

Legal, organizational and semantic aspects on Geospatially Enabled Ecosystem

Report



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Figure 1: The interoperability model of EIF Error! Bookmark not defined.

1. The European Interoperability framework (EIF)

The [European Interoperability framework](#) promotes seamless services and data flows for European public administrations. It is in no way a directive, but gives guidance to public administrations, through a set of recommendations, to public administration on how to set up digital services and how these can be improved. EIF is envisaged as the 'common denominator' of interoperability policies in Europe.

The recommendations in the European Interoperability framework underlies most of SDI's and ecosystems in development in Europe.

The European Interoperability Framework specifies 4 interoperability layers, with crosscutting called integrated public service governance and a background level on interoperability governance.

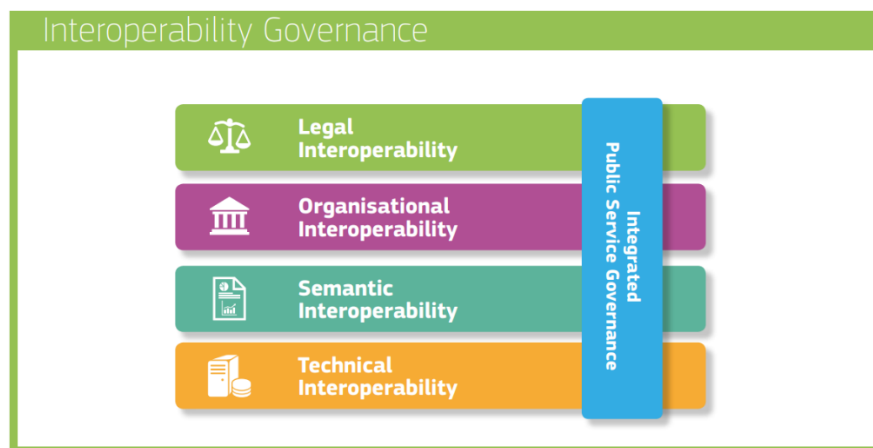


Figure 1: The interoperability model of EIF.

The interoperability of GeoE3 is based upon the European Interoperability framework, consisting of four interoperability levels:

- Legal interoperability
- Organisational interoperability
- Semantic interoperability
- Technical interoperability

This report describes the experience and status of work from the legal, organisational and semantic levels. The report on technical interoperability will be provided by activity 5.

This report is based upon the discussions and results from the following actions in activity 3:

- Interoperability map – This will provide maturity matrix for different interoperability layers.
- GeoE3 Data policies and licenses for the datasets related to the use cases – what policies and licenses will be recommended
- GeoE3 harmonisation process –How we will harmonise data and services in our data integration process.

2. Interoperability in GeoE3

2.1 Legal interoperability

2.1.1. Issues

Access to data is a requirement for the use cases defined in GeoE3. However, access to some data is limited.

Although data is uploaded to the INSPIRE geoportal, it does not mean that data is available in a way suitable for GeoE3.

Example:

FKB Bygning is available in the INSPIRE geoportal, the conditions applying to access and use refers to a specific license “Norge digital-lisens”, stating that usage of data is limited to the owners of the information, only discovery- and view-services are publicly available with reference to Article 13 of the INSPIRE directive. Which means negotiations with the owners for use in GeoE3.

2.1.2. Status of work

To get the full picture of licensees and restriction for use a survey is prepared in order to analyse the legal interoperability, based upon documents from JRC and the ELISE (European Location Interoperability Solutions for E-Government).

Our interoperability map will set the maturity levels for the legal interoperability.

2.2 Organisational interoperability

2.2.1 Issues

Organisational interoperability is about how organisations align their businesses, their expectations and what they expect from each other, according to agreed goals.

GeoE3 is building upon the existing SDI's and the national business processes. We experience that within one country, different organisations that makes their data available, does not necessarily apply standardized Web feature service, nor the newly developed OGC API's. Different organisations have focus on standards dedicated for their purpose. For many national land surveys, meteorological data in NetCDF is not easily handled. Similarly, GML data from standardised Web feature services provided by national land surveys are not easily handled by other

organisations. We experience that the national land surveys have a common approach related to OGC API's, while other organisations lack behind. This constitutes an interoperability concern for GeoE3.

From a cross country perspective we also see different business processes and strategies. One country (like Norway) has restrictions on use of some data. An example here is building information, where the FKB Building is not publicly available, even though the semantics (the attributes) is freely available in the cadaster. In other countries (like Finland), the footprint (geometry) is publicly available, but the semantics which is managed in other repositories is not.

2.2.2 Status of work

In GeoE3 we look into previous initiatives (EU or national)/projects, like OpenELS, ESDIN, ELF and National geospatial programs to potentially measure the organisational interoperability barriers.

We will introduce aspects like national interoperability arrangements e.g. availability of national agreements and platforms into our interoperability map. Our business model will also address how data integration can be implemented.

2.3 Semantic interoperability

2.3.1 Issues

The semantic aspects refers to the meaning of data, data elements and the relationship between them.

In e-Government the trend is to use vocabularies where definitions have been agreed on some fundamental concepts, called core concepts. These constitutes simplified models and are represented using different formalism like XML, RDF, JSON.

In the geospatial domain, the interoperability is handled through the creation of data models (UML) and geospatial encoding mechanisms like GML. The semantics are described in the models. An example on this is INSPIRE with its 34 data themes.

The importance of semantic interoperability is further described in UN-GGIM Future Trends in geospatial information management: the five to ten year vision - Third Edition, August 2020, stating that:

*The concepts and language used by stakeholders to describe the features and processes relevant to the domain has an impact on aspects such as the semantic structures – for instance ontologies and taxonomies – used to give meaning to the data, as well as the design and implementation of the tools for creating and storing data. Between different stakeholders and especially between different domains, even small differences can result in significant difficulties making data sharing or exchanging almost impossible or at best, not without some loss of information or changes to the structure or meaning of the data. **This is likely to become one of the most crucial challenges faced by municipalities working towards smart cities and Digital Twins and other contexts where collaboration, trust and transparency are necessary for removing the boundaries and fragmentation we see between domains today.***

In GeoE3 we focus on increasing ontology and semantics. Data should be discoverable in European Data Portal (EDP) using DCAT. Much data are already available, but there are also metadata in national portals that are not available in EDP. Further work will investigate the mapping between ISO metadata and DCAT.

In general, focus is on a higher level ontology, like OWL (Web ontology language) and RDF, allowing a higher level of ontology than what is provided by UML.

2.3.2 Status of work

The interoperability map defines different levels of semantics applicable in GeoE3, from level 0 (cannot be integrated) to level 3 (Advanced/Optimal vocabulary/descriptions in machine readable format and can be utilized automatically). There will be different interoperability levels based on the use cases.

Aspect considered in the interoperability map include Vocabulary and data specifications, data content and data quality and quality assessment.