The Possibilities of Using INSPIRE Themes for Process-Oriented Information

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Background

Problem:
• Housing shortage in many urban areas

One reason:
• The planning and building process has shortcomings and is very time consuming

One possible solution:
• Increase the efficiency of the planning and building processes by creating a digital information flow and where all actors can share information
Smart Built Environment – a Swedish development and research program

• Aim at improving the planning and building processes by utilizing new digitalization methodologies as well as creation of a new legal framework and new business models.

• Planned to be a 10-12 year program (started in 2016) with a total budget of around 100 million Euro

• Has more than 30 ongoing projects. Our study is linked to two of these projects

http://www.smartbuilt.se/in-english/
Our process-oriented approach to the information flow in the planning and building processes

Data level – general information
- Building Information Model (BIM) Evolves over time
- Geodata Model Evolves over time

Data level – phase specific information
- Planning
- Real property formation
- Building permit
- Projecting
- Construction
- Property management

The different phases use their own phase specific information models

Service level
- Data certificates, quality control and traceability

Application level
- GIS applications
- BIM applications
- Visualisation tools
Interesting INSPIRE themes in the planning and building processes

- Railroads
- Roads
- Buildings
- Cadastral parcels
- Existing Landuse
- Landcover
- Addresses
- Protected sites
- Agricultural aquacultural facilities
- Production and industrial facilities
- Utility and governmental services
- Natural Risk Zones
- Administrative Units
- Area management/restriction/regulation zones and reporting units
- Planned Landuse

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**Data level – phase specific information**
- Planning → Real property formation → Building permit → Projecting → Construction → Property management

The different phases use their own phase specific information models

Extending INSPIRE themes?
Using INSPIRE planned LandUse for the detailed planning phase
Focus of our case study

Same building with a unique id, but with attributes and geometry that evolves over time. The building can have multiple geographic representations.

Data level – general information
- Building Information Model (BIM) evolves over time
- Geodata Model evolves over time
- INSPIRE or extended INSPIRE services?

Data level – phase specific information
- National Geodata models
- Other Geodata
- IFC/CoClass
- The different phases use their own phase specific information models

Images borrowed from a TU Delft publication
Test case – construction in a municipality

- Examine the current information and models used in the planning and building process at a construction site in a municipality (concentrate on the general information)

- From a modelling perspective, analyse the information flow between the phases:
  - What is/is not digital today?
  - Which standards are used?

- Analyse additional information needs to achieve a digital and more process-oriented approach to the information flow:
  - How can unique identifiers and versioning be used to support a process-oriented approach?
  - How could geodata be linked to building information models (BIM) that are using life cycle standards (e.g. ISO PLCS)?
  - Can information from INSPIRE themes or other existing services be used in this process?
Information flow diagrams established by a Smart Built Environment standardisation project
Extending current geodata services?

INSPIRE data specifications

Standardised data specifications for nine selected themes for data exchange between municipalities, Lantmäteriet and other parties with an aim to get simpler and more efficient government services for among others: planning, property registration, construction permits and infrastructure construction

How can INSPIRE services and other existing National services be extended for a process-oriented approach to the information flow in the planning and building process?

- Unique identifiers
- Versioning
- Additional temporal information
- Multiple geometry representation
- ...

LANTMÄTERIET
Outlook

Soon services from 34 INSPIRE themes will be available from countries all over Europe.

How can we make the best and most use of them?

• Can extending INSPIRE themes make them more useful in the planning and building process?
  • Versioning
  • Additional temporal information
  • Multiple geometric representation
Thank you for your attention!