How to deliver the promise of eHealth – “The Estonian Way”

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Digital health in Estonia – now and tomorrow

12.01.2018 | Dublin

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Estonia is a digital society

- 99% state services are online
- Digital signature saves 5 days a year
- 100% providers are digital
- 100% of citizens have nationwide digital health record
- 99% of prescriptions are digital
- ...

A stack of paper saved each month
300 meters
Estonia is a place for independent minds.

celebrate our birthday →
a modest country that extends beyond its borders

- population: 1.3 million
- area: 45,339 km²
- currency: Euro
- member of: EU, NATO, WTO, OECD, DIGITAL 5
- ICT sector: 7% of GDP
our highest ratings

1. OECD tax competitiveness
2. WORLD ECONOMIC FORUM Entrepreneurship
3. EUROPEAN COMMISSION EU Digital Economy and Society Index, Public Services
4. BARCLAYS 2016 Digital Development Index
5. WORLD BANK Global Ease of Doing Business ranking
6. FREEDOM HOUSE Internet Freedom
7. GLOBAL IT REPORT Mobile Network Coverage
8. FREEDOM HOUSE Index of Economic Freedom
essential
Best secret weapons.

Internet is a social right
every Estonian resident has an electronic ID
99% of services are online
Estonians trust e-solutions
E-services in Estonia

- Internet banking (99%)
- E-school
- E-Business registry
- E-schoo
- ID-ticket
- E-ID
- E-state service portal
- E-voting (30%)
- E-business registry
- E-health record (99% population)
- E-land Registry
- E-police
- M-parking
- E-voting (30%)
- E-taxes and customs service (97% income tax)
- E-self-services
- E-prescription (99% population)
- E-residency (135 countries)
- E-court & justice
- E-land Registry
Easiest life: only getting married or divorced and selling real estate cannot be done online.

Yet.
Requests this month*

27,860,237

Previous month
41,849,148

Previous year
574,580,990

Requests to date*
3,182,333,593

5,793 consecutive days of smooth X-Road experience in Estonia*

As of 2001, the protocol has been amended only 4 times

* Estimate, based on data from 9/1/2017

The X-Road in Estonia has:

- 904 institutions and enterprises
- 668 public sector institutions
- ca 52,000 organizations as indirect users of X-Road services
- 1,019 interfaced information systems
- 223 security servers installed by members

Number of services that can be used via the X-Road
1,471

Every party who provides services offers 9 services on average
E-services in Estonia
E-services in Estonia (2)
elaborated
Clear and honest principles.

+ once-only
+ digital by default
+ truth-by-design
+ open internet

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Digital Society Recipe of Three

- Technology
- Legal framework
- Data governance
Access and control of health data becomes crucial

Fundamental principle:
Health data belongs to the data subject

1. Access to my data
2. Control of my data use
3. Delegation of my access and control rights
4. Individual monitoring of requests for my data
eHealth services in Estonia

- Health status summary for medical commission of Ministry of Defence 2017
- Drugs’ adverse interaction detection (2016)
- Services for dental care (2015)
- eAmbulance services (2015)
- Medical certificate services (2014)
- Statistics services (2013)
- Cross-border Patient Summary (epSOS 2013)
- Collecting health service reimbursement invoices ~1995
- Health status summary for Social Insurance Board 2012
- eConsultation services 2012
- Digital picture archiving services 2005
- EHR services for physician and patient 2008
- Digital registration services 2008
- ePrescription Services 2010
- Health insurance information ~2000
- Health status summary for medical commission of Ministry of Defence 2017
Estonian eHealth architecture

X-Road, ID-card, State IS Service Register

- State Agency of Medicines
  - Authorized medicines
  - Handlers of medicines
- Health Care Board
  - Health care providers
  - Dispensing chemists
- Population Register
- Business Register
- Hospitals 2009
- Healthcare Providers
- School Nurses 2010 September
- Defence Forces Medical Commissions 2017
- Prescription Centre 2010 January
- Health Insurance Fund Database ~1995

Patient Portal 2009 v1 2013 v2
Doctor Portal 2013
Social Insurance Board Portal 2012
X-Road Gateway Service 2009
X-Road Gateway for Emergency Services 2014
Pharmacies and Family Doctors
Emergency Service Mobile Workstations
Nation-Wide Health Information System 2008 December
Anonymized Health Data or Statistics 2013
Statistics Portal 2013
Authentication & Authorisation

- **Who are you?**
- **Constant** anywhere & anytime
- Solution = **Unique ID** (plus robust technology: ID-card, mobile-ID)

- **What can you do?**
  (read, write, delete etc)

- **Dynamic** in space & time
  (same individual can have multiple roles)

- Solution = **classification or roles** by profession, facility, service etc
Identification in healthcare Estonia
(no difference btw digital or physical identification)
Very fast system-wide adoption of e-services: the case of ePrescription

E-Prescription in Estonia:
Any doctor can prescribe to any patient, who can buy the medicine in any pharmacy
Service example: Medical certificate service

Applicant for Electronic Health Certificate
- Patient Portal
  - Initiates the process of applying Electronic Health Certificate
  - Fills Electronic Personal Health Statement
  - Reads messages

Electronic Health Certificate issuer (Family doctor, health care provider)
- Doctors Information System
  - Does medical examination and analyses, enters them into the information system
  - Adds to Electronic Health Certificate decision

Electronic Health Certificate recipient
- Recipient’s Information System
  - Gets automatically Electronic Health Certificate decision and validity, also changes in these

State Portal
- Informs citizen in State portal and with e-mail

Holder of the Electronic Health Certificate
ESTONIAN e-AMBULANCE SOLUTION
Strategic implementation of digital solutions for health and care – some fundamental assumptions

Time (incl the time of HC professionals) is the scarcest resource in healthcare - cannot „print“ it to meet the shortage

If you cannot measure the outcome, then you cannot agree on the optimal level of expenditure

Innovation (and entrepreneurpship) takes place there, where you have more favourable conditions
Combining the outcome measures of health and e-health strategies

1. Less unavoidable visits
2. More efficient use of time
3. Less avoidable hospital care
4. Less rehospitalisations
5. Decreased morbidity/mortality
Five focus areas of action for 2016-2020

- High quality data capture and information infrastructure for clinical services, R&D, economic development
- Holistic case management and integrated health & social service network
- Citizen-centered & personalised medicine
- Tele- and mobile services for increased service efficiency
- Quality & outcome based service and health policy management

Better information - more health!
Main strategic e-health projects
(in varying implementation phase)

1. Comprehensive patient care pathway „logistics“ management (referral letter + e-consultation + appointment booking) - 2018
2. Full cycle care continuity for chronic conditions - 2019
3. National quality assessment service for outcome based health system - 2020
4. Innovative integration of health and social care at the regional/community level - 2020
5. Clinical decision support systems for adaptive care pathways (including personalised medicine implementation) - 2018
6. Integration and sharing of personal medical data with 3rd party (non-medical) data services (including personal health record) - 2018
Thank you!