

Is OntoWiki useful as Collaborative Working Tool for Engineers?

Selver Softic, Alexander Stocker, Manfred Rosenberger, Jürgen Zernig and Michael Schmeja

Area Information and Process Management, Virtual Vehicle Research Center, Inffeldgasse 21/A/I, Graz, Austria

Abstract

In this work we examined whether OntoWiki¹ can be used as collaborative working tool for engineers. We used a specific domain related ontology PROTARES (PROject TAsks RESources)², created in our previous work on collaboration modelling (Softic et al. 2013) from a real world use case, to adapt OntoWiki for the case study. With this example we want to test to which extent, semantically driven customized applications can support monitoring, reflection and decision making in engineering collaboration scenario.

1 Motivation

Intensive changes on product within engineering working process need a high communication and consolidation effort (Müller et al. 2012). This is still carried out in meetings and does not interact directly with engineering artefacts affected by these decisions. Our work aims to overcome some aspects of this problem by offering a collaborative working tool based upon collaboration model ontology PROTARES (PROject TAsks RESources) which we defined and created in our previous efforts on this topic (Softic et al. 2013). As collaborative tool for our model we used a OntoWiki. Our solution allows creation, editing, tracking and visualizing of data about tasks, depending requirements and goals, persons involved, components and resources used, particularly during the planning and development phase of the product. With this case study we want to demonstrate the usefulness of OntoWiki as enabler tool for the purposes of collaborative working in the engineering environment.

¹ <http://ontowiki.net>

² <http://purl.org/protares/ns/1.0/>

2 Related Work

Semantic Web technologies fit well for designing complex models and relations. Their flexibility regarding changes in information model as well inference potentials are outlined earlier in research efforts like (Wache et al. 2001). Recent research (Jun et al. 2007, Matsokis & Kiritsis 2010) has shown that ontology based approach of modelling information in product design and development offers more flexibility on context changes than any other method applied so far. Those benefits, in particular for the segments of product life cycle, have been outlined by the work of (Young 2007). OntoWiki is a Wiki based collaborative environment application for maintenance and creation of semantically modelled data, originally developed to support distributed knowledge engineering scenarios (Auer et al. 2007, Frischmuth et al. 2010). It is extensible and it may also serve as development framework for knowledge based applications, as well as user interface for arbitrary RDF knowledge graphs.

3 OntoWiki as Collaboration Tool

We decided to reuse domain ontology named PROTARES (PROject TAsks RESources) created in our previous work (Softic et al. 2013). PROTARES is a light-weight ontology, which covers essential context of collaboration between engineers and project manager, on tasks level for development of racing car. The ontology combines own concepts, as well widely used vocabularies like FOAF (Friend of A Friend)³ to describe persons, and Requirements Management Ontology⁴, defined by the OSLC (Open Services for Lifecycle Collaboration) initiative, to describe requirements. In Figure 1 we see an example of visualization plug-in and editing interface in OntoWiki with PROTARES instances. This example shows the tree like visualization of a collaboration task with all related information. The visualization allows further on click expansion of linked concepts and uses colour schema to distinguish entities. OntoWiki enables user to get a fast overview over related resources, persons, and components related to this part of the work as well to monitor and edit changes on tasks, requirements, goals and deadlines.

³ <http://xmlns.com/foaf/spec/>

⁴ <http://open-services.net/ns/rm/>

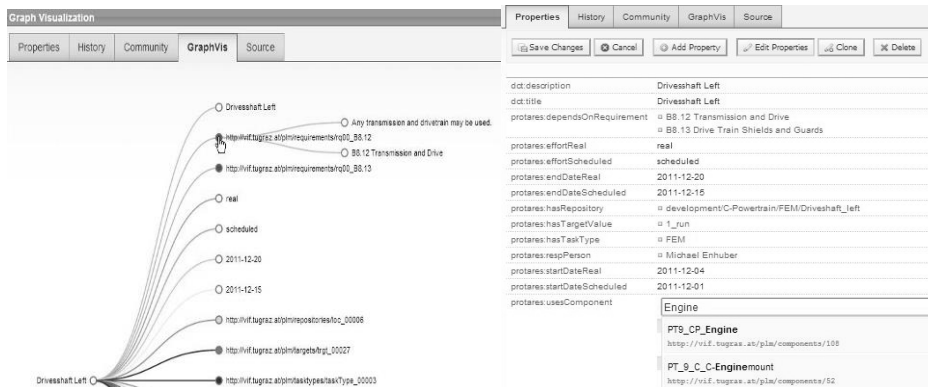


Figure 1: Visualisation and editing of collaboration task in OntoWiki

4 Evaluation and Conclusion

Our use case aims particularly on knowledge and information exchange in collaboration. We evaluated our prototype with Knowledge Management Approach (KMA) method firstly introduced by (Vizcaino et al. 2005). The KMA method analyse six aspects of the knowledge management process, which are: *Knowledge creation*, *Knowledge accumulation*, *Knowledge sharing*, *Knowledge utilization*, *Knowledge internalization* and *Knowledge integration*. This is done by evaluating based upon a checklist with questions regarding each of six aspects. According to results presented in Figure 2 our prototype supports fully the aspects of: *Knowledge integration*, *Knowledge accumulation*.

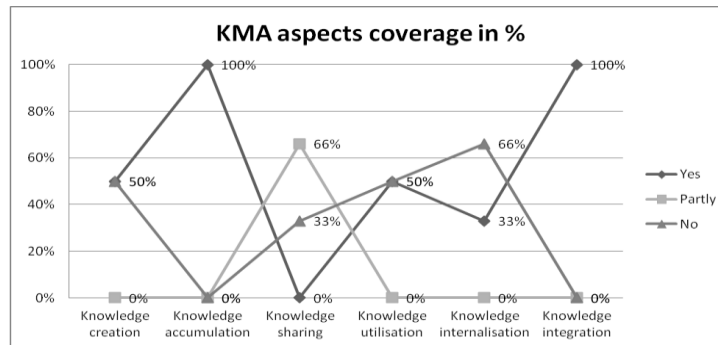


Figure 2: Positive, partial, and negative feature coverage in % for six aspects of KMA.

Evaluation of partial feature coverage depicted in Figure 2 reveals that aspect of *Knowledge sharing* is not covered yet. Negative feature coverage reveals the aspect *Knowledge internalisation* as not supported as well. Features for aspects like *Knowledge creation* and *Knowledge utilisation* are covered up to 50%. The preliminary evaluation we made implicitly confirmed observations showing that the tool can contribute strongly to

Knowledge integration, Knowledge accumulation, partially good to *Knowledge creation* and *Knowledge utilisation*, as well with some additional effort in the future also very intensively to *Knowledge sharing*.

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Contact

Selver Softic, Area Information and Process Management ,Virtual Vehicle Research Center
Inffeldgasse 21/A, Graz, Austria, selver.softic@v2c2.at