Abstract

This research aims to compare the capabilities of a thesaurus and an ontology for representation of domain knowledge and retrieval of concepts. This is the first to focus on the construction of an ontology in Library and Information Science (LIS), in the domain of Indexing and in Persian language. The research also develops the methodology of ontology construction by implementing domain analysis methodology.

The present work by applying the domain analysis approach developed a prototype ontology named ASFAOnt in the domain of Indexing by reengineering a current thesaurus in Persian language named ASFA.

The ontology was evaluated by a retrieval test in which the usability and the performance of the ontology were investigated. Usability and performance were compared with a baseline, a classic-type thesaurus with the conventional thesaurus structure, ASFA thesaurus. The evaluation was carried out as a controlled experiment in which a group of information searchers, LIS master students, used the thesaurus and ontology to extract three keywords according to their in mind search queries. The evaluative study was followed by a qualitative analysis of the nature of concepts, individual relationships and the textual and visual display so as to provide an understanding of and insight into the quality of the ontology as well as to gather ideas for further development. In order to gather more validated data on users' performance and satisfaction, thinking aloud technique was used. Also the experimental retrieval test in the usability test was followed by a questionnaire survey, constructed on the basis of ONTOMETRIC approach.

The result of the study indicates that ontology structure is useful and provides valuable inspiration for the user. Fundamental differences of domain knowledge representation between them were then identified: formality of language in the ASFAOnt ontology, logical consistency of concepts and relationships in the ASFAOnt ontology, and ambiguity of relationships among terms in the ASFA. Relationships such as broader term (BT) and narrower term (NT) in the ASFA could support a capacity for reasoning based on generation and specification, assuming the relationships themselves are valid. However, ASFAOnt ontology supports the deduction of conclusion based on domain knowledge described in the ontology, the search for information resulting from logical inference, and the automated validation consistency. We conclude that an ontology can provide a better representation of the domain knowledge and more advanced power of reasoning based on the underlying knowledge representation, which could improve searching.

Keywords: ASFA Thesaurus, Ontology, Knowledge Representation, concepts Retrieval, ASFAOnt