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Public e-services in Estonia: e-health and beyond

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E-TERVIS
EESTI E-TERVISE SIHTASUTUS

HCT
Health Care Technology

KLIINILISE MEDITSIINI INSTITUUT

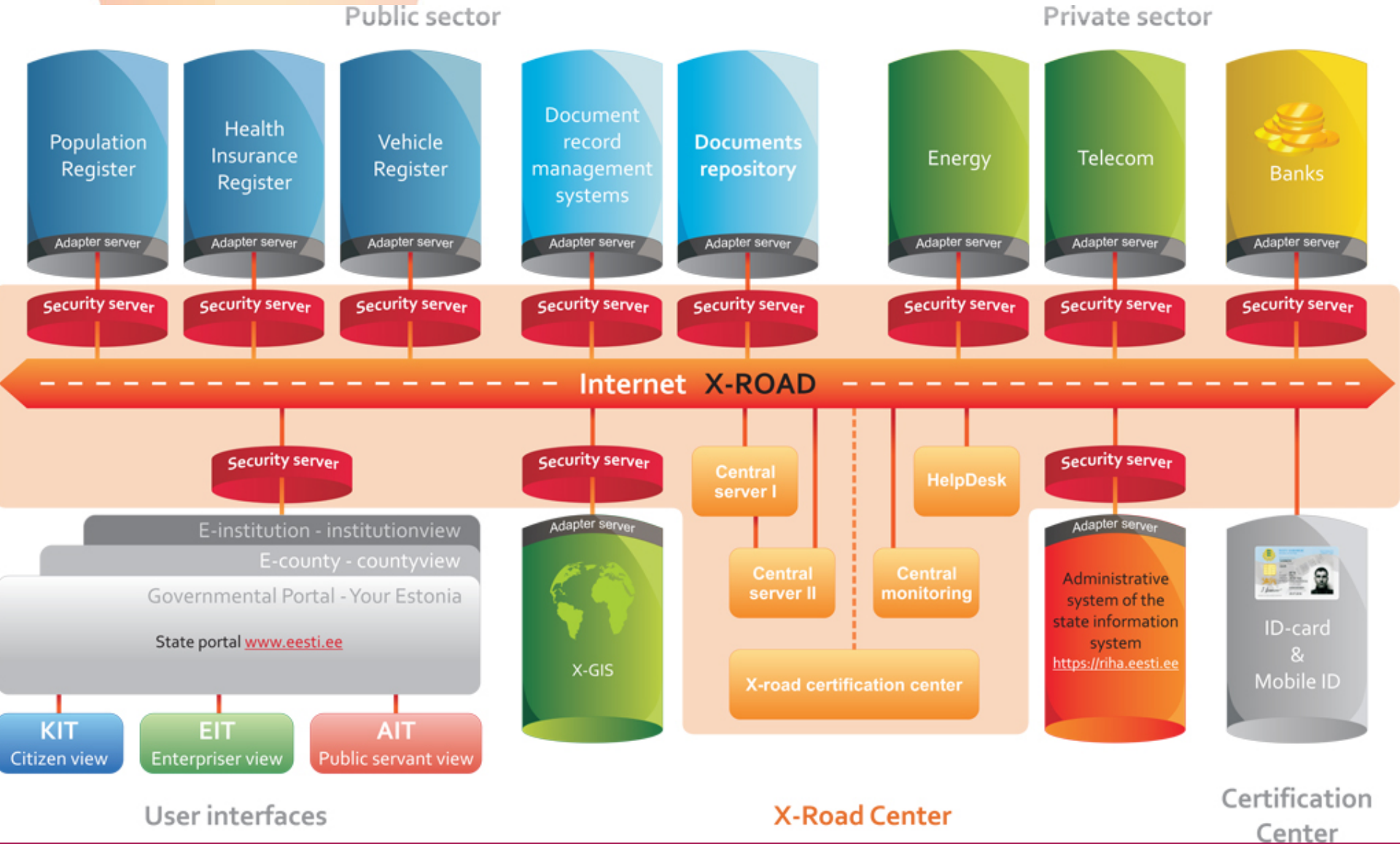
Facts about Estonia

- Basic facts:
  - Population is 1,3 million
  - Area 45 227 km²
  - Native language is Estonian
  - Member state of the European Union since 2004
  - Income tax 21% (flat tax); Currency – Euro
  - Every citizen has unique ID-number (like in Scandinavia)
- Health care system
  - Compulsory health insurance paid by employers; 13% of payroll tax
  - Health care costs make up to 6% of GDP (9,5% in OECD)
  - Healthcare providers are private, municipal or governmental
  - Hospital system – publicly owned private hospitals
  - General practitioners are private entrepreneurs

Facts about e-services

- 2000: Launch of e-Tax Board
- 2000: Launch of m-Parking
- 2002: Introduction of national electronic ID-Card
- 2003: Launch of ID bus ticket
- 2005: e-Voting was introduced
- 2007: Introduction of m-ID
- 2007: Launch of e-Police system
- 2008: Launch of e-Health system
- 2010: Launch of e-Prescription
- 2012: e-Census

Estonian e-state architecture



Facts about e-services

- Information society strategy 2001
- By 2013
  - All public services are digitally available
  - Public infrastructure is service oriented (x-road, e-ID, m-ID)
  - Data is stored where it is collected and exchanged between those who need it
- 100% of schools and government organisations have broadband connection
- 75% of households have internet access at home (2012)
- 99% of bank transfers are performed electronically
- 95% of income tax declarations made via the e-Tax Board (2013)
- 24% of votes were cast over the internet (2011)

Estonian nation-wide Health Information Exchange platform (HIE)

- The Estonian HIE is unique as it
  - Encompasses the whole country
  - Registers virtually all residents' health history from birth to death, and
  - Is based on the comprehensive standard based IT infrastructure


HELSE-IT JONAS GAHR STØRE: LOOK TO ESTLAND

Estland har medisin for effektiv e-helse

Estland: Kjernejournal


NASJONAL PASJENTJOURNAL «ALLE» SER TIL ESTLAND

Norge uinteressert i estisk suksess

Estland: 18 gode e-helse-pro sjekter for 12 mill. Norge: Bruker 149 mill. på dårlig e-helse-samhandling

Laget ambulanse-app

India–ja til Ikea

IKEA

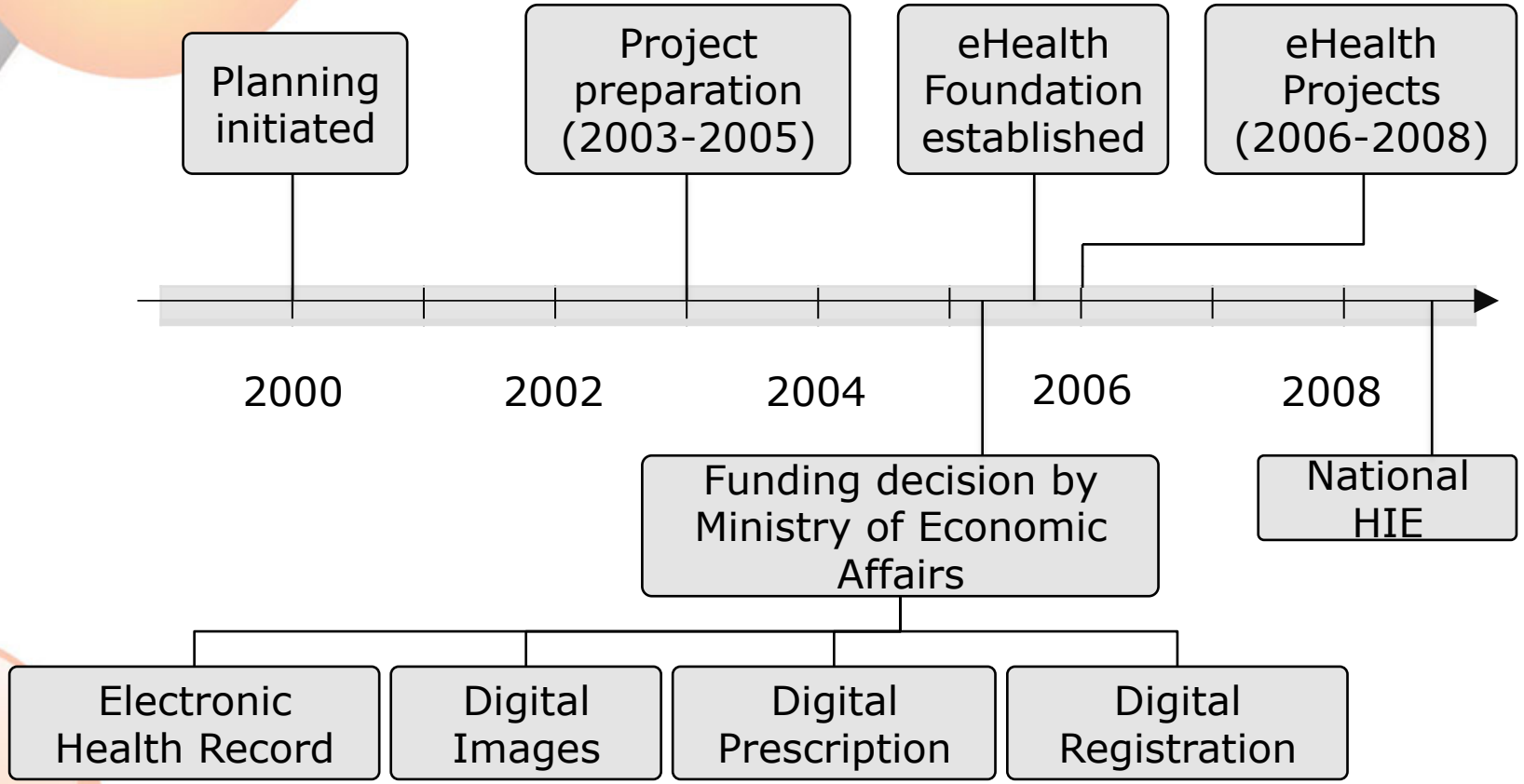
Basic components

- The HIE platform consists of 3 main layers
  - The secure internet-based data exchange layer
  - Health information exchange database and software
  - Application and service layer

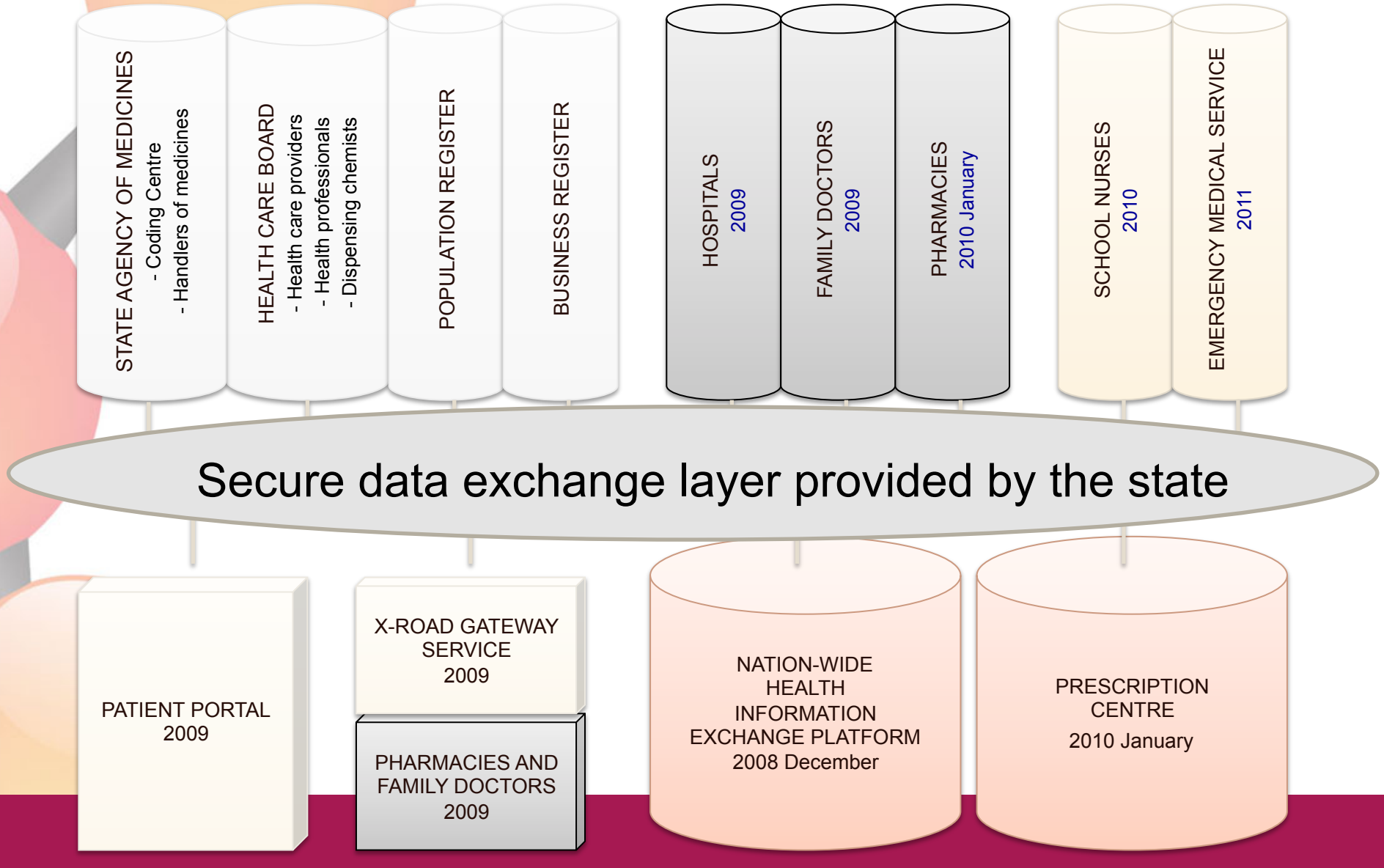
Main characteristics

- The data exchange layer is a messaging middleware which works as system integration layer
- Based on usage of Web Services
- Meets high security requirements
- Works as a service bus
- Provides uniform way for the offering, discovering and using services
- Highly scalabe

HIE platform history



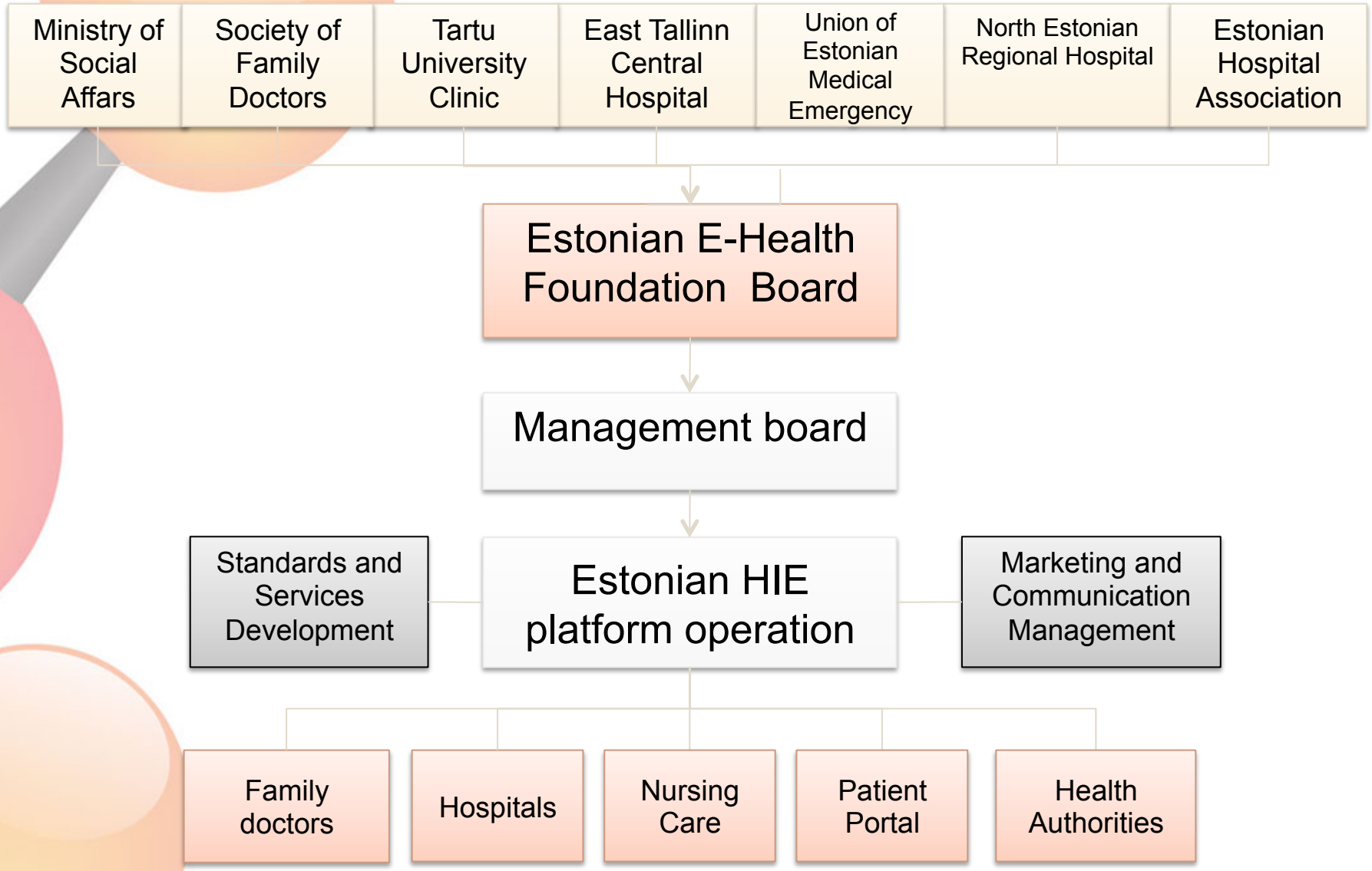
Estonian eHealth architecture



Main drivers

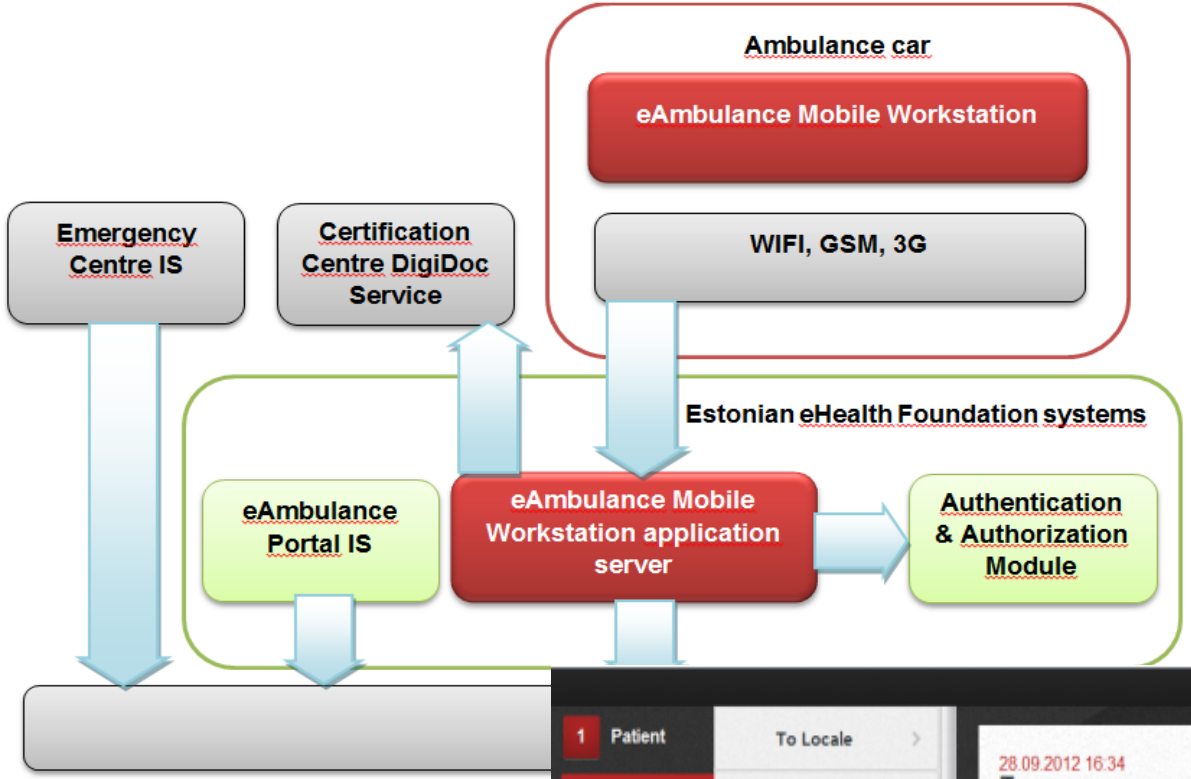
- Clear governacne of Estonian e-health services
  - Estonian E-Health Foundation
- Legal clarity
- Mature ecosystem for e-services in Estonia
  - Secure data exchange platform provided by the state
  - Established on-line identification methods
    - ID-card
    - Mobile-ID
- Agreement about access rights
- Standardization
  - Medical data
  - Data exchange

Governance. Organisation

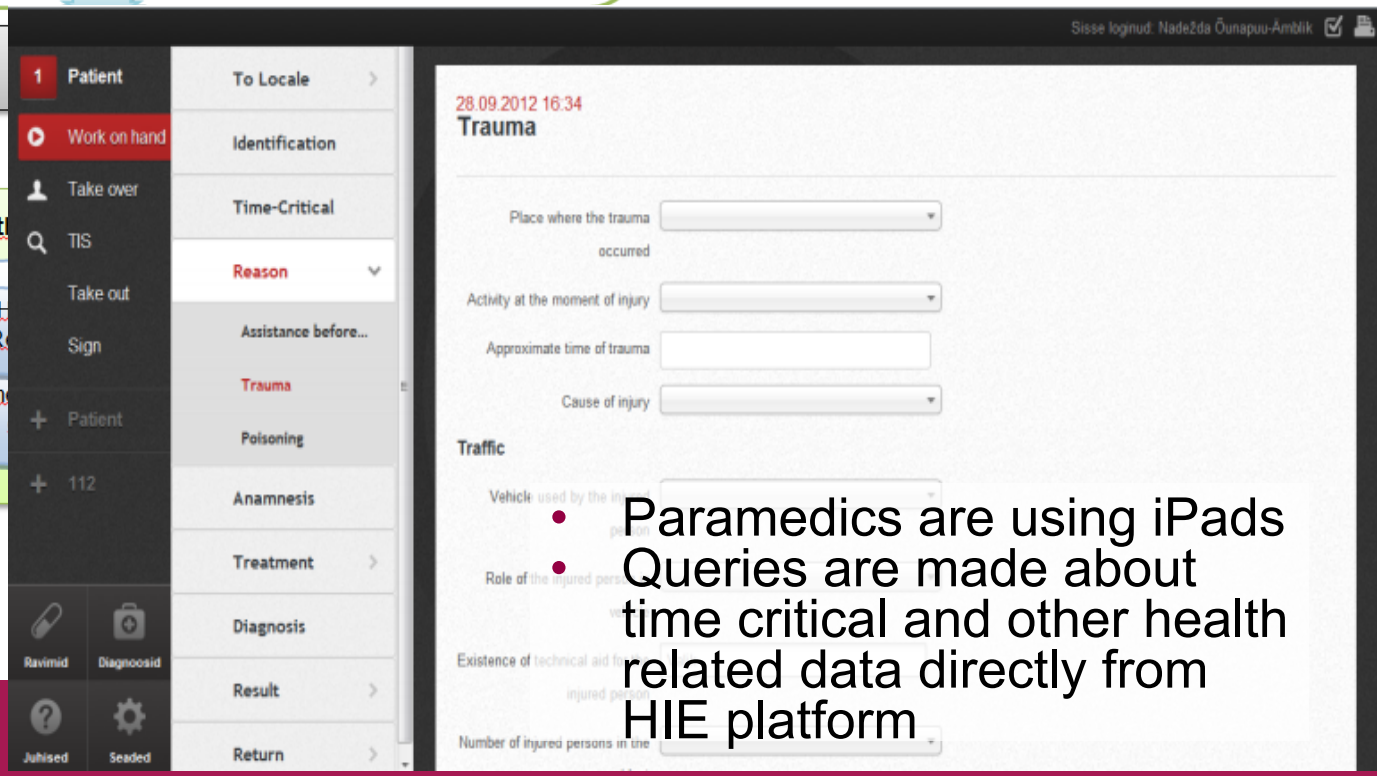


eHealth services in Estonia

- Nation-wide health information system
  - Available documents
    - Medical files
      - Time critical data (allergy, chronic diseases)
      - General practitioners and hospital visits
      - Summary of ambulatory and stationary case
      - Link to medical images
      - Referral letter
- ePrescription
- Digital images
  - Available all over the county
- eReferral
- eAmbulance



eAmbulance



- Paramedics are using iPads
- Queries are made about time critical and other health related data directly from HIE platform

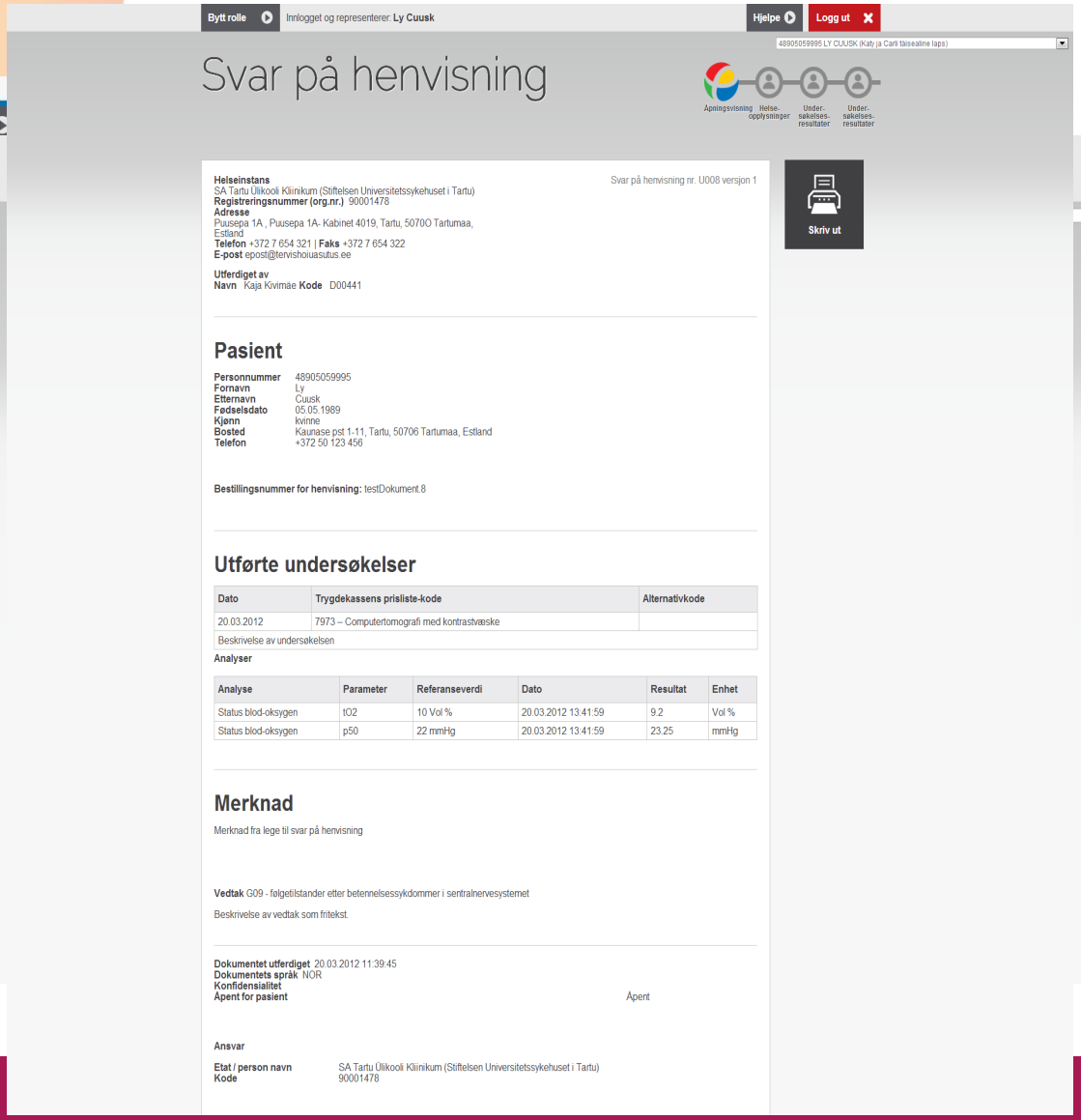
Legal environment of eHealth

- The Health Services Organisation Act regulates the development and maintenance of the health information system
  - Lay down the necessary requirements to the patient, health service provider, document standards, etc.
- All healthcare providers must send certain health data to national HIS
  - The set of documents is defined by the law
- Access only to licensed medical professionals
  - The attending doctor concept
- Patient has the right to close own data (*opt out*)
- The ethical committee was created to lead the discussions of patients´ rights and to select the proper system for the HIE platform
- Citizen can
  - Access their own data
  - Declare intentions and preferences
  - Monitor logs

Security and electronic authentication

- The access to HIE is secured by using the electronic identity card (ID-card) solution issued by the state
- ID-card is a compulsory and primary document for the purposes of personal identification in Estonia
- All attempts to view health care data are monitored both by patients and Estonian E-Health Foundation
- In case of the suspicions of the unlawful access to the data the necessary actions are taken immediately

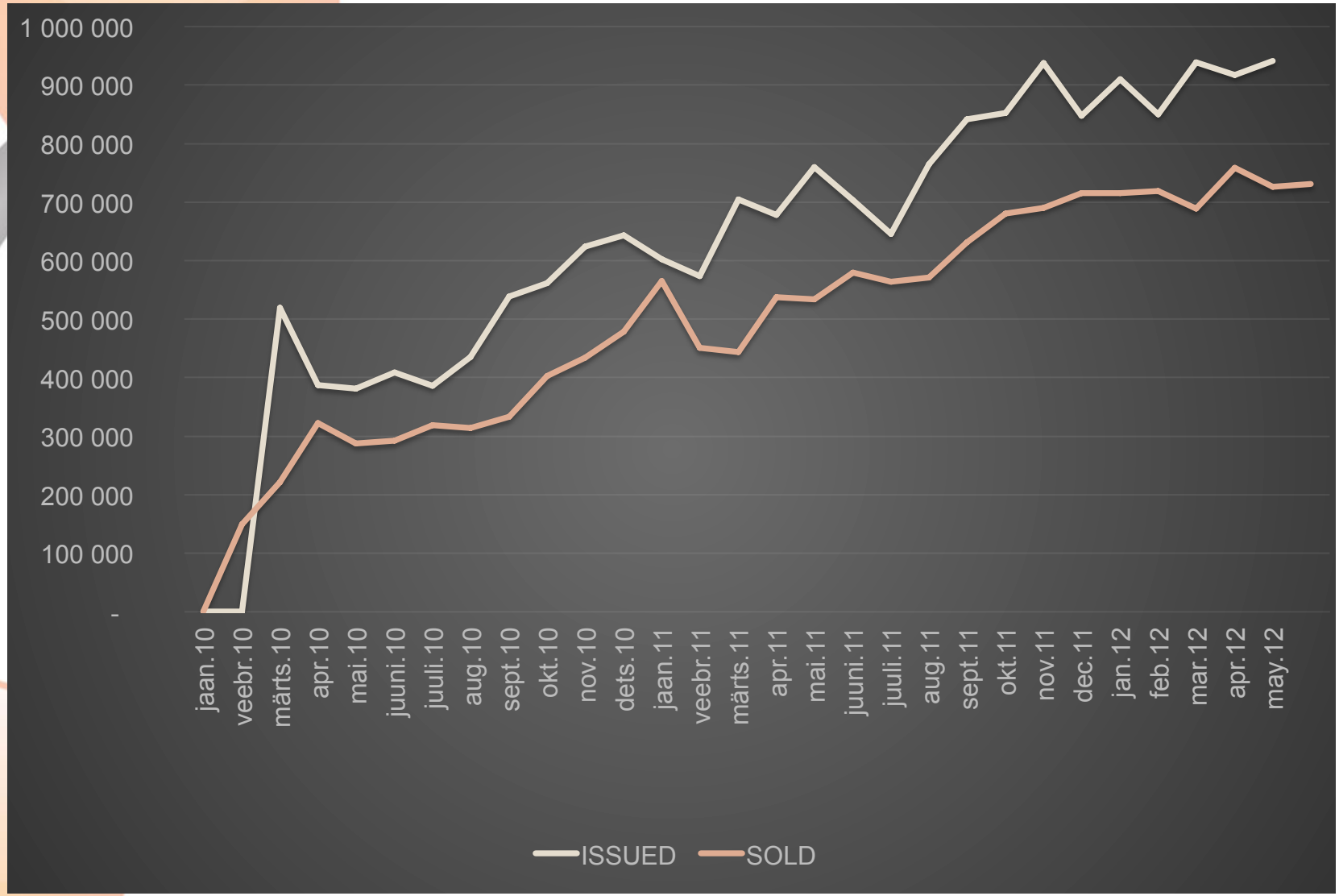
Patient Portal – 2013



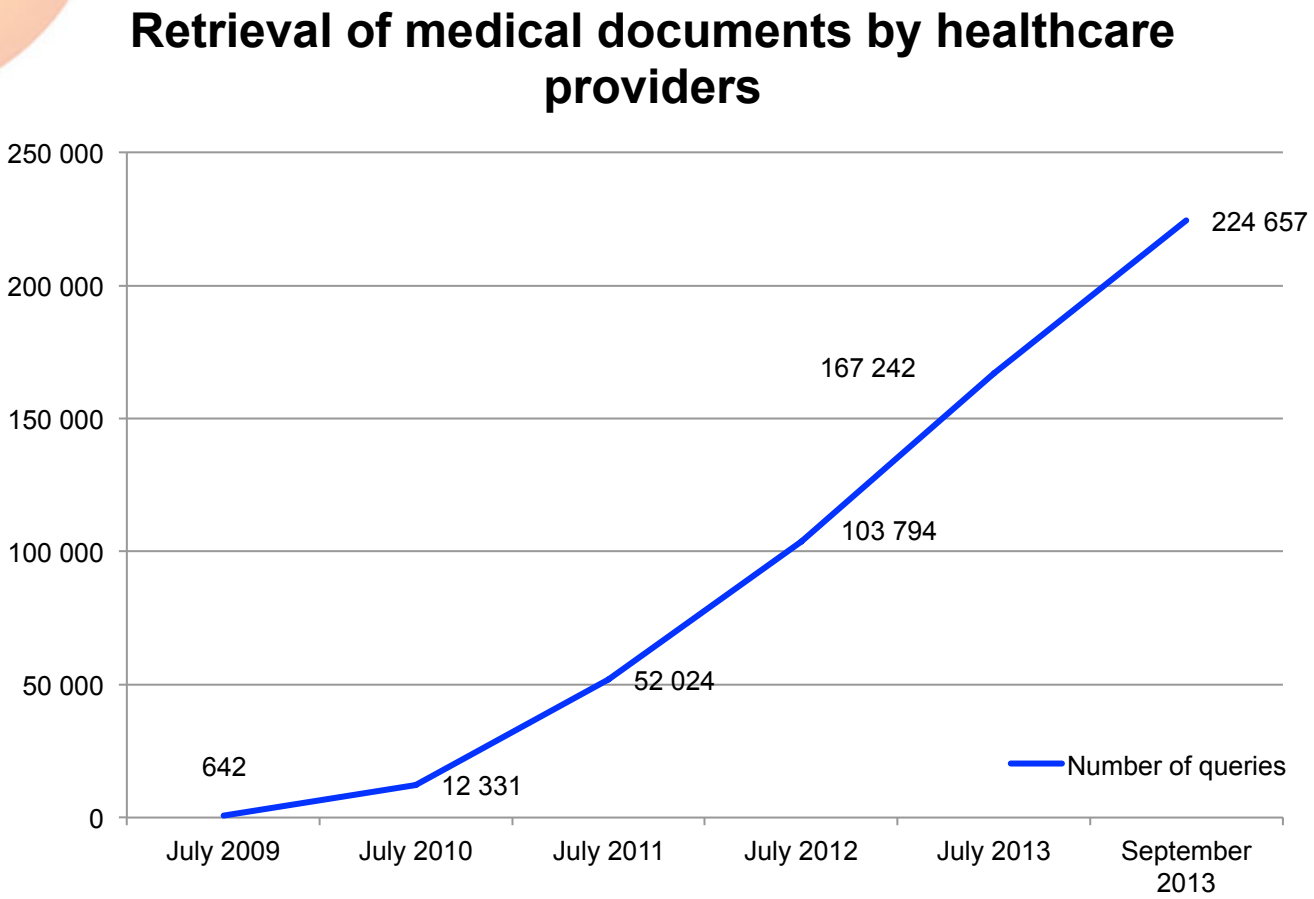
Acceptance

- ePrescription covers 94% of issued prescriptions
- Over 90% of Hospital discharge letters are digital
- Ambulatory case summaries sending level is low
- Patient portal usage is low
  - 58 115 unique visitors (4,5% of population)
  - **1 160 000** persons have documents (90% of population)

ePrescription



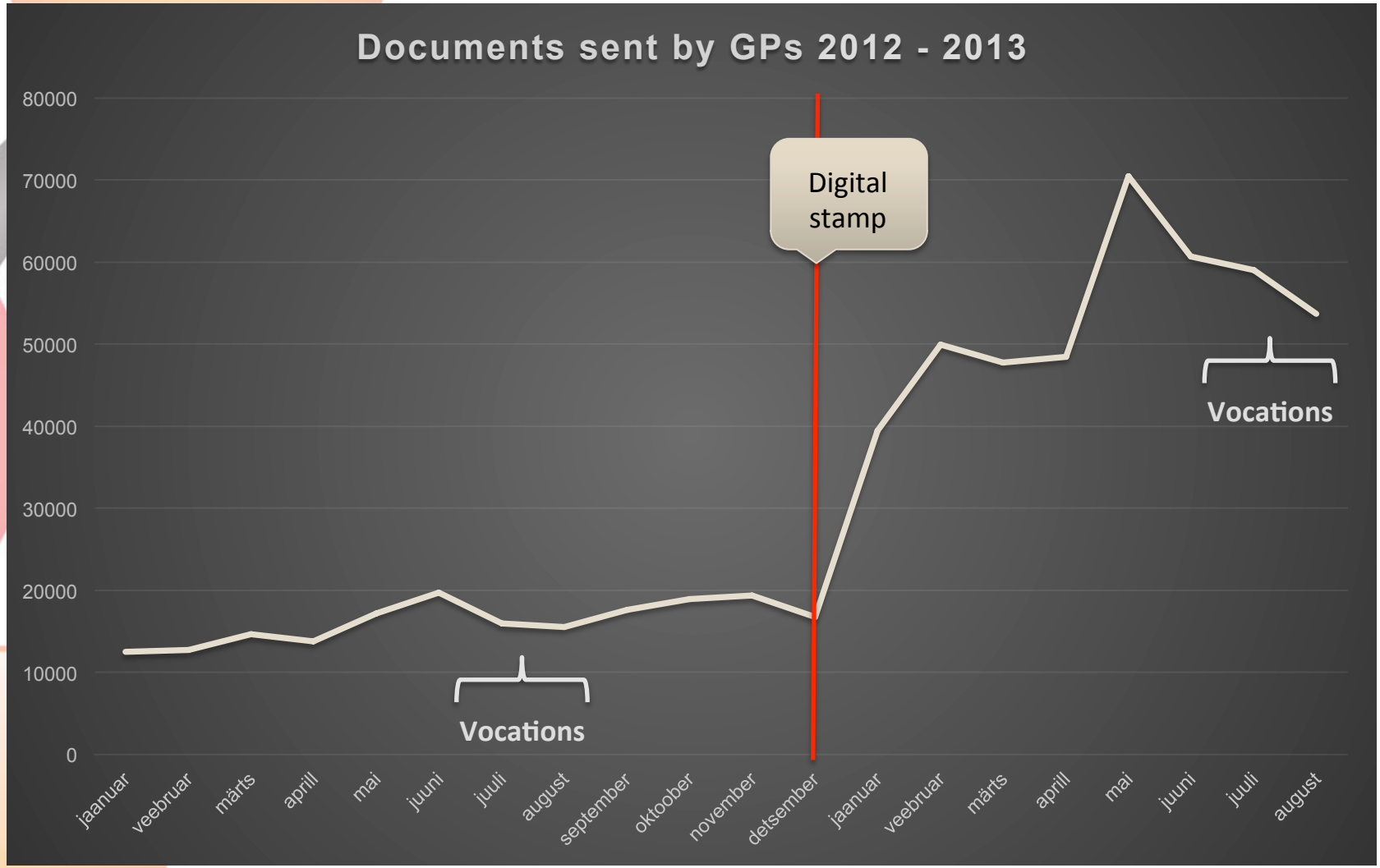
Acceptance


Retrieval of medical documents by healthcare providers
250 000
200 000
150 000
100 000
50 000
0
642
12 331
52 024
103 794
167 242
224 657
Number of queries
July 2009
July 2010
July 2011
July 2012
July 2013
September 2013

Difficulties

- General acceptance of hospital personnel to share medical data in patient portal with patient
- Much attention had to be paid on the security and electronic authentication of the users
- Resources were planned only for central development.
- Usability. Developing process has to include medical competence – users
- Data quality is important
  - Complete and quality data give value.
- Balance between security and usability
  - PIN for every document …

Digital stamp for general practitioners



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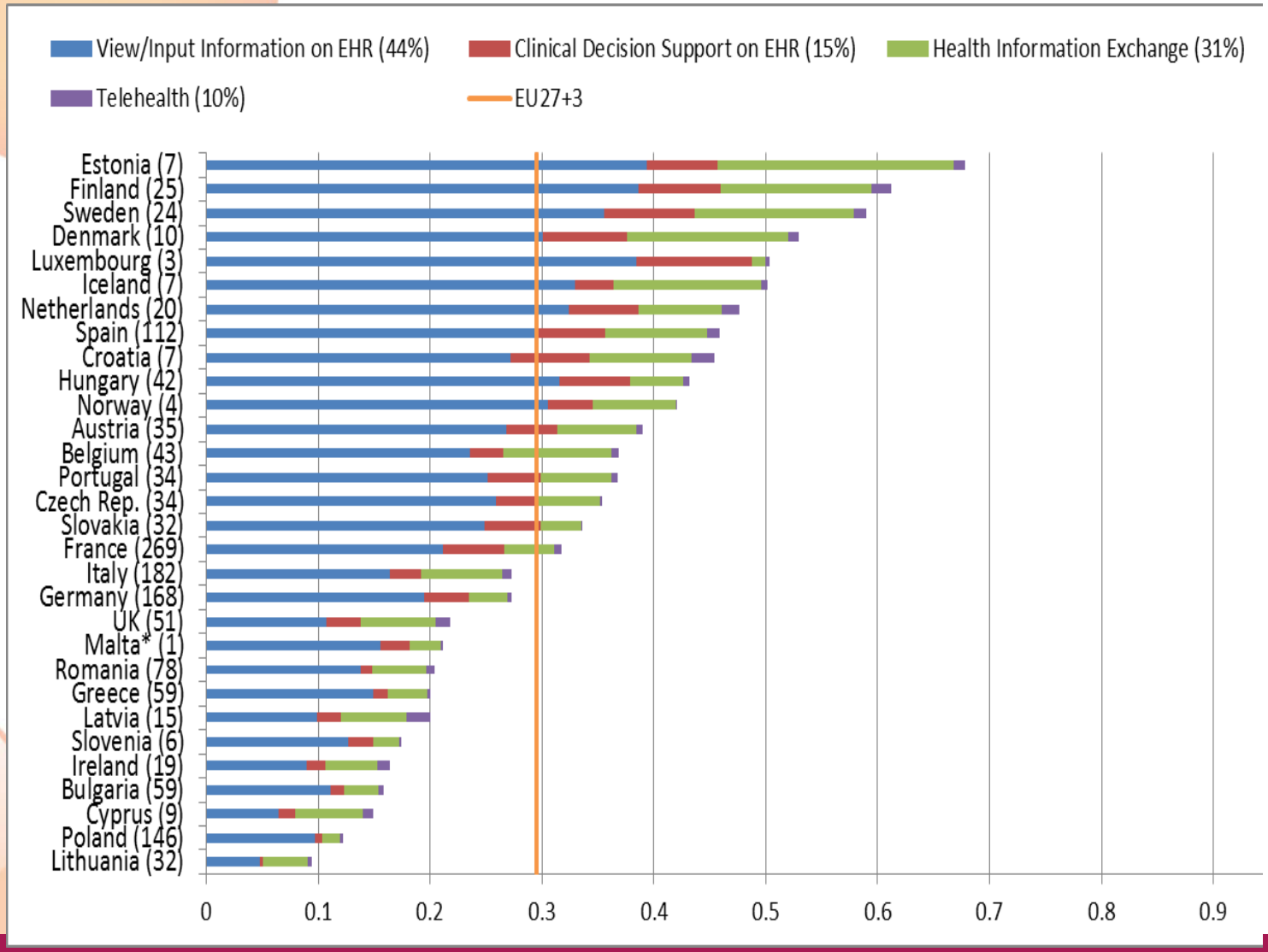

eHealth availability and use Indicator 2012: by country

Thank you!

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