

Co-operative Implementation of Knowledge Management: Applying Knowledge Management Methods and Tools for Implementing Knowledge Management in a Virtual Network of Autonomous Companies

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ABSTRACT

Using a Meta-Knowledge Management approach developed at our organization, this paper describes the process of parallel implementation of Knowledge Management at five companies of the Upper Austrian Automotive Cluster. It describes how the partners were identified, which criteria formed the basis for selection and how the consortium was finally established. Furthermore it presents a roadmap for co-operative implementation of Knowledge Management including methods and tools – derived from a Knowledge Management viewpoint – for enabling and fastening knowledge transfer within the consortium. It further justifies the need for research in this area. Finally we are discussing the advantages and disadvantages of this approach and deliver some ideas for further necessary research concerning this topic.

INTRODUCTION

Knowledge Management (KM) is an important issue for multi-disciplinary management research. Literature on the subject focuses extensively on the classification of knowledge under the tacit/explicit and personal/collective dimensions and on issues of converting one type of knowledge to another (Nonaka and Takeuchi, 1995; Spender, 1998). Therefore holistic Knowledge Management has to consider various dimensions within a strategic management approach. We are considering an organizational, a technological and a human dimension (Mayrhofer, 2000; Prenninger et al., 1999).

The setting of knowledge objectives, the identification, acquisition, development, transfer, storage, use and evaluation (Probst, Raub, Romhardt, 1998) of organizational knowledge will only be effective, if those dimensions are specifically concerted for each individual company (Mayrhofer, 2000; Prenninger et al., 1999).

Recently co-operation with partners, customers and suppliers has become more and more important for business success and competitiveness of companies. Of recent interest in this field has been the study of Communities of Practice (Wenger, 1998), an informally organized network of agents (representing companies) who share common interests and goals. According to some researchers almost all learning in organizations happens inside Communities of Practice (Stewart, 1996).

But there are also strategic reasons for the arising importance of Knowledge Management. The potentials of Total Quality Management (TQM) and Business Process Reengineering (BPR), important management issues developed in the 80s and 90s, are almost exhausted (Hahn, 2000). First there were huge improvement potentials through the optimization of primary production processes. Companies tried hard to produce products and services of high quality.

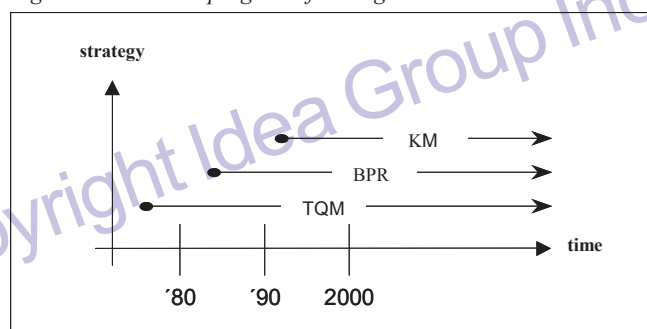
Afterwards there were also high improvement potentials through optimization of primary and secondary business processes (Porter, 1985). Companies tried hard to increase efficiency and effectiveness of all processes within the company.

Although TQM and BPR are still in use (and also will be in use in the future) to improve business processes and the overall quality of products and services it is now time to identify latent improvement and development potentials using concepts, methodologies and tech-

niques of Knowledge Management (Tiwana, 2000). The reason therefore is that focus of production oriented companies shifted more from optimizing material flow to managing information, i.e. the transition from hardware oriented to service oriented operations, in a knowledge society.

In future companies will operate TQM, BPR and Knowledge Management in parallel to be competitive (Hahn, 2000). Figure 1 shows the historical progress of the mentioned management issues.

Figure 1: Historical progress of management issues



Drucker (1998) stated, that companies will only achieve future economic growth by dramatically improving the productivity of their 'knowledge' resource. Davenport and Prusak (Davenport and Prusak, 1998) as well suggest, that companies will differentiate themselves on the basis of what they know. In terms of the resource-based view of the firm (Wernerfelt, 1984; Peteraf, 1993), the capability to create and utilize knowledge has been suggested as the key inimitable resource contributing to the creation of sustainable rents (Schendel, 1996):

It is the process of learning rather than what is learned, meaning that the capacity to develop organizational capability may be more important than the specific knowledge gained. Rates of learning can give rise to first mover advantages and from the speed of learning can come sustainability conditions that have more to do with movement than with static position.

Based on the fact, that the current situation on international markets is characterized by diversified, customer specific products with high quality and deadline requirements as well as shortened innovation cycles, globalization and liberalization, technological change and intensive competition (Bullinger et al., 1999), Knowledge Management has become an important topic within the Automotive Cluster of Upper Austria (AC).

Another important reason for Knowledge Management within the AC is that co-operation and communication are having more and more impact on the business success and competitiveness of a company. Mutual learning from partners within supply-, knowledge- or virtual-networks with common interests can produce synergy-effects that lead to extensions of the company's core-competence and by the way to an extension of the business success.

METHODOLOGY

Establishing the Project Consortium

The first and undoubtedly most critical issue was to set up a suitable project consortium as well as the rules for co-operation within the consortium.

Therefore the first step was to define the criteria. As we follow the approach of Nonaka and Takeuchi (Nonaka and Takeuchi, 1995) we have tried to include the enablers of the knowledge spiral as criteria. These are "intention, autonomy, fluctuation and creative chaos, redundancy as well as requisite variety". The overall objective of the project was to implement Knowledge Management in the individual participating companies we had to adjust these criteria for our purpose. As a result the following criteria have been adopted:

- "Intention": The participants have to be open-minded and willing to develop their organizational capability to acquire, create, accumulate and exploit knowledge. Furthermore they must be willing to exchange knowledge with other partners and agree to mutual learning.
- "Autonomy": Each organization should be allowed to act autonomously as far as the circumstances permit.
- "Fluctuation and creative chaos": Every participant has to be open to new approaches and the sentence "we have always been doing it that way" has to be banned from the consortium.
- "Redundancy": A part of the consortium should consist of organizations having similar problems, objectives, structures as well as a similar field of activity.
- "Requisite variety": In contrary to the prior criterion some companies have to be of different size, age or philosophy and culture in order to assure diversity.

Therefore it can be said that the adoption of the enablers of Nonaka's and Takeuchi's (Nonaka and Takeuchi, 1995) approach to Knowledge Management is the basis for our Meta-Knowledge Management approach.

After analyzing the criteria it turned out that a thematic network of companies would be suitable for achieving redundancy regarding the field of activity, not preventing any other criteria.

Therefore it has been decided to set up the project within the Automotive Cluster of Upper Austria, which contains more than 250 automotive companies. A further advantage was that the country of Upper Austria provides funding for research projects within this network which minimized the risk for the participating companies. To achieve the goal of implementing Knowledge Management in the participants companies we were restricted to 5 companies because of the limitations of our own resources.

To discover the suitability of the partners regarding the further criteria it was necessary to identify the needs and expectations of potential members.

Identifying the Partners Needs and Expectations

To identify the partners needs and expectations it was necessary to apply research and evaluation methodologies at each potential partners company (Bortz and Döring, 1995).

According to our philosophy of implementing Knowledge Management using a concerted set of methods, tools and techniques from the dimensions of organizational structure, human resource management and information and communication technologies, we requested participants from the corresponding departments to take part in the analysis. As we also wanted to assess the company's culture which requires personal communication we decided for a methodology where the analysis could be done simultaneously. Therefore we decided for a moderation methodology.

Furthermore it was essential to include members from the general management right from the beginning to assure management support for the project.

Finally five partners have been selected to take part in this project and the consortium could be characterized as following:

- Partners A, B and C are part of international groups with more than 2000 employees each and therefore with an institutionalized Quality Management like ISO 9001.
- Partner B and D are machine manufacturers.
- Partner C is a raw material supplier.
- Partner E is a rather young and small, but very innovative company, which already won several innovation rewards and represents the diversity in the consortium.
- Partner A, B and D have very similar objectives regarding the implementation of Knowledge Management.
- All partners have the intention to implement Knowledge Management although every partner has a slightly different perception of what is Knowledge Management.
- All partners are allowed to act autonomously.
- The requested redundancy by means of field of activity, size, objectives, company culture and philosophy is assured by the characteristics of Partners A, B, C and D.

The diversity could also be recognized by the different expectations on Knowledge Management and the basis where the companies started from. Meta-Knowledge Management, as applied in this project, was a generic tool to handle this diversity independent of the status of management organization.

Tools and Techniques to Install and Fasten the Knowledge Management within the Consortium

A Meta-Knowledge Management model developed at Profactor as well as Profactor's generic Knowledge Management roadmap was used as a basis for the development of the special roadmap applied for the project within the Automotive Cluster (see Figure 2).

The basic idea for the structure of the common roadmap comes from the project phases defined by Heinrich (Heinrich, 1997) – "pre-study, detailed-study, design, implementation and installation" – with further influence by the above described Knowledge Management tasks (Probst et al., 1998) and the roadmap for Knowledge Management to business excellence (Hahn, 2000). The single steps can be described as following:

As mentioned above, a moderation with every single partner was organized to identify the needs and expectations for the project. These individual, but only blunt goals were presented during the kick-off meeting as well as the overall objective and the detailed roadmap for the project.

As the goals were only roughly defined, it was necessary to detail them during the envisioning step, whose idea is taken from Microsoft's envisioning phase (Microsoft, 2001) and adopted for the project's purpose. The aims of the envisioning step were to set up a team, define the business goals, roughly assess the current situation, create the vision and define the scope of the project and assess the risks as well as define criteria for evaluating the project success at the end. This was also necessary to make the vision of Knowledge Management tangible for each single partner and define the mission for the project. Furthermore "intention" as an enabler (Nonaka and Takeuchi, 1995) could be guaranteed for the company as well as for the overall consor-

tium.

In order to identify in detail knowledge sources, users and providers, knowledge intensive processes, characteristics of the company culture and the IT-environment, it was necessary to perform a detailed current state analysis and requirements engineering, using research and evaluation methods like questionnaire, semi-structured interviews as well as moderation methodology (Bortz and Döring, 1995).

The results have been documented and presented for the management of each company. The detailed knowledge about the current state, needs and expectations could be used as input for the next step to refine the vision and goals of the project.

After this, the AC-consortium held a first official meeting which was indicated as a benchmarking meeting to compare and discuss the single visions and exchange knowledge about common problems and ideas for solution. For this purpose we have developed a method called Knowledge Bistro. This method is based on the open space technology (Owen, 1997), therefore supports the idea of removing trade barriers in knowledge markets (Davenport and Prusak, 1998) and still allows to reach the original goal of a benchmark (Spendolini, 1992):

3-4 tables are standing in a shared room, where each table represents a topic and is served by a moderator who documents and coaches the discussion. Additionally coffee and cake is served to simulate an informal environment where participants feel comfortable. Each participant can join and leave each table and therefore each topic as long as he/she prefers and may change as often as required. Due to this informal environment, the participants feel free to interchange knowledge and due to the fact, that each participant can join the preferred topic, he/she will be able to contribute and benefit best, in order to find out a local best practice.

A further enabler of knowledge exchange during the project has been implemented by using an internet based project-portal as a common knowledge base for the consortium. For this purpose we were using the MaKe-IT SME software tool (Prenninger et al., 1999).

As Knowledge Management as a business philosophy is complex and visionary it is necessary to define detailed steps to keep the participants motivated for the project. For this reason one of the first project results was the identification of quick-wins, which are defined as measures being realized within less than two months and optimizing the daily business of the participants by increasing their efficiency as well as their effectiveness.

The pre-study and detailed study phases have ended with a commitment point (Hahn, 2000). At this stage of the project, the general management of each partner evaluates the results achieved so far and agrees to the next steps.

In the next phase – design and implementation – methodologies to support the dimensions of human resource management, organizational structures and information and communication technologies have been planned, selected and concerted into an individual concept for each partner. According to the participants needs and requirements lessons learned, yellow pages, knowledge maps and further well known methodologies and tools have been taken to be combined for a holistic concept. As these methodologies are already described extensively elsewhere we do not have to go into detail in this paper. In parallel, quick-wins have been realized and occurring potentials for further quick-wins have been identified. Furthermore new measures have been planned. Again, this phase has ended with a commitment point.

Finally, the concerted set of conventional methods, tools and measures have been implemented at each partners sites and evaluated according to the criteria defined during the envisioning phase.

PROGRESS TO DATE

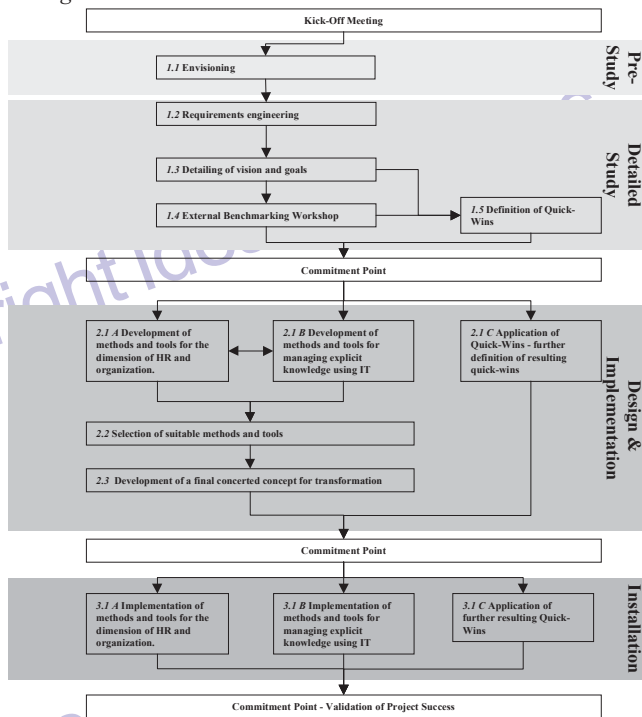
Benefits of Participating Companies

According to Probst et al. (1998) it is hardly possible to quantify the economic impact of knowledge management initiatives.

Nevertheless there were some considerable benefits reported by the participants:

- Reduction of communication effort and misunderstandings due to

Figure 2: Roadmap for co-operative implementation of knowledge management



company-wide usage of standardized templates and forms as well as the development of a collective definition (also see Davenport and Prusak p.98, 1998; Probst et al. 1998 p.303)

- Improvement of knowledge transfer along the primary business processes by developing and using a Knowledge-Consumer-Producer-Matrix. This matrix provides a detailed overview of different knowledge sources (e.g. existing business documents) their producers and consumers.
- Adaptation of partners' best practices due to exchange of "company-best practices" regarding topics which were of high importance to all partners. Especially the knowledge-exchange in the area of reporting (e.g. travelogues and meeting minutes) generated high benefits.

General Discussion

The research project showed that in general co-operative implementation of Knowledge Management possesses advantages as well as disadvantages and that there exist mutual influences.

First of all the selection of the mentioned criteria has to be analyzed:

Especially the criteria of diversity (deduced from Nonaka's enabler requisite variety (Nonaka and Takeuchi, 1995) has to be reconsidered, particularly thinking of the interpretation of Schüppel (Schüppel, 1996) who defines cultural diversity as one of the barriers for learning and knowledge transfer. As different cultures (multi-national organization and small sized company) were colliding during the project cultural diversity was present. The major advantage of this scenario was on the side of the small company which was able to get insight into processes, structures and cultures of big companies and therefore was able to learn a lot which could be adopted to its needs.

The idea of quick-wins, also promoted by Bach, Österle and Vogler (Bach et al., 2000), has to be seen with ambiguity. However the advantages may prevail. On one hand it turned out that operational results may hinder the strategic view and commitment of each participant, on the other hand it enabled and supported continuation of the

project in the participants companies, kept the employees motivated during the project and satisfied the management by delivering measurable results.

Furthermore it showed that the envisioning phase, although it is originally taken from Microsoft (Microsoft, 2001) and therefore developed for implementing e-commerce solutions contains good aspects for every project with external consultation.

CONCLUSION

Our research project showed that co-operative implementation of Knowledge Management in a set companies has predominantly advantages and some general rules to approach such a project could be deduced, although we had to realize, that some of our assumptions have to be reconceived and further research in the area of co-operative implementation of Knowledge Management is necessary.

It is indispensable for every partner to sign an agreement for confidentiality in order to make knowledge exchange across organizational boundaries possible. Otherwise the companies would not have told anything about internal procedures, structures or culture.

The criteria for selection of potential partners have to be reconceived. As mentioned above there had been some difficulties in overcoming the cultural diversity although the methodology of Knowledge Bistro worked well and supported knowledge exchange and mutual learning across organizational boundaries.

It has to be stated that our misinterpretation of the enabler "requisite variety" (Nonaka and Takeuchi, 1995) as "cultural diversity" led to difficulties. The main difficulty was that cultural diversity i.e. different company size and status, could not be handled in common. Quite the different "requisite variety" paves the way to address problems from different points of view by providing the same information basis for every participant. It turned out that the "cultural position" does not contribute to different points of view and that there does not exist a common information background, and therefore it is rather a barrier because the varying culture of the different companies could not be assessed by every single partner.

The roadmap for co-operative implementation of Knowledge Management has to be judged suitable although there is still room for improvement regarding the later stages of the model. This is especially true in the phase of installation where ways for further co-operation have to be found.

Using Knowledge Management based methods and tools in a project where Knowledge Management has to be implemented at different companies has the advantage for the consulting company, that unnecessary work duplication, expensive reinvention and repeated mistakes can be avoided (Tiwana, 2000).

Furthermore it can be thought of intensifying co-operation after the end of the project in the way that commonly generated knowledge will be exploited conjointly.

Recapitulating it can be said, that co-operative implementation of Knowledge Management may develop to a new way of handling management topics, although further research is indispensable.

ENDNOTE

1 Virtual network of manufacturers and supplier for the automotive industry sector in Austria.

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