An Ontology-based Knowledge Management System for Software Testing

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Software development is conceptually a complex, knowledge intensive and a collaborative activity, which mainly depends on knowledge and experience of the software developers. Effective software development relies on the knowledge collaboration where each and every software engineer shares his or her knowledge or acquires knowledge from others. Software testing which is a sub area of software engineering is related to various activities such as test planning, test case design, test implementation, test execution and test result analysis and they are all essential. Given great importance to knowledge for software testing, and the potential benefits of managing software testing knowledge, an ontological approach to represent the necessary software testing knowledge within the software testers' context was developed. Using this approach, software testing ontology to include information needs identified for the software testing activities was designed. Competency questions (contextualized information) were used to determine the scope of the ontology and to used to identify the contents of the ontology because contextualized information fulfills the expressiveness and reasoning requirements of the software testing ontology. SPARQL query was used to query the competency questions. A web based KM Portal was developed using semantic web technologies for knowledge representation. Software testers can annotate their testing knowledge with the support of ISTQB and IEEE 829-2008 terms. Both ontology experts and non-experts evaluated the developed ontology. We believe our software testing ontology can support other software organizations to improve the sharing of knowledge and learning practices.

Keywords: Software testing ontology, Software testing knowledge, Ontology-based knowledge sharing, Knowledge management system