

Modeling and Use of an Ontology Network for Website Recommendation Systems

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Abstract. The modeling of website recommendation systems involves the combination of many features: website domain, metrics of quality, quality criteria, recommendation criteria, user profile, and specific domain features. When specifying these systems, it must be ensured the proper interrelationship of all these features. In order to ensure the proper relationships of all these features, we propose an ontology network, the **Salus** ontology. This work presents the structure of each of the networked ontologies and the semantic relationships that exist among them¹.

1 The Salus Ontology Network

Currently, the development of ontologies to the Semantic Web is based on the integration of existing ontologies [1]. In this work we have followed this approach to develop the **Salus** Ontology used in a Health Website Recommendation System as an ontology network. Our focus is on the different kinds of relationships between the networked ontologies. More precisely, the **Salus** ontology is a network of ontology networks; this means that each component of the **Salus** ontology is itself an ontology network and all of them are related among each other. It is broadly outlined in the Figure 1.

Salus networked ontologies are interrelated by four different relations: *isAConservativeExtentionOf*, *mappingSimilarTo* and *isTheSchemaFor*, took from the DOOR ontology [2], and the *uses* relation, defined by us, which describes an extension of a given ontology by importing of individuals from another ontology.

The different specific-domain ontology networks correspond to the different knowledge domains conceptualized by the **Salus** ontology. The *Health* ontology network models the health domain: the *Health* ontology conceptualizes any diseases and the *Specific Health* ontology is a more specific disease. Both ontologies are related by the *isAConservativeExtentionOf* relation. The *WebSite* ontology

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network conceptualizes the domain of webpages and describes web resources considered in a quality assessment. The *WebSite Specification* ontology plays the role of a metamodel for the *WebSite* ontology (*isTheSchemaFor* relation). Its main concepts are *Web Resource* and *Web Resource Property*. A web resource is any resource which is identified by an URL. Web resource properties model the properties attached to a web resource. *Quality Assurance* ontology network conceptualizes metrics, quality specifications and quality assessments, each one in an ontology. The relationship *mappingSimilarTo* exists between the *Quality Assessment* and the *WebSite Specialization* ontologies, in order to define an alignment between Web Resource and Web Content concepts. *Context* ontology network describes user profiles and query resources. The *Context Specification* ontology is a metamodel to the *User Profile* and *Query Situation* ontologies. *Recommendation* ontology network describes the criteria of recommendation for a particular context and quality dimensions, and the obtained recommendation level. The *Recommendation Specification* ontology describes the criterion to make a recommendation. The *Recommendation* ontology models concrete recommendation assessments. This ontology uses the *Recommendation Specification* ontology.

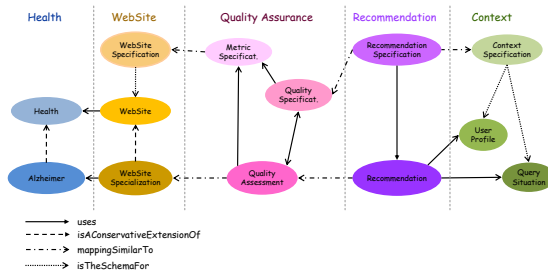


Fig. 1. Salus ontology network

During the execution of the process to recommend websites, the **Salus** ontology is useful to discover knowledge domain units in the web pages and to support quality and recommendation assessments. In the last cases, it assists in the modeling and specification of a recommendation system and in checking the correctness of the resulting system specification. The population of the **Salus** ontology is done in three different moments: at the start up of the recommendation system, when performing the quality assessment of a set of webpages and finally, at the execution of recommendation assessments.

References

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