Special citizens web portal with standard DB-services (Estonia)

Secure and comprehensive eGovernment service ensures high quality interactions with civil servants and the public

Executive summary of the case:

Abstract
Special citizen's web portal with standard DB-services.

The objective of this project is to ensure the availability of a web-based service for citizens and government staff, to enable them to access one hundred government databases and registers. Included in these are ten large registers that have thousands of local interactions a day.

The set of standard services available includes typical queries, such as:
- "give me my data" from the population register
- "give me my data" from the motor vehicles register

All services available through the citizen's portal have a common user interface, which is not dependent on a database management system for managing the back office. A standard authentication system for all citizens has been developed as well.

As an additional option for organisations which have data security problems, a special standard Mini InfoSystem Portal (MISP) which is very similar to the citizen's portal has been developed. MISP was designed primarily for civil servants to use in their offices and includes one additional function, the authorization of users. It is planned to develop a similar portal and set of standard services for private companies as well.

Case description:

Background
Estonia has similarly to other European countries a Personal Data Protection Act (enforced on 19.07.1996). According to this act (§10) every citizen has the right to know which data about him/her are stored in different governmental databases. For realising this right an ICT environment with a special citizen's web portal with standard DB-services (case) has been developed. The project for developing these services is called the X-road Project. The set of standard services includes typical queries, such as "give me my data from the population register" or "give me my data from the motor vehicles register". All services for the citizen portal have a similar user interface, which does not depend on the database management system for managing a concrete database in the back office. A standard authentication service for all citizens has been developed as well. There exist two possibilities for authentication:

- using Estonian citizen ID-cards or
- the authentication service of Estonia's commercial banks.

Today nearly 34% (475,000 people) of the Estonian population (1.4 million) have an ID-card and 40% have Internet service agreements with commercial banks and special authentication PIN-code cards. The special citizen's web portal and the set of standard services have another copy of this environment under the name of MISP-portal.
MISP has been developed for civil servants to use at their workplaces. This modification includes one more function, the authorization of users. It means that every civil servant will have the right to read only such data from databases, which he/she needs, according to the law, for solving everyday matters. The set of standard services of this portal is larger than the set of services of the citizen’s web portal and new services are added every month. It is planned to develop such a portal and a set of standard services for private companies as well [1-7].

Objectives

The specific objectives of the case is to guarantee a web-based service for the citizens (and governmental staff) to access nearly one hundred governmental databases and registers, which have been registered in the Centre of Registers by the Estonian Informatics Centre. Approximately ten of them are large registers and have thousands of local interactions per day. The processors of the large registers started to develop web services for citizens but the results of these first projects were very different. Every similar service has a different user interface, different forms of agreement between the database user and the processor, different authentication services, etc. All these problems have encouraged the project to develop the case.

In the short term we have developed a web-portal for citizens which has been functioning for over a year. In the long term we have planned to move this service technology within the next two years to the desktop computer of every civil servant who uses data from databases in everyday work. Several services for civil servants are already available. The next group of users who will join our services are employees of private companies (for example commercial banks, phone companies, etc.). The realisation of the case supports the main idea of the information society that the e-services belong to all members of the society.

In the context of the European Community the first objective is to realise the free movement of information across national borders, which guarantees the free movement of goods, people, etc. Access to this information is strictly realised according to the Personal Data Protection Act and principles of data security. A good example here is the possibility to link our services with the Schengen Information System, EUROCAR, etc.

Resources

The amount of financial resources used for this project is approximately one million euros. The project initiator is the State Information Systems Department of the Ministry of Economic Affairs and Communications in cooperation with the Estonian Informatics Centre.

Two private companies (Cell Network Ltd. as the main contractor and Cybernetica Ltd.) have developed the case within two years and have used subcontract work from the following companies: Datel Ltd., Reaalsüsteemid Ltd., Andmevara Ltd., etc.

The project realisation schedule was planned in different steps and iterations. The first steps included the deployment of the case environment for citizens and civil servants. These first step solutions for citizens have been running for over a year. The next steps will include the deployment activities for business companies. The main idea of the project was its realization with open standards and with internationally accepted standard protocols. The case uses two network protocols, the XML RPC (in the Alfa version of the case) and the SOAP (in the final version of the case). The digital documents and queries use the XML standard facilities; the monitoring system uses the SNMP protocol, etc. The number of potential users depends on the take up among Estonian inhabitants which number 1.4 million. The number of interactions per day is not more than 25,000 yet.

The testing of the central servers of the project showed that the servers enable 100 interactions per second and have the possible scalability of up to 1,000 interactions per second. The latter case is not probable in Estonia. The case is using the Estonian Public Key Infrastructure because the authentication service of the portal was developed so as to use the Estonian citizen ID-card for authentication. Every ID-card has the card owner's certificate. Every login to the portal checks the validity of the certificate. From the security point of view the system is very well protected. In the sense of data security the functionality of X-road is very carefully designed and developed. The security servers of databases and information systems, which are connected to the Internet, communicate over encrypted channels. All users must pass authentication and
authorisation. It is not possible for a citizen to read the data of another citizen or that a civil servant could read data, which is not related to his/her everyday work.

**Activities**

The case tasks and activities are shown in the functional scheme of the environment. Figure 1. The functional scheme of X-Road (Appendix A).

The system can be used in different ways (see Figure 1). At first every citizen can use the system via the citizen portal. To use the portal every user must pass the authentication service. There are two different possibilities to do that:

- First, every citizen can use the Estonian citizen's ID-card or the Internet bank authentication service of Estonian commercial banks (provided that he/she is a client there).

- Civil servants use X-road information systems from within their organisations.

As an additional option for organisations, which have data security problems, a special standard Mini-InfoSystem-Portal (shortly MISP; very similar to the citizen portal) has been developed. Agencies can use the MISP as an ASP service.

The users and partners of the X-road project will presumably include a lot of business organisations. The most interested business partners of the X-road project today are Estonian commercial banks and telephone companies. By joining the X-road the role of databases will basically stay the same but the productivity of services will rise because of the increasing number of solved queries. The database (back office) itself runs in the standard way: it organises data manipulation, develops the technology, etc. As to data security the functionality of X-road is very carefully designed and developed. The security servers of databases and information systems, which are connected to the Internet, communicate over encrypted channels. All users must pass the authentication and authorisation. It is not possible that a citizen could read the data of another citizen or that a civil servant could read data not related to his/her everyday work.

The number of components, shown in the functional scheme, which can be connected to the data exchange layer of X-road, is not limited. We expect that over 100 databases, 1,000 different information systems and MISP, and nearly one million citizens of Estonia will be included in the X-road. Today we have nearly half a million Internet-bank users and over 475,000 ID-cards have been issued (21 April 2004).

The description of how the case works from the user's point of view is given below.

- The first screen picture describes how to choose the authentication service provider.

- Figure 2. The authentication window (Appendix A). This authentication session will not appear if the user has logged on to a browser program and the user's ID-card is located in his/her computer card reader. After successful authentication the case environment is ready to reply to queries from different databases, such as the Traffic Register (in Estonian Liiklusregister), Population Register (Rahvastikuregister), Commercial Register (Äriregister), etc.

- Figure 3. The list of standard services (Appendix A). The following picture shows a reply from the Motor Vehicles Register of the Traffic register. From the technological viewpoint the key element for searching data in databases is the personal identification code. Figure 4. The data from Motor Vehicles register (Appendix A)

**Output and Results**

The X-road project solutions include a number of real and virtual results:

- Software components, which can be used for solving data manipulation and query operations by using data of different databases and information systems. It means dialogue operations between a web-browser and a user and batch processing between application programs and databases.

- The authentication and authorisation for all users has been realised. This is the foundation for the development of services.
- Set of standard services for citizens (developed in cooperation with other projects like e-citizen, digital signature etc.). Since the end of January 2002 every citizens can view his/her personal data in all main Estonian registers and databases, using Netscape and MS Explorer Window.

- Set standard services for civil servants (nearly 260 government agencies have joined the case project so far).

- Special service centre that manages agreements, issues certificates, gives consultations, etc.

- All everyday activities of citizens involving uses of databases have changed, less paper is used and the activities are Internet-based. For the case users, the economical advantages lie in a lot of free of charge services, including:

  - Free software, which enables direct and secure usage of different databases. It means that the project results use free software or that the software licenses are paid by the Ministry of Economic Affairs and Communications.

  - The X-road service centre gives free consultations to all participating partners.

  - The X-road project is based on the Internet which in principle is a free environment.

As described above, the case cost was one million euros. At the same time different database processors and different ministries have submitted over twenty applications to the government to launch similar projects that are oriented to special needs. According to our estimations special projects cost less than one million euros, on average one third to half a million euros. Calculations show that project applications for 2001-2002 totalled 20 projects x 0.4 million = 8 million euros, whereas the present case project costs one million euros.

**Lessons and conclusions**

Lessons learned from our case are very different. Naturally, there are advantages and disadvantages.

Advantages:

- For the first time the databases are open to all citizens who are interested in knowing which of their personal data is in the databases. People have actually found a lot of errors in their data field and have started to send information to the authorised processor. We believe that no such large data improvement could be carried out in any other way.

- The case project has a lot of examples where the number of interactions performed by civil servants has risen remarkably. For example, last year the Estonian police had over 20,000 interactions with the passport register, but after providing them with the standard service ("give the passport data of person x") the number of interactions has risen to 10,000 per week.

- Another Estonian national ICT project 'the ID-card project', which uses Public Key Infrastructure (PKI) has established a new and very intensively used e-service, which tests the cooperation with other PKI projects and services.

- The case project has developed very well protected data traffic over the Internet. This traffic has gathered a set of new users from other different projects, for example document management projects (for different ministries), projects which had planned to use database services (for different organizations and offices).

- Our neighbouring countries (Latvia and Lithuania) plan to elaborate the same services for citizens and civil servants. Similar developments have been initiated in many countries. According to our information, we are forerunners of implementing these services.

- The development and results of the project have called for necessary amendments in the legislation, which are in the process of being implemented at present.

Disadvantages:
Different stakeholders, for example the project team, the ministerial officials, and civil servants that need data from databases, have got negative feedback to the effect that sometimes chief processors are not fond of the new technology and mistrust the knowledge of outside specialists. They feel that they can judge for themselves when and where to use new technology and services.

The management system of the data resources does not work well in every situation, as every database has a chief processor and an authorised processor. Sometimes it is the case that the authorised processor manages the chief processor and there exists a risk that the central developers of the X-Road have to cooperate with the chief processor, who has not got the real development results from the authorised processor at all.

Such projects that call for to the modernization of legislation should initiate technological development activities and legislation improvement at the same time. In our case we were already a bit late to amend the legislation.

Sometimes civil servants tend to use the introduction of a new software environment only as a pretext for obtaining the newest computers.

We have tested our case in different international seminars (in Estonia, Latvia, Slovenia, Germany, USA, etc.) and have received many positive comments and remarks about the case project.

Our future plans include the penetration of our environment in various other fields, such as data manipulation at the local government level, using the protected data traffic channels of the case project for document management systems, etc.

References and links
x-tee.riik.ee
https://portaal.riik.ee/x/kodanik/

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