2016 update.

NIFO Factsheet – Estonia

In Estonia, the main online sources regarding interoperability are

- The Estonian Interoperability Framework: https://www.mkm.ee/sites/default/files/interoperability-framework_2011.doc and https://www.mkm.ee/en/objectives-activities/information-society/state-information-system
- The Information System Authority and the X-Road: https://www.ria.ee/x-road/

Main interoperability highlights

The third version of the Estonian Interoperability Framework[1] consists of two levels. The first level describes the framework itself. The second level describes sub-frameworks and activities on interoperability. The framework undergoes a consultation period whereby state and local government agencies, private sector, third sector entities and individuals can submit their proposals. The framework documents are enforced with the Directive of the Minister of Economic Affairs and Communications (11-0377).

Estonia has widely been taken as a good example of eGovernment services and Interoperability initiatives. According to the European Union e-government report 2016, other countries should follow the steps Estonia has taken in e-governance and the availability of online services to the public[2].

Over the next two years, the Tallinn-based e-Governance Academy will assume a lead role in creating a data exchange and information system in Ukraine, enabling up to 600 local service centres in the country to provide up-to-date public services to the people by exchanging information with national central registries[3].

Summary of the NIF

The third version of the Estonian Interoperability Framework is aligned with the terminology and general principles of the European Interoperability Framework, and other initiatives. The documents of the Estonian framework are divided into two levels.

The first level, the framework itself, includes a list of documents, a glossary, concepts, principles, policies, guidelines, recommendations and practices. The second level includes information on the service model and service, room, the interoperability dimensions such as the political, legal, organisational, semantic and technical interoperability. Furthermore, it includes lists and clarifications on open standards, software and open specifications, joint infrastruc-

[1] Interoperability of the State Information System (2011), see: https://www.mkm.ee/sites/default/files/interoperability-framework_2011.doc

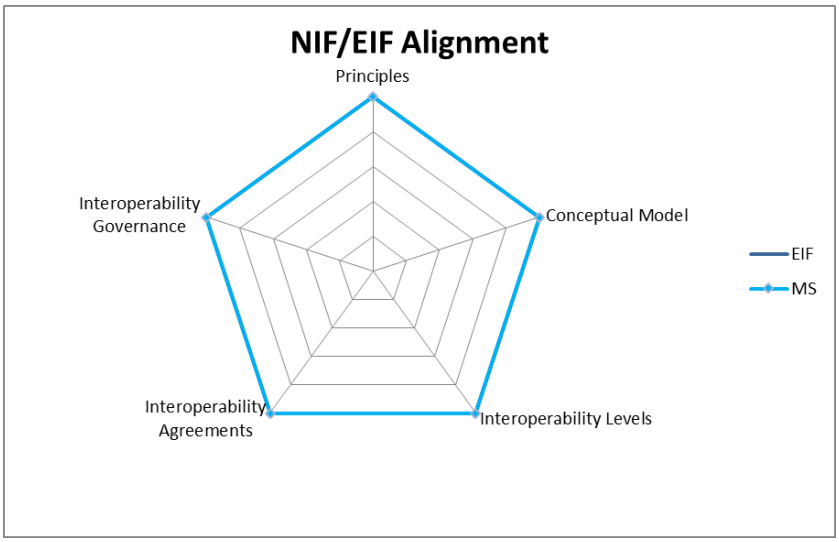
[2] http://estonianworld.com/technology/eu-e-government-report-countries-follow-estonias-footsteps/

[3] http://estonianworld.com/technology/estonian-e-governance-academy-develop-e-services-ukraine/

ture services, management of the interoperability framework and harmonisation of the Estonian framework with the EIF.

Alignment NIF/EIF

The Estonian NIF is fully aligned with all principles and recommendations of the EIF.



The Estonian NIF aligns with all of the twelve EIF principles whereby the general principle of subsidiarity is considered important, principle 2-8 deal with the needs and expectations of end-users and principle 9-12 are oriented at common activities of public sector institutions.

The conceptual model put forward in the Estonian NIF is fully aligned with the EIF. The Estonian Interoperability architecture of services follows a Service-Oriented architecture approach. The NIF puts forward common infrastructure building blocks to be used to develop new public services. Authentic sources are accessible through the secure distributed service bus X-Road. Authentication and authorization for data exchange is issued by the X-Road data security layer. Interfaces to authentic sources are aligned on a semantic and technical level.

The Estonian NIF describes the four interoperability levels. The NIF describes all relevant legislation with respect to data exchange. Business processes are unified documented and the organizational relationships are clarified among the different levels of the administration. The NIF encourages the definition of change management procedures to ensure continuous service delivery. The semantic interoperability framework puts forward semantic assets defined through a collaboration of different public administrations, private companies and associations. Technical interoperability is ensured through formal specifications including the open standards framework, interoperability architecture framework, etc.

The interoperability agreements described are fully aligned with the EIF. The Estonian NIF describes a consultation period for administrations, private sector and individuals to provide their feedback and suggestions for selecting formalised specifications. Data protection requirements are considered and implemented through suitable technical measures.

Regarding governance, the department of state information systems of Ministry of Economic Affairs and Communications coordinates the different initiatives and must ensure compliance with the Interoperability framework at all times.

The Information System Authority (subdivision of the Estonian Ministry of Economic Affairs and Communications) manages the Architecture Committee (AC) that discusses topical issues and problems in relation to interoperability. In addition to the AC, there are four subcommittees: eID, X-Road, basic infrastructure and e-services (attended by service owners).[4]

More detailed information on NIF / EIF alignment is provided on the NIFO Community on JoinUp on the Compare NIFs page.

Example of alignment – Common taxonomy of basic public services

As part of the interoperability levels, the criteria on the common taxonomy of basic public services is mentioned in the Estonian NIF as follows:

- The Semantic Interoperability Framework is a set of multilateral agreements and rules, which would facilitate the linkage between systems at the semantic level. The following types of semantic assets are included:
  - dictionaries
  - thesauri
  - code lists and classifications,
  - taxonomies,
  - conversion table (mapping tables),
  - ontologies,
  - service register.

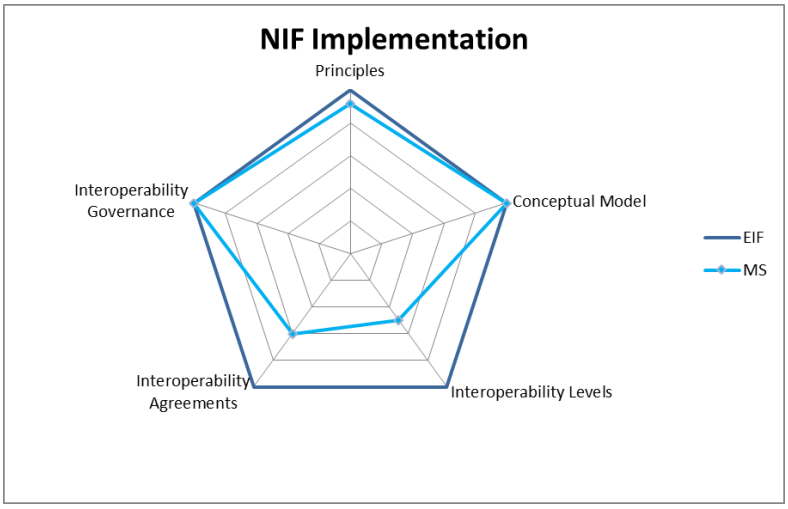
See:

https://www.mkm.ee/sites/default/files/riigi_infosusteemide_semantilise_koosvoime_raamistik.pdf

Implementation of NIF

The principles, the conceptual model and the governance are very well practically applied. The practical implementation for the interoperability levels and interoperability agreements are limited.

[4] See https://www.ria.ee/riigiarhitektuur/wiki/doku.php?id=an:an



All principles are practically implemented on a large scale, except for two – user-centricity and technological neutrality and adaptability - which have only some practical examples.

All conceptual model criteria are practically implemented on a large scale, mainly through the X-Road infrastructure.

In the dimension of the interoperability levels, the change management processes are implemented as part of the IT architecture framework[5] . Organisational relationships and formalised specifications are implemented through the interoperability framework mentioned above, whereas semantic interoperability is implemented through the Semantic Interoperability Framework[6].

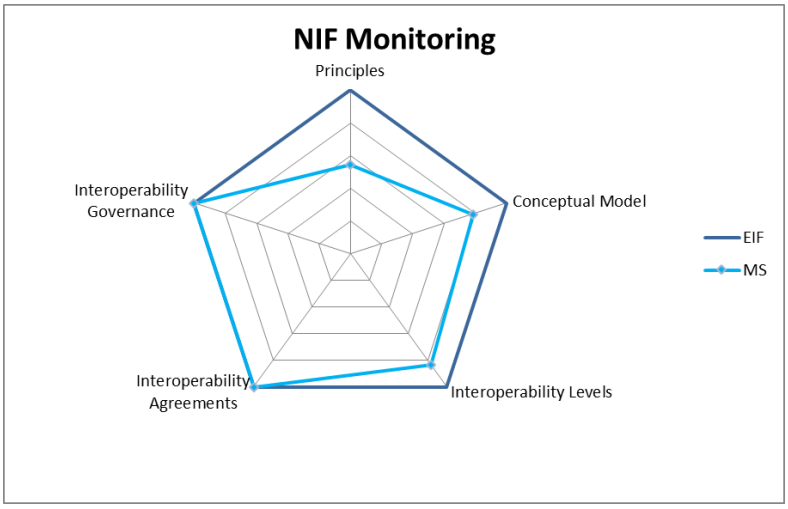
The interoperability agreements are implemented for the secure data exchange through the IT Architecture framework, and implemented for the approach to select formalised specifications and the preference for open specifications through the interoperability and software frameworks.

Governance is implemented through the different frameworks mentioned above. These interoperability frameworks of the state information system handle information systems from the point of view of the state as a whole[7]. The frameworks have been harmonized with the European frameworks.

Monitoring of NIF

All categories of the NIF are well monitored, except for the principles, monitored to a less extent.

[5] https://www.mkm.ee/sites/default/files/riigi_it_arhitektuur.pdf
[6] https://www.mkm.ee/sites/default/files/riigi_infosusteemide_semantilise_koosvoime_raamistik.pdf
[7] https://www.mkm.ee/en/objectives-activities/information-society/state-information-system



The subsidiarity and proportionality, user-centricity, security and privacy, administrative simplification, openness and effectiveness and efficiency principles are fully monitored. The inclusion and accessibility principle is partly monitored.

The conceptual model itself, the common schemes to interconnect loosely coupled services, the access and control mechanisms and interfaces used are also monitored through reports with monitoring indicators and the X-Road website[8].

All the elements in the dimension of the interoperability levels are monitored except for the interaction processes between administrations. The change management processes are monitored as part of the IT architecture framework. In general, monitoring is done by Estonian State Information Systems Authority. All changes in public sector information systems and their services are required to register in the administration system for the state information system RIHA[9].

The interoperability agreements and governance are monitored in the same way by the State Information Systems Authority. Monitoring for the secure data exchange through the IT Architecture framework.

More information on all the implementation and monitoring examples is provided on the NIFO Community on JoinUp on the Compare NIFs page.

[8] https://www.ria.ee/x-road/
[9] https://www.ria.ee/administration-system-of-the-state-information-system/ and https://riha.eesti.ee/riha/main

Example of implementation/monitoring – Conceptual Model: Access control

The data exchange layer X-Road is a technical and organisational environment, which enables secure Internet-based data exchange between the state's information systems as implementation.

- PKI or the public key infrastructure enables secure digital authentication and signing. The infrastructure also allows forwarding data by using an encrypting key pair: a public encryption key and a private decryption key. In Estonia, this technology is used in relation with electronic identity (ID card, mobile ID, digital ID).

See https://www.ria.ee/x-road/

The Estonian Information System's Authority is responsible for the monitoring.

- Measuring indicators such as the use of a secure electronic identity and the secure electronic identity card (ID card, mobile ID, digital ID, etc.)
    - The proportion of the population owning eID-s
        - Beginner: 37% (2013) → target: 65% (2020)
    - Issued by non-residents of existing eID-s
        - Beginner: 47 (2013) → target: 5000 (2020)
    - The proportion of persons who rate their computer skills sufficient for their own use and protection of personal data on the Internet
        - Beginner: 68% (2013) → target: a 10 percentage points higher than the EU average by 2020. A (2020)

Other initiatives on interoperability

E-residency[10] is a state-issued secure digital identity for non-residents that allows digital authentication and the digital signing of documents. The e-residency service[11] makes it easier to register companies in Estonia, declare taxes, access Estonian bank accounts and electronically sign documents and contracts. E-residents receive a smart ID-card with a microchip. The card contains a certificate that allows authentication on government portals, and a second certificate that allows the electronic signing of documents, with the **digital signature considered legally binding in all EU Member States**. The service also provides reusable open source tools for software developers so that they can build new services. In the context of the implementation of the Estonian e-Residency programme, the law on the Requirements and procedure for identification of persons and verification of persons' identity with information technology means by the ministry of finance[12] has been adopted in October 2016.

The Estonian e-Governance Academy (eGA) has gathered all knowledge on e-governance into the publication "e-Governance in Practice". The publication gives an overview on creating and managing digital society, covering all main domains, such as cyber security, interop-

[10] https://e-estonia.com/e-residents/about/
[11] https://joinup.ec.europa.eu/community/epractice/news/estonia%E2%80%99s-e-residency-open-business

[12] https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/eGovernment%20in%20Estonia%20-%20February%202016%20-%2018_00_v4_00.pdf

erability, infrastructure, enablers, e-democracy, legislation, educational programs and many critical e-services. The guide also provides an easy to follow step-by-step approach to main areas of e-governance. First edition was presented to the guests of the 2016 Tallinn e-Governance Conference that brought together representatives from 54 countries.

As almost all Government services in Estonia are online, a service catalogue with multiple views for different stakeholders has been created, including four views in total: one end user version for citizens and entrepreneurs; a statistical view for service owners and managers, and two machine-readable views, one of which is used as an input for the development of ICT policies. The benefits of the service catalogue are already clear. For citizens, customer view aids transparency – they can see the tools and services available, and how their Government is spending money[13].

NIF responsible contact person for Estonia

Kaspar Kala (kaspar.kala@mkm.ee)

[13] https://www.axelos.com/news/blogs/march-2016/using-service-catalogue-to-improve-public-services