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Pisa Summer School 2019
Digital Transformation of Audits

Examples from National Audit Office of Estonia

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National Audit Office of Estonia:

Auditor General:

- Mr Janar Holm was appointed in April 2018

for a 5-year term

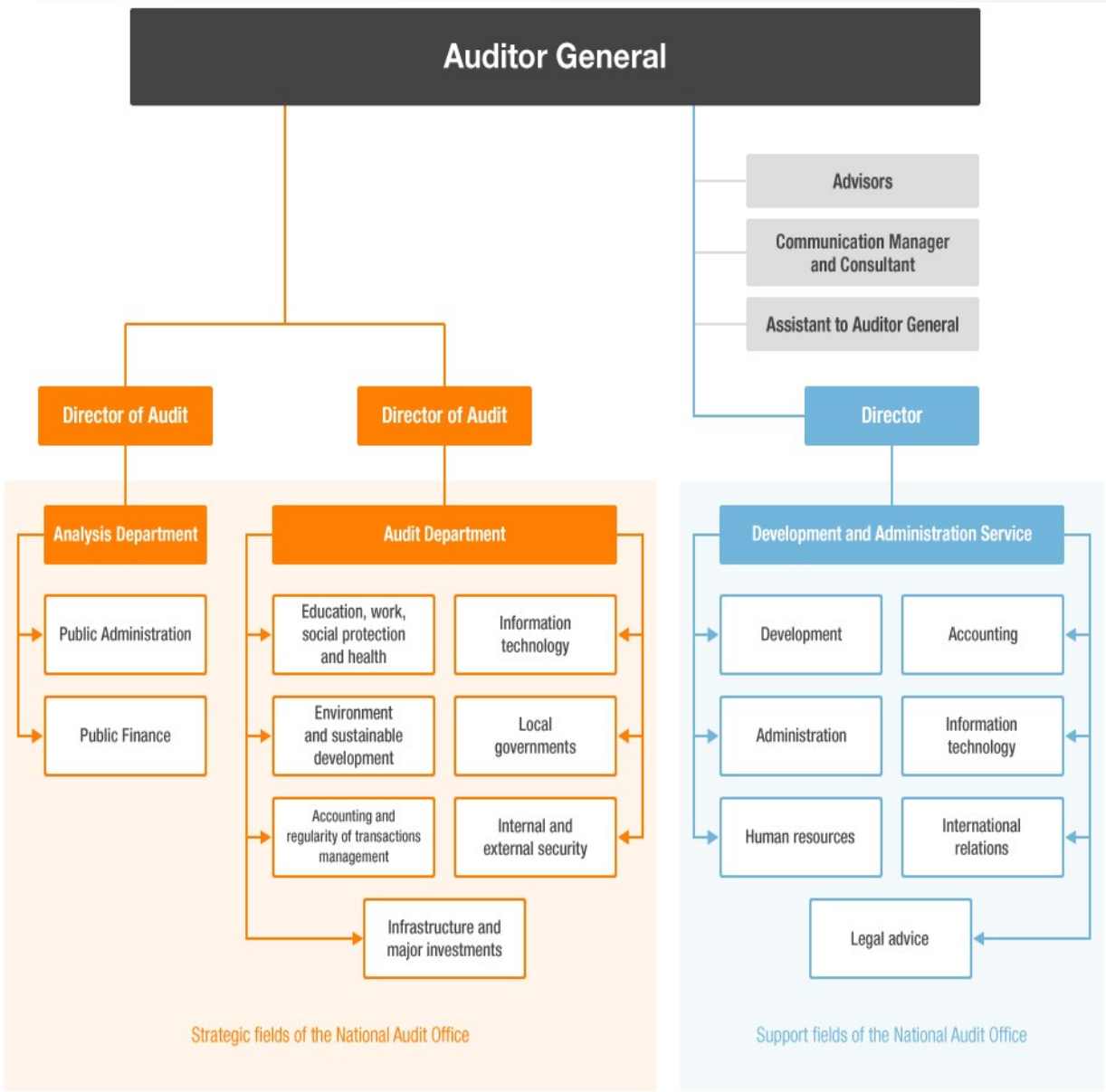
Staff:

- total ~ 100
- engaged in audit activities ~ 75
- average age – 38 years

Published audit reports:

- 2019 – up to now 7
- 2018 – 19
- 2017 – 34

Organisational chart of the National Audit Office of Estonia



Financial audit

Online databases and information systems

Online databases and information systems (1)

- Uniform chart of accounts – enables to compare financial data of different entities quickly, user-friendly.
- Financial auditors have viewer rights to IT systems used in the state. This enables easier risk-assessment and fieldwork.
  - **SAP BO**

    Web-based reporting system for management information, provides access to recordings, different reports etc. Auditors can perform high level analytics during risk assessment; assess changes in yearly balances; scan through detailed data during testing in order to indentify unusual recordings by strange explanations / parties / amounts / dates.

Online databases and information systems (2)

- **e-invoicing system**

  Access to invoices from contractors. Auditors can audit expenses/assets; information about acceptance of the delivery; construction in progress; also enables auditing authorisation of costs by budget managers.

- **e-reporting database**

  Access to monthly balance sheet and income statement. Enables to identify major changes in accounts quickly.

- **self-service portal for state employees**

  Access to trainings, secondments, vacations and cost reports of officials; also stocktaking documentation of the entity, useful when selecting stocktakings for on-the-spot visits, auditing the results of stocktakings.

Online databases and information systems (3)

– **Procurement Register**

Access to public procurement documentation.
Contributes auditing procurements, assets/expenses (example: decisions during the procurement process).
Contributes understanding of the auditee by providing information about major present or future investments.

Main benefits of those systems:

- ✓ Has increased overall transparency and contributed to better financial discipline in the whole public sector.
- ✓ Saves time - auditors don`t have to wait for auditees to provide the information and auditees don`t have to prepare reports for auditors.
- ✓ Access to complete information.

Performance audits in health care, social protection, work and education policy

The data used for audits

Last audits:

- Emergency medicine, 2018
- State's activity upon preparing for the work ability reform, 2017
- Funding of work, social, education and health care through structural aid from the European Union, 2017

Data from different registries, such as:

- Health services and benefits
- Health status (disability, decreased working ability)
- Employment services, programs and benefits
- Income (based on tax data)
- Education (status, degree, continuing education)

Audit: Emergency medicine, 2018

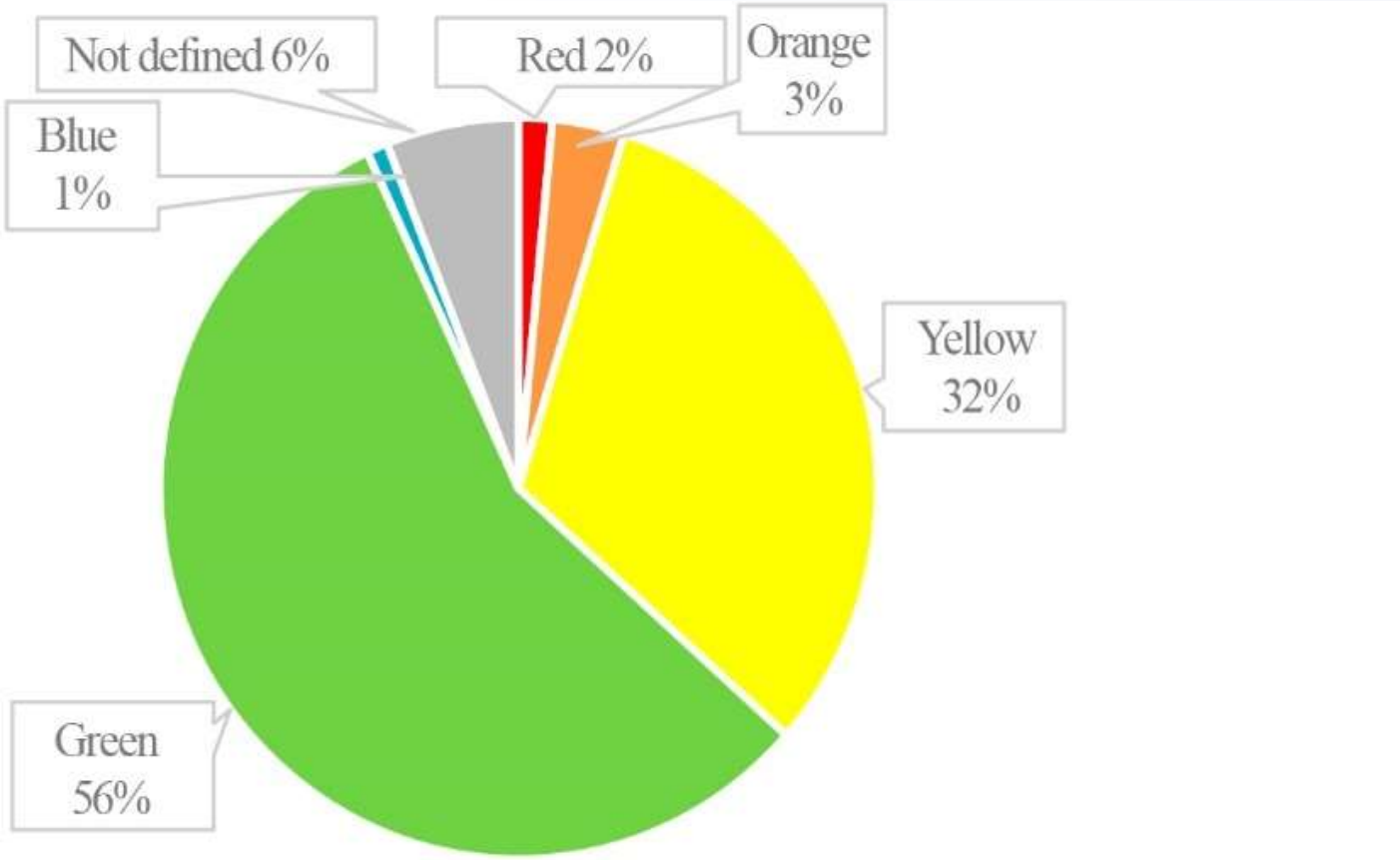
Central audit question: why are emergency departments (ED) overburdened?

- Do patients receive timely and necessary medical care before and after their visit to ED?
- What are the implications for the health care budget?

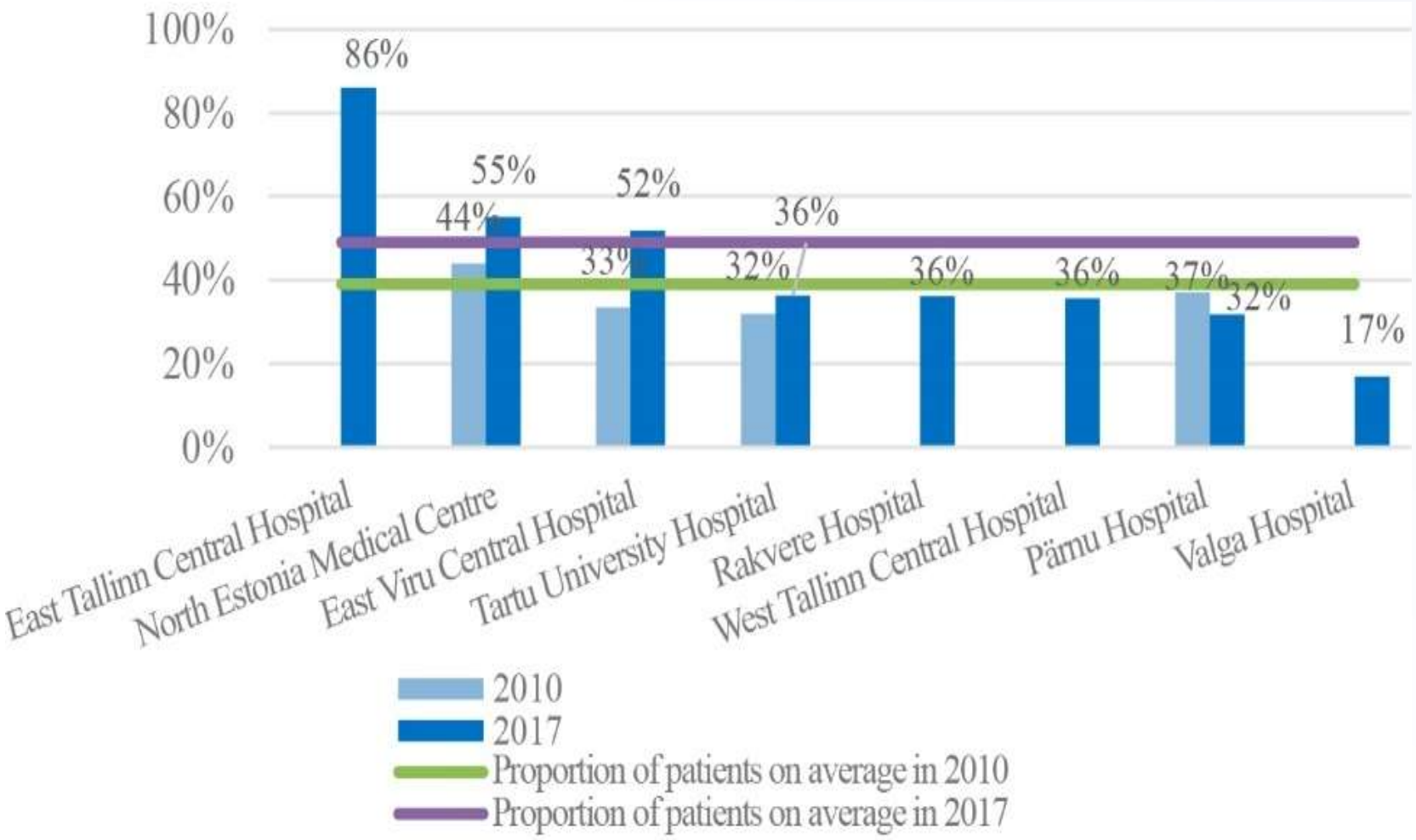
DATA

- Statistical data from hospitals with ED (19 hospitals)
- Survey in 8 EDs (approx 6000 respondents)
- Health services data of patients who visited ED during 1st half of 2016 (Estonian Health Insurance Fund, Central Health Database)
  - Health data 1 year before and after ED visit (100 000 ED visits + 1 million family doctor visits)
  - In collaboration with doctors (1000 sample pool)
- Comparison of visits by individuals with and without health insurance (testing for statistical significance)
- Calculating the average cost of ED visits (non-urgent conditions) compared to GP visits

Proportion of ED visits by triage categories in 2017 (data from hospitals)



Survey (proportion of patients in all the surveys who could have received help from a family physician)



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Before ED

Patient

Activity was inadequate prior 49%

Turned to ED without consulting his family doctor 61%

Didn't go to a medical procedure 39%

Didn't buy the necessary medicine 5%

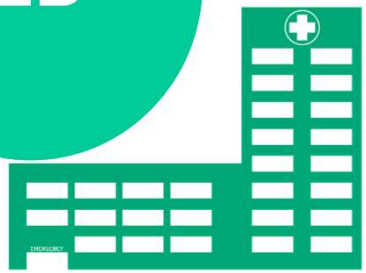
Family doctor

Activity was inadequate prior 21%

Didn't direct the patient to a medical procedure, even though it would have been necessary 36%

Didn't write the necessary medicine13%

ED



66% of ED patients did not need emergency care

45% of hypertension patsients need emergency care

16% of back pain patsients need emergency care

42% of lower respiratory diseases patients need emergency care

After ED

Patient

Activity was inadequate prior 34%

Didn't contact a family doctor 18%

Didn't go to a medical procedure 5%

Didn't buy the necessary medicine 9%

Family doctor

Activity was inadequate prior 19%

Didn't direct the patient to a medical procedure, even though it would have been necessary 22%

Didn't write the necessary medicine 6%

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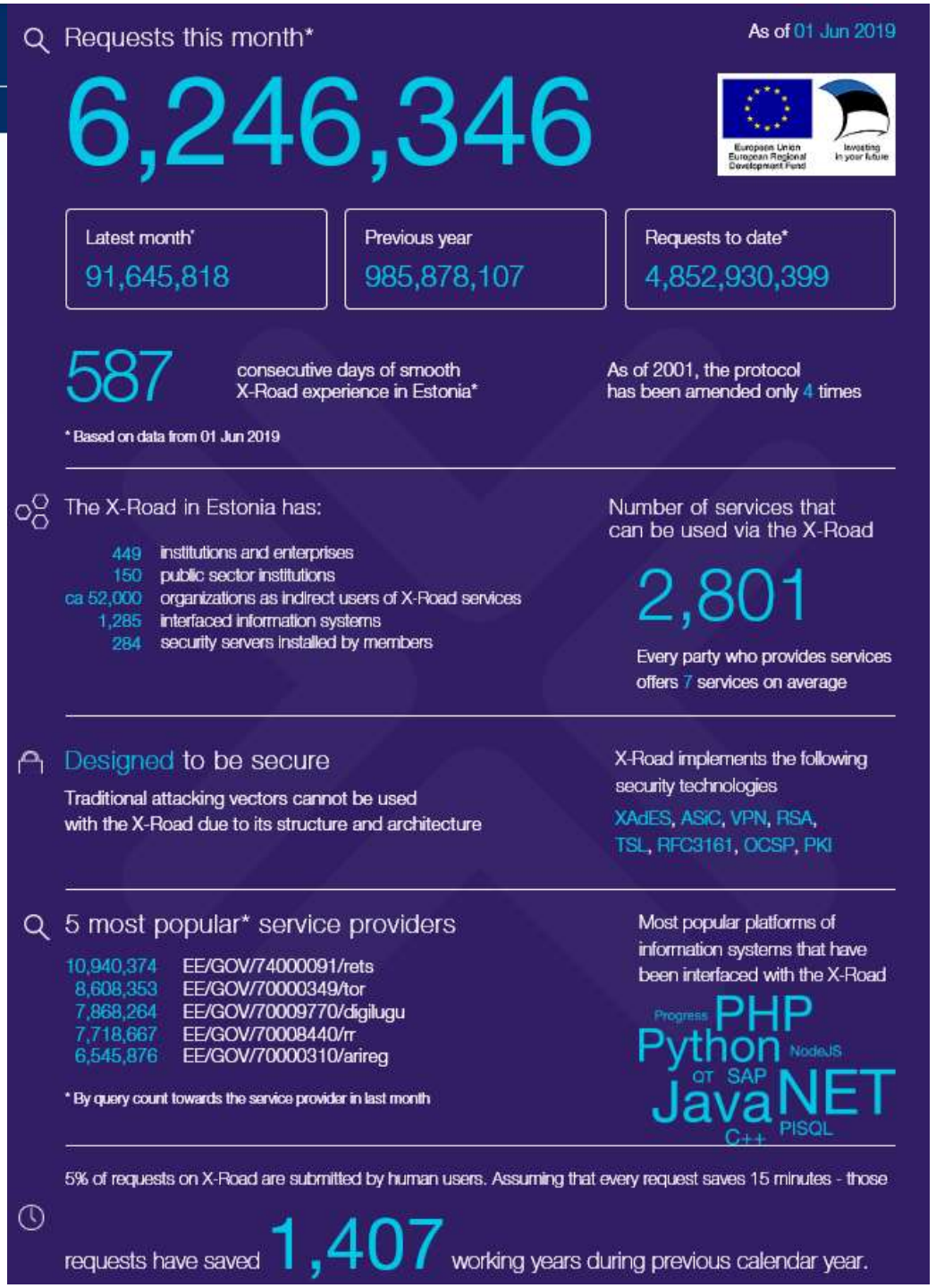
X-Road

X-Road connects different information systems that may include a variety of services. It has developed into a tool that can also write to multiple information systems, transmit large data sets and perform searches across several information systems simultaneously.

Some outstanding features:

- 99% of state services are online
- 500M queries annually by X-Road
- 1285 interfaced information systems

https://www.x-tee.ee/factsheets/EE/#eng
https://youtu.be/b-r6B28qVSY

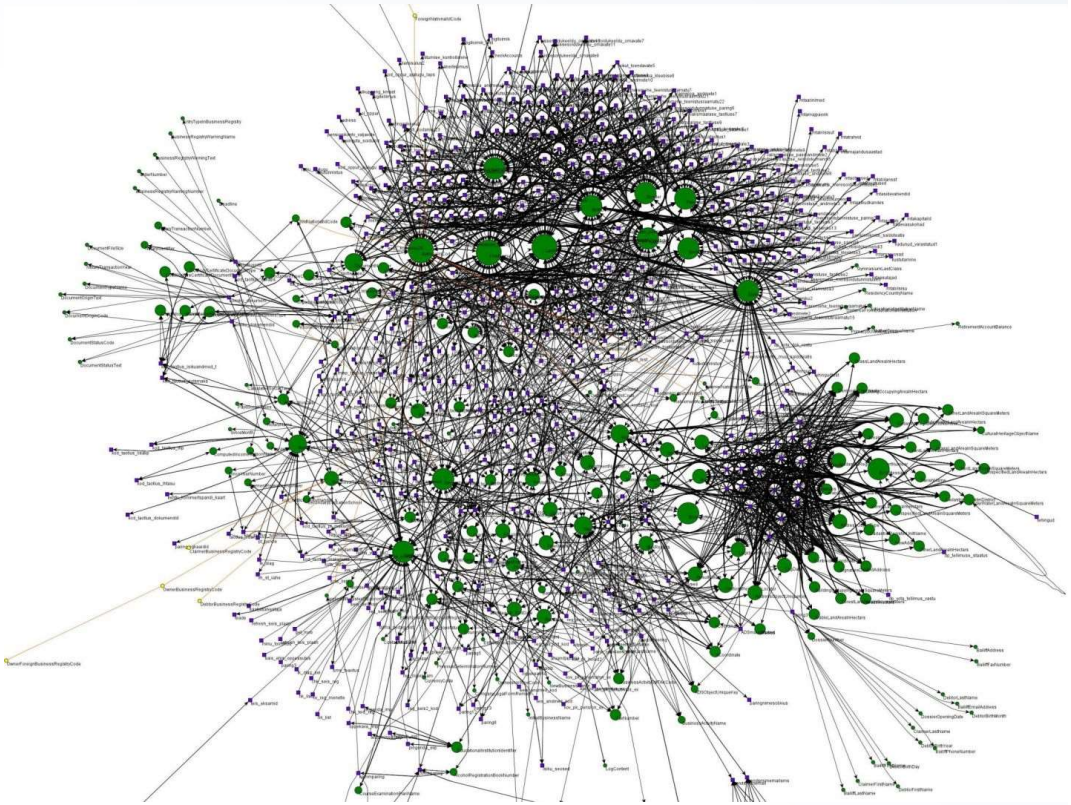


X-Road

All is beautiful in theory, but there are challenges using the full potential.

Some implications from our audits:

- Data is not trustworthy
- Data is duplicated in information systems
- Still no data is being collected
- All data is not easily accessible



Author: Aet Rahe

What if big data is not enough?

Audit: Problems related to the use of European Union and other infrastructure support in local governments

Problems related to the use of European Union and other infrastructure support in local governments

What is the status of local governments' real estate, what services are provided there and is the network of services optimal?

STARTING POINT

- Number of local governments: 213;
- Number of buildings: ca 5400, over 6300 services;
- Number of beneficiaries: 1 323 824.

DATA FROM 4 REGISTRIES, ALL PART OF X-ROAD:

- Register of construction works, Land Cadastre, E-land register and Population Register

ALL THIS DATA, BUT…

- still no data about status, management costs and location of local governments' buildings and services provided there.
- no understanding of where do the beneficiaries live.

Step 1: Obtain an overview of all buildings

SURVEY:

- A massive survey involving all local governments, using Google Sheets. All were expected to fill a row about each single service provided in a building.
- 18 fields per 1 service, so finally 213 x 6500 x 18 = 25M fields (size of rooms, yearly management cost, status)

DRAWBACKS:

- Human factor

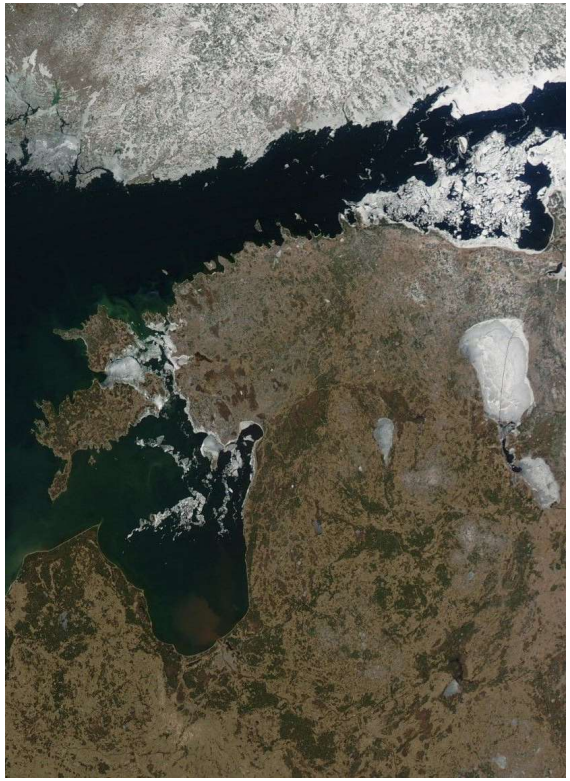
INTEGRATING DATA FROM REGISTRIES:

- Register of construction works, Land Cadastre and E-land register

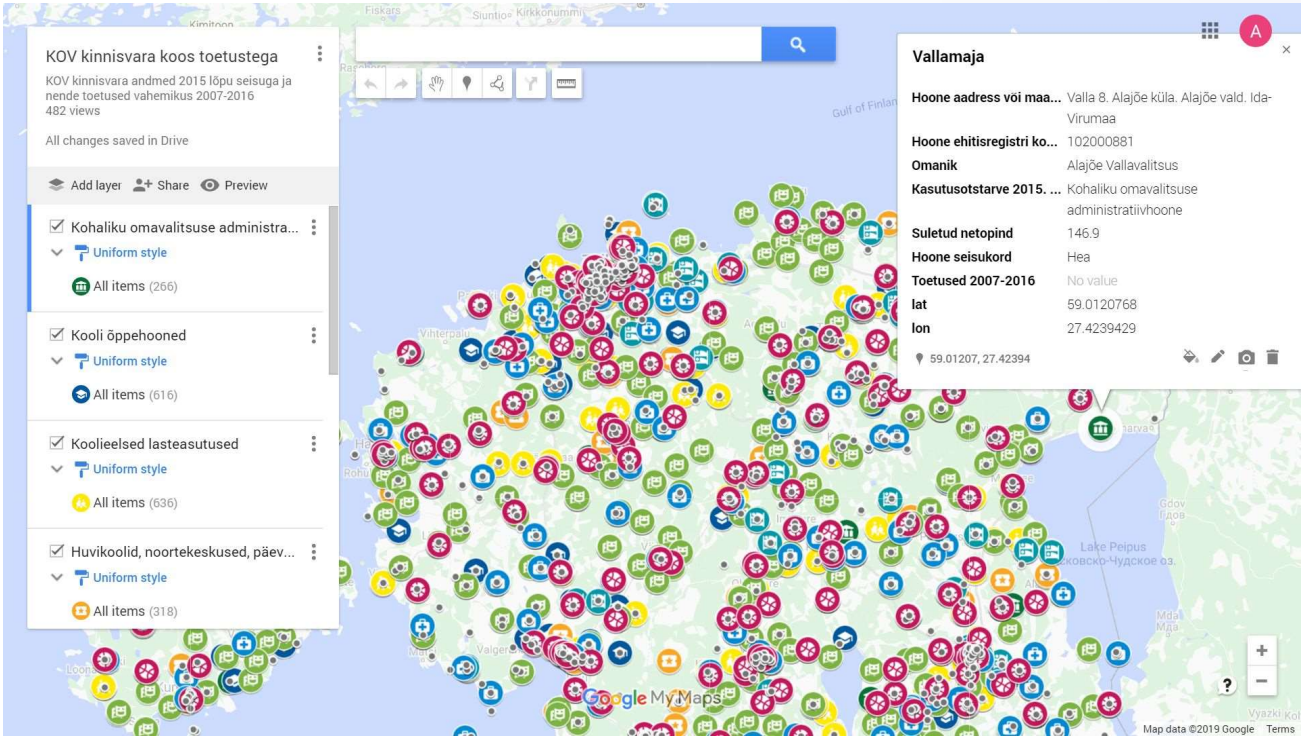
DRAWBACKS:

- Data not available (many buildings were not registered)
- Data from registers did not match with the survey data

Step 2: Getting the objects on the map



Estonian Land Board started geocoding (getting coordinates) all the objects based on their cadastral and/or building code.
First preview was created using Google MyMaps and coordinated with local governments.



Step 3: Where do beneficiaries live?

- Statistics Estonia provided data about the location of inhabitants based on their age.
- An area of the service was created based on the distance (for instance, 15 km area for a kindergarten):
- All this was analysed in QGIS (georeferencing)

Author: Aet Rahe

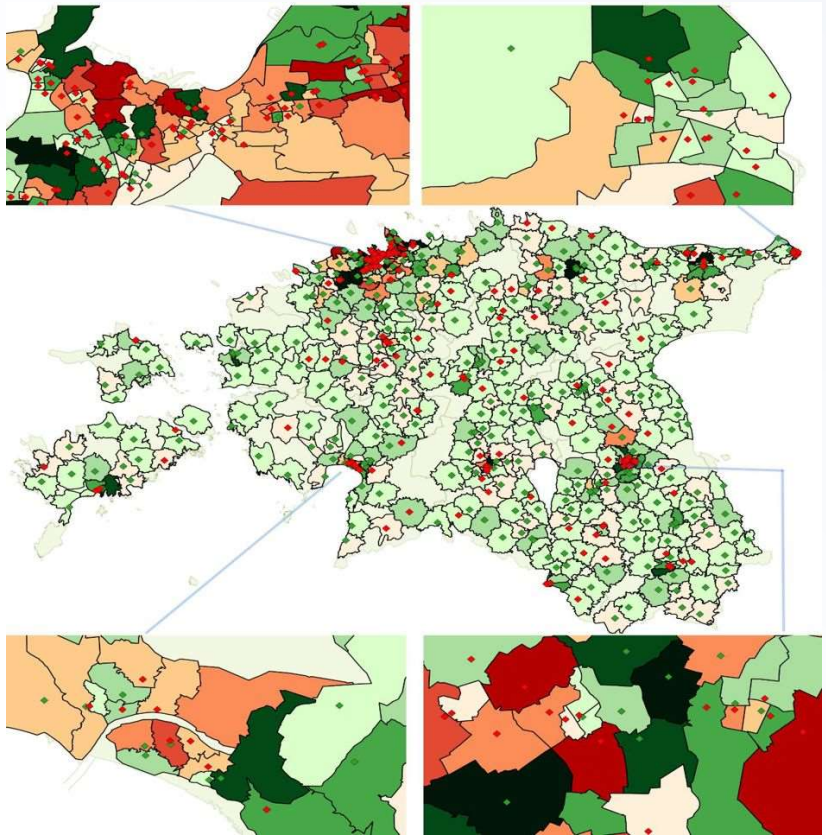
DRAWBACKS:

- It turned out, all objects could not be identified based on their building code, much manual work.

Step 4: Where has the EU funding been allocated?

Another data integrated from separate source:

- Data from Ministry of Finance was acquired and each grant between 2013-2018 was allocated to a specific building
- All this data was then analysed in QGIS (georeferencing), each service separately.



Data is available online and via mobile at https://estat.stat.ee/StatistikaKaart/VKR

Some conclusions…

- Although local governments estimate that they will need 81% of their buildings completely and 8% of them partly also in five years' time and their reconstruction would require 838 million euros in total.
- The total amount of support has been too small for streamlining the buildings required for the provision of services considering the capacity of the local governments on the one hand and the volume and condition of the property on the other hand.
- Approximately 20 million euros have been allocated in the last 10 years to the streamlining of sites that are no longer used for the former purpose or in the intended volume.

… and effects

- Local authorities are analysing, how to optimize their real estate;
- EU and local funding is now being supported by geographical analysis from Ministry of Finance.
- There is a new information system being planned for local authorities' real estate – new data on to the X-Road ☺.

Thank You!