Collective Knowledge Management via Virtual Communities

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1. Annotation

This article discuss the employment potential of virtual communities as a knowledge management tool. The special problems of knowledge management tools will be presented. The concept and the different services of virtual communities for knowledge management are discussed afterwards. After a short overview about the concept and the technological ooportunities of hypertext, the knowledge process in communities is illustrated. The "human" factor as a special characterism of virtual communities is underlined afterwards. The virtual community Processworld is then presented as an example for a knowledge management tool based on the community concept. The article finishes up with the perspective of future developments concerning virtual communities as tools for other knowledge processes such as customer relationship management.

Keywords:
Hypermedia; Knowledge Management; Knowledge Management Tools; Knowledge Objects; Knowledge Process; Virtual Community

2. Knowledge Management

The importance of efficient knowledge managent as a corporate asset for successful competition is currently undisputed [Bullinger et al. 1998; Probst et al. 1998].

The term „knowledge“ is defined in terms of different fields of study in several academic puplications and should not further be discussed in this article. A detailed overview provides Blackler [1995].

Knowledge management aims towards improving an enterprise's ability to acquire, develop, preserve, distribute and use knowledge. The different knowledge management approaches differ from creativity supporting techniques and improved qualification concepts to the implementation of groupware or artificial intelligence systems [Bair 1997; Nonaka/Takeuchi 1995; Payne 1996; Skyrme/Amidon 1997]. Those concepts have mostly the goal to connect the experts and knowledge workers of an enterprise, support their cooperation and to map the organisational knowledge inside of the organisation.

The collection of all accessable and relevant knowledge in a special topic is often mentioned as a basic idea of knowledge management. But the pure storage of knowledge does not contribute much to the company’s success. According to Arthur Anderson possibilities to interact with the knowledge base, like further inquieries by mail, discussion platforms, phone or personal conversation, are needed to get some sort of idea of the new information [Neumann et al. 1998, S. 207].

Databases and Data Warehouse store explicit knowledge, which is formal, timeless, standardized, structured and methodical documented [Radding 1998]. They offer no mechanism to manage implicit knowledge. This knowledge is based on subjective individual experiences, assets and feelings. It is hidden, very dificult to formalize and often only shown in actual actions.

Knowledge Management must aim to extract this individual knowledge from every individual and to make it available in specific ways as collective knowledge. To this end concepts and tools are needed for the extracting, standardized documentation storaging and distribution of existing explicit knowledge. Another important point these concepts and tools have to care about

is to offer a possibility to link knowledge objects (implicit or explicit) with each other.

3. Virtual Communities in the context of knowledge management

However, knowledge management is not only possible inside of organisations but can be extendented over organisational frontiers. Virtual communities offer the potential of generating knowledge beyond organisational boundaries and hence, innovations inside of enterprises.

Virtual communities are social aggregations that emerge from the net when enough people carry on those public discussions long enough, with sufficient human feeling to form webs of personal relationships in cyberspace [Rheingold 1993].

Virtual communities orginate in the dialog of the research community in the 80th. Topics and problems of several fields of research have been discussed, supported by internet services, above all newsgroups.

Every participant of a newsgroup has the opportunity to take part in the discussion by publishing a new article or by responding to an already existing contribution. With an increasing number of participants and articles, the efficency of newsgroups, as knowledge bases, decreases inversely proportional. The purely text style, the lack of transparency of the relevance to the present of the articles and the uncontrolled quality of the articles are the main criticism of this unmoderated forum. [Mynatt et al. 1998 ; Rheingold 1993]

Virtual communities lay claim to be able to be used as tools for knowledge management [Beinhauer et al. 1999, S. 415]. In particular, they should support the extraction, the storage and management of knowledge, that is otherwise difficult to access and to structure [Radding 1998, S. 39].

To this end hypertext tools of the internet are combined, for example personal homepages for the presentation of individual interests of the members, discussion platforms or moderated respectively unmoderated chatrooms for the

exchange of information. Synchronous and asynchronous, passive and active as well as formal and informal intercommunication become linked topic oriented and support in this way the interaction in the knowledge community [Kollock 1998].

4. Hypermedia as a technical solution for knowledge management

Hypertext-solutions show a consistent not linear structure, in contrast to knowledge, which is represented in text structures [Nelson 1987, S. 29; Conklin 1987]. The basic idea of hypertext is to navigate, activate and manipulate knowledge objects, that are connected flexibly in the logic of the specific field of application [Kuhlen 1991, S. 13]. These linked knowledge objects are not only restricted to text documents. If for example pictures, videos and sound recordings are integrated as well, “hypermedia” is employed as a synonym [Gloor/Streitz 1990].

The flexibility of the connections, described as “hyperlinks”, is however not only related to the multimediality of the embedded knowledge objects, but also particulary to the multidimensionality of the represented semantic context [Nielsen 1990]. The knowledge objects are not related in a hierarchy but in a network relation. Every knowledge object constitutes a nodal point in the knowledge network. It is possible to link every nodal point with any other of them [Koch/Mandl 1999, S. 48]. Due to this structure forming characteristic features, solutions based on hypermedia are used as a method for the integration of knowledge [Kuhlen 1991, S. 58; Horn 1990].

Two methods among others used to build hypermedia networks are concept mapping [Gaines/Shaw 1999] and mind mapping [Buzan/Buzan 1996]. The aim of both methods is to structure associatively a subject area. [Jonassen et al. 1993, S. 13].

The hypertext markup language (HTML), based on the internet protocol TCP/IP, has been established as a technical platform to create hypertext solutions.

Textobjects can be designed through so-called “tags” and links to multimedia documents can be implemented easily. Simultaneous HTML becomes more and more to the standard text format of traditional office software. By this development hypermedia becomes a tool not only for the logical, but also for the technical integration of knowledge. [Gaines/Shaw 1999]

5. The knowledge process in Virtual Communities

According to the hypertext concept virtual communities link different knowledge objects with each other. These objects may comprise text documents, powerpoint slides, contribution to a discussion, internet links, recommondations of books, video recordings of conferences or appointments of fairs, conferences etc. Virtual communities offer the possibility to post information concerning a specific topic. This information extends the knowledgebase. The following interaction finally allows the combination of information and thereby the generation of new knowledge. With the support of a combination of different multimediatools it become possible to link uploaded content with the individual know how of the members. So a collective knowledge base is generated. The textbased communication in a virtual community has the additional advantage, that these transformation process is automatically recorded and documented.
A knowledge spiral is a result of this process. Uploaded information become commented by other members and is therefore further developed. This conduct to new contents. Again new ideas are based on these contents. As a result it emerge from this knowledge spiral a dynamic flow of individual, implicit to collective, explicit knowledge (see Fig. 1).

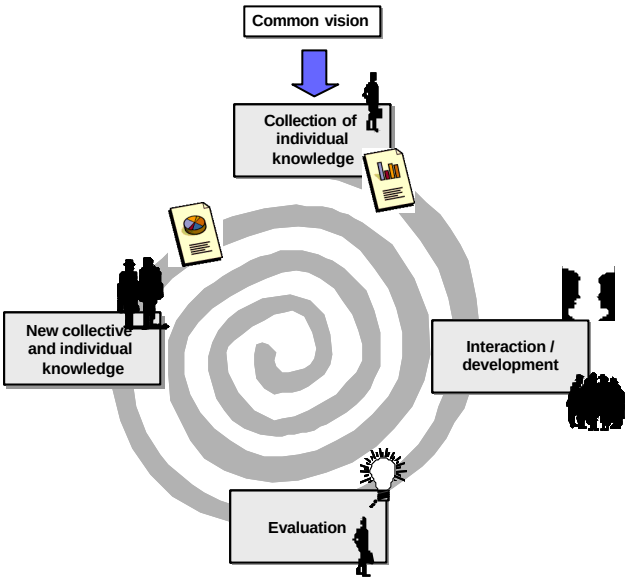

Fig. 1: Knowledge spiral in virtual communities

Virtual communities offer the possibility to not only post information concerning a specific topic but also to exchange experiences with other community members.

6. The "human" factor in Virtual Communities

The basic advantage of virtual communities as compared to other knowledge management tools is that there is not a single user-maschine interaction like by. On the contrary a community offers a platform to interact among other human beeings. This covers every adjustments of the knowledge management process.
The distribution of knowledge is supported by recommendations of other members. This can be achieved for example by peer assessments or as a simple answer of a question asked from a member in a discussion forum. If there is a clear drawn picture of the know how and specialisation of the members, matching methods can be used to build intra-interestgroups to distribut knowledge in a personalised way. The suggestions of amazon.com, "Customers who bought this book also bought….", become transferable to the knowledge management.

The development of knowledge can be supported with internet services like chatrooms. Members can find there a place to communicate simultaneous. In this way implicit knowledge like feelings and suggestions, normaly hard to extract, flow into the common knowledge base.

Communities of practice [Wenger 1998] emerge from the fact, that every member is known at least by its nickname. Every action in the community is based on another human beeing. Special interests, experiences and so on can be published on a personal homepage to complete the picture of the member. If phone number or mail adress is available there is nothing to stop to get in touch with another member in real live for example to plan a common project. This supports the networking in a special way. Notes can be compared as well as solutions for business problems.

7. Processworld.com – a knowledge driven community

Processworld is an example for a virtual community of interest with business-oriented content. The platform is developed since 1999 by the Institute of Information Systems (IWi) at the University of Saarland. The main topic of the community is business process management. Processworld covers further sub-topics such as knowledge management, performance management, activity based costing, enterprise resource planning systems, simulation, supply chain management, total quality management, e-business and workflow management. Processworld focuses on IT and organisational managers, consultants, scientists and all people that show interest for business process management. The goal of the community is to elicit, collect, structure and develop further case studies, theoretical concepts (methodology) and new trends in the above mentioned business areas based on international experiences in order to provide the community members always with the state-of-the-art of business process management. The processworld community counts about 1000 members.

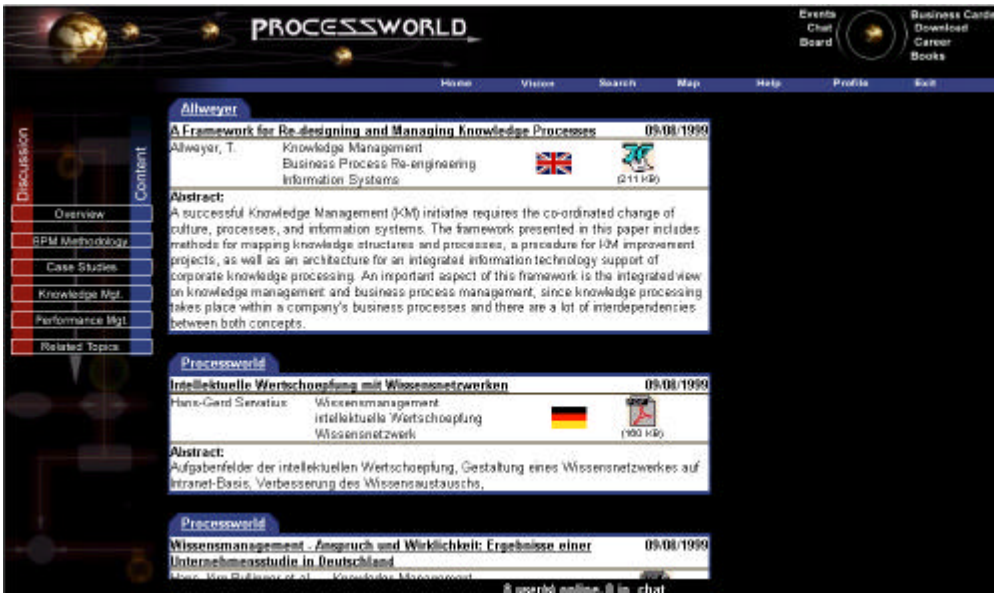

Fig. 2 : Processworld at http://www.processworld.com

Processworld aim at all services for a efficient knowledge managent process mentioned above. Processworld offers interactiv services to publish articles, slides and other documents. In addition to that it comprise services for an asynchron and synchron communication like chatrooms or discussion forums. Dynamic linklists, book suggestions, event calendars and a download area for free tools or demosoftware complete the supply for an effective knowledge management process.

There are also mechanism implemented for a efficient retrival of knowledge and information, like an intelligent search functionality which covers full text search and possibilities to link the knowledge objects that have been found with each other. The search functionality even include the vincinity of the different knowledge objects in its analysis of the content. This mechanism for retrival become increased by possibilities of peer assessments. Members can write comments to every knowledge object and give them marks. In this way other members can sort out useless information.

The human factor is supported by concepts like business cards, guestbooks, personal chatrooms and a ranking, that rank the members according to there activity in the community.

8. Conclusion

The concept of knowledge management has gained increasing interest during the past years. An organization’s and its employees' knowledge is regarded as the most important corporate asset in the arising global information society.

It has been shown that virtual communities can be used as a tool for knowledge management to extracts implicit knowledge and link it with already existing knowledge objects. The fact that virtual communities are not restricted within organisational boundaries increases the potentialities of a effective knowledge management.

But this is just one point of view of the potentialitites for using virtual communities in the context of knowledge management. The analysis of interests, actions and behaviour of the members within the community offers itself a huge knowledge base that can be exploited for customer relationsship management, product development or improvement of products and processes. The use of this possibilities for knowledge management will increase proportional to the rapid development in eBusiness.

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