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# Ontology-based Web Map

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**Abstract:**

When looking at maps that visualize large amounts of heterogeneous data, questions often arise: why was this particular input data chosen, or are all input data equally important. There are many challenges associated with spatial visualization, and these challenges have no clear-cut solution. The outcome often depends on the individual user's perspective and subjective understanding of the problem. Reflection of users' needs is the reason for developing interactive web maps. These allow the users to choose input parameters that suit their needs.

The paper Ontology-based Web Map wants to introduce the innovative architecture of interactive web map applications. The architecture interconnects four crucial components: map client for data visualization, robust tool for mathematical operations to process data, input datasets and ontology to define essential semantic relations among stakeholders, their requirements and input data.

The complex web map systems enable real-time visualization of results of complicated computational tasks and a real-time reaction to changes in input data (switching on/off a dataset or setting up the weight of the dataset in data processing).

The role of the ontology is to specify relations among types of stakeholders, tasks typical for various types of stakeholders and datasets relevant for this task. For example, the ontology shows interconnection among the role "investor", the task "investment to agricultural land", and data providing information about agricultural land. Except for the formalization of relations, the ontology makes the application user interface accessible for non-experienced users.

The reasoning process is the main benefit of the implementation of ontology. The reasoner can check the consistency of the ontology, detect errors and add missing relations. For these purposes, the reasoner uses formal and formalized descriptions of the system's components and Description Logic principles.

As an example of the particular solution following the architecture, the application designed for individual assessment of regional attractiveness is presented. This solution was developed in the Polirural project to assess pilot regions and compare pilot regions with the rest of Europe. The application uses HSLayers as the map client interconnected with the R script to calculate the index of attractiveness and clusters of homogeneous regions. The ontology of stakeholders' roles and relevant datasets is implemented as data input for the interactive user interface. The application uses only open-licensed components.