The use of ontologies in spatial planning domain

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INTRODUCTION AND MOTIVATION

Spatial planning is interdisciplinary domain, which takes into account many considerations, like environmental, technical and transportation issues, development parameters, cultural heritage, etc.

Spatial planning processes involves many actors, produces a lot of documents and data (also GIS data) and requires collecting information coming from many different sources.
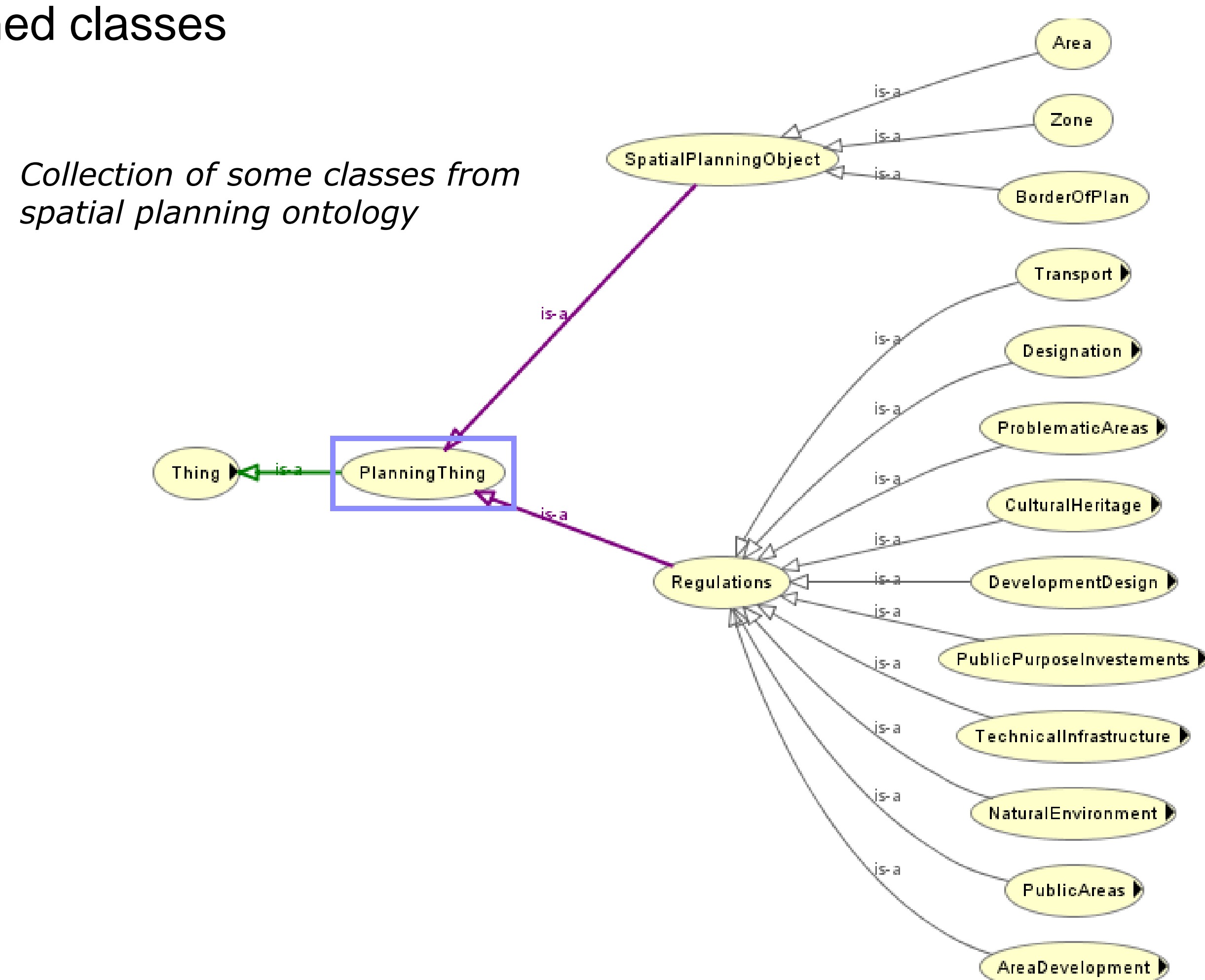
Final products, which are spatial development plans are heterogenous (data and semantic heterogeneity). There are no standards - structure and form of spatial plans and methods of their preparing are not unified. Some local standards exist, but they differ from each other. It is difficult to standardize plans because of their structure – a map and the associated textual description.

In current situation it is very difficult to integrate spatial development plans with other data (e.g. cadastral data, environmental data).

APPROACH

INTEGRATION SPATIAL DEVELOPMENT PLANS

Assumptions:
- Every plan has its own scheme and is represented in GML
- Domain ontology, which represents knowledge about spatial planning domain is created
- Semantic matching system which provides algorithms for mapping properties and values into spatial planning ontology is created
- Basing on DL reasoning, inference engine assigns individuals to defined classes

Collection of some classes from spatial planning ontology

INTEGRATION SPATIAL DEVELOPMENT PLANS WITH ENVIRONMENTAL DATA

- The reason is to support in preparing Strategic Environmental Impact Assesement , which is obligatory prepared during spatial planning processes
- The aim is to identify the endangered and conflict areas on the basis of development plan provisions and elements of the natural environment
- Decision ontology which is constructed and based on spatial planning and environmental ontologies can infer conflicted areas
- Alternatively SWRL can be used

CONCLUSIONS

- Ontologies can be useful in the attempt of integration spatial development plans
- Integration of spatial planning and environmental data can improve spatial planning processes in preparing environmental impact assesement
- Ontologies and rules, which can identify conflicted areas, can be shared and reused.

Acknowledgements