

Estonian e-Health

Development, successes and failures

Taavi Lai, MD PhD

Pristina, 27 Sept 2023

Outline

- Key messages
- Background, context and examples
- Successes and failures

What is eHealth?

E-Health is a cooperative network of health services based on digital solutions, which supports the promotion of consistency of the treatment, timeliness of the services, and patient satisfaction.

Key messages

Key messages (1)

- e-Health is not a technical solution – it is a way to bring people together
 - e.g., dynamic teams (in collaboration with the patient)
 - e.g., linking specialists and sharing data, creating patient pathways
- Trust is the „currency“ of e-Health
 - do patients and specialists trust that their data is secure?
 - do specialists trust that their colleagues are professional and fulfil their role in patient care process, patient pathways etc.?

Key messages (2)

- If the trust is there, e-Health system can be open, flexible and enabling good care
 - to foster engagement, increased professionalism, responsiveness to patient needs, agile approaches, novel services, etc.
- Focus first on designing health system, service delivery models and individual services
 - e-Health is a support tool and enabler of healthcare service delivery
 - e-Health services can (partially) replace some traditional services

Key messages (3)

- Always ask what data you would ideally need – build e-Health for that vision
 - think in data and what you can get out of it, forget about existing paper-based data forms
- Open the system / data analytics as much as possible
 - the more the data is used and analyzed, the better your chance to understand it, the better data quality can get, the more useful it is
 - integrate with social care, seamlessly coordinate health and social services

Background and context

Estonia

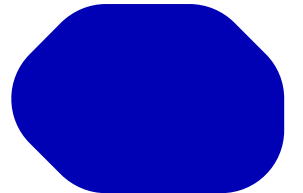
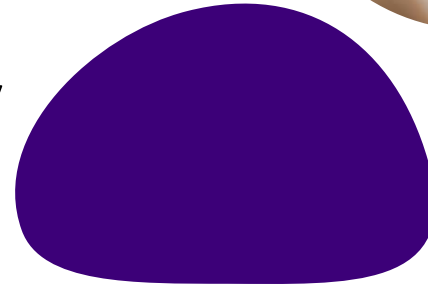
- Population: 1.3 million
- Financing built on solidarity-based health financing, mandatory public health insurance
- Main purchasing agency is Estonian Health Insurance Fund (EHIF), purchaser-provider split
- Overall funding
~76% public vs ~22% OOP
- Provider network is based on family medicine centred PHC + hospitals + other providers



- Health Expenditure 7.6 % of GDP (2021, significant increase due to COVID)
- Financed: 13 % earmarked health insurance tax on salaries, paid by employers
- Social health insurance coverage: 94% of population
- State Budget contribution for nonworking pensioners and emergency care, others

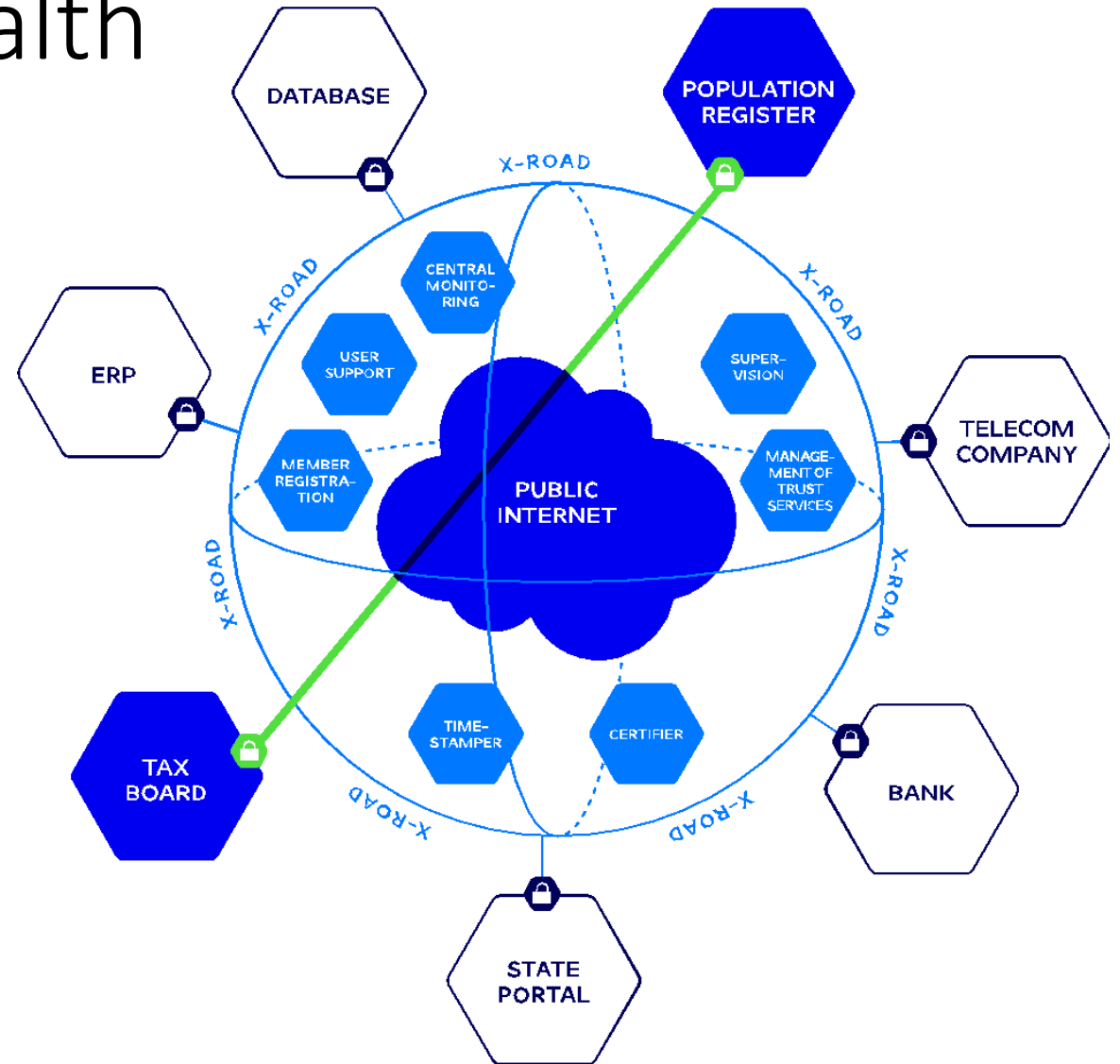
Patients' health data belongs to the patient

- All the data in National Health Information System is available for the patients themselves (through Patient Portal)
- Opt-out possibility to restrict access to personal health data
- Healthcare provider obliged to give out all patient's data on demand
- Principle of „data collected only once“ – if data already collected, must not burden anyone with repeated data collection



Wider context for e-Health

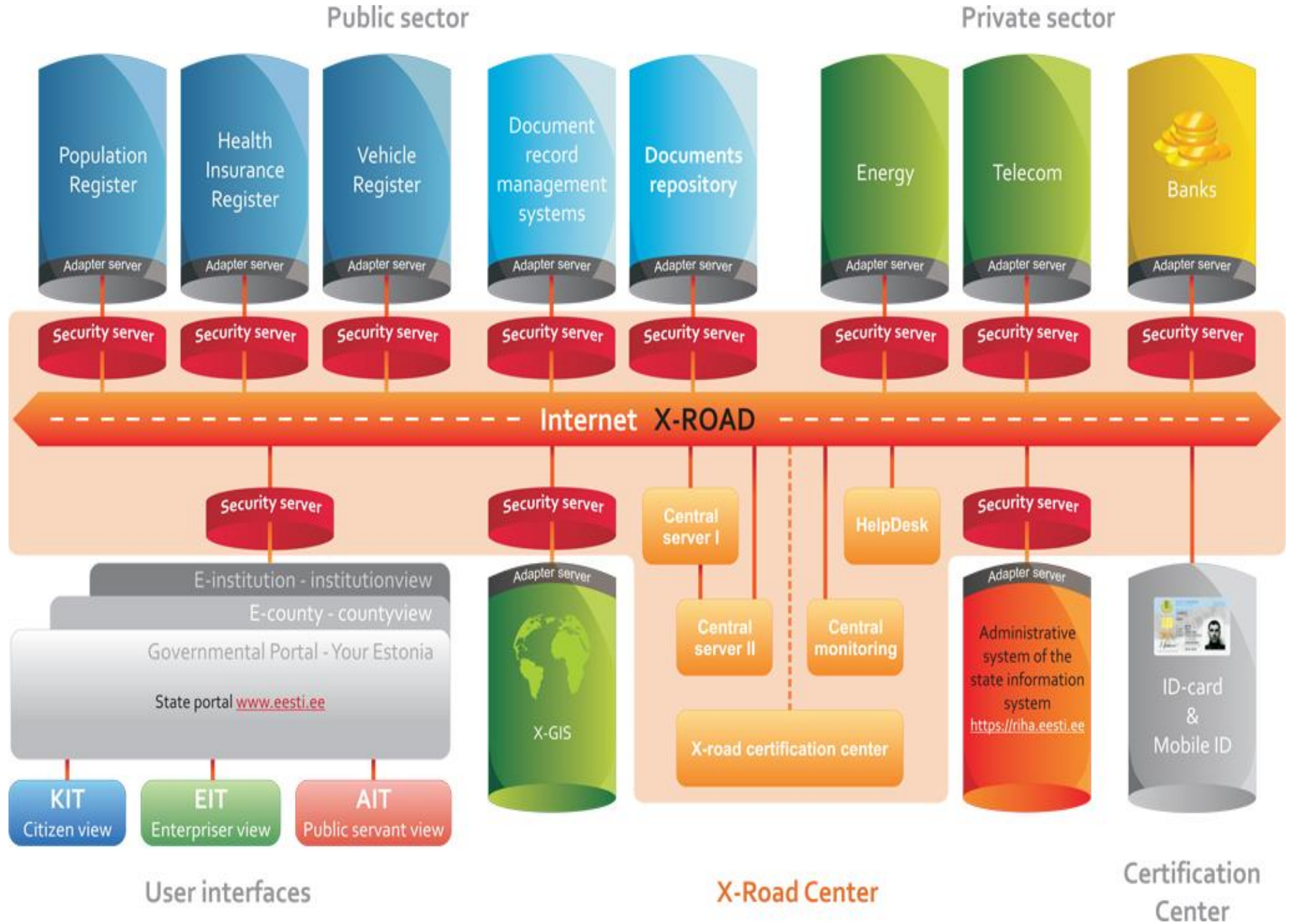
- E-State and its building blocks
 - Unique national e-ID for everyone, digital signature
 - Linking existing systems with secure information exchange layer (X-Road) with content agnostic system
 - Enabling and promoting new services and linkage to third-party systems/services



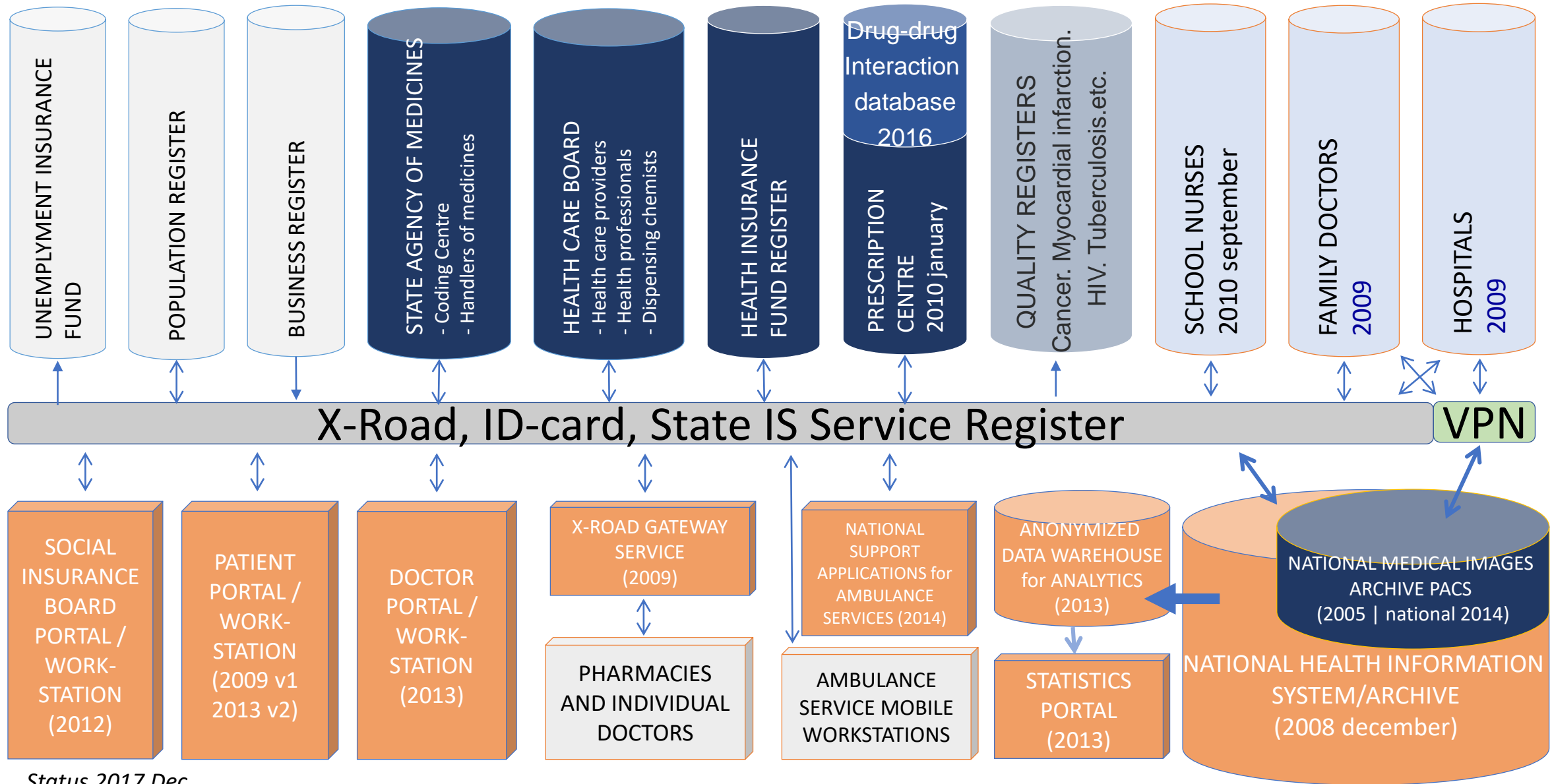
The 6 main principles of privacy & security in Estonian e-Health system

1. **Secure authentication** of all users with ID-card or Mobile ID
2. **Digital signing or stamping** of all medical data
3. **Maximum accountability (transparency)**: all actions will leave an unchangeable (and unremovable) secure trail
4. **Coding of personal data**: separating personal data from medical data
5. **Encrypted database** that allows to remove the confidentiality risk from the technical administrators
6. **Monitoring** of all actions together with the corresponding counter-measures

e-State architecture



e-Health architecture

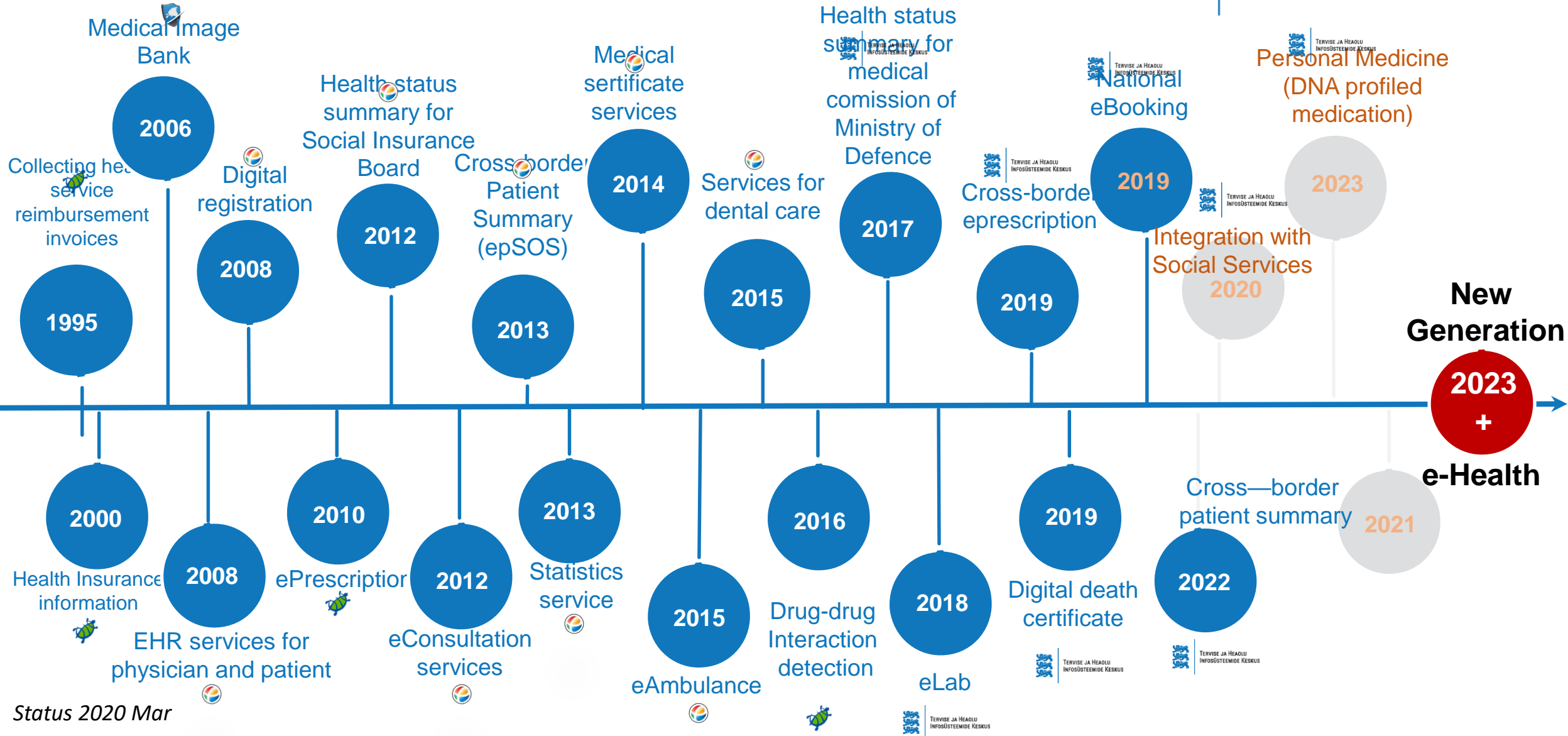


Status 2017 Dec

eHealth central services in Estonia



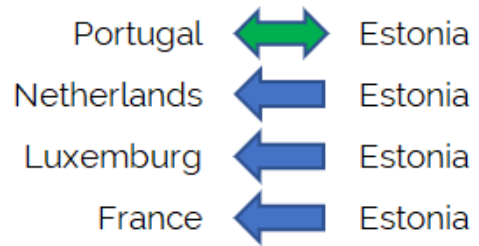
HEALTH AND WELFARE
INFORMATION SYSTEMS CENTRE



Status 2020 Mar

My Health @EL

Patient Summary



e-Prescription



Next:

- European Health Data Space
- Digital Health Insurance Certificate
- Lab results, medical images (2025+)



Successes and failures

Successes (1)

- Open system with high level of trust
 - Opt-out principle – everyone and all facilities included in the system by default
 - patients can later opt-out and close access to non-emergency info
 - User rights for specialists broadly defined – can look at all data available
 - However, there's a blockchain trail of all data access and change -> if someone looked at patient data they were not supposed to look at, it does come out and is followed by legal action
 - if data already collected, need to reuse this across all systems instead of collecting it again

Successes (2)

- Huge number of various e-Health services both in the background and user-facing
 - automation of tasks, data collection etc., in the background e.g., ePrescription info seamlessly compiles and checked across many databases and registries
 - Patient Portal for patients with all their data (and their under 18y children's data)
 - tools and services for specialists e.g., drug interaction warnings for patient prescriptions
- New model of integrated health (and social) care piloted in one region (Integrated Health Region) with dedicated e-health solution created
 - Functions for team-based approaches across levels of care (PHC+hospital+social)
 - Patient pathways and staff roles for pathway management
 - Predictive algorithms to find patients with future risks/service need
 - Scale-up and expansion to next regions ongoing

Successes (3)

- Continuous and systematic development of the eH system
- Architecture allows for unlimited number of different services, tools and systems to be created and integrated
- Huge numbers of working hours and other resources saved in healthcare
- Less time/life wasted for patients for queuing, starting treatment, doing repeated analyses, etc.

Failures

- Initially data collection based on existing document forms instead of data-centric approach
- Standardization of data formats and collection approaches slower than expected
- Initially not enough focus on data analysis, data mining and data-driven service development
- Initially, narrow focus on healthcare (service delivery) with missed opportunities for health-social care integration and analytics

Thank you for your attention!