INSPIRE Planned Land Use as a basis for revising SOSI Planned Land Use

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Outline

- Background
- Project goals and achievements
- Norwegian Standard SOSI
- SOSI standardization strategy
- Extension pattern (subtyping, realization, redefine)
- Summary and conclusions

- 3D SOSI / GML
- BIM - IFC
- Regulations given as XML
- Standardisation
- Rule checking
- Digital processes

- Urban planning
- Development
- Environment
- Transformation
- Democracy
- Transparency
- Engagement
Background

Update of SOSI Planned Land Use (major revision) according to:

- The Planning and Building Act of 27th of June 2008
- 3D geometry
- Synchronization with the Digital Planning Registers.
- Modelling of planning decisions
- Synchronization with building processes
- **Alignment with INSPIRE Planned Land Use**
SOSI standards and UML model repository

Standardization since 1990’s

- Set of standards for modelling of geographic information, and mapping to realization platforms (GML + SOSI)
- Fully ISO 191xx compliant
- EA SVN model repository
  - ISO standards and European specifications
  - General concepts
  - General feature catalogue (57 themes)
- Several versions
- Product specifications according to ISO 19131.
- Web view (geonorge.no)
National strategy for further development of SOSI.

SOSI Feature Catalogue shall gradually align with the specifications referenced from our Geodata act (INSPIRE) where appropriate, and at the same time fulfill requirements in national laws, regulations and use cases identified at the national level.

Extension mechanisms are standardized as part of SOSI, and consists of:

- Subtyping
- Realization
- (Redefine)

If there is no relationship to INSPIRE, a note should be added to the introduction of the specification.
Annex F
(informative)
Example for an extension to an INSPIRE application schema

F.2 General rules

Extending an INSPIRE data specification would imply at a minimum that:

- the extension does not change anything in the INSPIRE data specification but normatively references it with all its requirements
- the extension does not add a requirement that breaks any requirement of the INSPIRE data specification
Composition contra association!
Some attributes will never be implemented. Not necessary to document voidable for national data specifications.

Conclusion – not practical for PlannedLandUse.
Approach 2 – Subtyping with redefine

Introduced in UML 2.4

- Valuable mechanism (in theory)
- Implemented in EA for attributes
- Not implemented in EA for associations
- No tool support (ShapeChange???)
- Handle with care (May turn mandatory to optional).

Conclusion: To many technical issues to resolve
Approach 3 – Realization (<<realize>>)

Legend
- INSPIRE Planned Land use
- SOSI plan - Aggregert INSPIRE

- **featureType**
  - SpatialPlan
    - (from SOSI Model::Europeiske spesifikasjoner::INSPIRE-kopi-revision4618::Themes::Annex III::Land Use::Planned Land Use)
  - SupplementaryRegulation
    - (from SOSI Model::Europeiske spesifikasjoner::INSPIRE-kopi-revision4618::Themes::Annex III::Land Use::Planned Land Use)
  - OfficialDocumentation
    - (from SOSI Model::Europeiske spesifikasjoner::INSPIRE-kopi-revision4618::Themes::Annex III::Land Use::Planned Land Use)
  - ZoningElement
    - (from SOSI Model::Europeiske spesifikasjoner::INSPIRE-kopi-revision4618::Themes::Annex III::Land Use::Planned Land Use)
  - Arealplan
    - (from SOSI Model::SOSI Generell objektkatalog::Plan::Plan-5.0Utkast::Plan felles)
  - HensynOgBestemmelser
    - (from SOSI Model::SOSI Generell objektkatalog::Plan::Plan-5.0Utkast::Plan felles)
  - Arealformål
    - (from SOSI Model::SOSI Generell objektkatalog::Plan::Plan-5.0Utkast::Plan felles)
  - OffisiellDokumentasjon
    - (from Planregister)

**INSPIRE Planned Land use**

**SOSI plan - Aggregert INSPIRE**

**Legend**
- **featureType**
  - Plananskrift
    - (voidable)
  - Plan
    - (voidable)
  - Member
    - (voidable)
  - OffisiellDokumentasjon
    - (voidable)
  - Areaformål
    - (voidable)

**Insight**
- +officialDocument
  - 1..*

**Relation**
- +areaformal
  - 0..*

**Member**
- 0..*

**Restriction**
- 0..*
Approach 3 – Realization - example

- All mandatory attributes implemented
- Optional attributes considered and implemented if relevant.
- Voidable implemented if they can be derived or made available in other ways.

INSPIRE attributes that can be derived from existing semantics is stated derived in the model.

The following attributes are not implemented:
- beginLifespanVersion
- EndLifespanVersion
- DimensioningIndication

Conclusion: Pattern applied for SOSI Land Use.
Possible architecture

Geosynchronization without INSPIRE

Municipalities 426

Central repository

Geosynchronization and transformasjon til INSPIRE

Mapping

Distribusjon

(GML, optionally RDF/GeoJSON, etc)

Norwegian standard Geosynchronization

GML / WFS-T

Testbed in place.
Model validation (ISO 19103/ISO 19109) ++

Error: Class [» OmPlanbestemmelse] \ attribute [kpBestemmelser] has no definition. [/krav/3] & [/krav/definisjoner]
Error: Class [» RelasjonTilAnnenPlan] has no definition. [/krav/3], [/krav/definisjoner] & [/krav/19]
Error: Class [» RelasjonTilAnnenPlan] \ attribute [forhold] has no definition. [/krav/3] & [/krav/definisjoner]
Error: Class [«union» AdministrativEnhetskode] In package: [Plan felles] has non-unique name. [/krav/16]
Error: Class [» AdministrativEnhetskode] \ attribute [landkode] has no definition. [/krav/3] & [/krav/definisjoner]
Error: Class [«dataType» HøydefraPlanbestemmelse] has unknown type for attribute [høydefraPlanbestemmelse]: [høydefraPlanbestemmelse]. [/req.uml/profile & krav/25
Error: Class [«dataType» NasjonalArealplanld] In package: [Plan felles] has non-unique name. [/krav/16]
Error: Class [«dataType» PlanregisterDokument] has no definition. [/krav/3], [/krav/definisjoner] & [/krav/19]
Error: Class [«dataType» Utnytting] In package: [Plan felles] has non-unique name. [/krav/16]
Error: Class [«codeList» Plantype] has multiple Inheritance. [/krav/enkelav]
Error: Class [«codeList» Utnyttingstype] In package: [Plan felles] has non-unique name. [/krav/16]
Error: Class [«codeList» Utnyttingstype] has illegal code name [%-YBA-97]. Recommended to use the script <lagLovligNCNavnPakodelistekoder>. [/krav/6]
Error: Class [«codeList» Utnyttingstype] has illegal code name [%-YU]. Recommended to use the script <lagLovligNCNavnPakodelistekoder>. [/krav/6]
Error: Class [«codeList» Utnyttingstype] has illegal code name [%-YBA]. Recommended to use the script <lagLovligNCNavnPakodelistekoder>. [/krav/6]
Error: Class [«codeList» Utnyttingstype] has illegal code name [%-BRA]. Recommended to use the script <lagLovligNCNavnPakodelistekoder>. [/krav/6]
Error: Attribute name [Areaformålskategori] in class [«featureType» Areaformål] shall start with lowercase letter. [/krav/naming]
Error: Class [«featureType» Areaformål] \ association role [areaformål] has no definition. [/krav/3] & [/krav/definisjoner]
Error: Class [«featureType» Areaformål] \ association role [plan] has no definition. [/krav/3] & [/krav/definisjoner]
Error: Class [«featureType» Arealplan] has no definition. [/krav/3], [/krav/definisjoner] & [/krav/19]
Error: Class [«featureType» Arealplan] \ attribute [planhensikt] has no definition. [/krav/3] & [/krav/definisjoner]
Error: Class [«featureType» Arealplan] \ association role [plan] has no definition. [/krav/3] & [/krav/definisjoner]
Error: Class [«featureType» Arealplan] \ association role [offisielDokumentasjon] has no definition. [/krav/3] & [/krav/definisjoner]
Error: Association between class [«featureType» Arealplan] and class [«featureType» Plan(dokumentasjon)] lacks role name on navigable end on Arealplan-side. [/krav
Error: Class [«featureType» HensynOgBestemmelse] \ association role [restriksjon] has no definition. [/krav/3] & [/krav/definisjoner]
Error: Class [«featureType» HensynOgBestemmelse] \ association role [plan] has no definition. [/krav/3] & [/krav/definisjoner]

---Report for package [Plan-5.0Utkast]---

Number of errors found: 885
Run time: 558,05 seconds
Summary and conclusions

- Our SOSI model for Planned Land Use including the model for the planning register fits quite well with the INSPIRE Planned Land Use, but a generalized level for INSPIRE is required and is an extra burden.
- Our existing model (and the Planning and Building Act) has stronger semantics than INSPIRE (for example: Compositions rather than aggregations). No interest to weaken the semantics in the model to fulfil INSPIRE extensions informative rules.
- At the current stage, we are using the realization relationship, [Intends to including a matching table (from ESDIN/ELF project) to document the mapping between INSPIRE and the SOSI/Planning Register]
- UML 2.4 has a different extension pattern <redefine> that would fit well, but there is a lack of tool support.
- We will continue to examine the result from the JRS/Geonovum Extension pattern project, including the results from the INSPIRE extension workshop in Paris.
- INSPIRE informative extension rules are too strict.