Bremen Online Services (Germany)

Excellence in secure eGovernment supported by public/private partnerships and multi agency involvement.

Executive summary of the case:

Abstract
Bremen Online Services

Bremen Online Services aims to develop electronic government and to provide online transactions and payments in a secure and legally binding way. Targeting all citizens, businesses and intermediaries (lawyers, tax consultants, etc.) from its inception, the latter have become its prime user group. Quality of service has increased due to the elimination of paperwork from government communications. Significant savings have been achieved both on the part of lawyers and companies on the one hand and on the part of the administration's agencies on the other. The project has been fully operational for three years, with new services being added continuously. It uses electronic signatures for authentication and is implemented using OSCI (Online Services Computer Interface), an open communications standard which is in line to become the de facto standard for online transactions in Germany.

The project is carried out in an innovative public private partnership by the Free Hanseatic City of Bremen together with regional and national partners from private industry. It has created new jobs in the region of Bremen and stimulated the eGovernment industries all over Germany. In addition it has the potential to play a significant role in future EU-funded middleware initiatives, such as the IDA's eLINK pilot.

Timing of case
The project started in 1998 and although the MEDIA@Komm project which forms an integral part of the Bremen online project was successfully ended in 2003, Bremen online continuee to grow and flourish.

Geographic setting
Whilst the project has been developed in Germany, it is now being actively marketed to other European countries.

Main contributors
A number of organisations of all sizes contribute to the project.

Main beneficiaries
Beneficiaries of the project include organisations of all sizes as well as individuals, families and other households.

Case description:

Background
The reasons for starting Bremen Online Services were three-fold.

The prime reason was that the Free Hanseatic City of Bremen needed to reform its public administration and reduce operating costs quite quickly. Bremen is both a city and at the same time the smallest state in Germany (together with its sister-city, Bremerhaven). It has a population of around 660,000 inhabitants. Due to a decline in the once dominating harbour and steel industries the city's net income has been reduced in recent years. In order to present a balanced budget by 2005, Bremen needs to save up to 80 Million EUR per year out of its operational budget. In this context, eGovernment applications are a solution which not only help to increase the efficiency of services, but also allows them to retain a reasonable level of quality.
The second reason is to stimulate the economy in Bremen and its region. During the transition to an information society Bremen’s wealth and strength will in the future rest on the eAptitude of its citizens and businesses. The government needs to create favourable conditions for businesses to locate here, one aspect of which is to offer a streamlined and paperless process for company registration, tax filing, procurement and other services. It is the city administration's intention to lure most of the new jobs needed to develop eGovernment towards Bremen. The government also needs to function as a beacon and lead by example in using eCommerce technology.

The third reason was the development of electronic signature and encryption technology, which are among the most crucial e-commerce technologies today.

The project initially started as the successful answer to a challenge by the Federal Government of Germany in 1998, who had called upon the German local governments to present ideas for and develop eGovernment services using the highest level of electronic signature as determined by the European Commission and the German government (the MEDIA@Komm-initiative, cf. www.mediakomm.net). Bremen was among the three final winners and was awarded 10 Million EUR in match funding to develop an online transaction platform and specific applications for various user groups.

Objectives

Bremen Online Services prime objective is to develop eGovernment services for intermediaries, business and citizens as quickly as possible. In 1998, more than 120 services were analysed and 80 of them were scheduled for delivery by the end of the project in 2002. With Bremen Online Services, the city enhanced its leadership in eGovernment development.

All of the services are to be delivered via a common online transaction platform, encompassing transmission, signature verification, encryption and payment. This platform needs to be implemented using open standards to achieve platform and application independence. It must also answer to the specific needs of government such as data privacy, different types of transactions (synchronous, such as online changes and calls in company registers, and asynchronous, such as bids on public tenders).

The city's intention is furthermore to offer all of the services for intermediaries and most of the services for businesses online. Everything these target groups are expected to handle in conjunction with the city administration should be done via electronic means and the same tailored technology. In particular court services, tax services, procurement and car registration were targeted. Take up should not only be measured in percentage of the online transactions, but also by customer satisfaction and relative development of usage and cost-savings on the customer and the administration side.

The long term goal is to restructure the public administration from the outside in. Better and faster services will result from the use of electronic technologies and the necessary re-organization of workflows. By delivering these services using public/private partnerships, the city administration will benefit from a slimmed down workforce as well as a decreased operating budget.

Companies in Bremen, the region and in Germany and Europe have to receive direct benefits. Everything a Bremen company can do with the city administration should be available to other companies from all Member States and Candidate Countries as well (inclusion). The use of international standards for communications protocols and security functions is therefore paramount.

The project therefore needs to be based on standards using XML, SOAP, XML encryption and XML signature (e.g., W3C standards). Its technology is to be implemented using JAVA and it has to be platform and application independent. The necessary specifications of these general standards for use in eGovernment is achieved by defining a new standard called OSCI (Online Services Computer Interface). The goal is to establish OSCI as a standard for eGovernment. If used by other governments, OSCI guarantees the free flow of information and public services.

Resources

Technology

At the heart of Bremen Online Services lies an innovative eGovernment architecture, which can be called after its prime implementing product GOVERNIKUS. All the interfaces of GOVERNIKUS are described by an
open communications protocol, OSCI (Online Services Computer Interface).

GOVERNIKUS allows encoded and signed online transactions using electronic signatures according to the signature law. Particular value has been placed on the assurance of interoperability during the development of GOVERNIKUS.

GOVERNIKUS 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. Besides reducing costs, this also ensures the operational compatibility of GOVERNIKUS without particular commercial product features.

The GOVERNIKUS architecture 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 GOVERNIKUS client enabler caters for the linking of card reader, smart card and software certificates on the user side. It interfaces with various PKIs which include all of the commonly used German PKIs (TeleSec, Signtrust, DATEV, etc.) as well as the Austrian ones are already implemented. The preferred standard for PKI is ISIS-MTT.

This means that electronic signatures at the qualified level are supported (as specified in the EU directive on electronic signatures). However, as there is also a need to use advanced and simple electronic signatures in various business and government applications, they are supported. For example, software certificates of the German Internet provider T-Online can already be used as well as various electronic signatures issued by banks on their smartcards. What is most important is that the administration is entirely relieved of worry about accepting all kinds of different formats, a task which would be difficult due to the lack of standardization in the field (in spite of efforts such as ISIS-MTT, which standardizes PKI, in Germany).

GOVERNIKUS provides privacy features for electronic signatures and encoding, integrates attachments and displays data content before the signature phase. It is also able to work with various delivery channels, such as Internet and mobile devices.

GOVERNIKUS creates the OSCI message and caters for secure transfer to the intermediary. The GOVERNIKUS intermediary is a secure application and mail server. Besides all processes pertaining to the transfer of messages, this product comprises checking certificates as well as signatures and rule-based OSCI message routing in the form of value added services. The GOVERNIKUS intermediary serves as a central intermediary between client requests and "service providers". The GOVERNIKUS backend-server serves as a communication and OSCI handler with adaptation functionality for the respective special process. OSCI delivery orders are also archived for reference at a later date.

One of the most important characteristics of both OSCI and the GOVERNIKUS implementation is the "double envelope". A message will be encrypted end-to-end, while it is still processed via one platform. This is achieved by encrypting both the user data (the payload) and the transport data (the message header) individually. The intermediary is then able to perform all necessary verifications and payments, although not touching the potentially sensitive user data, which can only be read by the intended recipient.

Using the intermediary, GOVERNIKUS is able to process both synchronous and asynchronous messages. The first are used in applications such as searches in company registers or change of address forms. The latter is used when bids on public tenders or applications for tax exemption are processed.

On the application side, various implementations are possible because OSCI and GOVERNIKUS are flexible technologies. Obviously, for the high-volume transactions needed for intermediaries and businesses, customised turnkey solutions are needed. The OSCI data stream (which is XML) is produced in the client application, which can be either implemented in custom software such as lawyer's software or ERP-systems at car dealerships and registration companies. On the back-end side, the existing mainframe systems such as the legal process software in courts or the car registration software at the city office is directly linked via the OSCI Interface of GOVERNIKUS.

Receiving electronic forms as an alternative to FAX or letter has been in high demand. Carrying out these solutions, the form, for example a PDF or Word-Document, is sent as an attachment to an OSCI-message from the author to the recipient. It can be legally signed and encrypted, but the content data cannot be manipulated as easily as an OSCI-specified message.
Public Private Partnership

The product 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, Entwicklungs- und Betriebsgesellschaft GmbH and Co KG (Bremen online services development and operating company, cf. www.bos-bremen.de) was founded in 1999.

The Company is partly owned by the city state and industrial partners. Its major shareholders are the Deutsche Telekom and the local savings bank, which has a market share of about 50 % in Bremen. Several other smaller companies, as well as transport and telecommunications providers are also among the partners. Together, these partners have invested 10 Million EUR in the development of eGovernment between 1999 and 2002. This has been an impressive achievement, since about 5 Million EUR were invested by the private sector in eGovernment.

In addition to these funds, the Federal Government provided 10 Million EUR of matching funds to the whole project. These funds were only partly used to finance GOVERNIKUS and the applications. They have also been used to subsidize signature cards and card readers for the Bremen public as well as for process analysis and optimization inside the public administration (see below).

The company is scheduled to be profitable by 2005. Revenue is earned by marketing GOVERNIKUS to all levels of other governments throughout Germany and to other European governments. This approach is an example of how eGovernment can be a true win-win situation for the users, the administrations and the third party providers, as will be detailed in section 5.

Other resources

For the purpose of outlining a consolidated application for the eGovernment award, other crucial resources can only be summarized briefly, as the GOVERNIKUS architecture and the public private partnership have been the crucial success factors to the project. There will be a more complete discussion in the section discussing implementation.

Most importantly, the public administration committed significant human resources to the project. Approximately 20 agencies have been targeted by the case, with more than 100 employees involved directly in the project. To relieve permanent staff working on the project, several relief staff were recruited, amounting to 60 person years of assistance.

In addition, about 15 private sector companies were targeted, as the GOVERNIKUS platform is not only designed for government users, but also private companies. Banks, newspapers, the soccer club "Werder Bremen" and others offer online transactions all using GOVERNIKUS today.

Significant assistance was also provided by the University of Bremen, whose Institute for Informationmanagement Bremen (formerly Telecommunication Research Group) under the leadership of Prof. Herbert Kubicek was instrumental in devising the initial concepts and continued to support the project with project management skills and guidance.

Activities

Bremen Online Services is the primary outcome of the MEDIA@Komm-Project Bremen. It involved many actors both inside the administration and in the private sector. An extensive description of the project, its participants and tasks can be found in a case study on the project, which was designed for an international research project (see the document Bremen for CEFRIO.pdf; some of whose passages are quoted below).

For this application, we would like to limit the description of the implementation to the outcome of the MEDIA@Komm-project in the field of services for professional users. From the outset, five groups were targeted in this field, for which several high volume transactions had been identified:

Lawyers:
- Claims for outstanding liabilities, Searches of and changes in the commerce registers.

Tax consultants:
- Tax-related issues.

Architects:
Construction permits and several reporting requirements throughout construction projects.
Car dealerships and registration companies:
- Car registration for their customers.
General business:
- Procurement.

In addition, a host of other applications were developed for citizens and students. Several of these applications today contribute to the goal of advancing mobility inside and outside of Bremen and to and from Europe. Among these are services offered by:

The University of Bremen and the two institutes of higher education (Hochschulen) in Bremen and Bremerhaven:
- Immatriculation (car registration), Change of addresses, names etc.
the Public Transport Authority Bremer Straßenbahn AG, who is also a partner of Bremen online services: ordering monthly passes.

For each of these tasks, an individual project was set up. Each one had a double leadership: a representative from the central IT unit of the Bremen Government, the Department for New Media and eGovernment and the Senator for Finances, and a representative from the relevant agency such as the court, the tax office or the car registration office.

Each project started out by developing a specific vision detailing the intended workflow. This vision was developed by the civil servants and employees of the departments which were involved in the project, thus guaranteeing both the knowledge of their requirements as well as their buy-in from the start.

The first milestone in each project was a business process analysis, for which a consultancy company was hired. All processes were documented with the ARIS tool-set. After that the project groups agreed on an optimized process. Subsequently, several measures were taken in each project:

Legal requirements which needed to be changed in order to provide the service online were identified and proposals were made to change them eventually. Bremen's status as city-state with own jurisdiction over many of its laws gives it an advantage over other cities in Germany (and most of Europe). For example, the construction permit law was analyzed and 20 requirements for written forms were eliminated immediately.

Organizational changes were implemented. For example, in the courts dealing with collecting outstanding liabilities, four offices were merged into one, therefore freeing up 2/3rds of the employees involved.
The company Bremen online services (bos) was charged to develop an online application.
The following paragraphs focus on the latter. In order to achieve its objectives, it was necessary to tie all the applications into the existing software infrastructures.

Three main requirement patterns were identified:

Software Integration: Several professional users have existing software supporting their specific tasks. For example, lawyers usually use special software to create the forms necessary to collect outstanding liabilities. For these users, bos created strategic alliances with specific software developers and created OSCI-plug-ins to implement in the software.

JAVA-Application: For some applications, a new data entry interface needed to be created. It was implemented in JAVA. JAVA was chosen along with the freely available JAVA Web Start Runtime environment to guarantee platform independence. It runs on Windows, MacOS and Linux/Unix alike. JAVA is also the language to design the core of all applications: the visualization/signing/encryption component, which allows the user to "sign what he sees", by representing the XML-Message with the help of a stylesheet in HTML.

PDF-Form: There are many other administrations who have already published their forms in the PDF-Form online. In Bremen, currently 50 applications are available in this format. In order to avoid future paper printing, a GOVERNIKUS plug-in was developed, which can be easily inserted in any given PDF. It attaches the PDF to an OSCI/XML/SOAP-message, and thus makes it possible to sign it in a legally binding way according to the EU directive.

On the administration's side, if the options Software Integration and JAVA applications are used, an OSCI-interface adds to the mainframe applications. If the PDF forms are used, users inside the administration are
equipped with a so-called Pull-Backend, which functions as an electronic post-box. Users can receive the PDF as well as the report from GOVERNIKUS containing the result of the signature evaluation and payment, and then process the form.

Table 1 shows the individual applications grouped according to target groups and the chosen technology. It references the links from which one can directly access the service.

Services for businesses and intermediaries:

Collecting of outstanding liabilities
http://www.bremen.de/onlinedienste/anbieter/amtsgericht/02.html (Software Integration)
http://www.bremen.de/onlinedienste/anbieter/amtsgericht/03.html (JAVA Application)

Online-register search
http://www.bremen.de/onlinedienste/anbieter/amtsgericht/01.html (JAVA Application)

Bid for public tenders
www.vergabe.bremen.de (Software Integration)

Search for public tenders
www.bremen.de/ausschreibungen/ (Software Integration)

Reporting requirements after construction began
http://www.bremen.de/onlinedienste/formulare/stadtplanung_bauordnung/03_01.html (JAVA application)

Tax reporting requirements for business
http://www.bremen.de/onlinedienste/anbieter/finanzamt/01.html (PDF-Forms)

Car registration for car dealers
kfz-online.idbremen.bremen.de/index_haendler.html (Software Integration)

Services to increase Mobility

One-Stop-Government Change of Address, incl. students
http://www.bremen.de/onlinedienste/formulare/bos/05.html (Java Application)

Transport tickets
http://www.bremen.de/onlinedienste/anbieter/vbn-bsag/01.html (Java Application)

Various University applications, such as registration, change of address and others
http://www.bremen.de/onlinedienste/lebenslagen/kap04.html (Java Application)

Table 1: Addresses of the concrete services

PLEASE NOTE: As all of these applications are fully operational, please indicate that you are just testing by writing your name as "Mustermann" or "Test". Keep also in mind that you need to install JAVA Web-Start (which you may do by clicking on http://www.bremen.de/onlinedienste/service/kap01_3.html). You will also need a card reader and an electronic signature. (The latter can be provided through bos “please call +49 800 BOS-BREMEN or 49 800 267 2736). 

Also note that the linked pages give indications if "keine Signatur" (no signature) or "qualifizierte Signatur" (qualified signature) is necessary. In several cases, multiple applications are accessible through the link below. All of these applications can of course be navigated to from the common web-site of all applications, www.bremer-online-service.de (see graph 5), where services are grouped according to forms/services ("Formulare"), service providers ("Anbieter"), user groups ("Nutzergruppen") and life-situations ("Situationen").

Working as a public/private partnership

The project significantly profited from several unique forms of co-operation. The city, the Institute for Informationmanagement at the University of Bremen, the Deutsche Telekom and the Sparkasse Bremen
drafted the initial vision. The project won the first round of the MEDIA@Komm-competition in 1998 and was provided start-up funds for six months to further detail the project plan. This period was crucial for establishing the public private partnership which today successfully supports the Bremen Online Services.

Led by a steering group made up of the original partners, the key paradigm for Bremen Online Services was to form non-discriminatory and open working groups for every technical and content aspect of the project. More than a hundred representatives from industry, local commerce, and public administration participated. The private sector was invited to participate through open calls for tender. Of course the prospect of receiving a 10 million EUR grant also had considerable appeal. The project was an opportunity for the private sector as well as for the administration to gain know how about cutting-edge Internet transaction technology. When finalizing the project, the steering group issued a call for tender and selected preliminary industry partners to implement the project in the event that the final grant was awarded, as ultimately it was.

As for the agencies and private partners planning to offer services, participation has been voluntary. For several public administration applications, in such areas as legal administration, finance, building application permits, procurement, car registration, citizens register and the institutes of higher education, funds have been awarded to allow the necessary re-engineering.

During the initiation and design phases, the project profited greatly from the high-level support it gathered. Both the first mayor and the second mayor, who represent the true dominating parties in Bremen, the left-of-centre Social Democrats (SPD) and the right-of-centre Christian Democrats (CDU), personally supported the initiative and helped to ensure widespread cooperation and support within and outside the administration. For them, the project and its ultimate success presented numerous opportunities in which to present Bremen as an innovative and successful city-state, which they greatly appreciated since it contrasted nicely with Bremen's dire economic situation. The leadership was also necessary to overcome some initial resistance by individuals and companies which had originally intended to use the federal competition to fund other projects within their own remit.

When carrying out the project, dual leadership of Bremen online services company was helpful. One of the two executives of the company is the head of the city's Office for new media and eGovernment. Also, the company teams work closely with the working groups within the public administration and at the university, which again assists the project leadership. Thus, the company is tied very closely to the most important application areas. This strategy bridges the two worlds of public administrations and private sector, which have rather substantial communication problems, and which had to be faced in the course of the project.

Within the city, the project groups are led by members of the Office of New Media and eGovernment and a representative from the individual agencies which are also participating in the project. The ideas devised by each team have to be approved by the powerful employees representation office. Implementation of the project within these groups is greatly enhanced by the provision of additional personnel and funds for IT development in each participating agency.

The private sector partners who offer their services within the single-window component of the service delivery front-end were also assisted by Bremen Online Services. They were provided with the technology. In the end they became customers of Bremen Online Services.

The MEDIA@Komm-project will end by the end of this year. Bremen online services has found many more customers outside the initial scope of the project, as will be explained in the next section.

Partnering with the federal government and EU initiatives

As the federal government provided matching funds for the implementation, the case has sought close co-ordination with it.

Bremen online services has provided input for many federal initiatives, such as the federal procurement project "eVergabe", which was built partly in consideration of the process-analysis of the procurement process in Bremen. This project is also becoming a lead-project within the EC's IDA program and thus has an effect at the European level.

A very important area of collaboration turned out to be the civil registration arena. Here, the federal government will require the use of OSCI in future exchanges between the 14,000 registration authorities. This is a G2G application, which is not discussed in this proposal in more detail because it is not within the scope of theme 1.
Output and Results

In 2003, the project MEDIA@Komm will end and so will the match funding. However Bremen Online Services blossom. The online applications are growing continuously, specifically for intermediaries and business, and the company Bremen Online Services has continued to develop and operate GOVERNIKUS, and is on its way to becoming a successful eGovernment company.

General data: Services offered and electronic signatures distributed

In March 2003, 120 applications were available online. With this number, the original goals in terms of services offered have been more than met. Half of these services require some form of electronic signature and can be processed via electronic means only. (The other half can be printed out and mailed in or can be delivered by hand). This is one of the broadest ranges of applications offered by any government in Germany and Europe at the moment. (see http://www.bremen.de/onlinedienste for a complete overview).

Of the 60 applications requiring some form of electronic signature roughly 50 percent are of value to intermediaries and business (several applications are being used by more than one target group, for example some tax or car related forms).

It is difficult to judge the correct number of customers who use the online services. The website www.bremer-online-service.de logs well over 70,000 page impressions a month. The website www.bremen.de records 7 Million page impressions a month. One way of estimating it is by the number of users equipped with qualified electronic signatures.

Even though the actual number of users is a lot higher, since several applications require less stringent forms of electronic signatures or even none, these numbers are very significant. At first sight, they appear to be rather low, considering Bremen has roughly 660,000 inhabitants. With almost 2700 signatures distributed, and probably the same number of signatures available to users by other means (bank cards, company cards), this means that only about 0.8 % of the population have electronic signatures. A significant number of these signatures are used by students, about 30 %.

Consider the following: contrary to initial beliefs, many applications do not require qualified electronic signatures, but can be processed directly or with advanced electronic signatures. The actual user group of online services is therefore much higher, estimated at 10,000 active users throughout the city. Again, this number is difficult to compute from page impressions, as more exact data cannot be acquired for reasons of data protection.

In addition, the number of electronic signatures in use has been continually growing, last year by almost 30 %. At the same time, it will probably be difficult to find many communities in Europe and even in the world who have almost 3000 qualified electronic signatures in operation. The total number of electronic signatures distributed should not be mistaken for an indicator of the usefulness of electronic signatures. As will be explained below, the user group which is smallest in size is using electronic services the most: intermediaries and business, which total 665 electronic signatures.

Impact on users and public administrations

Having been operational with several important services for intermediaries for a little more than one year, it is now possible to assess the impact that the case Bremen Online Services has had on users and public administrations as well. Benefits of these transactions are both quantitative and qualitative, as the following overview summarizes:

- Faster processes (reduction of handling, waiting and answer times)
- Searches in the company register can be completed immediately: process time used to be the minimum length of a phone call including holding on for several minutes due to very busy demand; usually even a day for written turn-around.
- Small and medium sized businesses can search for public tenders and request the application packs online. Formerly, they had to do this in paper based media (or hard to get CDROM media). When full online transaction in the procurement application is achieved in 2002, all paper-based handling (two envelopes,
multiple copies) will be obsolete.

- Lawyers can search for legal information on companies and request extracts from the city register online. Formerly, they had to visit the courts in person to do this. This usually took half a day working time. Paper is eliminated completely from this process.

- Relief from repetitive tasks (by automating enquiries, responses etc.)

- All demands for collecting outstanding liabilities used to be taken care of in person by court personnel. With the online application, 80% of all enquiries today are dealt with electronically.

- All transaction applications are corrected for common mistakes in spelling and logical errors (dates etc.) and checks are made against relevant databases (e.g. official street names, Zip-codes), thus cutting time once needed to rework unclear applications.

- For the intermediaries, customer satisfaction is very high. In the area of car-registrations for example, the service has been implemented by all of the major car dealerships in Bremen.

Data quality

- Written forms, which needed to be keyed or scanned in, are very error prone. About 10% of all forms are spoiled by errors and require manual corrections. By providing XML interfaces to the user-applications, these errors are virtually eliminated.

Direct cost savings

- When publishing calls for tenders, costs would be incurred for copying the relevant information. By providing it electronically, copying costs and postage are saved.

Transparency of the process

- Both the eProcurement and the online construction permit applications will allow the active monitoring of the status of each individual application, thus creating valid transparency of how governments work.

Legal correctness

- By combining the online applications with fully automated workflows in the back-office, the correct procedural handling of all cases is ensured. Trust in government increases, and employees can more easily take on new responsibilities as they are helped by the system. For example, the eProcurement workflow will codify all EU and national regulations and requirements for preparing public tenders.

Controlling

- As the collection of process data becomes more and more crucial to effectively modernize public administrations, eGovernment applications can provide these numbers in an automated way. For example, in public procurement there exists no combined record of how many calls for bids are published each year, how many suppliers are out there or even what the total amount of all goods purchased amounts to. This will change with the electronic applications.

While these benefits tend to be intangible and can only be reported here in writing, there are also concrete savings with those applications which are already online, and which are shown here to demonstrate the efficiency gains of Bremen's eGovernment solutions.

The introduction of the application “Collection of outstanding liabilities” into the Bremen court system has resulted in approximately 1670 applications being received online per month. After the system had started it did not take long before it handled roughly 80% of all incoming requests as most of these are sent by major
companies, who immediately made use of this new option. Thus, of the 12 positions dedicated to the relevant section four could be eliminated. Each one of them leads to savings of 34,230 EUR a year, totalling 140,280 EUR a year. Similarly, the online register handled 20,000 requests and led to a reduction in personnel dedicated to answer the phone of one third. Thus, it can be fairly safely assumed that online transactions generate roughly 7 EUR in savings per transaction. This means that in the area of services for lawyers alone, Bremen saved 469,000 EUR in 2002 by introducing its online services. The estimated cost for developing these is 200,000 EUR (including both specific work on the project and a share of the costs for developing the intermediary), so these services have already paid for themselves.

In the tax area, applications both through the MEDIA@Komm-project and the ELSTER project, in which Bremen takes part and which targets electronic tax filing in Germany, savings ran up to 161,000 EUR as well. The other applications have been online for only a few months so far, or will be online within the next two months. In Bremen, in the construction department alone around 6000 calls for public tenders are written out each year. Another 1000 or so are handled by other departments. So, assuming a similar take-up as actually did happen with the court administrations, 2000 applications are likely to be received online. Already, staff in these offices is being reduced accordingly. In car registration, the office receives 10 transactions per day, totalling (including a slight increase in the second half of the year) 3000 applications. In 2003, the savings in the area of intermediaries will reach over 600,000 EUR. The 2000 applications for permits for construction trigger three times as many reporting requirements for the architects throughout the building process. Again, a conservative estimate for take-up is 2000 transactions. In the case of collecting outstanding liabilities, combining the introduction of electronic services with a general restructuring of the courts dealing with these services, staff could be reduced by 66%.

Thus, the project yields a significant return on investment for its participants. It has been calculated that the development of an individual online application with full OSCI (XML) application costs the administration in the region of 100,000 EUR. In addition, license fees for the GOVERNIKUS platform need to be shared. As eGovernment is still in an early phase of development, this license fee is being paid by the Senator for Finances. It costs 1 cent per inhabitant.

As for the users, the same qualitative and quantitative improvements can be noted. Of course the numbers largely depend on the frequency with which the online services are being used. Examples of savings are listed in table 3.

We can assume that approximately 100 lawyers or companies and 500 businesses used the court services in 2002. This means private industry and professionals in Bremen have saved 630,000 EUR already. Needless to say, this is just the beginning of eGovernment, as many more services are yet to be brought online and the user base 0.8% of the population has to be increased considerably.

Sustainability

Finally the successful development of the common transaction platform GOVERNIKUS is to be discussed. It has been developed on the basis that all of the services should use the same general functions such as electronic signatures, encryption and payment. Most notably, it allows the inclusion of all PKI providers in Germany, it is open to all commonly available signatures and it is compatible with most of the commercially sold card-readers (see the document Technical Annex.pdf.)

In this way, significant savings were achieved. The investment needed for the online platform amounted to approximately only 1/5th of the cost when compared to the cost if it had involved the implementation of a single service with its own individual security features. Most notably, in addition to the government services private companies are using the same platform.

The business case for Bremen online services showed early on that even if all of Bremen's services were bundled and used GOVERNIKUS, the revenue to be earned from this would not sustain the company. So it is strategically necessary that the product should be sold to other users as well.

Among the current users are:

Freie Hansestadt Bremen
Landesanstalt für Arbeitsschutz Nordrhein-Westfalen (state agency in Northrhine-Westphalia)
Kommunale Spitzenverbände in Niedersachsen und niedersächsische Datenzentralen (Local government

The buy-in of so many states and the federal government has meant a very big boost for the company's future prospects.

OSCI is considered the basis for the European Commission's Interchange of Data between Administration (IDA) programme's eLINK-project. The free flow of services between states and across national boundaries can now be easily implemented. The instrumental reason for this was the clear commitment to offer the GOVERNIKUS product not as a proprietary product alone, but in conformity with the OSCI Standard. OSCI is based exclusively on open standards such as XML, SOAP, XMLsignature and XMLencryption. It contains also the necessary specifications to tailor these standards to EC requirements. The transport security according to IT SEC criteria was certified by the Bundesamt für Sicherheit in der Informationstechnik (BSI), Germany’s national agency for security in information technology.

OSCI was developed separately from GOVERNIKUS. It models all of the administration’s requirements and is therefore a protocol from government to government. Because it is based on open standards, it was possible for all other governments in Germany to accept this as a general communications standard.

OSCI is required by law
- to be used in civil registration exchanges (a topic not covered in this application, but it is entered in action line 3 of the eGovernment awards).
- recommended by the KoopA ADV, Germany’s only co-ordinating body representing governments from the federal, state and local government.
- Recommended by the AK Digitales Rathaus (working group on digital town halls) of the Deutsche Städtetag, the representation of all of Germany’s major cities.

Along with this support, OSCI has generated interest both at the European and even international level. It is currently considered as a basis for interconnection middleware between national administrations by the EC’s IDA programme eLINK.

It is being considered for use by local governments in Sweden, specifically by the Arena for eGovernment in Blekinge, Sweden and invited into the OASIS new Technical Committee on E-Government for further discussion.

Among the software companies who have included OSCI and/or GOVERNIKUS into their products are:
- Administration Intelligence: software for Procurement.
- All for One Systemhaus AG: software for construction permits.
- HIS GmbH Hannover: software for university administrations.
- Phinware AG: software for collections processes.
- Sisis Informationssysteme GmbH: Library Software.

Also, major software developers such as Microsoft and T-Systems have expressed interest in developing OSCI compatible products themselves, along with the open source middleware eLINK of the EC IDA program. This will spur the market for eGovernment solutions which governments can now adopt, instead of being tied into dependency by huge industry players such as (once again) Microsoft or SAP. OSCI compatible solutions maintain platform and application independence and allow secure and legally binding online transactions.

Last but not least, the project created new jobs in Bremen. The company Bremen Online Services now employs some 50 personnel, most of whom are experts in the field of eCommerce who have relocated to Bremen in order to work in this new area. Inside the administration, whilst overall staff is being reduced, the
Lessons and conclusions

In order to build a common platform for eGovernment transactions, the architecture chosen by the Bremen Online Services project has proved to be successful. The common intermediary, GOVERNIKUS, has provided the necessary cross-cutting functions of transport, signature verification and payment. New applications can be added without the service providers having to worry about these issues, they can use the standard OSCI-API GOVERNIKUS supplies. Projects in the field of eProcurement, where GOVERNIKUS was integrated into existing software, Vergabe@Work by the Bavarian start-up Administration Intelligence (see www.ai-ag.de) show that software developers save at least 20% of their investments by using OSCI. This also serves as a reason why agencies from all German government levels are using GOVERNIKUS today and many more are considering it. From the start much attention was given to the question why it was necessary to use XML and SOAP and why an intermediary is needed. Many governments believed that eGovernment could be realized solely via eMail. However, as the development of Bremen Online Services showed, it has been far more difficult to integrate electronic signatures in SMTP messages. In addition, it is not possible to automatically parse eMail as well as XML documents. This seriously limits the integration in back-office systems. Also, the OSCI architecture ensures guaranteed delivery of the message, unlike eMail. This is a prerequisite of legally binding eGovernment services. In a recent report, the working group on eGovernment of Germany’s Deutsche Städtetag supported this development by recommending that it is the easiest way for German governments to comply with the new administrative procedure acts, which allows the use of electronic signatures, by offering online services via intermediaries such as GOVERNIKUS rather than handling signed eMails. An important lesson learned was that government requires its own online transaction platform. Initially the project believed it would be able to adapt online banking software for its own purposes. In 1999, it partnered with the then market leader of online banking software. However it soon became apparent that the banking software wouldn’t be able to comply with the requirements of the administration codified in OSCI. The major difference is that while in online banking one also needs to integrate several back-office systems, in eGovernment one needs to ensure the privacy of the data in each individual message. Combining this with the advantages of a common platform can only be done by using the OSCI principle of a double envelope. In his last report from April 2003, the independent contractor hired by the IDA eLINK group asserted that these are important features to be used in the European context as well. When Bremen online services started, most of its applications were either built as JAVA applications or integrated in existing software. This allows the creation of rich XML-messages, which can be processed by back-office systems. Interestingly, many partners have asked Bremen Online Services to find a solution for a different approach to deal with online forms. Not being able to open up their mainframe system, their interest lies exclusively in eliminating paper mail. Receiving electronic forms in PDF format is already considered a big help, even though data cannot be read automatically from them. For that reason, Bremen online services has built plug-ins for PDF, which allows users to sign these forms as well. These products are online. The same technology is used to sign MS Office documents. This functionality was presented as a pilot at Cebit 2003. Thus, at the moment, the project is supporting the signing and encryption of very different electronic formats. A further success factor was that the project not only focussed on proprietary solutions in Bremen, but involved major stakeholders from other levels of government as well. Their input is sought in the standardisation of OSCI. This protocol not only models the transport functions, but describes data structures and processes with XML schema. In the areas of court matters, construction and civil registration there are already specific groups who are officially backed by their respective ministries responsible for codifying OSCI-messages. They are called XJustiz, XBau and XMeld. Xjustiz and Xmeld are already codified for mandatory usage in various forms. Despite these successes, not all of Germany’s eGovernment services are built while using OSCI. For example, several tax related matters are dealt with through the ELSTER project, which is not OSCI-compatible yet. Also, the federal government’s eProcurement project “eVergabe” has not been implemented according to OSCI. Both of these projects however communicate with the OSCI co-ordination office and principally support the idea. They had to pursue proprietary solutions sold to them by their respective vendors. This is to be expected in a country as large as Germany, where the federal structure works in favour of separate and multiple solutions. The hope is that eventually over time the solutions will converge on common standards. It will require more competition in the market for eGovernment infrastructure. GOVERNIKUS will then have to survive in a market populated by heavyweights such as Microsoft or SAP. We are sure that it will do so by maintaining the edge in its innovativeness in using open standards such as SOAP (Web-Services) and electronic signatures.
The case of Bremen online services has been very instructive in the debate surrounding the need for and use of electronic signatures, especially regarding the required level of security. As was its mission, the project included the highest level of electronic signatures from the outset. As these are still quite expensive (about 50 EUR in operating costs per year), the question whether all eGovernment applications really require these services was immediately discussed. Having experienced the development in Bremen several things became apparent:

- there will be many applications which do not need the highest (e.g. qualitative) level of electronic signatures, at least not at the moment. However, it is cost-efficient to process these services through the same platform, because functions such as encryption and XML representation are still needed.

- there will be a definitive need for use of qualitative electronic signatures, especially if one offers applications for the prime target groups such as intermediaries and business. The court related matters of Bremen online services are one example. Thus, it is important to integrate this technology. As Bremen has shown, even a user base which seems to be small in absolute numbers already allows significant savings both for users and the administration.

The case has already put much effort into creating a cross industry business case for distributing electronic signatures. One of its most important early goals was to include the electronic signature on Germany's widely used banking cards. However, the banking industry has been slow to adopt this. Several banks are offering their own electronic signature, which tends to be on the advanced, but not qualified, level of security, whilst GOVERNIKUS can process these signatures respectively (see Technical Annex.pdf). This situation is unfortunate for the service providers in government who are required by law to use qualified electronic signatures.

Intermediaries are prime target groups for pan-European services as well. One of the most important lessons of Bremen online services is that the most important eGovernment applications are targeted at intermediaries. Professional users such as lawyers, tax consultants, architects and car dealerships who have made it their business to interact with government are using the Bremen eGovernment services the most. As detailed in the previous section, significant savings and major benefits of use are achieved.

While Bremen online services offers the same amount of services to private services, all of these services combined are used only 200 times a month. In relative terms this is quite a high number considering that most governments do not accept electronic signatures at all at the moment; but the calculated savings for these amounts to only 16,800 EUR per year and that is for all of the applications. Of course, offering services to the general public remains a high priority on the political agenda, especially since the service quality of government is a key factor in the eAptitude of the citizenry. Governments need to be aware though that there is probably a price to be paid for this service. What is helpful then is to reduce the price by offering services to the citizens with the same technology that is already used for the intermediaries. Thus, the additional cost for each new service for citizens will be significantly lower. When planning for Pan European eServices such as customs, procurement, labour-related services, this model of actual use and need will repeat itself. Thus, it is recommended that pan European eGovernment services for intermediaries (professional users) should be built first. In the meantime, Bremen's online services are available to everyone in the Member States and the Candidate Countries. It is now possible for every business in the EU to query the city's register of companies, to order collection of outstanding liabilities and it will quickly be possible to bid on public tenders via the Internet. However, the primary language is still German. Efforts to translate the service into English and Turkish (the language of the largest group of immigrants in Bremen) are underway. Critically self assessed, it remains difficult for an administration to implement foreign languages (as the official state language is German only) and consequently appropriate language skills are lacking. In this area, help from EU programs such as IDA is much needed.

An instrumental driver of the project was the public private partnership. It seems that eGovernment can only be implemented if the public and the private sector work closely together. Only through the know-how provided by the city administration was Bremen online services able to produce services of high value to the end-users and administrations. All the requirements were formulated by public employees, but only with the management and goal orientation of a company with the need to work for profit in the market was it possible to achieve the specific results as fast as Bremen did. The software development necessary for OSCI required skills in XML and web services which could only be developed by a private company, using the private sector’s unique incentives and flexibility to hire appropriate staff. Also, the inclusion of private industry and partners has guided the product development and forces the company to market its products
and solutions to many more governments than just Bremen. From this other business the Free Hanseatic City of Bremen profits in return, not only as the major stakeholder of the company, but also as the prime customer of Bremen online services at the moment. One problematic aspect of the public private partnership though is the involvement of smaller software companies. They typically cannot afford the long term investment strategy displayed by the bigger partners. Two companies who were included in the initial consortium dropped out after they were not awarded the expected contracts. However, their place was taken by other companies very rapidly. Still, as eGovernment yields more mid-term than short-term profits, the engagement of the smaller companies, whose know how tends to be very valuable since it is typically very up to date with the latest technology, is a serious issue. A more successful solution than to integrate them as capital providers is to launch well planned joint projects. Many of the companies listed in the previous sections are medium sized businesses, who along with Bremen online services are developing a new market of web based eGovernment services.

Cross state, cross national and European networking:

- All of Bremen’s activities were never solely focussed on finding solutions for Bremen. By working on OSCI and with the other MEDIA@Komm-partners, it has worked hard to achieve the transferability of its solutions to other governments. This strategy has turned out to be successful, as numerous implementations of OSCI using GOVERNIKUS in Germany and the more and more widespread interest in the solution at a European level show.

Visibility:

- Another success has been the high priority given to the project by the political leadership of Bremen, both in the Senate (the government) and the Bürgerschaft (the parliament). In return politicians in Bremen have profited from the widespread attention given to Bremen online services and its eGovernment solutions by national and international conferences, rankings and awards. As a result, Bremen has become a Beacon for eGovernment activities involving joint eGovernment development between federal and local government.

- As other states are implementing the software solution for collection of outstanding debts and common projects are implemented in the area of student grants, Bremen also represents German eGovernment activities in international venues, some of which are: EIPA’s conference on eGovernment in Maastricht 2001, the first ministerial eGovernment conference in Brussels in 2001, IDA’s conference on pan European eGovernment in Brussels 2002, the northern eDimensions eGovernment Conference in Vilnius 2003, as well as appearances on the federal government’s Cebit Stands in 2001, 2002 and 2003. Bremen is now recognized as one of the leading examples of eGovernment users in Europe, as recent evaluations by the Arena for E-Government in Blekinge, Sweden and the Northern Ireland Review of Public Administration have shown. This is the basis on which Bremen Online Services will build its future.

References and links

http://www.bremen.de/onlinedienste

cf. also the direct links in section B.4

PLEASE NOTE: As all of these applications are fully operational (the only pilot status is in the area of public tenders and construction, who are scheduled to go live in May 2003), please indicate that you are just testing by writing your name as "Mustermann" or "Test". Keep also in mind that you need to install JAVA Web-Start (which you may do by clicking on on http://www.bremen.de/onlinedienste/service/kap01_3.html ). You will also need a card reader and an electronic signature. (The latter can be provided through bos “ please call +49 800 BOS-BREMEN or 49 800 267 273636).

Also note that the linked pages give indications if "keine Signatur" (no signature) or "qualifizierte Signatur" (qualified signature) is necessary. In several cases, multiple applications are accessible given from the link below.

ENGLISH explanations are at

www.bremen-government-service.de as well.

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