UNIVERSITY OF TARTU
Institute of Computer Science

RIIGI INFOSÜSTEEMI AMET

CYBERNETICA

# Framework for Security Level Evaluation F4SLE

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What is my security situation?

Technical failure

E-ITS

GDPR

Assets?

ISO27001

NIS2

Supply chain failure

How to stay competitive?

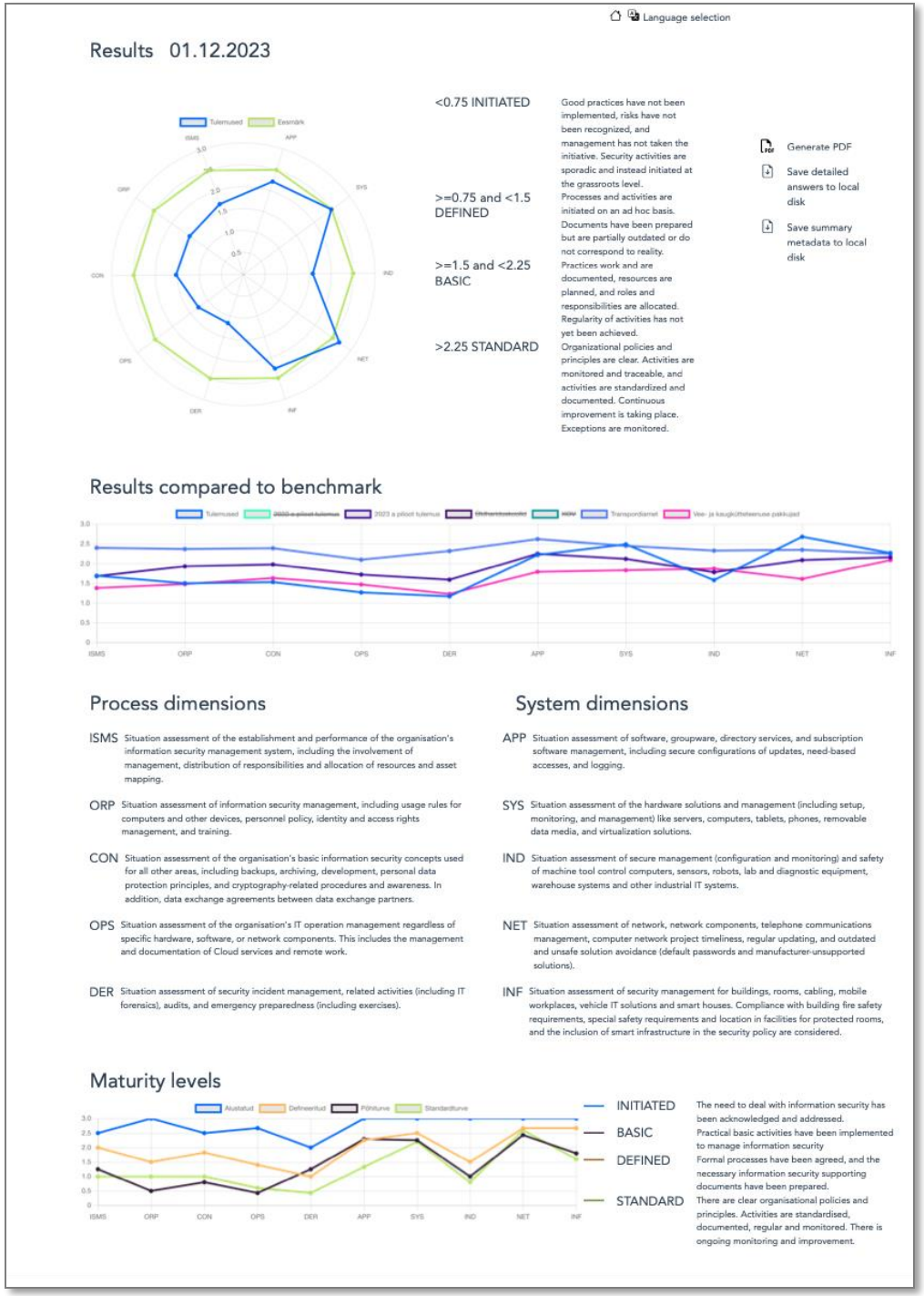
Reporting of security status to NSCS

Cyberattacks

# F4SLE *Framework for Security Level Evaluation*

- Self-assessment
- Immediate result
- All-hazard approach
  ISO27001, NIS2, E-ITS, ENISA Threat landscape report
- Comparision benchmarks

https://mass.cloud.ut.ee/massui/




# Organization and CISO

- Security evaluation result in 10 security dimensions
- Risk level values
- Comparing with expectation level (green line)

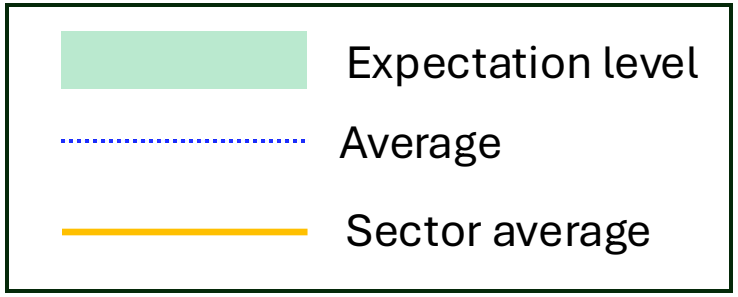
- Bechmarking with others

- Meanings of Security dimensions

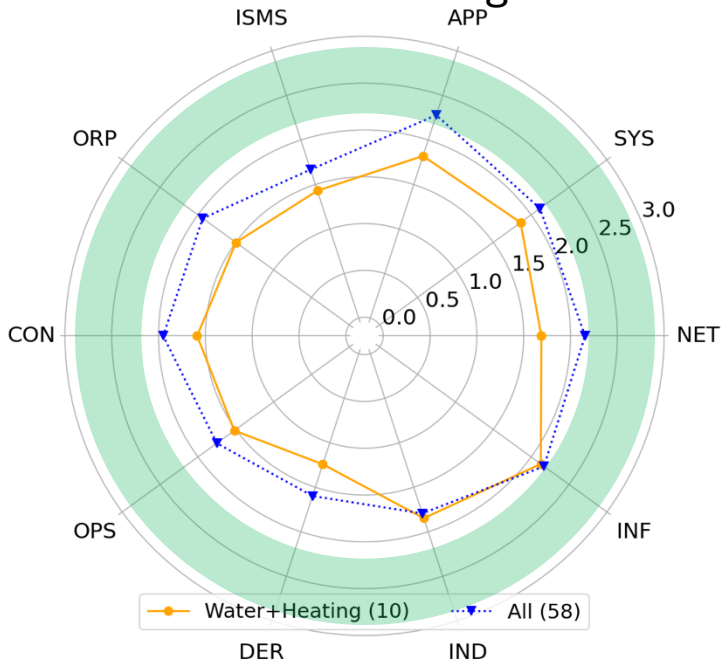
- Details of maturity, documentation, practical measures, continuity

https://mass.cloud.ut.ee/massui/

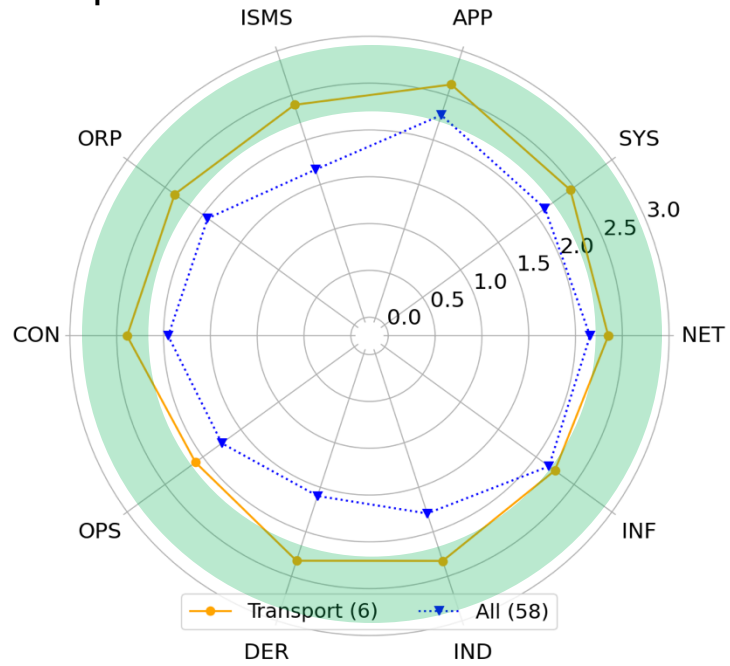
# Comparison of Sectors



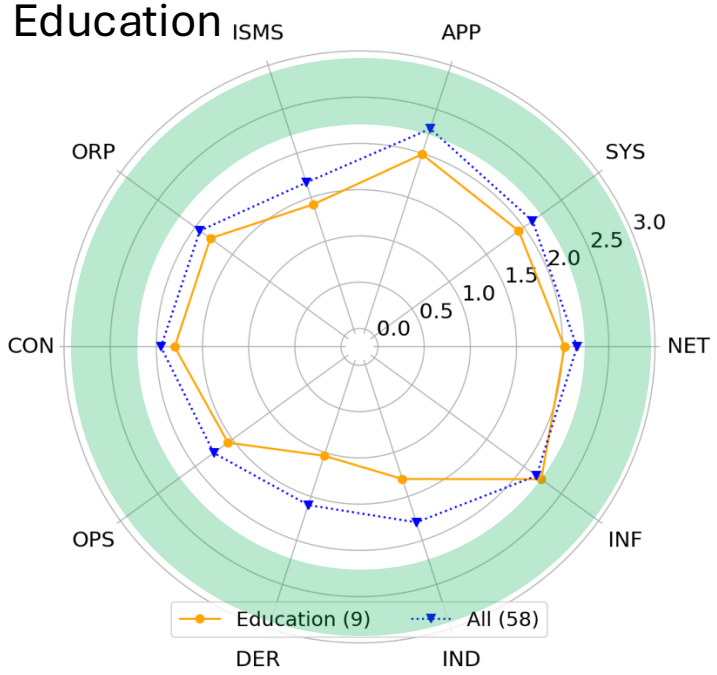

## Water and distance heating



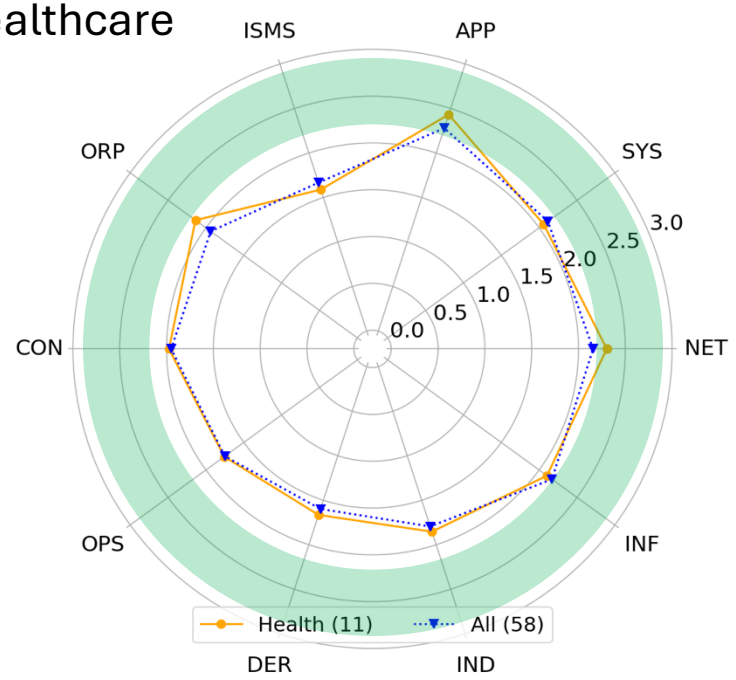

## Transport



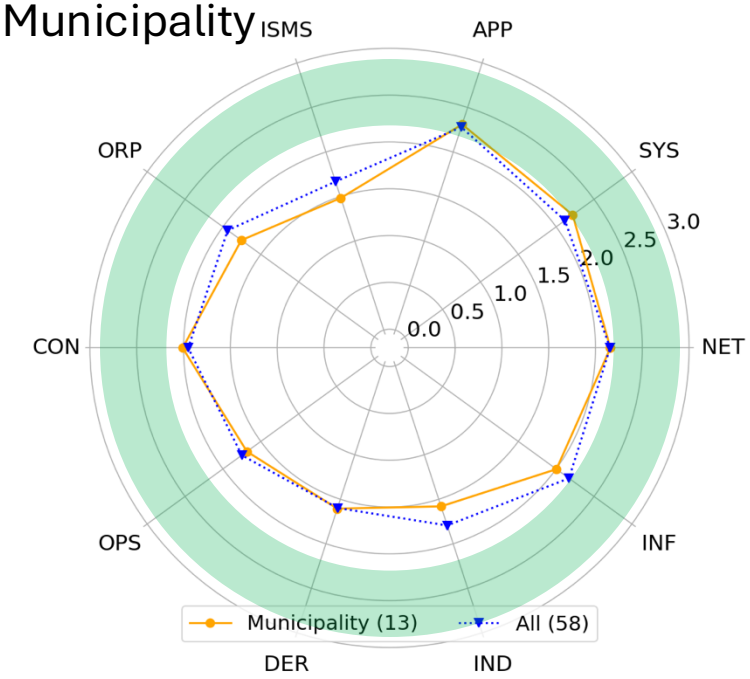

## Education



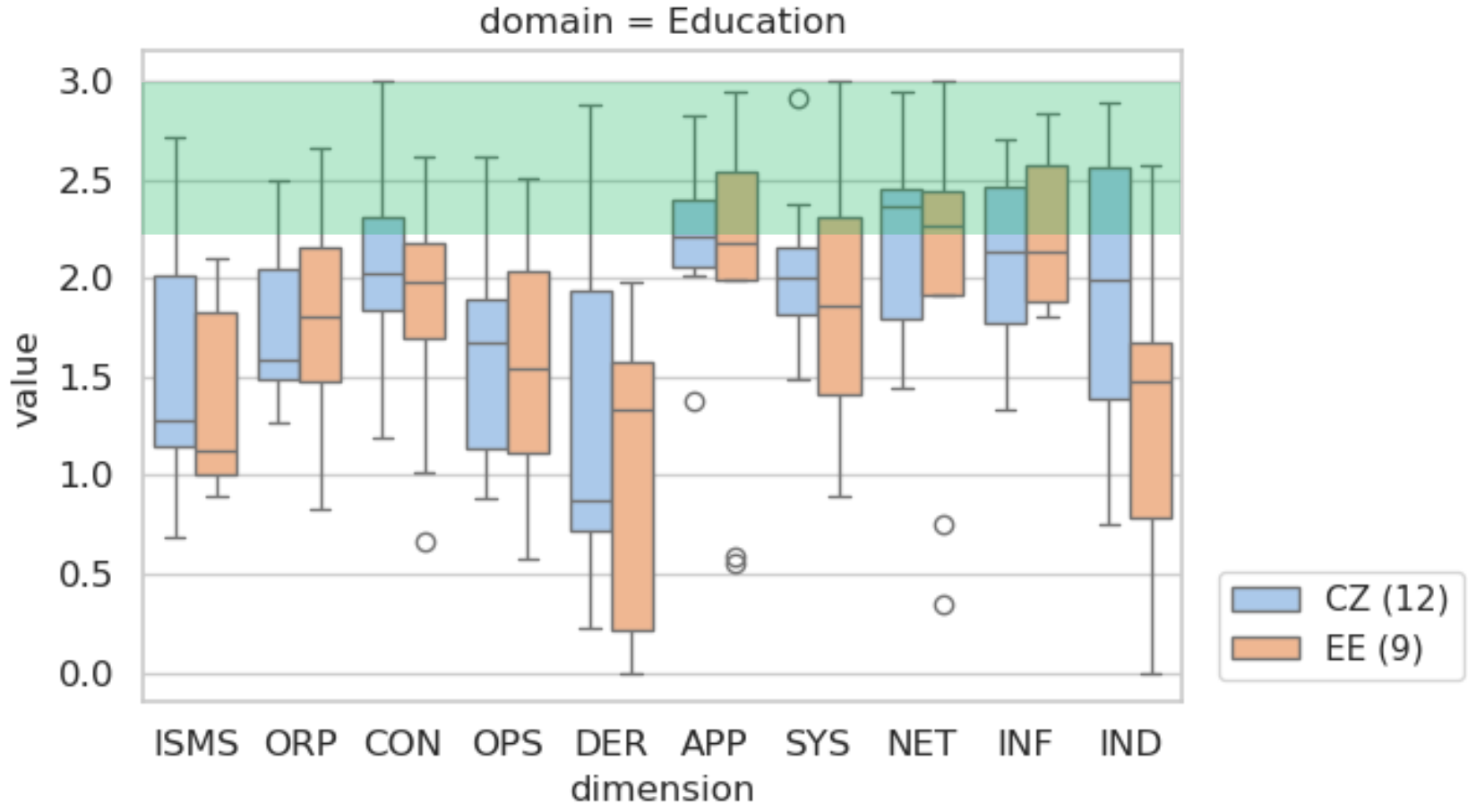

## Healthcare




## Municipality



# Estonia vs Czech - Education

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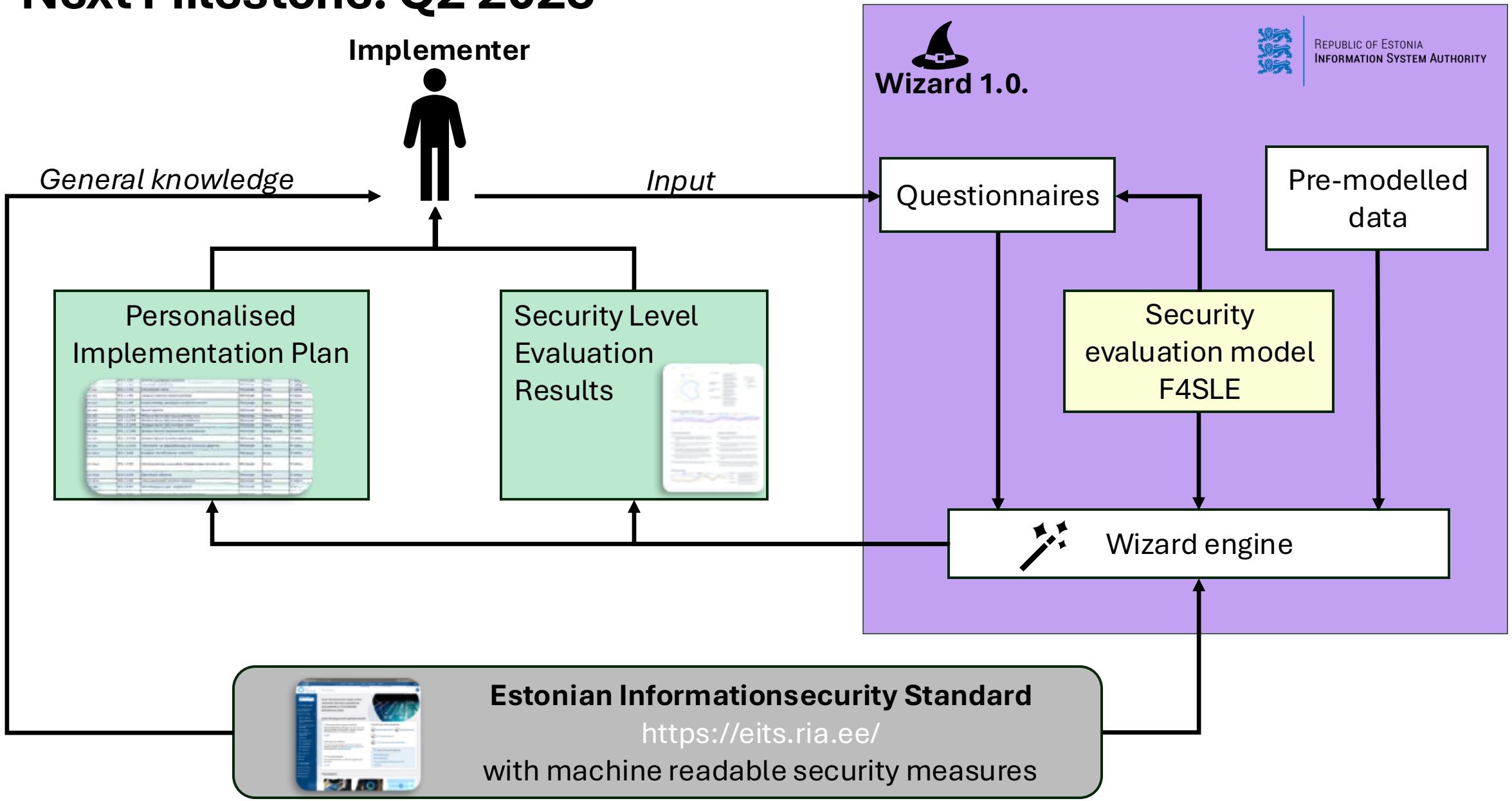
# Next Milestone: Q2 2025



# How to get best value from security level evaluation?

You can not measure security
but
you can evaluate what you have done to be secure.

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# Security Level Evaluation with F4SLE [1]

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CHESS
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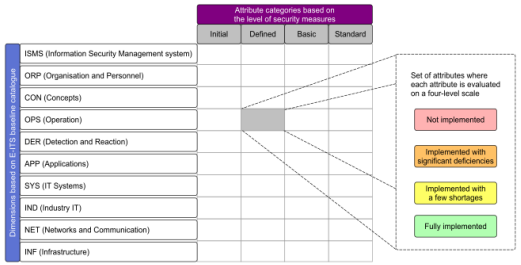
What are the avenues for interpreting the data collected using the security level evaluation instrument F4SLE?

## F4SLE- Framework for Security Level Evaluation

- An instrument for evaluating organization security maturity level
- Based on E-ITS, ISO27002 and ENISA Threat Landscape Report
- Attributes are updated yearly based on method for updating the security evaluation instrument MUSE principles
- Does not impose any prerequisites on organizations for self-assessment

## MASS - Measurement Application for Self-assessing Security

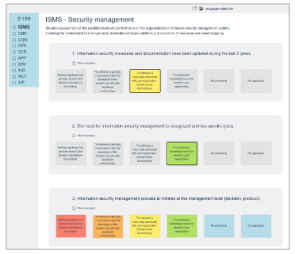
- Presents the F4SLE to respondents
- Provides immediate results on the organization's security status after responding to all security attributes
- Collects averaged results for cross-organizational analysis




F4SLE – Framework for Security Level Evaluation [F4SLE, MUSE]

Collected metadata with options (*in Italic number of respondents*)

| Data type | Options |
|---|---|
| Domain | Healthcare(1); Municipality (11); Government office (4); Education (9); ICT (2); Other private sector; Non-profit (1); Other (specify) |
| Workplaces | 1...30(3); 31...100(9); 101...300(7); 301...1000(5); 1001... (4) |
| Hours | Around 30 minutes; Around 1 hour; 2 hours; 2-4 hours; 4-8 hours; More than 1 working day |
| Role | IT manager(8); Information security manager /specialist(11); Management(4); Network/system administrator; Administrative assistant/lawyer/DPO (1); Other (specify)(4) |
| Country | Czech Republic(2); Estonia(28); Other |
| Implemented standards | ISO/IEC 27001; ISKE (Estonian); CIS Controls; KUTS (Estonian); NIST CSF; E-ITS (Estonian); BSI IT Grundshutz (German); Act on cyber security, no.181/2014 Coll. (Czech) |




MASS user interface example

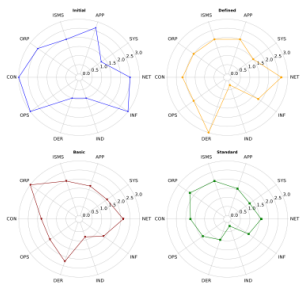
**Organizational level:**

- Maturity levels by security dimensions
- An aggregated result, which can be interpreted as a risk level
- Benchmarks

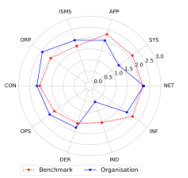
**Results**

**Cross organizations** (interpretation principles):

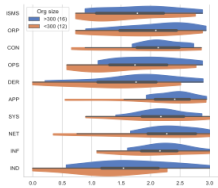
- Difference between organizations (data dispersion)
- Comparison based on individual data points (e.g., mean, median - compare results over time, provide benchmarks)



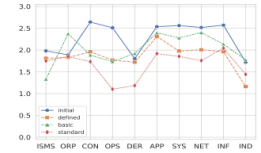

Security evaluation result example of one organization, breakdown by maturity levels



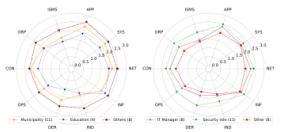

Security evaluation result example of one organization, comparison with the benchmark (cross-organizational average result)




Overall evaluation distribution by dimensions and organization size. The median has been marked with a white dot and 50% by the black thick line.




Overall evaluation results by maturity levels




Overall evaluation result breakdown by (a) organization domain and (b) respondent role.

## Limitations

- Selected, voluntary organizations – no random sample
- Dominating domain – municipalities
- Full statistical data analyzis is yet to be implemented
- Based on a self-assessment questionnaire
- Respondent's role and awareness could affect the results within an organization
- Comparing results between Estonia and other countries may be affected by the Estonian Information Security Standard bias

## Future Work

- Increase the number of respondents in Estonia and South Moravia (Czechia)
- Repeat the data collection at least twice (yearly dynamics)
- Update the F4SLE attributes using MUSE principles
- Compare responses from the same organization but given by different roles
- Conduct more data analytics and link it to other databases (causal relationships, threat landscape, security, and specific regulations)
- Assess the possibility of using the results to develop security-related strategies
- Engage national decision-makers
- Collecting the same data from Estonia and the South Moravia simultaneously

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# F4SLE *(Framework for Security Level Evaluation)* principles

- ISO27001, E-ITS, NIS2 and relevant threats (regular updates)
- Regularly but once-only (reusable data for interested parties)
- Immediate result to data provider
- Low entrance barrier
- Sectoral benchmarks (comparability)
- Comparability over time (dynamics)
- Security and privacy of data collection tool MASS
- Translation ET, EN, ES

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## Interested Parties by NIS2

- Org. management & CISO
- Supervisory
- External consultant
- Partner (supply chain)
- State level policy-maker


- M. Seeba, R. Matulevičius, I. Toom, Development of the Information Security Management System Standard for Public Sector Organisations in Estonia, 2021, doi:10.52825/bis.v1i.43.
- M. Seeba, S. Mäses, R. Matulevičius, Method for Evaluating Information Security Level in Organisations, 2022, doi:10.1007/978-3-031-05760-1_39
- M. Seeba, T. Oja, M. P. Murumaa, V. Stupka, Security Level Evaluation with F4SLE, 2023. doi:10.1145/3600160.3605045
- M. Seeba, A. amefon Obot Affia, S. Mäses, R. Matulevičius, Create your own MUSE: A method for updating security level evaluation instruments, 2024 doi:10.1016/j.csi.2023.103776.