

Chapter 3.13

Managing Requirements Elicitation Knowledge Using a Spatial Hypertext Wiki

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ABSTRACT

Wikis have been widely used as knowledge management tools. However, most of them do not support the conversion process of knowledge in an appropriate way. Specifically, they do not support brainstorming and creativity techniques, which are needed to convert tacit knowledge into explicit. This chapter presents how a wiki tool called the Spatial Hypertext Wiki (ShyWiki) can be used for supporting collaborative requirements elicitation following the knowledge creation spiral of Nonaka. The knowledge conversions in the spiral (socialization, externalization, combination, and internalization) and the knowledge types in each conversion are related to different activities in requirements elicitation, which can be performed through ShyWiki. ShyWiki allows stakeholders to

collaborate by creating, brainstorming, structuring and reorganizing requirements contained in notes. In this way, the requirements negotiation and prioritization process can be done through the wiki pages which are seen as virtual boards that hold hypertext notes.

INTRODUCTION

Knowledge Management is composed of the activities, methods, processes, and software that validate, evaluate, integrate, and disseminate information for learning and decision making (Rhem, 2005). A Knowledge Management System (KMS) is an information system that improves the organizational process of creating, storing, retrieving, transferring, and applying knowledge (Leidner & Alavi, 2001).

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One of the most accepted models for knowledge management is the knowledge creation spiral of Nonaka and Takeuchi, which describes how knowledge is converted into different types of knowledge (Nonaka and Takeuchi, 1995). The diversity of existing types of knowledge such as tacit, explicit, unstructured and structured force organizations to use several knowledge management approaches in order to deal in an effective way with the conversion between the types of knowledge (Leidner & Alavi, 2001). The concept of tacit knowledge was defined by Polanyi (1967) as knowledge that cannot be easily shared, and is composed of intuitions, unarticulated mental models, or technical skills. Explicit knowledge is the one that is documented and can be processed by computers (Nonaka & Takeuchi, 1995).

In any project, Requirements Elicitation (RE) is a critical phase due to the fact that most software project failures are caused from inadequate requirements (Hofmann & Lehner, 2001). The RE phase is the first step in the requirements engineering process, where the requirements or the needs of a system are discovered (Sommerville & Sawyer, 2004). Requirements elicitation is a creative process in which all stakeholders collaborate in the creation of the needs that describe a new system (Robertson, 2001). The stakeholders involved in the requirements elicitation process must understand a domain, and the problems that the different stakeholders want to solve using a software system. Some of the proposed needs will become system requirements after their negotiation and prioritization (Sommerville & Sawyer, 2004). In requirements elicitation, diverse methods are used such as interviews, workshops, brainstorming, and protocol analysis (Davis *et.al.*, 2006).

Tacit knowledge is related to undocumented work practices that workers use to take decisions. When stakeholders try to express their requirements of a system, they are converting part of their tacit knowledge into explicit knowledge. From this point of view, requirements elicitation is a knowledge intensive process which involves

converting, managing and sharing different types of knowledge among different stakeholders.

Recently, wikis have emerged as an effective hypertext technology for enabling organizations and individuals to manage knowledge. The advantage of using wikis, is that the knowledge management tasks such as capturing, searching, and sharing knowledge can be performed in an open, collaborative, incremental and distributed way (Decker *et.al.*, 2007), (Leuf & Cunningham, 2001). Wikis are based on the principles of easy of use, incremental content creation, open structure for editing and evolution, and self organized structure (Cunningham, 2006). The content in a wiki page is defined by using a simple markup language, which allows the user to format the content and create hyperlinks. In this way, users do not have to be technical experts in the edition and design of hypertext. However, most wikis do not support the conversion process of knowledge in an appropriate way. Specifically, they do not support brainstorming and creativity techniques, which are needed to convert tacit knowledge into explicit. This is an important characteristic that would improve and extend the use of wikis in requirements elicitation.

This chapter presents the use of the Spatial Hypertext Wiki (ShyWiki), a wiki which uses spatial hypertext for representing its content (Solis and Ali, 2008a, 2008b), for supporting requirements elicitation through the knowledge creation spiral of Nonaka. In ShyWiki, each wiki page can be seen as a virtual board composed of a set of notes. ShyWiki provides a flexible hypertext model that can represent the different types of knowledge involved in the knowledge creation spiral, and supports iterative knowledge creation. ShyWiki users are able to capture tacit knowledge by brainstorming using the virtual board, and represent explicit knowledge which they can incrementally structure by using spatial hypertext. The later is supported by allowing stakeholders to add, move, or group notes, and by defining templates and their instances.

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