e-Residency in e-Estonia

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ABSTRACT

In this paper, we give a brief overview of the basics of Estonian e-Governance, Digital Agenda 2020, and the newest approach – e-Residency.

General Terms

Management, Measurement, Documentation, Performance, Economics, Reliability, Experimentation, Security, Human Factors, Standardization, Legal Aspects.

Keywords

eGovernance, eResidency, eServices, Data Exchange.

1. INTRODUCTION

In 2014, a new term was coined in the Estonian Republic – e-residency. The concept was greeted with acclaim, as it gives equal opportunities to people residing in Estonia and in other countries to make business and use e-services in a high-level electronic environment of Estonia.

Estonia has a state information system the architecture of which is a precondition for introducing and implementing such a novel idea. Estonian state information system is designed to be flexible, secure, and to serve the purpose of collecting data only once and making it available for re-use. Thus, it allows designing the most modern e-services and making information management at the state level a success.

2. E-ESTONIA

The development of e-governance and e-services in Estonia is remarkable. Estonia has a unique system for the use of electronic ID and, therefore, it is possible to enjoy almost paper-free administration processes. Both public and private sector solutions have won international attention and provided the basis for the image of Estonia as an excellent e-state.

Development of the state information system has been the biggest strength of the current national ICT policy. The ground rules of the Estonian information policy – dispersed service-based architecture, suitable security of data and data exchange, online features, focus on e-services and the use of strong authentication measures – have been observed to achieve this result.

State information system services provide the basis for development of modern public services and successful information management at the state level. These services include the data exchange layer X-road, public key infrastructure and e-ID, the administrative system of state information system (RIHA), the document exchange centre, and the information gateway eesti.ee.
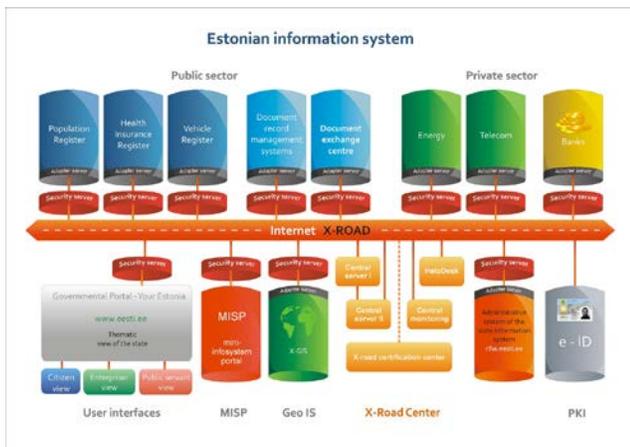
3. X-ROAD

The X-Road is often called the backbone of Estonian e-Governance and public services. The X-Road, operating since 2001, is a technical and organizational environment which enables secure Internet-based data exchange between the state's information systems. Therefore, there is no need to collect the same data several times, but it can be reused in a secure environment by various authorities. The X-Road not only allows exchange data, but also people to access to the data maintained and processed in state databases.

Public and private sector enterprises and institutions can connect their information system with the X-Road. This enables them to use X-Road services in their own electronic environment or offer their e-services via the X-Road. Joining the X-Road enables institutions to save resources, since the data exchange layer already exists. This makes data exchange more effective both inside the state institutions as well as regarding the communication between a citizen and the state.

3.1 X-Road and Services

X-Road provides a good solution for service design. Borders between different authorities are not a problem anymore. It is possible to exchange information needed for providing services. For example, if a business needs a certain business license then they do not have to gather data from different authorities (Tax and Customs Board, Local authorities etc.) and submit different documents providing evidence. X-Road gathers data in a matter of a second. Also, it does not matter any longer which authority provides a service. This means that it is possible to provide services in places where the client really is (in internet, in that authority service bureau, where most of the clients go). Thus, X-Road gives Estonian authorities freedom to customize services for clients. The same principle applies to every information system connected to the X-Road.

Figure 1. X-Road as the backbone of public services

In Estonia, pre-filled application forms, tax declarations, etc. that citizens and entrepreneurs can use in electronic self-service portals is a common practice. In addition, the X-Road enables to introduce proactive, "invisible" services. These are services where decisions are made without any administrative burden for the end-users of service – they do not need to submit any applications or additional information, but, at most, to confirm their acceptance of the service and the data. An example of a possible proactive service was given at the Athens meeting of the DLM Forum in June, 2014[1].

3.2 X-Road, Transparency and Security

In case of citizens, the X-Road enables using the services of the X-Road via different portals. That includes making enquiries from state databases and to control the information related to the person himself/herself. For example, every citizen can use X-Road to submit inquiries to the Population Register about their personal data or inquiries to the vehicle database of the Traffic Register regarding their car. In order to use the services, the end users must first authenticate themselves with an ID card or via an Internet bank. The entrepreneur's right of representation is authenticated on the basis of the data of the Commercial Register.

All of the inquiries made through X-Road possess probative value, i.e. have a legal effect. This means that inquiries made through X-Road can later be identified along with the person who submitted the inquiry and it is possible to establish that the inquiry has been logged correctly.

The security of X-Road is at the highest, third level of the Estonian three-level baseline security system (ISKE). The connection is created between two parties through standard security servers in order to ensure the safety of the data exchange. In the data exchange, data is encrypted, and a two-step authorisation is used – an agency is authorised in the security server of X-Road, and a user is authorised in the information system of the agency.

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[1] 'How to Move Forward without Having to Move Back' by Janek Rozov - http://www.dlmforum.eu/files/proocedings/2014%20Athens/Presentations/11.06.2014/Session%20IV/Janek%20Rozov.pdf

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3.3 X-Road and Public Sector Efficiency

Officials can use the X-Road services intended for them (for instance document exchange centre) via information systems of their own institutions. This facilitates the officials' work, since it avoids the labour-consuming processing of paper documents, large-scale data entry and data verification. Communication with other officials, entrepreneurs and citizens is faster, more accurate, and secure.

X-Road data transfer capabilities are not limited only to structured, machine-readable data. Unstructured electronic records (in the pdf-, word-, and other such formats) are also exchanged in the secure environment of X-Road. For that purpose, a central component Document Exchange Centre (DEC) was created in 2006. In 2014, more than 30 000 electronic records are exchanged monthly. In addition to security, DEC has other merits. Records are transferred in SOAP envelopes with XML containers ("envelopes" of records) each of which, in turn, contains a record and an extract of its metadata. The transfer of a standard metadata set facilitates the capturing and registration of the records in the recipient's system, since the necessary metadata can be populated automatically. Via DEC, electronic records and metadata are also transferred to the National Archives for permanent preservation.

The administration system of state information system (RIHA) is the main asset for information management at the state level. RIHA is a complete and detailed catalogue of the state information system. RIHA administers information systems, services, and classifications of the state, as well as semantic and XML assets. For the most part, RIHA's data is available to everyone, but can be amended only by the organisations registered in RIHA; each organisation is individually responsible for the correctness of the data they have entered.

3.4 X-Road and Cross-Border Connections

If we go into wider scales then borders between countries are not obstacles anymore. It is possible also to exchange information between different countries. Estonia and Finland have already started cooperation in that area. For example, confidential tax information between Finland and Estonian tax administrations is already changed. At the moment there are four services, where data is exchanged: Payments made to employees, withheld and calculated taxes; Employers of a natural person, payments and taxes subject to social tax; Control of tax arrears' absence; Legal person's data on VAT. Other opportunities arising from data exchange are being considered, e.g. faster ways of exchanging data necessary for payments of social welfare benefits (pensions, child allowances, etc.).

In cross-border data exchange, technology has not proved to be an obstacle. Problems which need to be solved for future are usually in other areas than technology. Usually, the obstacles come from legislation (for example the right to ask information from another country) and bureaucracy. That means there is the need to cooperate closely in these areas too, so that to fully exploit the whole potential of X-Road.

For clients it does not matter in which country they are. X-Road helps to exchange information between countries and also to design cross-border services. That would be a very big leap toward EU Single Digital Market. X-Road enables us to provide services based on client life or business event. So if there is a life event (for example getting married) in a client's life, different services of different countries could be combined or united so that clients would have to have minimal communication with public sectors.

4. ESTONIAN DIGITAL AGENDA 2020

In Estonia, there is a common understanding that ICT is an important tool for achieving economic growth and improved quality of life. In November 2013, the Government approved the Digital Agenda 2020 for Estonia. This is an ambitious strategy that will serve as a basis for various sectoral strategies as well as for development plans that all the public sector organizations have to follow.

The digital agenda sets out the development activities to be implemented by the end of 2020:

- The construction of ultra fast basic Internet network will be completed – at the moment, one third of the planned 6,500 km basic network is finished. By 2020, the basic network will be finished and everyone in Estonia will be able to use fast Internet.
- The Nordic E-governance Basic Infrastructures Innovation Institute will be established at the initiative of Estonia. This is intended to be an international development centre, aiming at joint development of X-Road, digital signature and other components of the basic infrastructure.
- By 2020, 20% of the employment age population of the European Union will be using digital **signature** for faster business and handling of personal issues. The implementation of digital signature in the European Union will become one of the main goals of the external activities of Estonia and, where appropriate, also the issue to be pursued by Estonia in 2018, while holding the Presidency of the Council of the European Union.
- Coping with increasing data volumes and loss of privacy resulting from extensive interbase cross-usage of data will be made easier by taking control over the data usage. Conditions will be established to allow people to be always aware of who, when and for what purpose their date is being used and to marshal the use.
- To avoid getting stuck in old technologies, a reform will be introduced to reform the public e-services and support IT solutions. Estonia's public e-services must be modernised and meet uniform quality requirements. In addition, the "legacy" principle will be adopted, which means that in public sector, IT solutions of material importance must never be older than 13 years.
- The state owns huge quantities of data; however, these are not used enough to adopt better political decisions and to offer better services. Over the years to come, the public sector's capacity to absorb analytical solutions will be considerably improved.
- Estonia will start to offer its secure and convenient services to the citizens of other countries. **Virtual or e-residency will be launched** – Estonia will start to issue electronic identity,

in the form of digital ID, to non-residents; the services will be aiming for a position similar to that held by Swiss banking.
- The "Data Embassy" concept will be implemented. This means secure storage of digital copies of registration information and records important for the state in virtual embassies that are located in other countries. As a result of the project, Estonia will be able to ensure the running of the country, using "cloud technology" and regardless of whether Estonia's territorial integrity can be ensured or not; this concept is also valuable in case of many other hazards.
- Estonia will strengthen its position as the think tank of information society to continue the dissemination of e-governance experiences and stand for the freedom of the Internet and the protection of privacy. A global information society think tank will be established in Estonia to achieve this goal.
- The existence of a competent and innovative provider or competitive ICT sector is important for both the development of public sector IT solutions and economic development. In 2020, about 50% more people than in 2013 will be working in the ICT sector. For that purpose, we will contribute to enhancing the popularity of IT specialities within the framework of a life-long learning programme and improving the quality of the doctoral degree studies of these specialities.

5. E-RESIDENCY

The Republic of Estonia is the first country to offer e-residency. On 21 October, 2014 the Estonian Parliament passed a bill that sets out the legal basis for the issuance of a digital identity to persons who are not Estonian citizens or residents of Estonia. The bill will enter into force on 1 December, 2014. People from all over the world will now have an opportunity to get a digital identity provided by the Estonian government – in order to get secure access to world-leading digital services from wherever you might be.

As it was described above, Estonian citizens and residents enjoy the merits a modern and secure digital environment offers. For residents of other countries, there have been no similar opportunities. If Estonian businesses or public sector organizations develop cooperation with non-residents, they have to use paper-based parallel processes which are time-consuming and costly. It has no economic justification that the availability of Estonian e-Governance and other electronic services depends on the residency or citizenship of a person. Nor does it facilitate the development of Estonia and the single market of the EU.

5.1 Authors of the Idea of e-Residency

The concept of e-Residency was proposed and developed by Mr Taavi Kotka (CIO of the Estonian Government, the Deputy Secretary General for Communication and State Information Systems with the Ministry of Economic Affairs and Communications), Mr Siim Sikkut (National ICT Policy Adviser with the Government Office), and Ms Ruth Annus (then Head of Migration and Border Policy with the Ministry of Interior).

The concept was approved by the Government on April 24, 2014, and awarded as the best development idea by *Arengufond* on June 12, 2014. *Arengufond* is a public institution subject to the

Parliament whose aim is to contribute to the economic development of Estonia.

In July 2014, Taavi Kotka received the European ICT award "European CIO of the year" at the ICT Spring Conference in Luxembourg. Two of the main reasons for awarding him were his global strategies and technical choices.

5.2 e-Residency of Estonia – Who and What for

E-residency gives to foreigners residing abroad similar opportunities as to the people living in Estonia. At any place in the world, a person with an Estonian ID card can:

- sign and encrypt documents within minutes;
- establish a company within an hour;
- make bank transfers within seconds;
- participate actively in the management of a company registered in Estonia;
- submit tax returns in Estonia with just a few mouse clicks.

E-residency is especially useful for entrepreneurs and others who already have some relationship to Estonia: who do business, work, study or visit here but have not become a resident. However, e-residency is also launched as a platform to offer digital services to a global audience with no prior Estonian affiliation – for anybody who wants to run their business and life in the most convenient, digital way. Estonia is planning to keep adding new useful services from early 2015 onwards.

The digital ID of an e-resident will enable a foreigner to perform transactions online regardless of the location. People from outside the EU can thus create a central base for themselves for the transaction of business in the EU – establish a business in Estonia and participate actively in its management while residing in Brazil or Australia, for instance.

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In Estonia, a business can be established and the bank account opened within a day. This is but one electronic service that Estonia can offer for its e-residents – not to speak about simple and fully digital tax system, flexible (digital) usage of highly qualified workforce, etc. In addition, reinvested profit is not taxed in Estonia and highly developed e-banking enables e-residents to manage their assets from the distance.

Thus, the main stakeholders of the Estonian e-residency are:

- foreign investors, and people working abroad in the companies founded by them;
- board members of companies, residing abroad;
- foreign specialists and workers of Estonian companies;
- foreign clients/partners of Estonian companies;
- foreign scientists, academics, tutors, and students;
- representatives of foreign and international organizations in the Republic of Estonia;
- family members of the aforementioned.

There are, however, other groups of people who are interested in and benefit from becoming e-residents of Estonia – former Estonian residents, people of Estonian nationality, etc.

For giving access to world's best e-services, the X-Road infrastructure is used, including the Estonian information gateway, the State Portal eesti.ee. The portal brings together many of the information systems that are in use in Estonia and provides its users with the opportunity to find the necessary information and gain access to various X-Road, register and information system services through one portal. On the opening page of the portal, a user can choose whether to use e-services, read materials on various topics, or search for contact data of agencies. After choosing e-services or topics, a choice can be made whether to search further in the area designed for citizens or entrepreneurs and, depending on the user's choice, the list of services or topics intended for the role in question can be retrieved.

5.3 How to Get e-Residency of Estonia

An e-resident will be a physical person who has received the e-resident's digital identity (smart ID-card) from the Republic of Estonia. This will not entail full legal residency or citizenship or right of entry to Estonia. Instead, e-residency gives secure access to Estonia's digital services and an opportunity to give digital signatures in an electronic environment. Such digital identification and signing is legally fully equal to face-to-face identification and handwritten signatures in the European Union.

The card is not a physical ID-card or even a travel document because it has no photo on it, but it does have a microchip with security certificates. These enable the card to be used with a small piece of software installed and a reader attached via USB to a computer. It works on two-factor authentication. To get access to a service or sign digitally, one needs to enter secure PINs which only they will know.

To apply for e-residency, it is necessary to visit a Police and Border Guard office in Estonia – to submit an application and provide biometrical data (the facial image and fingerprints) for background check. The decision will be made within 2 weeks and if it is positive, the card will be issued to the applicant in-person at the Police and Border Guard office. The one-time state fee for the card is 50 €, other fees will depend on service providers – public digital services will be offered mostly free-of-charge, just like to 'real' residents. Measures are being taken to add capacity to Estonian embassies to process e-residency applications and issue cards abroad by the end of 2015 – so that it would not necessarily need to travel to Estonia.

6. ACKNOWLEDGMENTS

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