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Information technology and its impact on productivity
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What will we be discussing?

- ❑ **Information system** – the set of rules and measures necessary for information and processing thereof. The information system consists of hardware, software (incl. application), computer network, data, process and people. (*Eesti entsüklopeedia*)

- ❑ **Interoperability** is the ability of disparate and diverse organisations to interact towards mutually beneficial and agreed common goals, involving the sharing of information and knowledge between the organisations. (*U. Vallner*)

Actual data vs digital data

“Next time I will go to the market it will be the digital market.”





Ensuring the interoperability of state information systems for the first register-based census

Interoperability of state information systems

Interoperability of information systems for the register-based census



Levels of interoperability

- Strategic interoperability (decisions, strategies, visions, etc.)
- Legal interoperability
- Organizational interoperability
- Semantic interoperability
- Technical interoperability



Main focus on data collection from registers/information systems

Requesting
data

Submitting
data

Receiving
data



What are the prerequisites for the interoperability of information systems for the register-based census?

- Machine-readable
- Classifications
- Definitions
- Web service standard
- SDS

Interoperability contributes to the quality aspects!

- Interoperability of state information systems develops when database administrators contribute to the central organisation of key data and introduce their use in state databases.
- Ensuring the interoperability of information systems for the register-based census is also useful for society as a whole.



Why is it relevant?

- To reduce time consumption and burden related to data collection; it is in the interests of Statistics Estonia.
- Organising register data; it is in the interests of society.
- Need for faster and timelier statistics; it is in the interests of the state.
- Census costs have to be reduced; it is in the interests of the taxpayer.
- Data quality has to be increased; it is in the interests of data users.



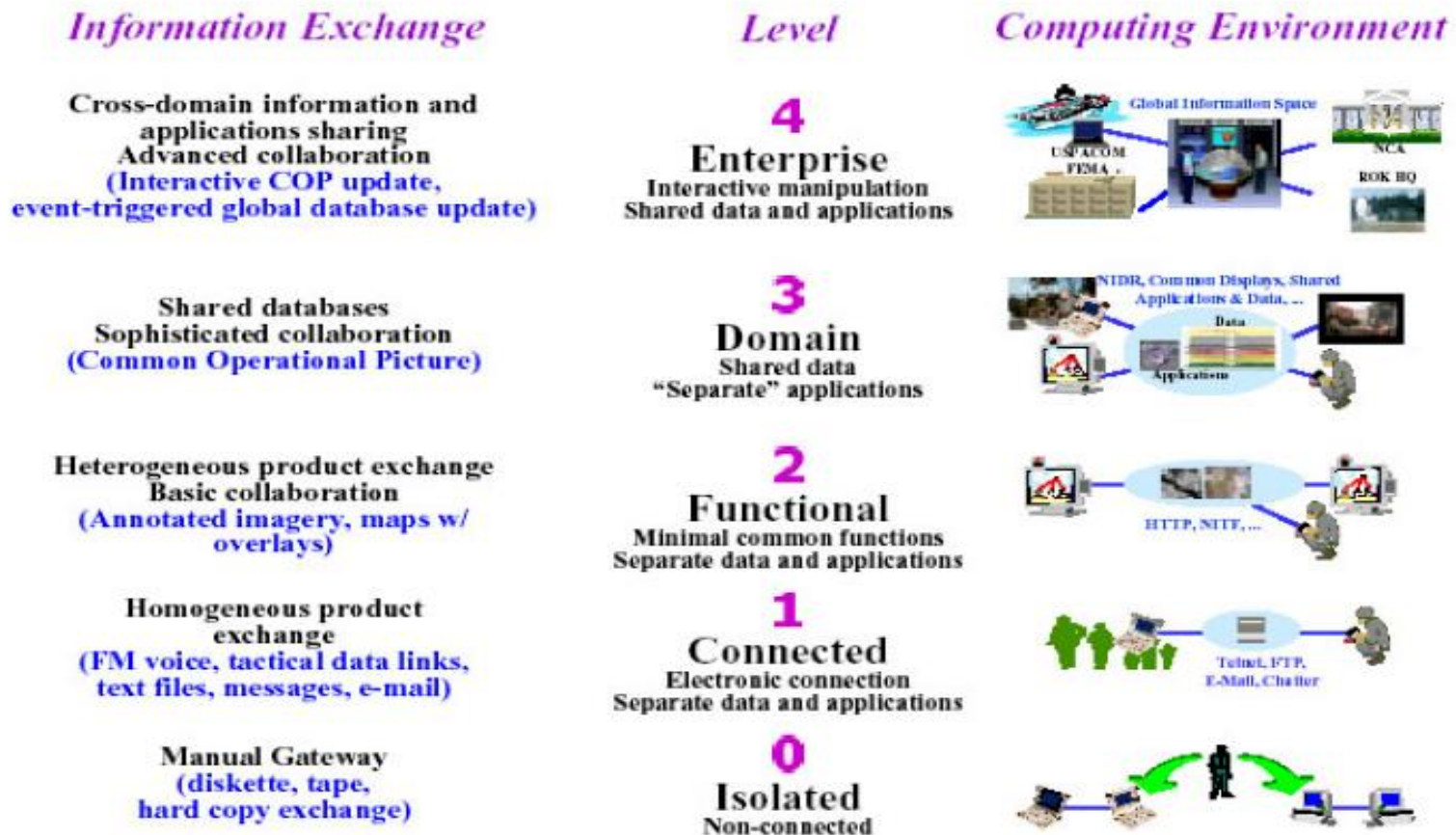
Problems

- Register data are not of high quality.
- The presence of identifiers is not always ensured (personal identification code for individuals, register code for enterprises, ADS identifier for addresses).
- ADS system has not been implemented in registers, i.e. using only the location addresses that meet the requirements of the ADS system, ensuring the address-based linking between various registers.
- Data exchange with 22 registers takes place in 4 different ways.



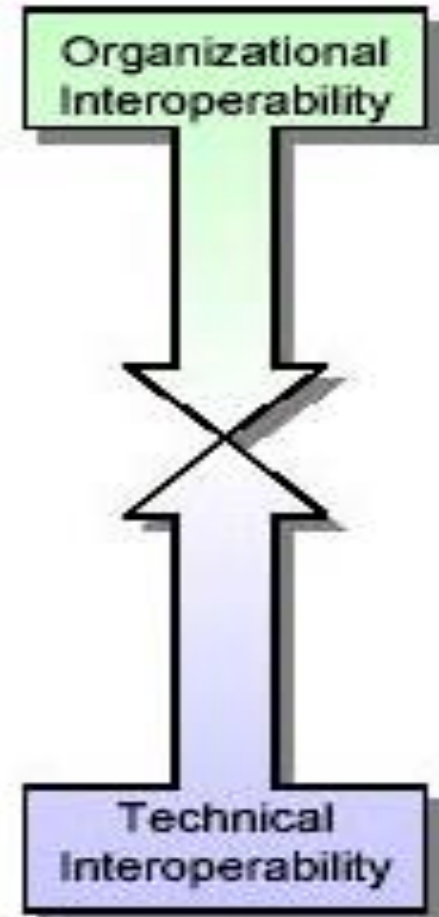
Levels of interoperability of information systems

(The LISI interoperability maturity model, 1998)





Two strategies





Factors impeding interoperability involve the presence of heterogeneity

1. Heterogeneity of information

**Semantic,
Structural,
Syntactic, etc.**

2. Heterogeneity of system

3. Heterogeneity of information system

**Databases,
Repositories,
Data models,
Management systems, etc.**

4. Heterogeneity of platforms

**Operation systems,
Hardware systems,
File systems, etc.**

ES Guarantees of interoperability in Estonia

- Administration System for the State Information System (RIHA);
- Data exchange layer for information systems (X-Road);
- IT Baseline Security System (ISKE);
- Classifications system;
- Address data system (ADS standard);
- Geodetic system.



Why are frameworks good?

- For increasing the interoperability of databases
- For ensuring data availability
- For reducing duplication in data collection
- For ensuring the purposefulness of data collection
- For increasing data quality



Most important quality indicators of information system and data in connection to interoperability

Indicators

Completeness
Accessibility
Coherence
Accuracy
Timeliness

Information system quality



Punctuality
Accuracy
Relevance

Data quality



We have assessed the effectiveness of the mechanisms of the functioning of data capture from databases necessary for the census

1. Service is not always accessible, interfacing is required;
2. External interfaces need to be supplied with descriptions of WADL or WSDL services;
3. X-gate functionalities need to be enhanced;
4. Metadata repository should include descriptions of the metadata captured in the same semantic framework, incl eliminating obsolete terms and links and anomalies, e.g. the definition of household;
5. Census data being captured must be converted from XML to SDMX (EU requirement);
6. Time spent on capture should be optimised by up to 85%;
7. Monitoring and improving the data quality of registers is not effective;
8. Implementing SLA instead of signing contracts between institutions.



What must be done?

- Create subject-related/legal/technical capacity for data collection.
- Solve problems connected to definitions of register and census characteristics in databases.
- Create concept of census data capture from databases.
- Create framework for improving quality, ensuring not only coverage, accuracy, regular updating of data in registers but also providing feedback to databases.



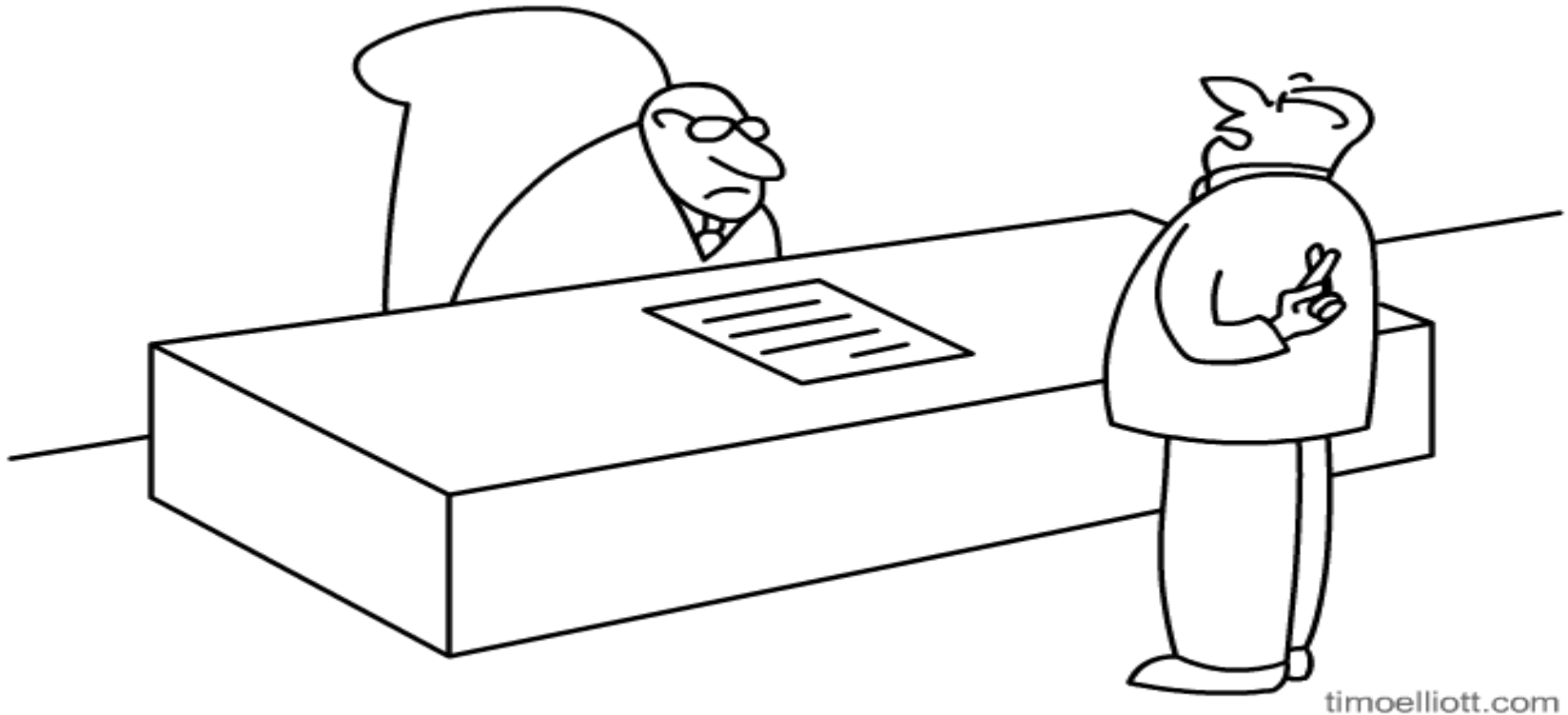
Conclusion

- The framework of the state IT interoperability is a collection of standards and guidelines which ensures the functioning of the information systems of the public sector as a single entity for also the census.

For this we need the following:

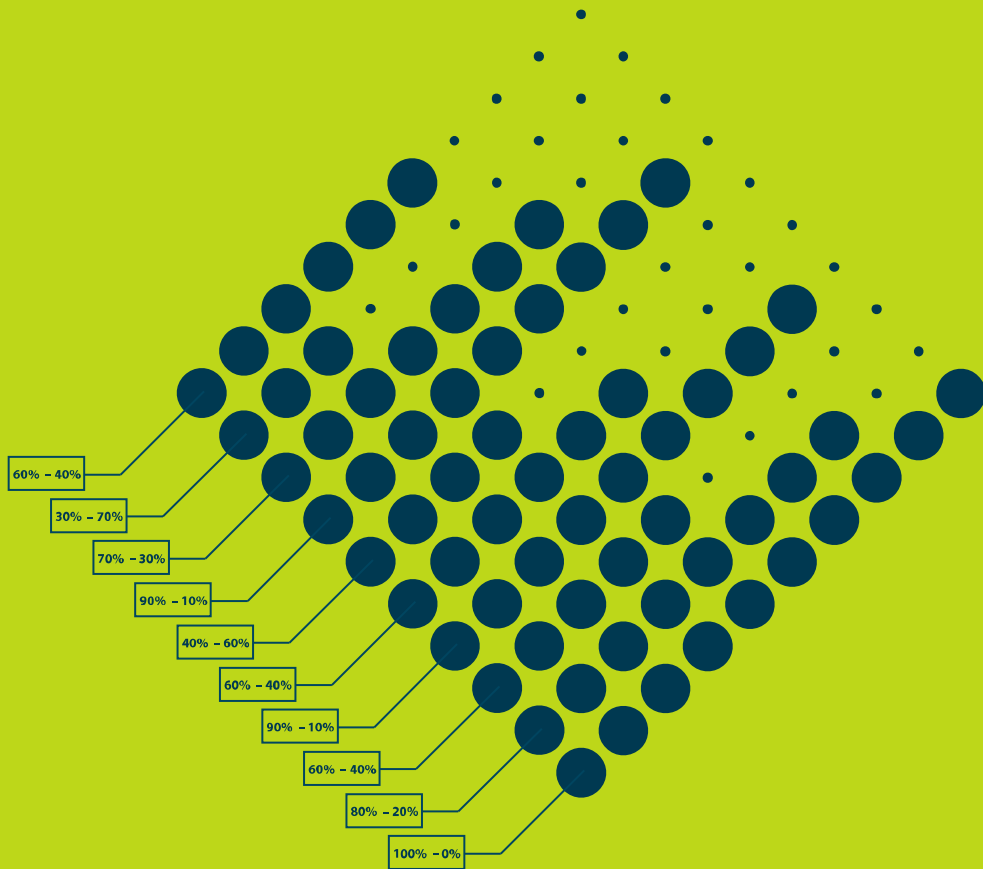
- Compatible and linkable registers on the person and housing level;
- Dwellings must have a unique address;
- Addresses of data sources have to be linkable;
- Necessary software and implementing ADS system in all registers which include addresses;
- Ensuring regular updating of register data;
- Harmonising definitions and classifications used in registers;
- Finding possibilities to collect the characteristics 'workplace' and 'occupation' in a register-based way;
- Ensuring fast data exchange with the administrators of the register.

In an e-environment, data quality is vital!



timoelliott.com

"Yes sir, you can absolutely trust those numbers"



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