure. The Agencia Tributaria is trying to change this at legal level, so they do not need to do it anymore and can change and automate this step.

Another important thing to take into account is the Agencia Tributaria lasts some time to validate information related to births. This information is sent by the INE each 4 months. When the digital signature is used (so they do not have the information before), they trust in the information introduced till it can be checked.

In the end, the taxpayer can always consult via Internet the status of the application, payments done and check (and change if necessary) the information relevant for the service.

To introduce this new service no special training of the personnel was needed, as the agency staff has the required skills in computing. 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.

This case is innovative because, starting from back office organisation and previous infrastructure and proceedings , the Agencia Tributaria has managed to advance payment of deductions (something usually done during the income tax declaration period of time). This is something completely new in Spain. What is more important, the agency, having the needed information about taxpayers, has gone in advance of the applications, offering the user an easy one step procedure to get the benefit.

6. Results

Previously to explain the result, it is important to note that the Agencia Tributaria has not performed an evaluation yet. This service has been working for 8 months and the agency is still working on some functionalities that need to be finished before the next income tax declaration campaign. Here, known statistics and facts are shown to give an idea of the first months of use.

The Agencia Tributaria has managed to integrate all information dispersed among different institutions to be able to deliver the service on time. Now, all that information is automatically collected and processed each month, offering the service via Internet since January of 2003, date in which the allowance itself come into force. The Internet procedure results in a reduction of steps for the public administration, skipping human intervention, but when invalid data is introduced or errors occur. Mistakes are also reduced because of the automatic process.

The total number of applications (from the beginning to 8th of August of 2003) is 655.098. The distribution depending on the method is as follows:

Manual	451.116
Manual-Letter	62.781
Telephone	93.326
Telephone-Letter	1.385
Telephone-Letter, including modifications	6.392
Internet	26.743
Internet-Letter	7.672
Internet-Letter, including modifications	5.683
TOTAL	655.098

Summarising, the number of applications presented via Internet is 40.098. This is a 6,12 % of all applications presented. It is not spectacular, but it is important to take into account that this service has been running for only 8 months.

The number of letters that have resulted in an application is 83.913, a percentage of 12,81% over the total number of applications. This number is important because is part of the effort of the agency to bind together all previously dispersed information.

Comparing the two methods, using digital signature and the reference number provided with the letter, we find the following results:
- Digital signature: 26.743. (66,69%)
- Reference number: 13.355 (33,31%)

It means that a third part of the applications presented via Internet used the reference number, not needing the digital signature to complete the process. Therefore, the impact of not having to use the digital signature for Internet users can be considered important. It provides more flexibility to the service offered via Internet.

In August of 2003, the number of payments has stabilised around 450.000 per month.

On the other hand, the Agencia Tributaria thinks that some black economy has emerged. This deduction comes from the statistics. The agency has detected a slight increase in the percentage of enrolments in the Seguridad Social since the new measure has come into force. Then, mothers who can apply for the allowance would have enrolled in the Seguridad Social to obtain the 100 euros/month.

In the end, applicants can take advantage of applying via Internet in a secure way, avoiding movement and, therefore, saving time and costs stemmed from the transport.

7. Learning points and conclusions

What is really important is the degree of digitalisation achieved in the automatic intercommunication with other agencies of the Spanish Administration and other institutions to run the process and confirm information automatically. The automatic transaction of information has allowed a more flexible service in which the Agencia Tributaria only needs the confirmation by taxpayers, as it already has data necessary to start the process.

The Agencia Tributaria uses information it already has, mainly coming from previous income tax declarations, a closely related service. The deduction is done on tax income declaration, with the possibility of obtaining deduction previously by payment. The agency has a lot of services and data reuse can be in advantage of taxpayers, facilitating the procedures they must do. Besides, the service is supported by horizontal services the Agencia Tributaria has developed, such as bank payment. This horizontal services help to develop new layers and new application that can take advantage of them, making easier and faster these new developments. It is possible that without them, and taking into account the short time this project has had, they could not achieve the objectives on time. Fortunately, previous applications supported the development. The Agencia Tributaria has been able to make this service available in a short time after it was legally approved. Using previous technology, infrastructure and knowledge, this is, experience, has been one of the factors that has contributed to the success. However, without doubt, close co-ordination and work with legal staff to being able to implement the service as regulations were developed has been the main factor to make the service available on time. Also other institutions, like friendly societies, were involved in the process so the agency had available the information they process.

The digital signature could be one difficulty to extend the use of the Internet service, because of the low acceptance. It could make a lot of potential users not being able to take advantage of the service via Internet. The Agencia Tributaria has implemented various methods to apply for the allowance, so the digital signature is not obligatory to get the benefit. This flexibility allows users with different skill levels to deal with the allowance via Internet. The fact that a third part of the applications via Internet were done using the reference number and not the digital signature confirms it. At the same time, this method, even lacking the level of automation the other has and not using the digital signature, is completely secure. This is an option that should be considered for future services. Of course, it will depend on the kind of service, its complexity, information available, level or automation, etc., but it can offer to the users a new way of interacting with online services.

Reference number is directly related to the mailing the Agencia Tributaria did to inform about the possibility of getting the benefit. Taxpayers that fulfil the requirements were informed in advance that they could apply, providing them with the information so it could be checked and changed if necessary. With this method, steps needed to complete the application were simplify. It is only necessary to introduce the reference number to confirm the application, which is automatically accepted as the Agencia Tributaria has already validated the information. This allows to reduce the time to process the application and to shorten time to make payment effective.

Complementary services are offered to the user in the same web page. The taxpayers can consult the status of the application, payment, change information and get help about deduction for maternity regulation, procedures and technical issues. The taxpayer can be aware of his situation within the system and consult the payment record. This makes a more compact and complete service which does not finish with the application, improving the satisfaction of the user.

All in all, the Agencia Tributaria has manage to develop the service in a short time, co-ordinately with regulation development, gathering information dispersed among various institutions, collecting and processing it automatically, and offering a flexible and compact service to potential taxpayers.

8. References and links

Agencia Estatal de Administración Tributaria (AEAT): http://www.aeat.es/
Autoridad Pública de Certificación Española (CERES): http://www.cert.fnmt.es/
Instituto Nacional de Estadística (INE): http://www.ine.es
Seguridad Social (Social Security): http://www.seg-social.es

Abbreviations and references

AEAT: Agencia Estatal de Admisnitración Tributaria o Agencia Tributaria (Tax Agency)
CERES: Autoridad Pública de Certificación Española (Spanish Public Authority of Certification).
FNMT: Fábrica Nacional de Moneda y Timbre (Currency and Stamp National Factory)
INE: Instituto Nacional de Estadística (National Institute of Statistic)
NIF: Número de Identificación Fiscal (Fiscal Identification Number)

Spain

Case 28
Business portal:
AEAT portal for companies

1. Executive Summary

The Agencia Estatal de Administración Tributaria or Agencia Tributaria (Spanish Tax Agency) offers through its web page a complete set of services for companies. They cover the obligations that companies have with the agency.

In the virtual office there are two main links for companies. One for big companies. They have the obligation to present their declarations via Internet. These companies have an specific page which groups services offered to them. The second access to a page in which all services are listed. They include:

- Deductions and income from work
- Deductions and income of funds and property investment.
- VAT declarations.
- Tax on societies.
- Customs (declarations and taxes).
- Special taxes (alcohol, tobacco, hydrocarbon, etc.).
- Income tax for societies.
- Income tax on economic activities.
- Informative declaration of donations
- Maintenance funds

Other services are available for companies. Informative services allow companies to consult their information, presentation and debts status, etc. and change it, if necessary. Help and legal information are also available in the web. The web site centralises all services related to the national finances and, in this case, those related to companies.

The Agencia Tributaria tries to simplify up to the maximum its services. It makes systematically re-use of information trying to avoid redundant data entry. Each company has a file which centralises information about it. This information can be used to help companies to complete information or to validate it. The number of back offices involved is really large. Public organisms, finance entities, back offices from other countries. The amount of information the Agencia Tributaria manage is really impressive.

The portal offers to the companies an only web site where they can deal with procedures in a telematic way. It allows both the Agencia Tributaria and companies to speed up procedures and information processing, saving time and costs associated.

The portal corresponds to model D. Services offered share information and it is reused if relevant. The complexity score is 4. It allows payment and uses digital signature to identify the users. The case has been chosen because was chosen because it is one of the most advanced of those found in Spain. The group of services are very varied and complete, covering all those offered to the companies by the AEAT.

2. Background

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. To make services available on Internet, legal modifications and advances have taken place. Even when the level achieved is excellent, some more changes are needed to improve the processes in the future.

The number of companies in Spain in 2002 were 2.710.400. This is a very important number of potential users that can take advantage of Internet services. Besides, these services cover a very important part of the economic activity of the country. Digitalisation and telematisation have been an essential step forward to a more efficient tax management.

The Agencia Tributaría aims to provide efficient, flexible and quality services to make easier to the companies to carry out their obligations with the tributary system and, at the same time, to develop a more efficient system to speed up the workflow. The amount of information and procedures that companies must afford each year makes these services very important and beneficial for all parts involved.

At this moment, the Agencia Tributaria leads e-Government services in Spain.

3. Specific objectives

The overall objectives are:
- To introduce new ICTs to the benefit of the taxpayers. This must be done in an efficient way and achieving the maximum level of security.
- To drive forward the Information Society development.
- To provide quality services which increases the demand of telematic services by the taxpayer.

By digitising and making available the income tax declaration via Internet, the agency tried to achieve two main groups of objectives.

To improve the services for the citizen: Regarding improving the services, the main objective was to simplify the steps the companies must carry out to complete declarations and other procedures. The Agencia Tributaria wanted to make an integral offer of services via Internet, trying to reduce time and costs for itself and companies. At the same time, the Agencia Tributaria wanted to increase the transparency, providing the relevant tax information it already has, making easier to complete the declarations. On the other hand, it was considered important to offer as much help as possible to support users and solve any problem they could have when interacting with services. With the Plan de Modernización, the demand by companies of a longer and more flexible timetable, avoiding journey (and its cost) is heeded.

To improve the operation of the services: The Agencia Tributaria aims to reduce the time between the presentation of the declaration and its processing by the system. The cost of storing the documents, (previously paper copies which had to be introduced manually by personnel of the agency) is reduced. The system aims to speed up workflow and procedures.

4. Resources

The implementation of all telematic services by the Agencia Tributaria has been a global effort to bring to the users a easier way of dealing with their obligations. Resources mobilised has been shared by most of the services. They also share technology, platforms, processes, etc.

A multidisciplinary team was created in the Departamento de Informática Tributaria (Tax Computing Department) to co-ordinate the development the targeted applications. The objective was to allow presentation and management of the telematic declarations and services and, at the same time, to adequate the regulation to the foreseen changes. The team was made up of staff from all divisions: exploitation, customs, planning and co-ordination, etc. Because of the significance of the project, it has involved a lot of public organisms, which has contributed to develop the applications and legal changes: regional and central units for management of big companies, Collection, Collection National Office, collection regional sections and other delegations and public organisms.

To allow payment directly via Internet a NRC (complete reference number) must be generated. In order to do this, the contribution of the banks and financial institutions has been necessary. When the company pays, the bank provides a NRC, which must be included when the declaration is presented. The Agencia Tributaria assigns a coded number and with this number, the bank provides a NRC per each deposit.

In order to implement services of the virtual office, security had to be solved. The result of the study was a security infrastructure based on Internet standards: SSL-3, digital certificates 509V.3 and digital signature with format PKCS-7.

The technical environment has been based on the operative system Z/OS, transaction monitor CICS and data base manager DB2. Programming has been developed using Cobol and Natural, and HTML and Javascript for client

applications in Internet. An SMIME secure e-mail infrastructure has been implemented. EDITRAN protocol is used to exchange information between some entities when information exceeds the Internet capacity.

5. Implementation

In may of 1996, the first Internet services were implemented. They were more successful than expected. Therefore, in the Plan de Modernización (Modernisation Plan) of 1998, the Agencia Tributaria decided to include Internet as the main tool to provide its informative and interactive services. It includes the proper and secure identification of the user.

At first, some informative services were implemented (consult of procedure and refund status). The next step was the implementation of services for big companies, which are suppose to have the necessary infrastructure to deal with this services telematically. They are obligated to present some of their declaration via Internet. Later on, the services has extended to all companies. The number of services offered have also been increased, trying to cover the maximum number of procedures through Internet.

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, SMEs (Small and Medium Enterprises) requested the same kind of services. Services for them are available since the third quarter of 1999.

As commented above, a multidisciplinary group was created. It co-ordinated the application development and legal changes. Meetings with the contributing organisations were frequently held. It was very important the meetings with financial institutions, as the Agencia Tributaria wanted to implement payment service in its web site. It allows payment not having to disconnect from the agency page. Therefore, the generation of NRC method was agreed. The NRC serves as validation the payment has been done. It has been a very important step which allows payment via the Agencia Tributaria web site and complete the procedures in one session.

The back office reorganisations has taken place in different phases. The Agencia Tributaria has set-up a layer over the previous working application which allows to enter and exit from Internet. This previous program (installed approximately in 1992) automated the internal management of the declarations. Now, with the new layer, companies have the possibility directly communicate with the program. Different applications have been implemented on the same infrastructure and platform, allowing the Agencia Tributaria to quickly develop a large amount of services. These services cover most of the procedures companies must carry out.

The telematic procedure to present declarations needed legal modifications and approval. Some of the legal changes (up to year 2000) are as follows:
- Disposición final (final regulation) 5ª Ley (Law) 66/97: Big companies authorisation
- Disposición final 1ª Ley 50/98: SMEs authorisation
- Disposición final 2ª Ley 50/98: SMEs authorisation
- Order (Order) 20/1/99: Presentation of models 111, 320, 332.
- Order (Order) 20/1/99: Telematic presentation of model 380.
- Order (Order) 22/2/99: Presentation of model 117.
- Order (Order) 30/9/99: Telematic presentation of models 110, 130, 300, 330.
- Order (Order) 18/11/99: Telematic presentation of model 190.

The description of each model commented can be seen in the following table (by order of approval):

Model	Description
111	Deductions and income of work
320, 330	Monthly VAT declaration.
332	Monthly VAT declaration of exporters and other economic operators
380	VAT assimilated to importation.
117	Deductions and income of funds and property investment
110, 190	Deductions and deposits into the account: from work, some economic activities, prizes and some income special cases.
130	Economic activities directly estimated
300	VAT quarterly declaration

They are not the only models offered by the Agencia Tributaria. There are many more that cover most of the procedures they must carry out. For example, VAT services has a large number of models. They are as follows:

- Declarations and payments:
  - Quarterly declaration (form 300).
  - Simplified system - quarterly declaration (form 310)
  - Simplified system - final declaration (form 311)
  - Monthly declaration for big companies. Annotation in tax current account (form 320)
  - Monthly declaration of exporters and other economic operators (form 330)
  - Monthly declaration of exporters and other economic operators for big companies. Annotation in tax current account (form 332)
  - Refund of the VAT request. (form 361)
  - Monthly declaration of operations related to importations. (form 380)
- Annual summaries
  - Annual summary (form 390)
  - Annual summary for big companies (form 392)

The Agencia Tributaria tries to simplify procedures to the maximum. They share the same infrastructure and similar implementations, which only vary in case the service requires it. Continuing with the previous example, VAT declaration procedures are as follows (very similar to those implemented for income tax declaration):.

The company, using a program, fulfils the cells with the required information. It produces a file in which the amount that must be paid is reflected (if the result of declaration is paying in). Then, the company can use the payment service provided in the AEAT web site or pay by other means. If it is done using the service provided by the Agencia Tributaria, digital signature is checked with the CERES (Spanish Public Authority of Certification, dependant on the Fábrica Nacional de Moneda y Timbre). The digital signature is equal for both citizens and companies. The difference is that the private taxpayer uses the NIF (Fiscal Identification Number, which is the same number that the National Identity Card plus a letter, which is included in the National Identity Cards) and the companies uses the CIF (Código de Indetificaión Fiscal, Fiscal Identification Code) and needs a person who is authorised to use the digital signature on behalf of the company.

Once it is validated, directly connects with associated banks. This is, the payment service offered by the AEAT is something similar to an interface application to communicate with banks which, through an association, deal with the payment issues. Once the payment is done, the bank submit the NRC to the company, also through the AEAT web site. The NRC is also provided if any other way of payment is chosen.

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 applications 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 does not have debts. If there was any debt, the system uses the refund to pay it.

Most of the services use equal or similar procedures (for example, VAT declarations, corporation tax declaration, etc.). The main exception is customs, a rather complex service which involves a lot of sub-services and different forms. Processes vary depending on which kind of custom service is used. In order to use some Customs services it is necessary the authorisation of the Departamento de Aduanas e Impuestos Especiales (Customs and Especial Taxes Department), presenting a form that can be downloaded from the web and must be presented in the customs where the user is going to operate. The relationships between companies and the government are intermediated by a Customs Agent (an special kind of notary). These agents acts on behalf of the company. In order to be allowed to operate the agents must settle a guarantee.

The customs declaration is presented using Internet or the EDI system. These services are supported by EDI system for electronic exchange of data, and uses EDIFATC, the messages generated with this system. It is used to electronically present declarations.
The declaration (an EDIFACT file) is sent through the AEAT web site. In order to settle the payment, the warranty is provisionally used at first. It is automatic and allows to proceed with the circulation of the merchandise. Together with the authorisation sent, a payment letter is generated and sent. It must be settle in 30 days by the company. Once this is done a NRC code is generated and sending it to the AEAT the warranty is returned.

Instrastat is a data system to send periodically declarations of purchasing and sale operations by economic operators . It arose because of the need of getting statistics about trade inside the European Union. Those users choosing Internet can present this statistical declaration sending a file or fulfilling and electronic form.

There is telematic communication between countries of the UE to co-ordinate Customs. For example, any merchandise goes into the EU through Spain and its final destiny is Germany. The needed processes are done in Spain. Information about the merchandise is sent to Germany and this country informs about the arrival and the correctness of the information provided about the merchandise. Then, in Spain, the warranty is returned. In this case, an administrative act, needing human intervention, is not necessary. Concerning transit issues, NCTS (Nuevo Sistema de Tránsito Informatizado (NCTS, New Computerised Transit System) was implemented at national level in 2001. It allows real time connection with customs involved in a transit operation (departure customs – passing through customs – destination customs). The operator can make all steps electronically from his/her own office or home.

Updates about taxes and other issues are sent automatically to the AEAT from Brussels when changes take place. For the countries of the EU it is possible, thanks to the Intrastat decision, to declare customs telematically. Companies within the EU can monthly declare via Internet to the public organism responsible, in Spain it is the AEAT. It also uses the Internet or EDI system.

There is an important human intervention in customs which does not affect the automation of the service but it is interesting to comment. An application generates a risk analysis depending on many variables which are frequently updated. Three levels of risk (green, yellow and red) are produced for each custom declaration. The green ones, does not need human intervention and are automatically processed. The yellow and red level requires human intervention, depending on the risk analysed. In the end, it can produce the review of merchandises by a human agent.

The common back office organisation of other services by the AEAT is as follows. To identify users and allow them to access to the services the digital signature is needed. The user is validated through the CERES. It is possible the company uses a program to produce a declaration which needs calculations or only has to make an informative declaration. If it is informative, the information is saved in the system to be used as needed. In case that other kind of declarations must be presented, if the result is paying in, the company must pay it and get the NRC. To perform payment operations, the company has the possibility of using the service offered by the Agencia Tributaria. The user is validated with the digital signature. Once it is validated, it directly connects with associated banks. It is important to note that the interface does not change depending on the bank. This is, the payment service is an interface application to communicate with banks which, through an association with the agency, deal with the payment issues. The same interface is showed for all users. The back office organisation is in charge of submitting the validated request. Then, the transfer is done from the bank account of the taxpayer. Once the payment is done, the bank submits the NRC to the user, also via the web site, which is shown in the screen. The NRC is also provided if any other way of payment is chosen and the user still wants to send the declaration through Internet.

Then, the declaration is presented, signed with the digital signature and including the NRC. If the declaration results in refund, debts are checked with information the Agencia Tributaria already has. If there was any debt, payment is used to pay it off. If there are not debts, the AEAT send and order to the Banco de España (Spanish National Bank), which makes the transfer to the company bank account.

The Agencia Tributaria centralises information from a lot of sources. The number of entities presenting information to the AEAT are around 200.000, so it is not possible to describe all of them here. Depending on the entity, information is sent telematically or not. Telematic means are EDITRAN (information transfer protocol) and Internet, depending on the amount of information. Related to this, there are maximums to send information via Internet. Other entities use computing mediums, like diskettes, cd-roms, etc. Over 25 registries it is obligatory to use computing mediums or telematic exchange. On the other hand, there are agreements with País Vasco and Navarra (regions which have competencies on tax management) to exchange fiscal information.

Services for companies obtain and manage a lot of information. However, the information the Agencia Tributaria has is not as much complete as the information it gets for income tax declaration. Besides, a lot of that information is submitted directly by companies. Anyway, information available is crossed and processed to check error or inconsistencies, but and important part of the validation or checking relies on the fiscal inspection corps.

All processes are digitised, but, because of legal obligations an administrative act is mandatory when the Agencia Tributaria must pay. This is an published in the BOE (Boletín Oficial del Estado, State Official Bulletin). This process could be automatic, but the law obligates to this procedure. The Agencia Tributaria is trying to change this, so they do not need it and can change and automate this step. Despite of this, the transmission, reviews and other answers are automatically managed by the system. The system generates statistics about the processes and procedures to get feedback about declarations or, as commented above, risk analysis.

The Agencia Tributaria offers a lot of support to the companies, together with the services. Besides, the agency offers helps via telephone and chat . Help covers technical support, legal information, procedures, etc. In this way, the AEAT offers a more complete services which helps companies to take advantage of them.

6. Results

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.

Regarding companies, the frequency with which they must present declarations is high. The possibility of completing procedures via Internet allows a more agile and efficient management of tax issues.

On the other hand, the amount of procedures with which the Agencia Tributaria deals with each year is really high. Thanks to telematisation of procedures the agency is able to process information, declarations and payments in a more efficient way reducing time and costs. The following table shows the total number of VAT and tax on societies declarations presented by any mean in 2002 to have an idea of the amount of declarations processed by the agency.

NUMBER OF DECLARATIONS (by any mean)		
Service	Result	N. of declarations (2002)
Tax on societies	Pay in	361.611
	Refund	177.615
	Zero quote and renunciations	405.352
	TOTAL	944.578
VAT declaration	Pay in	1.852.883
	Refund	248.896
	To compensate	572.266
	Negative	100.800
	TOTAL	2.774.925

Not only traditional procedures, also complementary services are offered in the Agencia Tributaria web site: own information consult, status of declarations, payments and refunds, getting tax certificates, to request deferment or split of debts, etc.

The user can access to help through Internet. Updated legal information related to tax topics is included in the site so companies can consult it. Laws, orders, and other kind of regulations which affect the taxpayer are included. Despite of all documentation and other means to get help (for example, telephone), the Agencia Tributaria has developed the Programa INFORMA. It is a database including a large number of questions and answers about tax topics (concepts, procedures, etc.). There were 3.169.421 consults in 2002, of which 948.723 have been done via Internet. It means a 30% of consults done through Internet.

To rise awareness and provide help, the Agencia Tributaria issues informative publications which allow users to know 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. Instruction manuals are also provided by the Agencia Tributaria. In 2002 570.600 manuals have been printed and distributed. Concerning companies, main issues addressed are VAT declaration and tax on societies.

The following tables show statistics about the number of declarations presented telematically in the year 2002 for different services and models. Growth (%) in comparison with year 2001 is also included.

BIG COMPANIES TELEMATIC DECLARATIONS			
Model	N. companies	Declarations (2002)	Δ% 01/02
Obligatory to present via Internet			
111. Deductions on work income	24.715	295.004	9%
320. VAT	17.604	207.318	8%
332. VAT for exporters and other economic operators	6275	73.195	9%
117. Deductions for collective investment societies	131	1.166	1%
218. Tax on Societies. Split payment. Big companies	18.710	51.773	-
Voluntary to present via Internet			
202. Tax on Societies. Split payment. General system.	747	1.299	-1%
222. Tax on Societies. Split payment. Groups Associations	78	173	125%
123. Deductions on property capital (explicit)	1.415	4.122	163%
124. Deductions on property capital (implicit)	30	212	126%
126. Deductions on bank accounts	60	501	132%
115. Deductions on lease	2.342	18.825	162%
128. Deductions on insurance operations	12	95	332%
216. Deductions on non residents income	775	4.132	165%

The total amount of declarations presented by big companies in 2002 has been 657.815. As it can be seen in the last column, almost all services have incremented the number of presentations in comparison with year 2001. Of course, the growth has been much higher for voluntary services (the mandatory ones were the same the previous year), but it means that companies find Internet services offered by the AEAT a good solution to deal with tax procedures and are increasing its use.

The following table shows the number of declarations done by SMEs concerning some models and the growth in comparison with the previous year.

SMEs TELEMATIC DECLARATIONS			
Model	N. companies	Declarations (2002)	Δ% 01/02
110. Deductions and income of work	24.715	295.004	221%
130. Income tax split payment	17.604	207.318	295%
202. Tax on societies	6275	73.195	178%
300. Deductions for collective investment societies	131	1.166	321%
330. Tax on Societies	18.710	51.773	151%

The growth of these services is even more important than the growth of services used by big companies. This shows the increasing acceptation by SMEs of Internet as a advantageous way to deal with tax procedures.

Companies have available some programs to support their declarations and procedures. Most of the declarations are completed with the support of these programs. The Following table shows declarations done with support programs and the percentage over the total amount of declarations for some kind of declarations.

DECLARATIONS SUPPORTED BY PROGRAMS		
Service	N. declarations (200)	% over total
Deductions on work income	1.547.899	84,13%
Deductions on property capital	51.272	64,67%
Tax on economic activities	69.884	8,31%
Tax on societies	833.160	88,70%
VAT	1.991.815	71,06%

Concerning customs, during year 2001 a 17,55% of the Intrastat declarations were presented telematically. In year 2002 this percentage has been the 55,83%. Of this declarations presented telematically, a 86,72% were presented via Internet. Therefore, more than half of these declarations have been presented in a telematic way this year, being Internet by far the most used one.

In 2001, when NCTS (New Computerised Transit System) was implemented, 4000 movements where managed using this system. In 2002. In 2002 the number has increased up to 50.000. It places the Agencia Tributaria ahead of the European Union agencies managing these issues. Internet use for presenting Customs forms and documentation, payment and risk analysis have allowed to shorten the time to dispatch goods. In 2002 the average time to dispatch goods was 1,13 hours in comparison with 1,20 hours in 2001 and 1,32 hours in 2000 (when NCTS was not implemented). This margin is important taking into account the amount of good dispatches.

We do not have separate information available for different services and users, but how much successful the Agencia Tributaria web site has been is demonstrated but the number of visitors. In 2002 the web site of the Agencia Tributaria has had 45.408.011 hits, which supposes a 147,8% more than the previous year.

All in all, the Agencia Tributaria has managed to implement and offer a broad range of services for companies through Internet, which cover most of the procedures they must carry out in relation to tax issues.

7. Learning points and conclusions

The Agencia Tributaria has done a global effort to offer through Internet the maximum amount of services. The agency aims to offer a complete set covering all procedures taxpayers must carry out. Over the last years, the agency has extended the number of services available in its web site. The common technologies and platforms have allowed a fast development of the different services and models. They share common procedures and horizontal services. It makes easier and faster the development. Horizontal services, like payment service offered in the AEAT web site allows other applications to benefit from them and an easy integration. Following with payment example, it is used by most of the other services. The interface and the procedure is equal, no matter the origin of the payment, and it provides the NRC, which can be used by any service which needs some kind of payment.

The final aim of the Agencia Tributaría is to provide efficient, flexible and quality services. This helps companies to carry out their obligations with the AEAT. At the same time, this development produces a more efficient system which speeds up the workflow.

The web site of the Agencia Tributaria offers a complete set of services, including not only declarations but payment, personal information consult and change, legal information about taxes, help, etc. Users find in the web all services and support they could need. They can know the status of their declarations and payment, they can change personal information if relevant, consult last legal changes, etc. Another complementary service is the possibility of getting invoices directly from Internet. These invoices are signed with the AEAT digital signature and have legal status, so they can be used by the company for any desired purpose. All these complementary services makes a more compact and useful web site which companies can take advantage of. Internet allows companies not having the means that big companies have, to complete procedures in an easy and fast way.

Companies can benefit form a extended timetable which provides them with an increased flexibility to carry out their tax obligations. Declarations and other services, like help, can be accesses at any time, not depending on offices timetables.

Concerning the process of development and implementation, the Agencia Tributaria has achieve an important level of co-ordination with other agencies or entities. This co-ordination has been essential in order to achieve the defined objectives. The Agencia Tributaria needed to solve problems together with the organisation involved to find the best solution for both. The NRC is a good example of this. Meetings and combined efforts with the banks made possible a secure and comfortable way to allow payment and certify it.

The NRC has been a secure solution to be able to offer payment via Internet. It allows to complete procedures in one session not needing to disconnect from the AEAT we site. The only thing the user needs is the digital signature to access to the service. This way of payment simplifies the process for the user, who does not need to connect to other web (for example, of his/her bank) or go to the bank to pay. The user has an only interface. Back office organisation is in charge of dealing with banks to make the transfer from the user bank account to the AEAT.

The use of digital signature for so sensitive services has been an important factor to guarantee a secure connection, data exchange and payment. Security on the net is one of the main factors which makes users to reject online services. It is essential companies trust in security of the system to use them. The digital signature provided by the CERES has allowed this secure connection identifying the user unambiguously. These facts seem to be recognised by an increasing amount of companies.

Telematisation and digitalisation of procedures allows the Agencia Tributaria to process information in a more efficient way and improve the quality of the services. Users can take advantage of better services. Reduction of time to dispatch goods or to make refunds are some examples. The Agencia Tributaria centralises information coming from a large number of entities. This information is used to validate information introduced by companies in declarations or it is reuse in order to make easier for user to complete procedures. Information sent by companies and other entities can be transmitted using EDITRAN or Internet. The Net has still limitations depending the size of the files. When it is over a number of registries, the AEAT obligates to use EDITRAN. The Agencia Tributaria dynamically changes these limitations as Internet and servers of the AEAT allows broader band connections. The agency is making an important effort towards telematisation. The more information is obtained through telematic ways the more efficient its management is.

The Agencia Tributaria has made an important effort to make potential users to know the availability of services. Informative publications help to improve awareness among those who can benefit from online services. Even though it is difficult to establish an only cause, the number of declarations sent through Internet has increased spectacularly in the last year. At least, the growth shows the usefulness companies are finding in dealing with tax matters via Internet.

In the end, taking advantage of new Information and Communication Technologies, the Agencia Tributaria has implemented more efficient and transparent services. Digitalisation and telematisation of tax services affect to a very important part of the economic activity of the country. Making these process automatic helps companies to have a more efficient management. Digitalisation and telematisation improve information management and processing, methods, etc. All this makes the agency more efficient managing tax issues and playing its role within the Spanish Government and economic affairs. The Spanish Tax Agency has manage to offer most of its services through Internet in a short time and in a easier and flexible way, allowing companies to speed up procedures they must carry out each year. Both the agency and companies take advantage of a more efficient way of information management and workflow.

8. References and links

Agencia Estatal de Administración Tributaria (AEAT): http://www.aeat.es/
Autoridad Pública de Certificación Española (CERES): http://www.cert.fnmt.es/

Sweden

Case 29
Business portal:
National Tax Board (www.rsv.se)

1. Executive Summary

Since March 2001, companies and organisations in Sweden can declare their monthly tax, VAT and social contributions on the Internet. Together with the high use of Internet banking in Sweden, this means that companies electronically can fulfil the requirements for tax declaration and payment. Since March 2003 the project is a regular service at the Swedish National Tax Board (RSV).

The project concerning electronic tax declaration was established after demands from the users (companies). The technology leap that the authority took in 1998 – which included the upgrading of the computer system and the integration of the information flows in a more process-oriented manner – was crucial in facilitating the implementation of the project. Accordingly, the project should be viewed in a perspective of process development rather than a completely new innovation that is based on technology or reorganization.

The project has focused on two key issues. The first issue – to handle the legal questions of responsibility of the person declaring taxes – was solved by implementing a software-based certificate already existing on the market. The second issue was to develop an interface, not changing RSV's core system. The project main objective was to develop routines and functions that made the "form smart" (e.g. automatic summary and control functions) rather than merely focus on developing the interface. All in all, the project was implemented during one year and thereafter evaluated two years before becoming a regular and open service. At present, about two per cent of all organisations and companies (450 000) in Sweden uses the service.

This report is outlined as follows: first we present a short, general overview of the National Tax Board. Secondly (section 1) we discuss the tax declaration project (the primary project RSV has undertaken in the context of e-services). Thirdly (section 2) we discuss RSV's other portal services. Finally (section 3), we conclude the report with some general comments concerning learning lessons, primarily focusing on the tax declaration project.

The National Tax Board: a general overview

The Swedish tax administration comprises of the National Tax Board (RSV, Riksskatteverket, in the following text the Swedish abbreviation RSV will be used) and the ten regional tax authorities in Sweden. Similarly the Enforcement Service is a collective term for the National Tax Board and the ten regional enforcement authorities which, in turn, consist of a number of local offices within each region. The role of the Tax Administration is, of course, to ensure that taxation and collection of taxes and charges is carried out in a fair and cost-effective manner. The taxation system affects all individuals, companies and organizations. Furthermore, the Tax Administration is responsible for determining the rateable values of real properties in Sweden. The Tax Administration is also responsible for registration of population.

The main task of the Enforcement System is to help to maintain legality and equality before the law with regard to payment liabilities and obligations of other kinds. Distraint, eviction and attachment orders are examples of actions which can be taken by the enforcement authorities. Up until 2001, RSV also has the task of organizing and administering general elections in Sweden. This responsibility is now the task of a separate body, the Electoral Authority.

2. Background

Electronic tax declaration

If you are registered as an employer you must fill in an employer's contributions and PAYE tax return every month. The same applies if you are registered for VAT and do not report VAT in your income tax return. Payment must be made with a separate paying-in form.

During the 1990s, the National Tax Board in Sweden merged, upgraded and developed their computer systems handling taxation. In 1998, this work was finished and all systems were put on UNIX-systems. As a result of the work with upgrading the systems, a new way of managing information flow – a process perspective –was established. Another result of this work with improving the system also

Moreover, the improvements of the system were significant for facilitating the project concerning electronic tax declaration in two ways:
- the monthly declarations for social contribution and VAT were put on the same form
- every company or organization got a tax account which shows how much tax the company needs to pay every month

In 1999 a debate started in Sweden why companies not could do the monthly declarations of tax on the Internet. All individuals authorized 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 the beginning of year 2000 the project were initiated and in March 2001 it had fully been implemented as a pilot activity open for small businesses. In March 2003 the pilot activity were adopted to a regularly part of work of RSV, where companies can choose to declare VAT and social contribution on the Internet or by the more traditional way by paper. At present, about 8 000–9 000 companies and organizations of 450 000 (i.e. 2 per cent of the users) use the electronic alternative to declare VAT and social contributions.

To use an electronic tax return the individual have to obtain an electronic identification document. Posten AB (The postal service) or the following banks can provide the individual with an electronic identification document (providing the individual have a personal identity number):
- Handelsbanken (www.handelsbanken.se)
- FöreningsSparbanken (www.foreningssparbanken.se)
- Ikanobanken (www.ikanobanken.se)
- Skandiabanken (www.skandiabanken.se)
- Östgöta Enskilda Bank (www.oeb.se)
- Nordea (www.nordea.se)
- Posten (www.posten.se)

Furthermore, the individual have to report that he or she want to use an electronic tax return by submitting a form (www.rsv.se/E-tjänster/Skattedeklaration/Anmälningsblankett – elektroniska tjänster) to skattemyndigheten (tax authority).

A company or an association must, on the same form, notify who is authorized (name and personal identity number) to fill in and sign the electronic tax return. This authorization must be verified by a confirmed copy of a certificate of registration or a confirmed extract from, for example, a resolution of the board of directors or a resolution of the committee.

3. Specific Objectives

The objective for the electronic tax declaration project was to facilitate for users to carry out their monthly declarations of tax, VAT and social contributions digitally. The initiative was demand-driven (i.e. the "tax payers" identified a number of benefits and, thus, wanted RSV to implement such a system), but also the providers of the service, RSV, identified a number advantages if such a system was implemented. One 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 minimize 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).

At times of initiating the project, approximately 450 000 companies and organizations were bound in law to complete their declarations of tax, VAT and social contributions monthly. Thus, even if only a relatively small share of these 450 000 companies decided to deliver their monthly declaration of tax, VAT and social contributions via the Internet, the number information transactions still would be significant, and, thus, the project was regarded as having a great potential for improving RSVs area of responsibility in this context. In addition the projects potential for satisfying RSVs "customers" special requirements (i.e. the firms and organisations bound in law to complete their monthly declarations of tax, VAT and social contributions.) was regarded as high.

For several years, Swedish companies and organizations 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.

The major problem facing the project was related to security aspects, mainly related to issues concerning how to secure that the individual delivering the tax form in reality is an individual that is authorized to sign for the company in question.

Two questions of issue existed in this context, namely:
- How do we find a solution for certificates that guarantee data security in general as well as security concerning data related to the givers of information (i.e. the individual responsible for supplying the digital tax declaration form to RSV)?
- How do we create an interface between the users and RSV for the declaration process and, in this context, not neglecting to develop the interface with the already existing system (i.e. how do we create a well functioning intersection with the system already in existence)?

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.

4. Resources

In relation to ICT, the project has been internal to a great extent. In fact, RSV has developed almost all of the resources related to the project internally. The most important explanation for this "internal profile" of the project is that the relatively new system platform has both been designed and developed by RSV internally. The system for certificates and some consultancy support on the RUP methodology (Rational Unified Process) are the only external resources that have been outsourced to market.

As concerns the system of certificates, it was chosen from an already implemented technology developed by the Swedish Postal Service (Posten Sverige AB). During the implementation process of the project, and pilot activity, the system was extended to work with a certificate technology developed by the Swedish banks called simply Bank-ID.

The development of an interface between the users and RSV's tax system was developed in java as a web-based form accessible through the Internet. The work in selecting certificate for identifying the informant conforms with the W3C organization. All transactions of information and information packaging are based on open standards. However, the users are at present restricted to Microsoft Windows as operating system and the certificates do not work with Linux or Macintosh.

As mentioned above, the resources used in the project were developed internally and planned as a part of the ordinary activities at RSV. Therefore there were no specific budgets for the project. In total RSV invested in software solutions for less than 20 million SEK.

During the implementation of the project a new service office was set up to assist the users with questions concerning certificates and procedures of electronic tax declaration. Moreover, resources were also taken from the local tax boards. The reason for this was that users of electronic tax declaration had to make a formal expression of interest to the local tax board which approved the users and ordered the Swedish Post to issue a certificate to the person authorized to sign the firm.

5. Implementation

The electronic tax declaration was launched in March 2001. In March 2003, after a process of evaluation, electronic tax declaration became a regular service. During the pilot period the number of users increased from none to 9 000 monthly. As demonstrated above, firms can both declare and pay taxes electronically.

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. Another explanation is that all major processes and communications between different back-offices as well as systems handling different taxes and tax accounts respectively were already in place, after the modernization of the systems back in 1998.

The implementation method was based on RUP (Rational Unified Process) and focused on two sub-projects which had to be coordinated and integrated at the end. The first sub project was to create a method to certify and identify the informant (i.e. the tax payer submitting the declaration of tax electronically). The second sub-project 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.

While 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).

The information process handling the monthly declarations means that all individuals authorized 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 organizations and companies have an Internet account.

The abovementioned work aiming at the development of a user-friendly web interface focused on designing an interface as similar as possible to the printed form. Moreover the interface should include automatic calculations and control routines.

The main problem was how to handle the certificates. In Sweden all declarations has to be signed by a person who has the authority to sign for the firm. This means that a company cannot have a general certificate. It is only the individuals enlisted as having the right to sign for the firm in the articles of association who have the right to sign for the firm. This is explained by the fact that the declaration is a legally bound document and the person responsible for the declaration must be responsible by law.

The person who has the right to sign the firm allies to the local tax boards for the right to declare electronically. The local tax boards manually controls that the person has the right to sign for the firm. Thereafter, the local tax board register that the company is open for electronic declarations. This also means that if a person signs the firm for more than one company, all of those becomes open for electronic declaration.

After the local tax board has controlled that the person and the company is open for electronic declaration, the RSV orders the intermediary organization Posten Sverige AB (The national postal service) to send the code which enables the user to activate the soft certificate. The code is sent by mail to the prospective user's registered home address.

The pilot project is now finished and has, thus, become a regular service. Moreover, bank-ID has come to be an integrated solution as an alternative to the soft certificate. The use of Bank-ID works in a similar way, but instead of the process where the local tax board orders the intermediary organization to activate the certificate, the user him- or herself self issues a Bank-ID through his/hers Internet Bank.

The activate a Bank-ID is very simple and takes less than five minutes. The process can be handled directly on the Internet. This means that the starting point, when an actor want to alter their structure for declaration of tax (i.e. when they want to "go digital") only use one paper based transaction – the application to the local tax board. The application form is downloadable from the RSV website, but needs a "real" signature.

6. Results

One important result of the project is that users get a direct confirmation that the declaration has been processed. Another result is that the formal errors with miscalculations, more or less, have been eliminated. Thus, this means that the quality of the information has been improved. 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 reorganization has been fairly small due to the relative low number of users (only 2 per cent of all users of the system use electronic tax declaration).

One major reason for this is that only the person to sign the firm is allowed to do electronic declaration. This person usually is the managing director or the CEO for a company. Most of the companies and organizations obliged to do the monthly tax declarations have either an economic department or a consultancy service that handles the declaration. Therefore, the person authorized 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 authorized representative to sign tax declaration needs to be changed.

When concerning economic benefits, every declaration of tax delivered via Internet reduces administrative costs etc at RSV with about 60 per cent.

Finally, it is important to note that due to the major reorganizations of the information processes within RSV, most of the work with integration of back office functions already was made in 1998. Therefore, many of the visible advantages took place earlier than the current project.

RSV's other portal services

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.

Apart from the abovementioned tax declaration service, described in section 1, the RSV also provide three other e-services, namely:

a) Company registration
This is a joint service with the Swedish Patent and Registrations office (PRV). The service provided facilitates for start-up companies to register (limited companies as well as sole traders and private firms, i.e. trading companies). The service requires that the company has obtained an electronic identification document.

b) Special scheme concerning VAT
If a company outside the European Union sells electronic services to private persons within the Union, this turnover is considered to have taken place in the home country of the private person. Value Added Tax (VAT) is therefore due to the authorities in the respective countries. From 1st of July 2003, there is a special scheme that facilitates this procedure for those companies that sell services to more than one country in the European Union. This special scheme means that these companies only need one contact within the Union for all trading. The company is free to choose which country this should be. On RSV's portal it is possible handle such VAT-related issues. The website is developed and tested for the following webbrowsers: Internet Explorer 5.0 and later , Netscape 6.2.2 and later and Mozilla 1.0 and later.

Furthermore, RSV offers the following services (Self-services, N.B! Moreover it should be noted that not all of these services are digital, although the client, be it a company or an individual, can find useful information on the portal, for example concerning telephone and fax numbers):
- Make inquiries about and individuals (maximum 8 individuals) name and/or address (provided that the client making the inquiry know the individual's personal identity code
- "Auktionstorget": Get information concerning ongoing sale by public auctions administered by the Enforcement service (real estate as well as privet property)
- Order different types of forms and brochures via the Internet (from birth certificates to brochures concerning tax laws)
- Download "ELDA". ELDA is an abbreviation for a free software simplifying the transport of digital data (e.g. quarterly reports) via modem. The portal offers free download for Macintosh as well as PC users.

- A "jobcentre function" (for potential employees, i.e. individuals interested in pursuing a career at RSV)
- Forms for calculating tax, rates and car benefits (taxes related to private use of company cars)
- Tax tables and tax rates
- A general FAQ

7. Learning Lessons

What specific (for the actual case itself) and generic conclusions (potentially for other cases) can be drawn from the RSV-case presented in this report? In this section we would like to be reflective about the conclusions drawn and to use this to give advice to others similar or related back office projects. It should be noted in this context that specific and generic conclusions to some extent intersect.

Specific conclusions

When concerning good specific conclusions the following can be noted, namely that the RSV-project is a clear cut case demonstrating that the most positive results are achieved if a process-oriented way of working is implemented. Thus, the project have not changed the information/data flow. Instead, the project's focus has been on the development of routines and functions embedding the existing system (technological, organizational etc. se the enclosed workflow figures). The project, thus, have been very cost efficient and have not interfered with the day-to-day activities carried out at RSV.

So, what made it possible, then, to integrate the different services offered by different back offices? How was the integration of services managed by the responsible persons? How did the services come together? The relatively simple answer in the context is plainly that history matters. In the context of this specific case, some of the basic structures needed for the success of the project outlined in this report dates back to the late 1970s when the initial steps to integrate the back office functions at RSV was taken. Moreover, between the period 1995-1998

To address weak points are extremely useful in a project like this. Two such weaknesses are visible in this project according to our findings:

Firstly, that not all companies can use the electronic tax return. Thus, you cannot use the electronic tax return:
- if, for example, you are an accounting consultant, as you have no legal rights to fill in the tax return for your clients
- if you submit tax returns only occasionally instead of every month or once a year
- if two or more persons jointly are authorized to represent your company or association or
- if you are not a PC-user and you do not have a Java-script activated. We recommend Internet Explorer 5.0, Netscape 4.5 or later versions (not Netscape 6.0, though)

Some of these problems obviously are complicated to solve. For example, a change that would allow accounting consultants to have the legal right to fill in the tax return for their client/clients requires quit substantial alterations in several acts. On the other hand it do not seem as an insurmountable obstacle to offer technological platforms suitable for all hardware and software solutions available on the Swedish market.

Secondly, there is a need to further highlight the pros of using the online form. Out of 400 000 companies that submits the tax declaration, only approximately 10 000 companies use the online form at present (august 2003). Thus, more information and marketing of the service is needed. Particularly since cost-benefit analyses indicates that the authority would save money and time if more companies used the on line service.

Generic conclusions

The most important generic conclusion from the project is the importance of a) having long-term strategies and b) have a process-oriented approach when working. Moreover, another generic conclusion is the importance of intersecting different organizations and areas of activities an (for example RSV and PRV, The Swedish Patent and Registration Office).

To some extent, there may have been a tendency to focus too much on analysis and organization rather than strategic action and knowledge/change management. Accordingly, in this context it is important to discuss how actors can initiate change management processes in back office projects such as the RSV case demonstrated in this report. Processes of change in back office projects is to some extent trips into the unknown (e.g. what will the "customers" say, the dangers of path dependency; the emergence of new technologies). This does not mean, however, that a successful project is an unplanned trip, where you so-to-speak choose your destination randomly. There is a starting point and
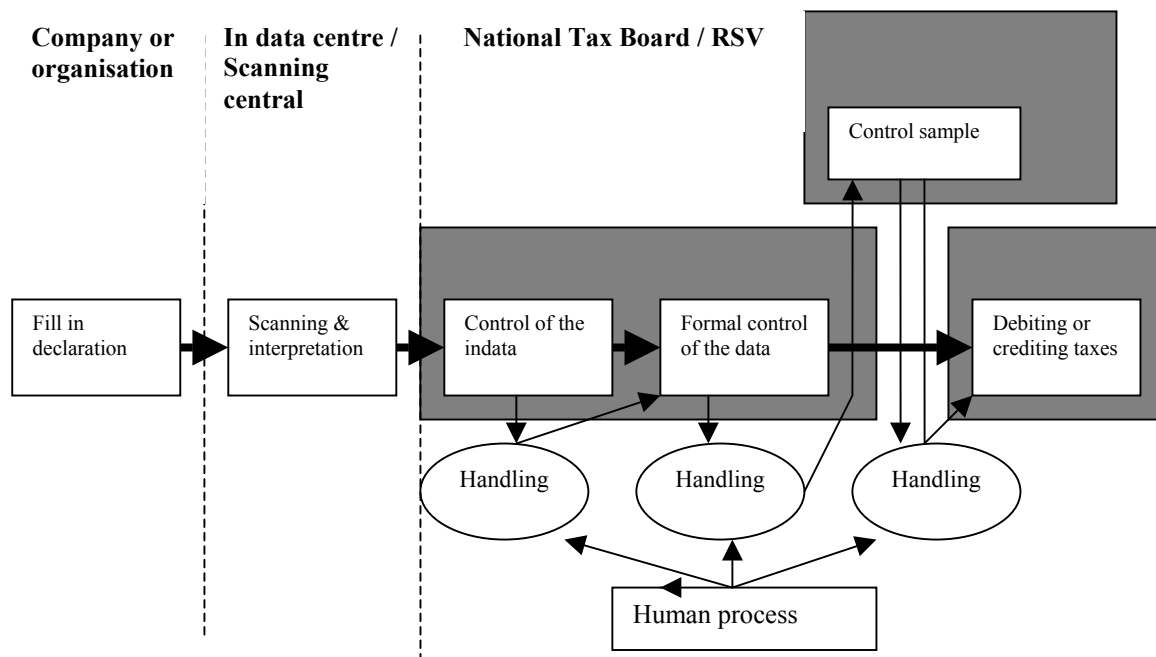
there are one or more goals – final destinations. (The process then starts again, of course, though somewhat differently.) As the RSV case demonstrates, a project is not about simply gathering a number of engineers. The project rather demonstrated the need to create an ongoing process of pooling resources and initiating new projects that serve as "brokers" (e.g. not only allowing soft certificates but also allowing bank IDs). Important in this context is of course also, in organizations such as RSV, the ability to hand over knowledge.

Paradoxes that need to be taken into consideration in this context are: A) the drive for autonomous processes vs. the need for policy coherence in the organization; B) acceptance of uncertainty vs. the need for control, C) planning and rationality vs. intuition and creativity; C) the interest of the organization vs. the interest of the customers; D) proven systems/structures vs. the need for incremental innovation; E) the need for quick fixes vs. long-term strategic orientation; and, finally, G) the desired state vs. the actual state.

Finally, some notes on the transferability of the RSV case. Although it is clear that this case is unique especially in relation to its cultural, legal, national and organisational context (and the fact that the project to some extent is an a example of an incremental, on going process that initially was launched in the late 1970s), the principles underlying good practice can be examined by other administrations and adapted, used as inspiration, as guiding principles, and to develop new concepts and approaches.

Workflow before and after the project (tax declaration)

Before

After

| Company or organisation | Internet | National Tax Board / RSV | Automatic control procedure |

Rationalized processes, built in the web based forms.
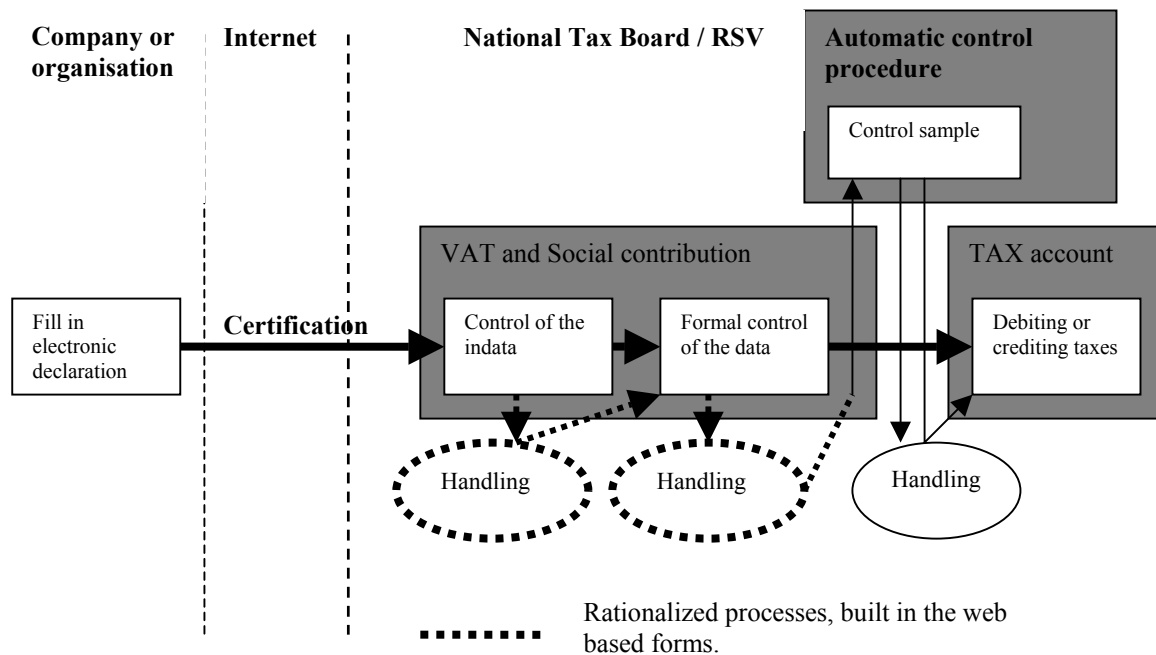
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www.rsv.se

Barbro Svensson, National Tax Board (Riksskatteverket, RSV), 26 August 2003, Solna. (interview)

United Kingdom

Case 30
Citizens enrolment in higher education:
UCAS – Universities and Colleges Admissions Service

1. Executive Summary

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 for the Social Work Admissions System (SWAS), the Nursing and Midwifery Admissions Service (NMAS) and the Graduate Teacher Training Registry (GTTR). The following report focuses on admissions to undergraduate and sub degree programmes, which is where the bulk of UCAS's work lies.

For this market, UCAS provides a number of services. It acts as the intermediary between nearly half a million applicants for university places and over 330 HE institutions. Most applications are made in the autumn before candidates sit their advanced school leaving examinations; for UK students, these examinations are usually the Advanced (A) Level examinations run by the English, Welsh, Scottish and Northern Irish examination boards, though some schools and colleges enter. pupils for the International Baccalauriate (IB). After the publication of the A Level examination results in mid August, UCAS arranges for offers of places to be confirmed or withdrawn, and runs a 'clearing system' designed to match unfilled places with unplaced candidates before the university terms begins in mid/late September. In order to ensure that candidates make informed choices, it publishes a Directory and other information about courses aimed at potential applicants, their teachers, careers advisers and parents. It also captures a great deal of data from application forms, in order to provide statistical information and analytical services for the HE sector. 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 backoffices of UCAS and the HE institutions since the 1960s. This case study describes the process by which UCAS is now increasing the intensity of digitalisation among back office processes associated with university admissions and beginning to digitalise the front office arrangements which serve nearly half a million applicants and thousands of schools and colleges. We will see that this case fits into Model C of the European Backoffice Project's schema. 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 case was chosen because it represents a good example of the development of a successful e-government application in a service playing a significant part in the life of an increasing number of young people in the UK and abroad. It is relatively complex, and illustrates many of the political, technical and organisational dynamics involved in back office integration.

2. Background

Since the original introduction of a central university admissions service in the early 1960s, when less than 4% of the age group attended university, the number of school leavers going on to university in the UK has risen steadily. 437,615 people applied through UCAS for entry in 2003, an increase of 3.6% on the previous year. In line with economic

change towards the knowledge-based society, the present Government aims that 50% of the age group should experience HE. To achieve this, it is particularly anxious to remove significant differences between the numbers of qualified school leavers that participate in HE from the highest and lowest social classes. The globalisation of the economy, and especially the increasingly dominant position of English language in the international order, means that has also been a sharp increase in international (non –EU) applications to study at British universities. In 2003, 12% of applications made through UCAS came from outside the EU, an increase of over 10% on the previous year. As a result of all these factors, the volume of business handled by UCAS has risen markedly and will continue to rise.

Furthermore, the flow of business is uneven, with a large number of applications coming into UCAS between October and January, and another period of intense activity following the commencement of Clearing in mid August. There are also peaks of information flows when universities update information about courses in the early Spring, and minor peaks when the winter A level results are issued in January. Further pressure would be put on UCAS's capacity to manage peaks of business if the Government decides to accept the recommendations of a recent report on the A level system (Department for Education and Skills, 2002). This would require students to apply to university after the publication of school leaving examination results instead of some six to nine months before they take their examinations. Such a change would enable a better and more efficient match between candidates' achievements and preferences, on the one hand, and the reputation of specific universities and their courses, on the other, but it would oblige UCAS to handle a great deal of its annual business in a very short space of time. Managers believe that this would be impossible unless much more of the application process could be undertaken online. UCAS is also faced with the real possibility that the Government will change the pattern of the school year, with more terms and more frequent, but shorter, holidays.

In the light of these factors, UCAS wishes to enhance the quality, flexibility and timeliness of services it offers applicants and other stakeholders in the HE community. Using traditional print methods, for example, there can be a gap of up to two years between a decision at a university to close an existing course or open a new one and the publication of a new edition of the UCAS Directory. Universities operate under more stringent financial regimes and in more competitive and volatile markets than ever before. They therefore need to be able to revise their course portfolio more easily, and need better, more up to date information to help them to make effective decisions. At the same time, the expansion of the British higher education system has created a much greater range of universities offering courses to a much wider cross section of the age-group. These changes in the populations of both providers and consumers means that UCAS needs to offer more information, support and advice to applicants during the admissions process, if they are to enjoy equal chances of making choices that maximise their life chances. For all these reasons, UCAS has become increasingly interested in exploiting ICTs to support the provision of its services, as well as in enhancing the value derived from the data captured from the university admissions process.

3. The specific objectives of digitalisation

As we will see below, UCAS is undergoing a steady process of digitilisation: this has increased in pace in the last few years. The objectives implicit in this process 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.

A further strategic aim is to future proof the university admissions process against a major policy shift, such as a decision to delay university applications until after the publication of the A Level results.

4. Implementation - the process of putting UCAS online

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. The following sections describe the workflows used to process them, and also describes the process and nature of change. Figure 1 (attached) shows the workflow involved in the admissions

process as it has operated for the last twenty years of so with paper forms. Figure 2 shows the process as it is expected to operate in the next year or so, for those candidates who choose to apply on the web.

Applicants fill out a paper form containing basic personal details and their educational record and qualifications. The form also allows them to make a restricted selection of university courses. There is also space for a 'personal statement': this can be used by candidates to tell the selectors about themselves and explain their choice of course. Applicants then pass the form to their school or college, which appends a reference and a prediction of their A level results. The form is then sent to UCAS by post, often in a batch with other applications from the same school or college. The school may choose either to enclose payment for the fees (currently, £15 an application) or to have the applications charged to its UCAS account. In the latter case, fees are invoiced monthly.

Admissions: the introduction of the Electronic Application Service (EAS) and Apply.

There are sound business reasons for digitalising 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 can save huge amounts of 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 admissions 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.

For the 2003 entry, 168,558 applicants (nearly 40% of the total) used either EAS or *Apply,* and UCAS expects this proportion to rise rapidly in the next year or two. 83% of these applicants used EAS, the CD ROM version. Nevertheless, U*CAS* is hoping to phase out EAS by 2005 or 2006, for a number of reasons. First, its market research suggests that the web service will rapidly increase in popularity. 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.

Data transfer between UCAS and HE institutions

Data submitted on paper forms has to be input manually into UCAS's computer systems. The long sections containing the candidate's qualifications, personal statement and reference are not keyed in, for reasons of cost and time. A flat file containing the captured data is sent electronically to the universities to which the candidate has chosen to apply. Institutions can use this data to build up their own databases, which may be accessed by terminals around the university and manipulated for management and statistical purposes. At the same time, the application form is photocopied, reduced in size and mailed to the universities, so that admissions staff can also read the personal statement and reference.

About 10% of institutions, mostly small HE 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.

Web based information and the Applicant Enquiry Service

To help support candidates through the admissions procedure, UCAS runs a telephone helpline service. This is heavily used, with 2000–2500 calls a day during the admissions season. In 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 is planned to take place increasingly via the enquiry service.

EBL – Examination Board Linkages

The offer of a place at a university is often conditional on the candidate achieving certain grades in his or her examinations. In order to validate examination results, UCAS runs 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 IB. 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 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 labour intensive work, as UCAS staff seek to reconcile as many discrepancies possible well before the results data are transferred to UCAS. The work of resolving discrepancies - which may, for example, be caused by applicants using different versions of their name, changing their mind about the number of subjects in which they propose to be examined or simply listing their subjects inaccurately – may involve correspondence between UCAS and the Boards or phone calls to applicants' schools.. Through such means, UCAS matched 98.4% of Scottish and English applicants with their A level results in 2001-2. The problems of reconciling discrepancies are exacerbated by the fact that different examination boards use different identifying numbers for the same examinees It would therefore significantly reduce the burden of this process if the Government were eventually to introduce a national qualifications database, so that UCAS was less dependent on data from the examinations board to validate applicants' claims about the examinations results.

Completing the digital chain?

It can be seen that UCAS is on the way to achieving a high level of vertical integration between the services offered to applicants, its own back office processes and the admissions processes within HE institutions. There remain two problematic links in the electronic chain. The first is that 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

The second problematic link in the vertical chain is the one between UCAS and the HE institutions. We have seen that, with a few exceptions, hard data is transferred to universities electronically and 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 personal statements and references which are, of course, the most subjective and probably the least useful information contained on application forms.

We discuss below, the organisational arrangements through which UCAS consults stakeholders about the strategic choices facing partners in the admissions process. But first, we turn to the resources used to support the digitalisation process.

5. Resources

ICT

UCAS runs a high volume business, handling large quantities of personal data. Like most organisations in the higher education world, it tends to be a target for hackers and other incursions. It is also subject to a number of intense periods of activity, especially towards the January applications deadline and in the hours following the publication of the A level results. For example, in the summer of 2003, the UCAS website scored 60,000 searches in the midnight hour immediately following the opening of Clearing. Despite these difficulties, UCAS is committed to maintaining continuity of service, 24 hours a day, seven days a week, a commitment expressed in its formal performance target of 99% systems availability. This objective was successfully achieved in 2001-2. UCAS seems therefore to have solved the technical problems associated with e-government, in that it can maintain systems which are scalable, flexible, resilient and secure.

It achieves 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. The network also has spare server capacity, which can be brought into use to support different processes as they come under pressure at different times of the year. In addition, UCAS is negotiating for an external recovery site which would host additional hardware. This site will be connected to UCAS via a separate ISP and will provide additional resilience and flexibility, especially during the period of particularly intense traffic in the early days of Clearing. Second, UCAS uses two different telecommunications networks simultaneously, allowing it to automatically increase and reduce bandwidth as needed to support changing levels of web-based traffic. For electronic data transfer with institutions and to support *Hercules*, it uses a third network, JANET, the private, government-funded network that supports the UK academic and research community. This is a long-established, robust network with a high level of reliability. Third, UCAS's systems are subject to constant load testing and year-round health monitoring, with regular simulations of the flows to be expected at peak periods.
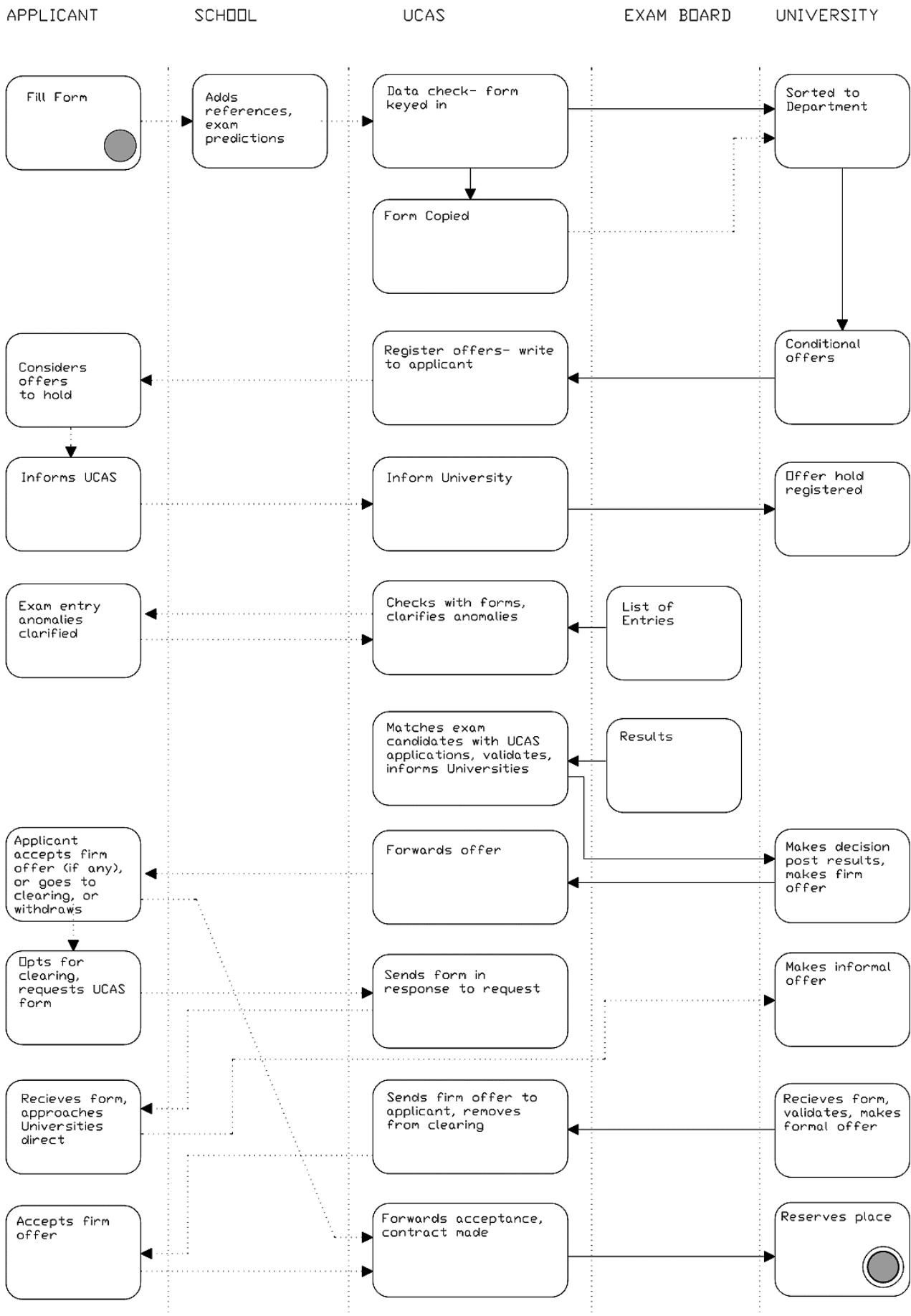
Security

UCAS achieves a high level of security. It does this, in two main ways: first by multiplying its databases and file servers, and second by protecting the network with a series of firewalls. The only access to the network for traffic generated by the general public is through a single web port, which is controlled by special software that sifts messages for spam and viruses. Managers report that this has proved 100% successful, thus far, in warding off serious incursions. Customer data sent via the web is subject to 128 bit encryption. Traffic with universities is not encrypted, but is sent via FTP within an area of the network secured behind firewalls.

Privacy, authentication and payments

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. As mentioned above, 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. On the other hand, it is willing to give copies of school references to applicants on request, on the grounds that it is required to so under the access clause of the Data Protection Act (1998). Such requests are frequent, because many school teachers believe that such references are confidential. UCAS's published statements make it clear that they are not.

Applicants using *Apply* 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.

APPLICANT   SCHOOL   UCAS   EXAM BOARD   UNIVERSITY

```
  Fill Form         Adds              Data check- form                        Sorted to
                    references,       keyed in                                Department
                    exam
                    predictions
                                      Form Copied


  Considers                          Register offers- write                   Conditional
  offers                             to applicant                             offers
  to hold


  Informs UCAS                       Inform University                        Offer hold
                                                                              registered


  Exam entry                         Checks with forms,      List of
  anomalies                          clarifies anomalies     Entries
  clarified


                                     Matches exam            Results
                                     candidates with UCAS
                                     applications, validates,
                                     informs Universities

  Applicant                          Forwards offer                           Makes decision
  accepts firm                                                                post results,
  offer (if any),                                                             makes firm
  or goes to                                                                  offer
  clearing, or
  withdraws

  Opts for                           Sends form in                           Makes informal
  clearing,                          response to request                     offer
  requests UCAS
  form


  Recieves form,                     Sends firm offer to                     Recieves form,
  approaches                         applicant, removes                      validates, makes
  Universities                       from clearing                           formal offer
  direct


  Accepts firm                       Forwards acceptance,                    Reserves place
  offer                              contract made
```

Finance and staffing

UCAS is a company limited by guarantee, and is registered as a charity. It therefore operates as a not-for-profit organisation, but one that must cover its own costs. Its main sources of income are from applicants, subscriptions form participating HE institutions and commercial activities, such as conferences and advertising.

UCAs's analysis suggests that *Apply,* the web-based application channel, yields much better value for money than the CD ROM system, EAS. This is because the CD ROM, has high up front development and maintenance costs. The cost savings associated with this application 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. 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 reskilling existing staff, on the grounds that they know the nature of its business best.

Implementing digitalisation: relations with key stakeholders

Schools
UCAS believes that the rate of uptake of EAS and *Apply* is determined mainly by the willingness of schools and colleges to embrace ICTs. This willingness is unevenly distributed. Many schools lack hardware and technician support, and not all teachers are experienced users of ICT. It is relatively unusual for applicants whose schools use paper forms to apply electronically, though this may change. UCAS 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. In a year or two, UCAS's management may come to believe that access to the web is sufficiently widespread in homes, schools, public libraries and so on, to justify a refusal to accept paper forms at all. This might lead to two problems. The first is the danger that UCAS would upset its customers, particularly the schools and colleges, and provoke a public outcry. The second is that it would restrict access to UK higher education from overseas, and might particularly exclude applicants from countries where access to the web is less than universal. It is, therefore, quite possible that, in the interests of keeping alternative channels open, UCAS will choose to receive a decreasing, but still significant, volume of applications on paper, by post. If this is the case, then its management will have to decide whether to reduce its data capture costs by phasing out the 'soft' parts of the application form – the personal statement and reference – or to continue to bear these costs.

HE institutions
As we have seen, UCAS also sees significant business benefits in encouraging HE institutions to adopt *Hercules,* as a way of cutting down postal costs and speeding up the admissions process. The problem is that the necessary technology costs about £450k per institution, 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.

Relations with the HE sector are handled mainly through a network of institutional correspondents, usually people from the universities' administrative staff. UCAS also maintains links with the Committee of Vice Chancellors and Principals, the national organisation of heads of universities in the UK. UCAS is using links such as these to persuade

the sector that there are real benefits for institutions as well as for UCAS from digitalisation. In particular, it emphasises the added value that would accrue to institutions from interactive access to UCAS's databases. To take an example, universities are now under pressure from the government to take more students from lower social classes: in practice this means that there are financial rewards for admitting students from relatively deprived geographical areas. UCAS can track applications and offers made by each university by postcode, so that university staff can make decisions accordingly. Access to this kind of dynamic information is made much easier with the use of electronic channels.

6. Results

The sections above show that UCAS is on the way to achieving its objectives, although full vertical integration on the basis of electronically-supported work flows is not yet complete. Indeed, especially in relation to the overseas market, the business case for full digitalisation of the admissions process is not self-evident and without ambiguity. Even in respect of the UK, the withdrawal of the paper form service probably depends on the speed of, and extent to which, web technology is disseminated. This is a particularly important consideration if digitalisation is not to undermine the Government's policy of widening access to higher education.

UCAS has also established a high degree of horizontal integration with the various examinations boards, enabling the qualifications of over 98% of applicants qualifications to be checked without their intervention at the time when the results are issued, and about 95% without any intervention by the applicant at all. It is probably the case that these numbers cannot be significantly increased without changes outside UCAS's control, such as the introduction of a national qualifications database.

In the last 7 years or so, and increasingly since the introduction of *Apply*, UCAS has shifted a significant and fast-growing proportion of its applications, information and inquiry business onto electronic channels, and particularly the web, without any apparent loss of business. Rather the reverse. The numbers using an electronic support to apply for university have grown from 7,000 in 1996, to over 100,000 in 2003. Moreover, these numbers are likely to grow rapidly, with the introduction of a web-based service, and UCAS's market research estimates that up to 70% - around 350,000 applications – might be achieved within two years. The Applicant Enquiry Service is very well-used, with some 50,000 hits a day during peak times of the year.

In digitalising and integrating its processes in these ways, UCAS has reduced and changed its workforce. It makes much less use of casual, low grade labour, and has shifted its skillbase from one that was largely composed of clerical workers to one that is predominantly composed of technical staff and knowledge workers. Furthermore, it has increased its dependency on ICTs, while suffering none 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, also cited above, suggests that they are also secure.

There is plenty of evidence, too, that these changes 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.

7. Lessons to be learned

All in all, then, this appears to be a successful case of back office integration, linking data flows between hundreds of schools, over three hundred and thirty universities and around ten examinations boards, to provide a resilient and well-

regarded service that, year on year, matches several hundreds of thousands of applicants to places in the UK's increasingly diverse higher education sector. As we saw above, this is a good case study of a high volume public service that has achieved a high degree of dependence on ICTS without any major project management problems or infamous disruptions of service. The available data show that, despite the intense pressure that is put on this service at particular period of the year, it has proved resilient and secure, its network infrastructure has been scalable to the tasks involved, and that its technology-enabled services are acceptable to, and increasingly used, by stakeholders. UCAS stands, then, as a good working example of e-government.

It is also a good example of Model C in the European Back Office's scheme. That is, UCAS basically provides one service – university admissions – but one involving data sharing between (about) 350 back offices. The service is only partially automated, but is on a clear upward trajectory in this regard. Facilitiies for online payment are incorporated.

This case study also provides some interesting lessons. The first point to make is that 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, e-government targets. Indeed, UCAS's initial forays into this process predate the publication of the British Government's first e-government 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.

Another point of note is that, in contrast to many other public services, UCAS has developed its systems and maintains them in-house, rather than contracting them out to one of the major information services suppliers. UCAS's elecommunications 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. We were also told that UCAS has a strong preference for employing staff that are familiar with the organisation's business, a preference that accounts in part for its reskilling strategy.

This case also exemplifies the importance of attention to both the robustness and the acceptance to customers of the technology employed. Indeed, these two issues may be closely related, since customers soon loose confidence in technology that is difficult to use or proves unreliable. These issues are particularly important to UCAS, for reasons to do with the nature of its customer base. UCAS is a monopolistic provide of the university admissions process. Being young and bright, many university applicants are likely to be IT aware and literate, but it is known that many school teachers are not, and many schools still have inadequate IT provision and technician support. It is also the case that the Clearing process, in particular, now takes place in the full glare of media attention, largely as a result of a series of administrative problems in the issuing of the A levels results and public concern about standards (Department for Education and Skills, 2002a). 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 steps actively 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.

All these factors go some way to explaining why UCAS seems, thus far at least, to be successfully negotiating a leap that is proving difficult for many other UK public services, namely the one from heavy reliance on 1960/70s-generation back office mainframe computing fed by paper files, to back office processes that are integrated with web-based front line services. As we have seen, too, it must manage this innovation in a context where its workflows must be integrated with those of some 350 other organisations, namely the institutions of HE and the examinations boards. So how, and how successfully, are these relationships managed?

The first point to make is that the case exemplifies well an important issue that frequently impinges on attempts to integrate the workflows of different organisations. While integration may have significant benefits overall, the distribution of financial costs and business benefits may not be symmetrical. In this case, for example, the significant costs of investment in backoffice integration between UCAS and the universities would fall on the universities, while many of the cost savings will accrue to UCAS. UCAS has no power either to force universities or to pay universities to adopt the necessary software. UCAS's strategy for dealing with this problem is to provide incentives for institutions to co-operate, by offering them access to much enhanced management and market intelligence – a case of carrots rather than sticks. This Case also provides a particularly good illustration of a general point about investment in ICT-enabled back office integration, namely the opportunity afforded for the 'informatization' of the service. This term refers to the greatly enhanced possibilities for capturing and analysing data which may have important business or policy value.

Indeed, the description of this case shows clearly that the digitalisation of university admissions is not only securing efficiencies and service enhancements but is also yielding added value in the form of access to much richer data and significant enhancements in facilities for interrogating and analyzing them.

The second point to make is one that speaks, too, to the interesting comparison, made above, between the relative success of UCAS's shift to e-government services and the less successful ones attempted elsewhere in the UK. *Prima facie,* this case appears to be an example of a relatively complex integration process, with a large number of stakeholders. In practice, two factors mitigate its complexity, and make it relatively simple to manage. The first is that many of the key relationships have been in place for over forty years, during which time the university admissions process has changed little in its essentials. The institutions involved are intimately familiar with the UCAS process and understand its logic and conventions. Secondly, the process has a single dominant player – 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.

The Case also identifies where these limits might lie and how they impact on the processes of digitalisation and integration. As we have seen, the process of integration is constrained by four major factors. They are:
- the traditional preference of university admissions tutors for 'soft' as well as 'hard' data about applicants; this preference is, at present, limiting the proportion of data that UCAS can capture electronically;
- the cost for universities of investing in software that would enable full interactive electronic communication with UCAS;
- the absence of common identifiers of candidates among university admissions and examinations bodies: this factor may be regarded as a subset of a more general problem for joined-up e-government arising from the absence of a national citizen database; and
- uncertainties about the impact of a wholly-electronic admissions service on university access policies and the international market for UK higher education .
- All these factors relate to issues that are beyond UCAS's remit and control, and show how the nature and extent of digitalisation and back office integration may be influenced by external factors. Maintaining the trajectory of digitalisation and integration rests in part, then, on the development of strategies for anticipating, understanding and managing these dependencies. The case of UCAS provides good illustration of this point.

8. References

Department for Education and Skills (2002), *Inquiry into A Level Standards.* (Final Report of the Tomlinson Inquiry).

Department for Education and Skills (2002a), *Outcomes of the Review of A Level Grading.* (The First Report of the Tomlinson Inquiry).

The performance indicator and customer survey data cited in this report are published on the UCAS webiste, at www.ucas.ac.uk.

Information about the JANET network may be found at www.ja.net.