

# The all Digital Society of Estonia

Presentation for PCC Faculty and Students

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Electrical engineer, technologist

Local Estonian community leader

enter e-estonia





- Computer Lab in my high school ca 1982





# Teletype



11/12/2020



# Agenda

- Introduction
- Estonia, restoration of free society and economy
- E-society, government, services
- Challenges
- Resources
- Discussion, Q&A





## Personal background – Kalev Sepp, PhD

- Grew up in Soviet Estonia
- Conscription to Soviet Army while studying at the University
- Glasnost, Gorbachev, Singing Revolution and the fall of USSR
- Graduate studies in the US
  - University of Washington, Electrical Engineering, MSEE, PhD
- Technical career with Tektronix, now as a consultant for high-tech
- Involvement with Estonian organizations in Seattle and Portland



# Path to all digital

- Education
- Technical fields attracted good students
- Small, yet dynamic work force
- Rebuilding coincided with dot-com boom
- Adoption of state-of-the-art technology
- Acceptance of privacy and security trade-offs
- Results in computer savvy society





# Initiatives during early Independence

- Tiigrihüpe – Tiger Leap (1996 - 2000)
  - Equip and promote computer education in schools
  - Projects like BaltNet, Miksike, Külatee (Village Road)
- E-Government portal (1998), initiative “Today I Make Decisions”
- Success of companies like Kazaa, Skype
  - Bolt (Taxify), Skype, Transferwise, and Playtech
- Joining European Union, Euro zone and NATO contributed to digital advancement
- Digital ID, smart card with wide functionality





# Estonian Success

Most unicorns per capita – aiming global!



... and upcoming next



Was added  
today  
11/12/2020



# E-Government

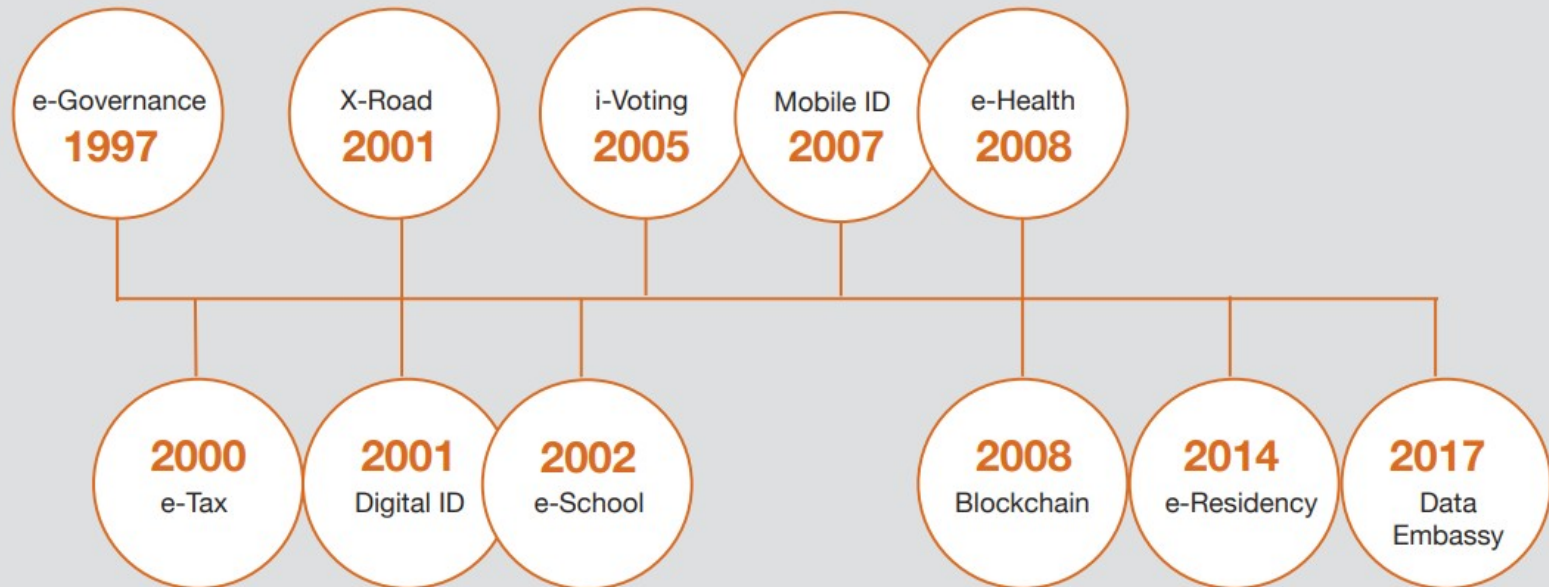
- LEGISLATIVE SUPPORT ESSENTIAL
- “Design thinking” approach
- Mandatory e-identity, ID card for every person
- i-voting
  - Fun fact: de-identification of data using CD/DVD-ROM (USB stick)
- Opening business, e-taxes, e-State Treasury, customs
  - Only buying real-estate and signing a marriage certificate must occur in person
- National Land Information System (services for public as well as other agencies)
- E-Prescriptions, e-Health
- E-residency
- Digital embassy – copy of data in another country (Luxemburg)





In a connected world, how the citizen wants to deal with government and the public sector is changing, driven by the possibilities opened up by new technology.

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# e-Residency

- Provides digital citizenship without physical presence
- Establish and manage an Estonian company online from anywhere in the world
- Apply for a business bank account and conduct secure e-banking
- Access international payment service providers
- Digitally sign and transmit documents
- Declare Estonian taxes online





# Challenges

- Security and privacy – public trust
  - Issues with ID-card manufacturing
- Digital and Age divide
  - Access to high-speed internet in rural areas
  - Computer literacy of older generation
- Money laundering, KYC and other legal issues
  - Privacy laws of Europe and other countries
- Computer viruses, ransomware, phishing





# Cybersecurity

- Estonia got early exposure in 2007
  - Misinformation campaign from Russia
  - Massive cyberattack on Estonian Internet infrastructure
- Cybersecurity is essential to the stability of e-governance and all services
- Estonia hosts the NATO Cooperative Cyber Defence Centre of Excellence (NATO CCD COE)
- Fun fact: Malwarebytes virus prevention software has a development center in Estonia





# X-Road – backbone of E-Estonia

- 2500+ services provided by the government entities
- Exported to Nordic countries and Africa
- Cooperation in Europe
- Nortal in US (Seattle)

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# X-Road → NIIS

Maintained by:  
Nordic Institute for  
Interoperability  
Solutions (NIIS)



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Image 1. X-Road development and testing tools



# News as we speak ...

- Article about avoiding authentication via FB or GOOG
  - Lack of strong privacy laws in US
- Attempt to attract British businesses to Estonia – to maintain their access to European markets
- Statistics department World Record – 70% census data form e-government databases
- Statistics department has more data than government can handle!
- Digital Government Index – Estonia has fallen below average of OECD countries
- Pipedrive majority ownership sold – became 5<sup>th</sup> unicorn (Billion \$)



# Resources

- **Living in a digital society: e-Estonia**
  - [https://www.youtube.com/watch?v=xBQQ1dQ\\_2Ow](https://www.youtube.com/watch?v=xBQQ1dQ_2Ow)
- **Kalle Palling TEDx Talk (2016) – Country as a service**
  - <https://www.youtube.com/watch?v=W5rAc5B3Ggg>
- **X-Road Academy** – technical session, how to set up software on Ubuntu Linux, containers and servers
  - <https://www.youtube.com/watch?v=RV-Dq69yFVE>
- **Estonian voting Harvard**
  - [https://www.youtube.com/watch?v=QGwH0Js\\_BfU](https://www.youtube.com/watch?v=QGwH0Js_BfU)
- **Recent article on Estonian voting and application to US process**
  - <https://www.marketplace.org/2020/11/02/estonia-proves-trust-is-at-the-heart-of-online-voting/>
- **Estonian Education**
  - <https://www.theguardian.com/world/2020/oct/30/lessons-from-estonia-why-excel-digital-learning-during-covid>
- **Recent initiative of Estonian ICT Ministry**
  - <https://www.mkm.ee/en/news/itu-estonia-germany-and-dial-collaborate-efforts-accelerate-digital-transformation-and>
- **An Exploratory Study of Innovation Adoption in Estonia**
  - <https://pdfs.semanticscholar.org/8d84/6c1db3d5e59f2af03f30485e8d073a00a41e.pdf>
- **OECD Digital Government Index**
  - <http://www.oecd.org/gov/digital-government-index-4de9f5bb-en.htm>



# Conclusions

- E-Government successful with
  - Support of the society
  - Universal secure e-identity
  - Legislative support
  - Investment in education
- Challenges must be actively monitored and addressed
- Small country can effectively contribute to the betterment of society
- Q&A