The KMDL Knowledge Management Approach: Integrating Knowledge Conversions and Business Process Modeling

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Abstract. This paper shows the KMDL Knowledge Management Approach which is based on the SECI and ba model by Nonaka and Takeuchi and the KMDL Knowledge modeling language. The approach illustrates the creation of knowledge with the focus on the knowledge conversions by Nonaka and Takeuchi. Furthermore, it emphasizes the quality of knowledge being embodied in persons and creates a personalization and socialization strategy which integrates business process modeling, skill management and the selection of knowledge management systems. The paper describes the theoretical foundations of the approach and practical effects which have been seen in the use of this approach.

1 Introduction

Knowledge management clearly has become more and more important since the beginning of the early nineties. Companies expect an improvement of the innovation capability and a significant increase in process efficiency. Globalization, increasing competition, more dynamic markets and shorter cycles in product development and innovation increase the need for a better adaptation to those environmental factors. These factors establish the need for a consequent adaptation of all business processes to existing and future market needs.

Knowledge processes are executed parallel but also linked to normal business processes in a ladder like structure. The knowledge processes are only slightly structured. Detecting, modeling, analyzing and finally optimizing those processes should be the long-term aim of a process-oriented knowledge management approach.

Knowledge and business processes are integrated and should be evaluated as a whole [1]. Business processes can be modeled and analyzed via the existing business process modeling methods. Furthermore, there are numerous approaches which take into consideration the knowledge within the company or the organization [21, 22]. Mapping static, explicit knowledge can only contribute little to a broad and integrated process-oriented knowledge management approach. Modeling the business processes and the processes of knowledge creation can ensure an effective and reasonable process-spanning knowledge flow.

The described problems and challenges have been the motivation to develop the knowledge modeling language KMDL (Knowledge Modeling Description Language)
[2] in order to model knowledge-intensive business processes with the KMDL-based software tool K-Modeler. The tool implementing the language in an early version has been integrated into an approach which is based on the knowledge management philosophies of Nonaka, Takeuchi and Konno. The definition of the term knowledge is based on the very ideas of Nonaka and Takeuchi [18]. The knowledge is bound to a person, it is indeed personal knowledge. This so called tacit knowledge cannot be expressed by formal methods. It is based in the employee’s occupation, the proficiencies of each employee and his ideals, values and experiences. It is possible to analyze and model this knowledge through KMDL even if it is not directly used in the operational business process.

2 Theoretical Foundation of the Approach

2.1 Definition of Knowledge, the SECI Model and ba

Nonaka and Takeuchi’s thoughts and ideas are not only influenced by Japanese tradition but strongly by Michael Polanyi. Polanyi [20] defined the idea of a tacit knowledge embodied as personal knowledge. Therefore, Nonaka and Takeuchi distinguish between two types of knowledge: the tacit and the explicit knowledge. Tacit knowledge is personal knowledge which consists of mental models, beliefs and perspectives which cannot be easily articulated or shared. Explicit knowledge is formal, codified, systematic, articulated in writing/numbers, easy to communicate and shared; it is transmittable in a formal language and can be stored in databases or libraries [12].

The tacit knowledge is the more interesting knowledge when looking at knowledge-intensive business processes as we will see later. But yet, there are ways and possibilities to convert and combine tacit and explicit knowledge. Nonaka and Takeuchi mention four types of knowledge-conversions in the so called SECI model, the socialization, the externalization, the combination and the internalization.

The socialization is a conversion from tacit knowledge to tacit knowledge. Often it is done by sharing experience, just like apprentices of a craftsman learn their skills by watching a knowledge-worker can learn his needed abilities through on-the-job training. Even if possible, the socialization can be done without speaking or writing a single word.

The externalization is a conversion from tacit to explicit knowledge. By using metaphors, analogies or models one can express his tacit knowledge in a manner which can be understood by others. It is the essence of tacit knowledge which can then be handed over in a written form, yet it can be very difficult to externalize tacit knowledge, often it is simply impossible.

The combination is the conversion from explicit to explicit knowledge. Different kinds of explicit knowledge can be combined through media like telephone, mail, word processing by reconfiguring, categorizing and adding new information and context to the knowledge.

The internalization is the conversion from explicit to tacit knowledge. It is very close related to learning-by-doing. Experiences made through socialization, externalization or combination are internalized and put into one’s own knowledge framework, they can become know-how or mental models and according to this, very important knowledge assets. It is very helpful it the explicit knowledge is in a written form like documents, handbooks or stories.