Chapter 10

WikiDesign: 
A Semantic Wiki to Evaluate Collaborative Knowledge

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ABSTRACT

This paper presents a knowledge evaluation and evolution in a knowledge management system by using a Semantic Wiki approach. The authors describe a Semantic Wiki called WikiDesign which is a component of a Knowledge Management system. Currently WikiDesign is used in engineering departments of companies to emphasize technical knowledge. This study explains how WikiDesign ensures the reliability of the knowledge base thanks to a knowledge evaluation process. After explaining the interest of the use of semantic wikis in knowledge management approach, the architecture of WikiDesign with its semantic functionalities is described. The effectiveness of WikiDesign is proved with a knowledge evaluation example for an industrial project.

1. INTRODUCTION

A wiki is a web site allows collaborative distant creation of information and editing of hypertext content. Leuf and Cunningham (2001) were the first to propose a web site where people could create, modify, transform and link pages all from within their browser and in a very simple way. Indeed Wikis become popular tools for collaboration on the web, and many active online communities employ wikis to exchange information.

Indeed for the most of wikis, public or private, primary goals are to organize the collected information and to share it. Wikis are usually viewed

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as tools to manage online content in a quick and easy way, by editing some simple syntax known as wikitext (Singh, Wombacher, & Aberer 2007). Schaffert (2006) enumerates the specifications of a wiki system:

- It allows the editing via a browser;
- It has a simplified wiki syntax i.e. simplified hypertext format usable by all the internet users;
- It manages a rollback mechanism i.e. it is able to versioned the changes in the content each time they are stored;
- Its access is unrestricted, everybody can write in the wiki;
- It manages the collaborative editing i.e. if someone create a article, everybody can extend this article;
- It proposes a strong linking, all the pages of the wiki are linked with each other using hyperlinks;
- It has a search function over the content of all pages stored;

It allows the uploading of different content like documents, images or videos. Taking consideration to all these properties, Wikis seem to become a new approach to collaborative knowledge engineering based on social networks of the Web2.0 (Richards, 2009). Indeed new research works (Schaffert, 2006; Vrandecic & Krötzsch, 2006) propose wikis to exchange knowledge. Knowledge is information with a context and value that make it usable. Knowledge is what places someone in the position to perform a particular task by selecting, interpreting and evaluation information depending on the context (Malone, Crowston, & Herman 2003; Volkel Krötzsch, Vrandecic, Haller, & Studer, 2006).

However a serious obstacle for the development of Semantic Web applications is the lack of formal ontologies and knowledge. Indeed, one of the main reasons of this is the rather high technical barrier for using Semantic Web technologies that deters many domain experts from formalizing their knowledge.

In another hand, wiki systems are becoming more and more popular as tools for content and information management. Much information is nowadays available in systems like Wikipedia. Unfortunately, this vast information is not accessible for machines. If a small amount of this information would be formalized to become knowledge, wiki systems could provide improved interfaces and advanced searching and navigation facilities.

Nevertheless, several analyses (Buffa, 2006; Majchrzac, Wagner, & Yates, 2006) of traditional wikis as shown that they are not enough structured, and it’s difficult to navigate and to find the relevant information. Besides, the wiki markup language (WikiML) used by most wiki engines makes internet users reluctant to contribute to the wiki.

One solution to perform the knowledge creation, evaluation and navigation inside wikis is to use technologies from the Semantic Web (Au- Mueller & Auer, 2005) which use the languages like OWL, RDFS and query languages like RDL, SPARQL or annotation languages like RDF to formalized information, content, structures and links in the wiki pages. These Wikis would take consideration of the semantic in their content management and become Semantic Wikis.

“Semantic Wiki” systems aim to combine “traditional” wiki systems with Semantic Technology. This combination bears much potential in many application areas.

Thus we propose to use a Semantic Knowledge Wiki approach to complete our knowledge management system by facilitating the knowledge sharing, updating and evaluation. This article is structured as follows: Section 1 introduces the Semantic Knowledge Wiki concept and describes features which represent advantages for the knowledge management; Section 2 briefly