International Cartographic Association
Association Cartographique Internationale

Topographic Thesaurus of the BEV

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Keywords: Knowledge Organization, Thesaurus, Semantic Web, GeoAI

Abstract:

INSPIRE (EU Directive 2007/2/EC) obliges the member states of the European Union to create a shared spatial data infrastructure. The particular challenge of a shared spatial data infrastructure is the cross-border harmonization of content, s. Hörfarter et al. (2019). A simple example of this issue are roads with a supra-regional character that cannot be characterized as a freeway or expressway. In Germany, these are defined as "Bundesstraße" in the Bundesfernstraßengesetz (FStrG §1), in Austria they are now primarily referred to as "Landesstraße B" (Bundesgesetz über die Auflassung und Übertragung von Bundesstraßen; further specified in the respective state laws). So, what would be the appropriate name for the respective entity and how does a German user find the "Bundesstraße" he/she is looking for in Austria? One way to solve this problem is to use a so-called thesaurus: Thesauri organize knowledge. They allow terms or entities to be (a) clearly explained, (b) made uniquely identifiable via a URI and (c) structured contextually to overcome the particular limitations mentioned above, e.g. ANSI/NISO Z39.19-2005 (R2010) (2010), and Gilchrist (2003).

In addition, matching terms with linked (open) data can help to reduce ambiguity and lead the user to additional information about the respective entities, e.g. Jobst and Gartner (2021). Finally, a thesaurus in the sense of the Semantic Web, is a machine-readable dataset that enables the computer not only to read the data, but also to understand it, e.g. Martínez-González and Alvite-Díez (2019).

Several published topographic thesauri are available. For example, the Dutch “Kadaster Catalogus” (https://catalogus.kadaster.nl/) and the INSPIRE Registry (https://inspire.ec.europa.eu/registry). A topically related thesaurus is the geological thesaurus of GeoSphere Austria (https://thesaurus.geolba.ac.at/). While most thesauri were created manually (e.g., the INSPIRE Registry using the Open Source Software Re3gistry, s. https://inspire.ec.europa.eu/registry/about.html), a few are based on automatic or semi-automatic procedures. For example, the “RDF database of glycan, pathogen and disease resources” was partially built using the Python RDFLib package, e.g. Arakawa et al. (2023).

As Austria's national geodata provider, the Federal Office of Metrology and Surveying (BEV) provides topographic datasets via the BEV Geoportal (https://data.bev.gv.at). A thesaurus, currently in development (Figure 1), helps to increase the interoperability of the data and to comply better with the FAIR principles (Findable, Accessible, Interoperable, Reusable) (https://www.go-fair.org/fair-principles/) as well as the Commission Implementing Regulation (EU) 2023/138 (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R0138).

Abstracts of the International Cartographic Association, 7, 41, 2024.
European Cartographic Conference – EuroCarto 2024, 9–11 September 2024, TU Wien, Vienna, Austria.
https://doi.org/10.5194/ica-abs-7-41-2024

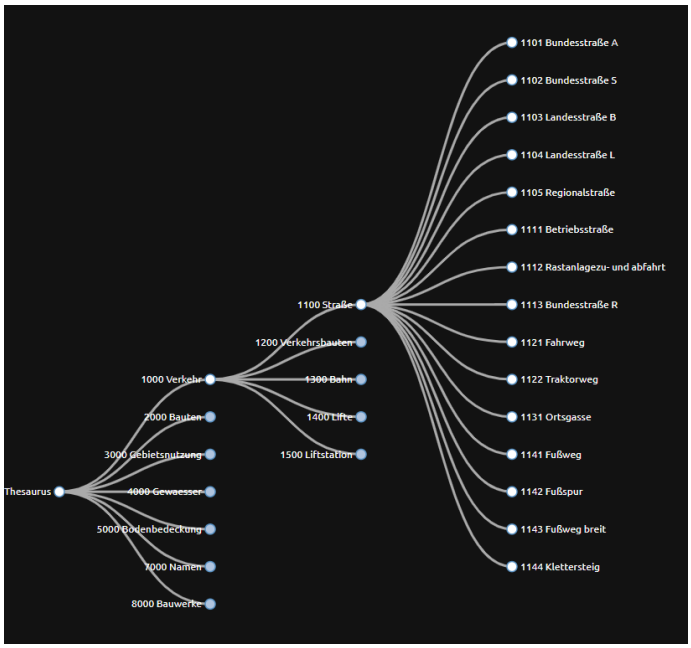

Figure 1. Excerpt from the BEV Topographic Thesaurus showing the object keys of the Digital Landscape Model.

The presentation provides an overview of the exact objectives, development processes and areas of application of the research project. Special attention will be paid to the semi-automatic creation process. The metadata about the topographic data of the BEV are currently managed in an Excel File. Using Python/RDFLib, the information is converted into the Turtle RDF-Format and enriched with links to concepts in other knowledge organization systems. Further considerations regarding the embedding of styles and linking to map applications will also be presented.

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