

# PROCESS ORIENTED KNOWLEDGE MANAGEMENT

## *IT System and Case Study*

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Abstract: The paper describes the methodology of process oriented knowledge management and an IT system which has been developed in a German publicly funded research project. The case study describes the activities while implementing the ideas of process oriented knowledge management in a large German infrastructure service provider. The description includes the occurred challenges during the implementation, e. g. organisational bottlenecks and the question, how detailed a process has to be modelled. The solution of these challenges is described as part of the paper as well as examples of the information considered and identified potentials for benefits of the approach.

## 1 INTRODUCTION AND OBJECTIVES

As a result of today's knowledge and innovation oriented communication era, the existing knowledge capital of a company turns out to be increasingly the decisive factor of production (PROBST ET AL. 2006). As an example especially in the industrial engineering service sector knowledge management plays a significant role. The products of these companies are based on complex, non standardized solutions. The companies realize that the efficient management and goal-oriented handling of this factor of production contributes to an increase of an organizations' competitive advantage in terms of product- and service quality. A study in which over 2300 companies from Germany participated, is confirming this thesis (see figure 1). In addition to a higher quality and the offer of customized solutions, the interviewed companies declare the goal-oriented handling of knowledge as significantly responsible for their own competitive advantage (PAWLOWSKI ET AL. 2006). More than 60% of the interviewed companies of the service sector in Germany are saying that the enhancement of the product quality is the main motivation when thinking about the

implementation of knowledge management (PA Consulting 2004).

Practical experience is showing though, that many initiatives which want to implement knowledge management in an organisation aren't successful. The calculated cost frame has been exceeded in most of the knowledge management projects as well as the defined goals haven't been reached.

A possible solution for the difficulties while implementing knowledge management is to focus on the business processes of a company. Knowledge is emerging in the business processes of a company and is being asked for as well as needed by the employees in business processes. The process oriented approach is taking this circumstance into account by structuring the knowledge needed for routine tasks according to the real processes in the company. With this approach, the knowledge can be offered systematically to the employees at the right point during the completion of the task (REMUS 2002; HEISIG 2005).

This article is introducing a new ontology-based IT system to support the process oriented knowledge management and is evaluating the benefits from a practical point of view.

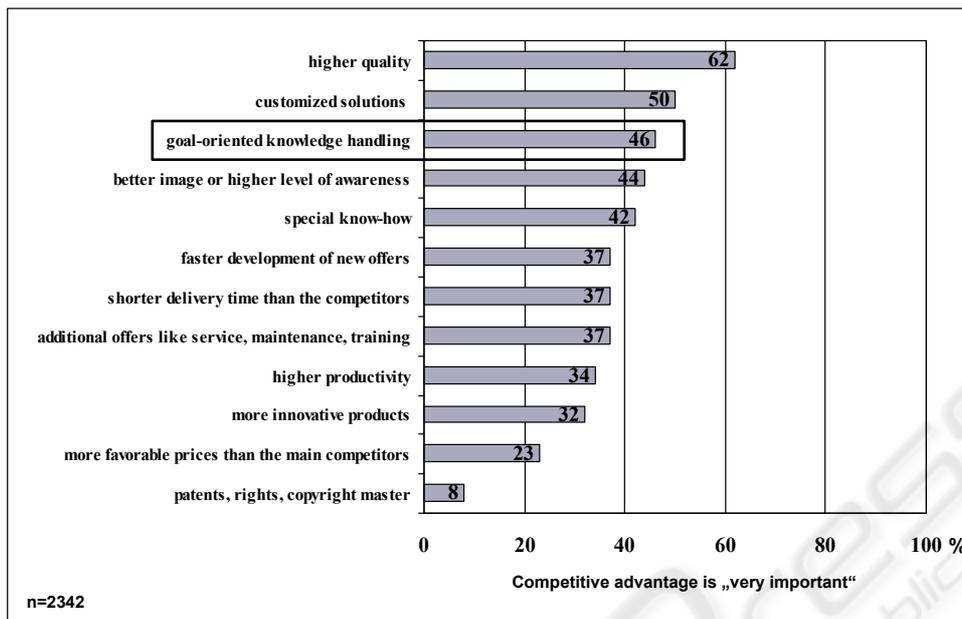


Figure 1: Estimation of competitive advantages.

The described IT system is one of the core results of a publicly funded German research project. In the course of the project, the IT system was evaluated by a number of companies, tested successfully and reviewed favourably. This paper describes the experience with the operation of the IT system in the pilot phase at a large-sized German infrastructure service provider.

## 2 METHODOLOGY USED

The process oriented knowledge management is based on the assumption, that the employees of a company normally complete their tasks within defined business processes (REMUS 2002, S. 82; HEISIG 2005, S. 15). A knowledge management concept should therefore support the efficient handling of knowledge in the operative business processes. The use of business processes as context of knowledge provides the opportunity to distribute the knowledge to the employees along the path of their tasks. Additionally an easy way to put new knowledge into the system should allow the employees to instantly document new knowledge "on the fly" within their normal work. The process orientation is helping to avoid problems of traditional knowledge management systems like additional work and lack of time (BACH 2000, S. 52; HEISIG 2001, S. 13). The business process can be used to structure knowledge for knowledge

management solutions in company networks as well. To avoid communication problems arising from differing company processes or languages, it is necessary to develop company independent process and knowledge structures.

The concept proposed here envisages that every employee can document his knowledge of any individual operation during the completion of the task. Since the technical and process context is known due to the embedment into the business process, the operator does not need to assign keywords or categories to his knowledge. Employees who need to do the same task later on can access the saved knowledge directly.

Important results of the projects are two standards in the form of publicly available specifications (PAS) for the introduction of knowledge management in small and medium enterprises as well as in networks of small and medium enterprises. These standards allow a structured and therefore promising introduction of knowledge management regarding achievement of objectives as well as planned costs.

## 3 TECHNOLOGY AND BUSINESS CASE DESCRIPTION

### 3.1 Technology Description

The IT system developed in the research project

consequently implements the approach of process oriented knowledge management. Process oriented knowledge management begins with modelling the business process in the company. The modelling of the business processes is done with an especially developed process designer. This tool allows the graphic modelling of organisational structure and process organisation including company specific roles and persons. Additionally it is possible to model the relevant knowledge structure of the company using the process designer. For this purpose the designer offers the possibility to gather the semantics of the sector and link them to precise implicit (e. g. persons) or explicit (e. g. documents) knowledge objects.

The system “translates“ all business processes modelled with the process designer automatically into executable workflows. The user interface to the processes and the knowledge is a web portal. This portal includes a workflow-area in which users can work on their tasks. The portal contains as well a Process management area which allows users to view current or finished processes or to start processes if necessary.

The suitability of the software for the use via Internet is necessary for the use in networks of organisations and in the actual early stage of development for an easy and quick updating process. The operation in networks is connected with difficulties concerning the lost of know-how to network partners. To ensure a selected knowledge transfer within a network a security mechanism has been integrated. It allows giving access rights for knowledge objects, which are described and marked out by definable knowledge classes.

### 3.2 Business Case Description

Currently the method of process oriented knowledge management and the IT system are introduced to a large-sized German infrastructure service provider. In this case, the business processes for the planning and building of infrastructure are challenging. The processes include multiple locations and take several years, leading to complicated coordination processes and updated documents. Furthermore an employee experiences only a couple of these processes in their complete duration and can only resort to a limited amount of experience. Therefore a good documentation of the processes themselves and the availability of templates and experiences within the processes are necessary for a high quality of the execution.

Until now, the company has countless documents like templates, specifications and field reports, which exist in different versions and are not completely harmonized. To make matters worse, some of the documents are named in different ways, thus making the communication even harder.

To solve these problems the company has set up a pilot project with some experienced persons with different points of views to these infrastructure project. With the implementation of the IT system it is now feasible to provide the person in charge of a business process with the needed documents and the know-how of earlier projects for his current task. Additionally the information flows without delay and comprehensible between operators at different locations.

The following potentials for benefits of process oriented knowledge management and the supporting IT-System have been identified; most of them are applicable for the organisation:

- Processes get documented which is a first step to quality management.
- Processes are more part of daily business than it was with paper based process documentation for traditional quality management systems.
- Processes can be controlled better as there is information on the actual status available.
- Processes can be automated by using workflows, so that the flow of information is quicker.
- Knowledge can be better structured for example with ontology.
- Knowledge is given to employees in a pointedly way in processes.
- Horizontal integration of information sources like wikis, document management systems and intranets.

Types of knowledge which can be provided to employees are on high level expert knowledge, practical knowledge, process knowledge, knowledge on methods and knowledge on standards and rules. The infrastructure service provider started with information about processes. The first knowledge documented in the system is the following:

- A description of the activity and available facilities.
- A description of the intended result with quality criteria.
- Participants and contact persons (person responsible, persons acting, decision maker, contributors, persons to be informed).
- Efforts and lead times, which are very important in the long term running projects for infrastructure planning.
- Submittals and filed in examples as good

practices.

The granularity of the process modelling has been an important challenge which had to be solved. Not well selected granularity either leads to too long and detailed processes which require immense efforts for maintaining and which block the creativity of the employees or it leads to management view to the processes which is not useful for daily business. After having modelled the processes too detailed activities have been taken together. For this action the following criteria have been identified. A new activity should start when:

- A new person is acting.
- A milestone has been reached which shall be used for information on the process status.
- A new subject area has been reached in the process, so that the employee needs other information which can be given pointedly.

As a possible limitation of the approach of process oriented knowledge management might be seen that in most organisations there is much which is unrelated to business processes. But these things are also activities means mini-processes. If these activities are knowledge-intensive it is possible to provide this knowledge to the employees by describing the activity.

#### 4 CONCLUSIONS AND RECOMMENDATIONS

This paper described the approach of the process oriented knowledge management and a new IT system for the implementation in a company and presented a case study.

The approach of process oriented knowledge management is the consequent merging of process management, quality management and knowledge management. The approach can be supported by IT-systems and leads to more efficient handling. Even if activities are not part of processes in the organisation the necessary information can be provided via ontology for different topics.

In the currently running transfer project the IT system is being refined and implemented with the method of process oriented knowledge management in ten companies, where it is extensively used and evaluated. The experiences from these implementations are used to document and publish the methodology of implementing the process oriented knowledge management in form of a prestandard together with German Institute for Standardization as DIN SPEC (PAS).

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