

OntoStanD: Ontology-based Standards Development Methodology

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A standards development method exists to guide a group of stakeholders to develop a standard specification, which a number of parties may need to comply with. Standards development organisations usually provide a guideline for the process of developing standards. However, these guidelines are usually more concerned with the administrative aspects of the process and lack practical technological support for developing the content of a standard specification. On the other hand, semantic interoperability is considered to be an essential factor for effective interoperation. This implies that the meaning of terms, their relationships and also the restrictions and rules in the standards should be clearly defined in the early stages of standards development. Ontologies are considered as an appropriate means for capturing the definitions and interrelationships of concepts in a domain, resulting in a robust shared understanding of the domain, which is indeed the ultimate goal of IS standards.

This project utilises semantic web technologies, specifically ontology, in the process of standards development and develops OntoStanD, a novel, comprehensive, ontology-based standards development methodology, which takes into account the collaborative nature of standard development. OntoStanD may be used for developing new standards specifications from scratch or new versions of existing standards, re-engineering existing standards and also formalising concept in existing standards. The overview of OntoStanD is shown in Figure 1.

Each round-cornered rectangle is either a phase or an activity. A phase is a collection of activities, which can be a composition of several other activities. There are nine phases and eighteen activities in OntoStanD. The activities of knowledge breakdown and knowledge elicitation contain two and four activities respectively. An arrow-tipped bar indicates an execution path between two phases or between two activities. Note that each phase has an output, which is used as an input for its follow-up phases.

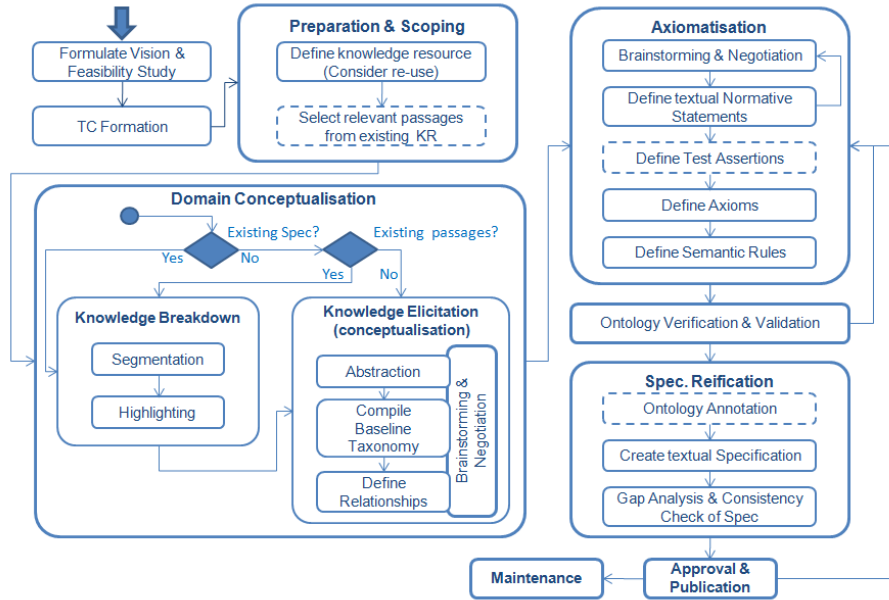


Figure 1 an overview of the OntoStanD methodology

The phases and activities in OntoStanD are designed with respect to a typical standardisation process drawn as a result of extensive study and analysis of various standards creation processes being used in different standardisation bodies. The phases concerning capturing domain semantics, namely preparation & scoping and domain conceptualisation, are designed based on the methodology of Developing Ontology-grounded Methods and Applications (DOGMA), which is a collaborative ontology development methodology.