



RIIGI INFOSÜSTEEMI AMET



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X-ROAD

FORUMPA 2016

X-Road, Estonia

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The introductory material of the X-Road has been compiled with funding from the structural funds support scheme “Raising Public Awareness about the Information Society” of the European Regional Development Fund.

Myself

- ✘ **Working with information tech., systems, integration ~35 years**
- ✘ **One of the pioneers in internet, public access points, www, banner advertisement, cataloguing systems in Estonia, starting 1994**
- ✘ **Former IT Manager of Tallinn Stock Exchange and Estonian CSD, followed by consolidations with Riga, Vilnius, Helsinki (HEX) and Stockholm Exchanges (OMX, Nasdaq-OMX)**
- ✘ **State registries in area of Health, Citizenship and Migration, Border control, Visa**
- ✘ **Currently as project manager of X-road, State Information Agency (Ministry of Economy and Communication), for 3mo**

Why, how?

It's all about the money 😊

- ⌘ Good things happen under the pressure**
- ⌘ Cost of function, value we get, profit / efficiency**
- ⌘ Cost-reduction without damaging business alignment**

Country background: Estonia

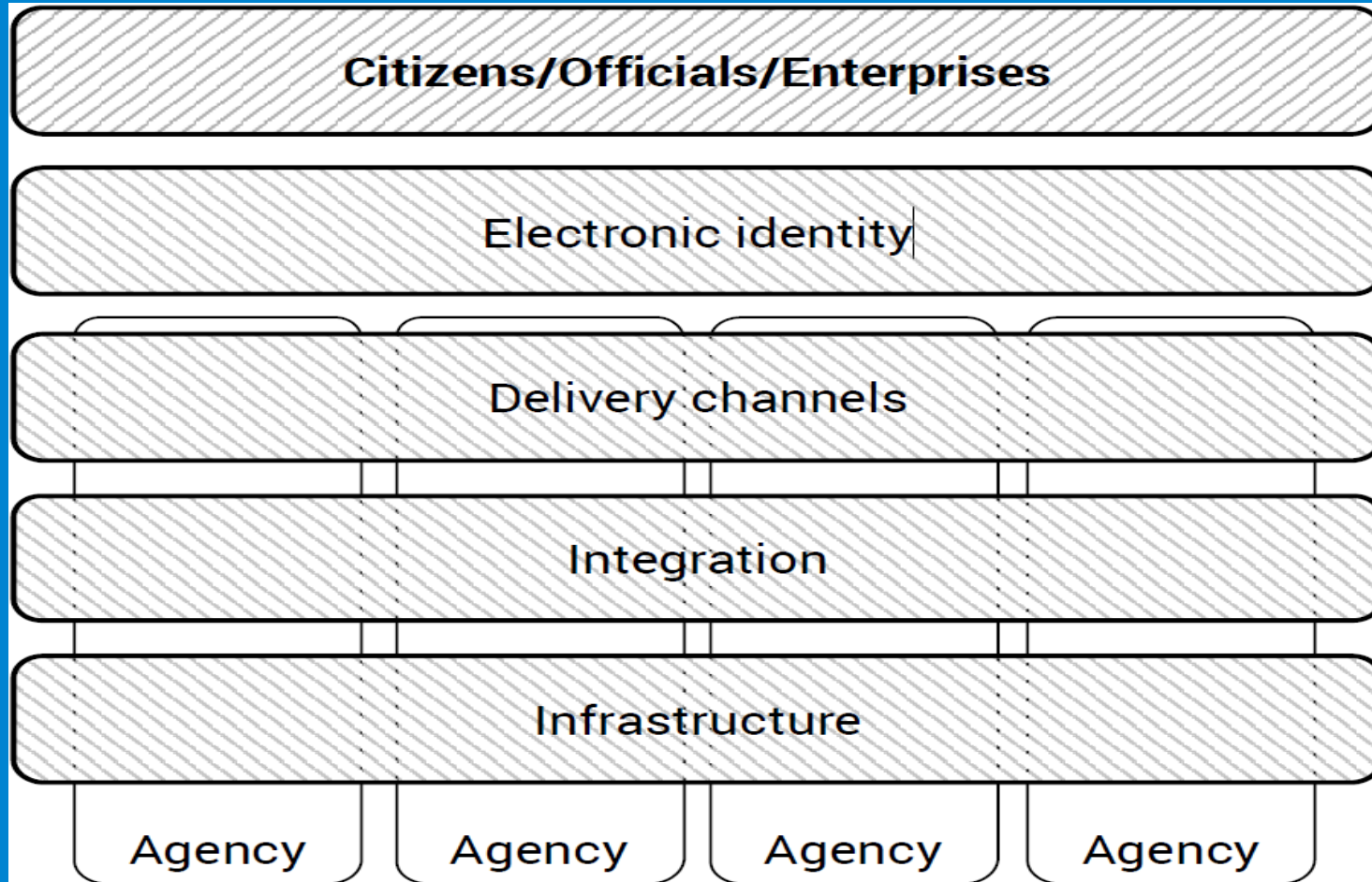
A small open economy in Northern Europe

	Population (mil, rounded to 1)	Surface (sq km thousands)	Population density (per sq.km)	PPP gross national income per capita
Estonia	1	45	28	23,280
Latvia	2	64	34	21,820
Singapore	5	0.7	7,700	71,900
Italy	61	301	201	29,721
Russian F.	144	17,098	8	22,800
United States	320	9,857	35	52,610

How to run a country with a small scattered population, tiny economy and no natural resources?

- ⌘ For the past 20 years, Estonia has chosen focusing on e-government**
- ⌘ A need to provide increasingly complex services in an increasingly complex world**
- ⌘ Impact of e-government on democracy**

Meta-architecture. Form



Denoting the main focus of the framework.

The layers used to split the underlying architecture into manageable, technologically uniform parts.

Agencies as containers for the individual information systems.

The e-governance technical architecture framework

What is it that we ended up building and using?

Estonia. The electronic identity layer

- ✘ **State-delivered, PKI based smart-card, eID, compulsory**
- ✘ **A SIM card as a secondary token, mobile-ID, optional**
- ✘ **Federated bank-based authentication schemes**
- ✘ **The card is tied to a unique ID code of a person**
- ✘ **There is little information on the card but that code, auth and sign certificates**
- ✘ **Digital signature is legally equivalent to the physical one**
- ✘ **2-3 digital signatures per capita per month**

Estonia. The delivery channels layer

- ✘ Web is the main service delivery channel for most widely used services**
- ✘ Mobile is not there yet**
- ✘ Branches are used for tailored or complex services**
- ✘ In 2016, 96% of personal tax returns were filed via a web-based portal (over 90% every year since 2008)**
- ✘ 120+ different contact points exist, centralization is low**
- ✘ Although a central service portal for citizens, eesti.ee, exists**

Estonia. The integration layer

- ✘ A distributed enterprise service bus, X-Road**
- ✘ Designed to be secure. Authentication of parties and secure transport of message/data**
- ✘ Communication happens peer to peer**
- ✘ Use of X-road is compulsory for any intraagency communication**
- ✘ A central service discovery portal exists**
- ✘ Registration of any public information system is compulsory**

Estonia. The infrastructure layer

- ✘ The infrastructure is mostly disperse**
- ✘ Albeit most gov. networks having been consolidated**
- ✘ There is a large number of tiny hosting facilities with varying levels of quality**
- ✘ There is a readiness and a plan to move towards central platform offering, state cloud**
- ✘ Most agencies use virtualization extensively**
- ✘ A common set of non-functional requirements towards new systems is in place**

X-road requirements for secure exchange of data

- ✘ All data exchange with governmental agencies must follow X-road requirements**
- ✘ Must be easily accessible by the authorities that are authorized to use it**
- ✘ Integrity of the data must be maintained; no third party should be able to make any changes to the data while it is in transit**
- ✘ Data must remain confidential during its journey; it must be protected from the eyes of unauthorised parties**

Some more additional aspects

- ✘ Estonia as country is tight into e-services, not vice versa.
- ✘ Registries have data only once, duplications avoided, even prohibited
- ✘ No single or super-database. Data is stored where it is created.
- ✘ No money for agencies who do not follow the principles
- ✘ Bases on trust, is transparent, integrity principles followed.
Continuous awareness of security aspects is important
- ✘ Source code of X-road is opensource

Opportunities

- ✘ **eIDAS Regulation ((EU) N°910/2014)**
- ✘ **International cooperation, federations (with Finland ongoing)**
- ✘ **Less dependencies from central points**
- ✘ **Usage of mobile versions in eGovernment (2016 first time tax declaration over mobile)**
- ✘ **Blockchain as enabler of trustworthy**
- ✘ **State and private clouds, data embassies**
- ✘ **Data quality aspects through monitoring and opendata**

X-road presentation

✘ Video

✘ Factsheet



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Thank you!

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Thank for translator(s)!
Thank for listeners, watchers,
participants

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