An Ontology Model and Service for Managing Scientific and Common Names of Plants

Jouni Tuominen, Nina Laurenne, and Eero Hyvönen

Semantic Computing Research Group (SeCo)
Aalto University School of Science, Dept. of Media Technology, and
University of Helsinki, Dept. of Computer Science
http://www.seco.tkk.fi, firstname.lastname@aalto.fi

1 Introduction

Scientific names of plants and animals have a major role when indexing, querying, and integrating information about species. Biologists use scientific names while the vast majority of people use common name equivalents. Contrary to common belief, neither the scientific or common names do not identify organisms unambiguosly as one name may point to multiple species and one species may have multiple names. This is a problem when combining data from heterogeneous sources covering applied biological sciences and cultural contents. The scientific name system differs significantly from common names but they both change over time.

Machine-processable ontologies provide a solution for managing parallel views, multiple meanings, and changing information of biological names. They allow unambiguous referring to organisms and semantic enrichment of biological contents. We present an ontology model for managing common names of organisms and linking them to scientific names, and a use case of the model for maintaining and publishing Finnish vascular plant names as Linked Open Data.

2 Results

The ontology model for the common names is based on the TaxMeOn meta-ontology [1] for biological names. The simplified structure of the model is presented in Fig. 1, where the core classes are Scientific name, Common name and their statuses. The status of a Scientific name indicates if the name is an accepted or a synonymous one, etc. The Common names (in one or more languages) that refer to the same species are connected through a Scientific name.

The model supports the approval process of the common names: 1) a new name is proposed; 2) the name is accepted and its usage becomes recommended; 3) the name may become an alternative, if a more suitable name is introduced. The temporal management of the names is based on time stamps created in the approval process of the names.

We applied the ontology model to a database of the Finnish names of plants created by the Finnish biology association Vanamo[1]. The database contains ca.

[1] http://www.vanamo.fi/

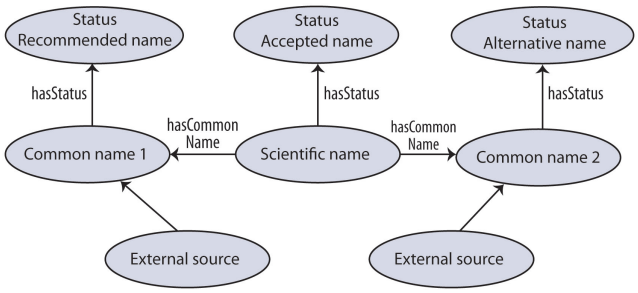

Fig. 1. The ontology model for the common names of organisms. The ellipses represent classes and the arrows depict relations between the classes.

26,000 common names of plants and it was originally only in internal use of the association. The database was converted into RDF format based on the ontology model.

The resulting ontology of common names of plants is managed in the SAHA metadata editor[2] for collaborative content creation. SAHA also provides a SPARQL endpoint for using the plant names as a service. The ontology is published as Linked Open Data in the Finnish Ontology Library Service ONKI[3] [2], which provides user interfaces and APIs for accessing and using the plant names in applications.

The ontology is used by several cultural museums and libraries for annotating collections. The model has been adopted as a use case in the research program ENVIROFI[4].

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2. Viljanen, K., Tuominen, J., Hyvönen, E.: Ontology libraries for production use: The Finnish ontology library service ONKI. In: Proceedings of the ESWC 2009, Heraklion, Greece. pp. 781–795. Springer–Verlag (2009)

[2] `http://www.seco.tkk.fi/services/saha/`
[3] `http://onki.fi/en/browser/overview/kassu`
[4] `http://www.envirofi.eu/`
[5] `http://www.seco.tkk.fi/projects/finnonto/`