

## **ONLINE SEMANTIC KNOWLEDGE MANAGEMENT FOR PRODUCT DESIGN BASED ON PRODUCT ENGINEERING ONTOLOGIES**

### **ABSTRACT**

The influence of the Semantic Web is growing in many areas. In this paper, the authors present an online Product Design Semantic Knowledge Management System (PD-SKMS) in order to provide a novel approach for presentation, querying/reasoning, and instantiating/updating of knowledge related to product design in an engineering domain. A distributed model is proposed, which is composed of a host hybrid-data repository (HDR), external public linked data sources (EPLD), a Semantic data management engine (SDME), and a web-based user interface layer. Ontologies to preserve knowledge for the product assembly domain are set up as product semantic repositories (PSR) in the host hybrid-data repository. To utilize the legacy design data, a conventional product database (PDB) storing design data is also integrated into this repository. The SDME is able to supply querying/reasoning and instantiating/updating services on PSRs, as well as searching and updating services on PDB. Through web-based user interfaces, engineers on the Web can inquire/contribute design information from/to both PSR and PDB. Additionally, the capability of PD-SKMS is extended by querying on external public linked data sources. It is concluded that the product design environment, constructed on PD-SKMS, allows more knowledge questioners/contributors to be involved in product design tasks in a more interactive manner, and thus greatly improves traditional behaviors for design knowledge sharing and exchanging.