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# The Knowledge Café - A Knowledge Management System and its Application to Hospitality and Tourism

Norbert Gronau<sup>1</sup>

**ABSTRACT.** Knowledge management is identified as a key success factor in most industries today. While data or information can be stored independently from people, knowledge is bound to people who use it for their interactions. The main goal of knowledge management is to improve the usage of knowledge in the enterprise. Knowledge management systems are not only organizational memory information systems. They also contain organizational standard procedures and a certain cultural attitude. A reference framework gives implementation hints mainly influenced by technical possibilities. The knowledge management system reference architecture contains layers of sources, repositories, taxonomy, services, applications and user interfaces. A software tool that largely corresponds to this reference framework is the Knowledge Café. Possible applications of this tool to the area of hospitality and tourism are described in this paper.

**KEYWORDS.** Knowledge management, discovery, collaboration.

## ***KNOWLEDGE MANAGEMENT***

Knowledge can be defined as the sum of information and capabilities that individuals use in arriving at solutions to problems. Thus it can entail theoretical findings, practical every day rules or instructions for action. The availability of data and information is a prerequisite for knowledge. In contrast to this, however, knowledge is always tied to some type of interaction by people (Probst, 1998).

Knowledge management is defined as an operational management task that encompasses a decision-oriented approach. It is the goal of this management task to establish learning processes across all levels of the organization and to develop them consistently. An organizational knowledge base is one possible result of knowledge management in an entrepreneurial context (Davenport, 1998).

Since the knowledge of an organization exists in an unstructured and dynamic form, the use of information technology should have the purpose of rediscovering internal and external data and methods and referring them to human experts. Support systems for this application can be called OMIS (Organizational Memory Information Systems), competency or know-how databases (Ackerman, 1994).

### ***Components of a knowledge management system***

In the following section, the necessary components for a knowledge management system – from the viewpoint of the authors – will be discussed.

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The goal of knowledge management is to improve organizational capabilities and the efficiency of the implementation of the organizational strategy while consistently using knowledge as a resource. The basic approach of knowledge management is to capture documents, personal experience and all other categories of information and to provide it in a manner that is useful to reach the goals of the organization (Lawton, 2001: 11). An important task in this context is to analyze the demand of knowledge that is needed by the members of the organization to support the reaching of the goals of the organization in the best possible way.

Additionally internal and external sources of knowledge are to identify which can satisfy the knowledge demand concerning process knowledge, knowledge of the members of the organization or of stakeholders. Knowledge that is not available in an explicit form, e.g. in documents, databases, formulas or technical data should be explicated. Experience, capabilities, unwritten rules (also named as tacit or quiet knowledge) should be converted in a digital form (this is called externalization) (Nonaka, 1994: 14) or transferred to other members of the organization (socialization). So it is possible for the organization to access and share its knowledge. The so gained and externalized knowledge needs to be structured, presented, cultivated and administrated.

Knowledge management systems (KMS) support the channeling of existing sources of knowledge. An additional goal of a knowledge management system is to provide relevant information at any time and anywhere to help members of the organization to solve problems related to their tasks.

Therefore different sources of knowledge have to be integrated. The categorization and classification of knowledge should be possible automatically or manually. KMS deliver tools for easy input of information in different ways like adding new information by members of the organization, automatic inspection of electronic documents like e-mail or by indexation of external contents (data bases, CD ROM). Prerequisites for the keeping of this kind of knowledge are the definition of knowledge goals, the creation of a uniform organizational structure and a company culture which stimulates the exchange of information and knowledge. Information technology has to map structures and processes of the organization. The biggest amount of collected information is only useful if transparency and ease of use are available. Therefore extensive information retrieval functions and knowledge distribution mechanisms are necessary.

The characteristics of a knowledge management system separated from other business information systems can be described using an architecture that is divided into six layers (Fig. 1).

[Please insert Fig. 1 here!]

- *Information and knowledge sources*, which in light of the increasing digitalization of contents make up the overwhelming portion of the available information in organizations, are dedicated to be the basis of the knowledge management system. In hospitality and tourism possible knowledge sources can be the contents of files on a server, intranet pages, directory of business relevant persons, e-mail traffic that is guided to specialists for certain situations (e.g. for technical maintenance). Additional potential sources of knowledge are databases that probably contain reports and relevant data for business cases. If a document management system is available this is a potential knowledge source, too. In the near future it will be possible to analyze and segment audio and video files so that they can be used in KMS in circumstances other than what they were created for.
- *A knowledge repository* integrates the different sources and ensures a uniform, logical view of the variety of sources. This is a condition for the processing of knowledge sources by the higher levels of the system architecture.

- A structured presentation of the knowledge available in the system that can be used for navigation is made available by the *taxonomy* layer. Some existing implementations also integrate knowledge repository and taxonomy into a single component. Glossaries, key word lists and thesauri are used to form a taxonomy. This is a useful component especially in the field of tourism and hospitality where employees have a higher turnover rate than in other industries. . The use of taxonomy makes it easier to understand the special terms in this industry.
- The *service layer* provides some service components based on the lower layers and is used by the application layer. The differentiation in services and application layers is an architectural decision which points out the possibility to distribute services in a network environment and which separates applications (with a user defined goal) from services (with a system defined function). At least four services are necessary to be able to create knowledge management applications:
  - A primary function is *search*, which is provided by the discovery services. A differentiation between pull and push technologies (other sources refer to this as active and passive techniques) can be made. In a *pull situation* (or with an active search) the user searches the knowledge management system by inputting a search string. The stimulus for generating the knowledge thus comes from the user. In a *push situation* (or a passive search) based on a customized interest profile, the user receives unsolicited and automatically generated documents that have been newly added to the knowledge management system based on his/her interest profile with every usage of the system. The advantage of the push technology is that no stimulus from the user is needed to generate the output of knowledge. With skillful utilization of the interest profile, other relevant documents are also found, which would not have been retrieved using the traditional pull technology.
  - *Collaboration services* allow a distributed cooperation between different persons at different times. Examples for collaborative services are workflows for document approval or the work on texts or graphical models by a group whose members are located at different sites.
  - *Publication services* deliver functionality to publish a document in the intranet.
  - *Template services* allow creation and administration of templates for the storage of different kind of information in different document types.
- The functionality of a knowledge management system on the *application* layer is constructed using the services of the service layer. Some examples for knowledge management applications in hospitality and tourism are described at the end of this paper.
- The *user interface* layer provides a uniform interface for the operation of the system, which may be customizable. Personal customization is an important requirement for the success of knowledge management systems because different user types exist. A differentiation of user types is possible regarding the user's experience (inexperienced, well- informed, expert) Additionally the demand for information the user needs is important for a typology. Every employee belongs to a certain department and works in certain processes. He will be interested at first in information about his department and processes and then about others if this information is easily accessible for him. Customization allows the creation of favorite links, a personal start page with extended information on his department and processes and introductory information on other. The discovery services will help the user to find out more if necessary.

### ***THE KNOWLEDGE CAFÉ - A TYPICAL KNOWLEDGE MANAGEMENT SYSTEM***

The Knowledge Café, developed 1999 by Berlin University of Technology (Krallmann, 2000: 205; Gronau, 2001: 77) and now distributed by altavier (altavier, 2002), is a modular knowledge management system based on the above discussed architectural framework. It

contains a basic module with glossary, newsletter, full text search and help and can integrate different components like yellow pages, knowledge base, virtual library, discussion and project module.

The Knowledge Café can be used either with a browser or with Lotus Notes client software. The access to the contents of the modules is realized by hyper link structures and with user-friendly context-sensitive full text search engines. All documents in the system are characterized by keywords from the glossary. Fig. 2 shows the architecture of the Knowledge Café.

[Please insert Fig. 2 here!]

### ***Yellow Pages***

The access of existing knowledge in the enterprise is often difficult because corresponding competencies of employees are known only inside the borders of work groups and departments (Choo, 1998; Tunik, 2001)..

[Please insert Fig. 3 here!]

Yellow Pages are helpful if the right contact partners are searched or a project team has to be assembled which should correspond with the requirements of the problem to be solved.

Employees can be found corresponding to their qualification, experience and competency.

Persons also can be found under criteria like position in the organization (location, branch offices, departments, etc.), project participation and name.

The basis for these functions is a personal home page for each employee (cf. fig. 3). In this document actual and past work areas, project experience and competencies are stored. Every employee can take care of his own personal home page because the entry and publication of information in an intranet is very easy with the Knowledge Café.

### ***Knowledge Base - topic centered pool of information***

Employees collect experience, create reports and contribute with their work to the success of the enterprise. The intranet can be very helpful to facilitate the access to experience, opinions and documents of relevant topics for many employees. Fig. 4 shows the creation of a new entry in the knowledge base.

[Please insert Fig. 4 here!]

With this module knowledge can be provided either for all employees or for special interest groups. So knowledge which was not known till now will be distributed and can be used extensively. Double working is reduced and the experience of other people helps to process tasks faster and in better quality.

The knowledge base supports the generation, use and distribution of competencies in an enterprise. It forms the technological basis for a topic-oriented discussion.

The publication of documents and the access of different contents is controlled by an access control system. So it will be possible to give only the members of a project group access to their documents. All documents are categorized based on the entries of the glossary.

Documents in other file formats can be embedded easily (e.g. Lotus Smart Suite, Acrobat PDF files, MS Word etc.).

### ***Virtual library - management and publication of documents in the Intranet***

Although lots of documents exist in enterprises, employees often have neither knowledge of the existence of these documents nor access to these books, journals, papers and other relevant publications. In the virtual library employees can search efficiently for documents and read them either in a digital form or be informed about the source location. Contrary to the knowledge base only few responsible persons with the role “librarian” publish documents in the virtual library that can be accessed by either all employees or specified groups. The basis for access is an access control system that prevents unauthorized access to certain

documents. The duration of a publication period in the intranet can be chosen so that after a certain period of time the document disappears and will be archived. An archived document will be found using the discovery services but is not seen in document catalogs sorted by key words. An example for the creation of a new document in the virtual library is shown in fig. 5.

[Please insert Fig. 5 here!]

### ***Discussion groups - expert circles in the Intranet***

Using this module, employees can discuss self- chosen topics. Topics, discussion contributions and responses to these contributions can be stored in this module up to a depth of 17 levels. With this module it is possible to form expert circles. Other employees who have questions about certain topics will also benefit from these discussions.

The generation of a dynamic discussion culture can be controlled and supported actively by the enterprise. Electronic discussion groups are useful in hospitality and tourism to give inexperienced employees hints for their tasks. Online discussions allow participants from different locations to join. This is a great advantage particularly in the international industry of hospitality and tourism. Additionally it is possible to store intermediate results from a discussion for some months until other participants are able to continue the topic.

### ***Project module - knowledge based project management***

The module is separated into a public and an internal project area. In the public area the projects are commonly described and selected documents are published for (nearly) all employees. In the internal area where only project members have access the project is organized, all project-related documents are stored, people, dates and resources of the project are administrated and the communication within the project is supported.

Advantages of the project module are the publication of project results and solution alternatives in the Intranet. Therefore, employees with similar problems in other projects can use existing experience. Additionally it is easier to find colleagues who are familiar with certain problems and their solutions.

## ***APPLICATION OF KNOWLEDGE MANAGEMENT SYSTEMS IN THE AREA OF HOSPITALITY AND TOURISM***

Possible application areas of knowledge management systems in hospitality and tourism are business planning, service operations, quality improvement and reaction on emergency cases. For each of these application areas a configuration example of the Knowledge Cafe is described.

Every scenario is based on a common glossary that contains the relevant vocabulary in this industry, synonyms and an explanation of each term.

### ***Business planning***

Business planning involves the process of planning capacities, quality standards and prices of airplanes, hotels and additional services. This is a collaborative task with participants in different roles like seller, buyer and middlemen. To make the business planning process easier it is useful to store relevant information about different people and their roles in the process in the yellow page module. So it is possible to find out, who has experience in certain countries or with foreign government procedures. As the number of participants in the business planning process increases, it becomes more difficult to find the person able to answer one's questions.

The virtual library is a possible storage location for standard operating procedures e.g. for calculation of prices, capacities and reports. Documents in the library are accessible for every authorized user of the system.

### ***Service operations***

Applications in service operations are between hotel facilities planning, event scheduling or the creation of restaurant menu selections. Information about vineyards, hotel characteristics or cooking constraints can be stored and classified in the virtual library. Actual work in progress can be accompanied either by the knowledge base or by the project module. The news flash function of the Knowledge Café keeps people informed without an inquiry being made. An example from hospitality may explain this function. A food procurement manager is interested in the region of California, in vineyards and in poultry. He chooses these keywords from the glossary of the Knowledge Café and stores them into his personal interest profile. Now a hotel manager from the same company enters a new suggestion of menu selection containing Californian Chardonnay (white wine) into the knowledge base. He classifies this new document with some keywords from the glossary, too.

The next time the procurement manager enters the system and checks his “MyNews” area, he will be informed about the new document that was entered by the hotel manager. Now the procurement manager can generate the knowledge that in future more Chardonnay will be needed and that it would be a good idea to look for some sources with high quality.

### ***Quality improvement***

The process of quality improvement can be settled up on the same system that is used for business planning. For managing customer complaints the integration of web based forms is necessary. Paper based quality questionnaires can be entered into the system either by automatic character recognition or by helpers. Using the project module of the Knowledge Café the definition of workflows based on customer complaints, the investigation of their causes and their remedy are possible. Experience won in these processes can be used for future business planning processes.

### ***Reaction on emergency cases***

In emergency cases an extremely fast reaction on operative, administrative and strategic level is necessary. Standard procedures stored in the virtual library of the Knowledge Café help to do the right things even in crisis situations. If plans of hotels, airports and streets are stored in the virtual library the Knowledge Café should be accessible also for external participants.

## ***SUMMARY AND FURTHER DEVELOPMENT***

Knowledge management systems are a combination of different services basing on several sources connected with the system by a repository layer. A realization of the knowledge management framework architecture is the Knowledge Café. Some examples from the area of hospitality and tourism show that there is a broad range of use possibilities for knowledge management systems.

To reach a return on investment after the installation of a knowledge management system (Harvard, 2001), it is necessary to integrate knowledge management functions in existing intranets (Logan, 2001; Gronau/Kalisch, 2002).

Actually the Knowledge Café is an “all-in-one” system with components adjusted to work fine with another. Problems can occur if a third party search engine like case based reasoning (Aha, 1999, Gronau/Laskowski, 2002) or an automatic text classification program should interact with the Knowledge Café. Therefore one development task will be the partitioning of the system in smaller components which can be used in heterogeneous software environments (Saha, 2001) and together with other knowledge management tools.

The other development task is the evolution from a company specific knowledge management tool to a knowledge community tool. The most important step on this way is the proper integration of customers and their representatives (e.g. travel agencies) and to open the

possibility of discussion with customers and to learn from their experience without surrendering proprietary business information.

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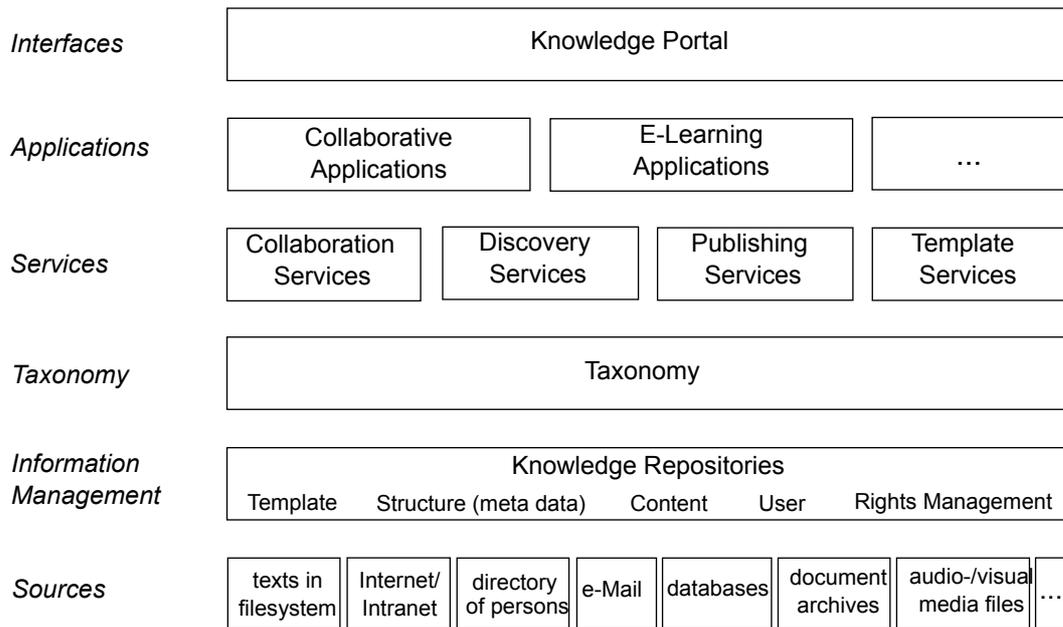
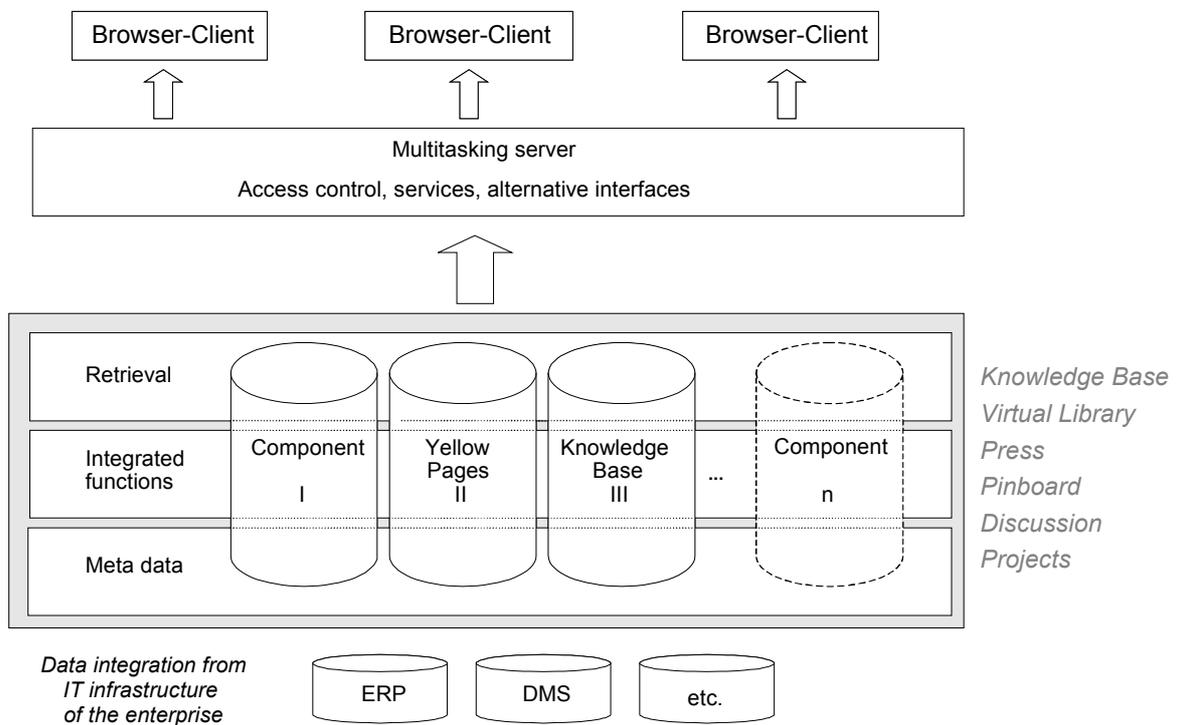


Fig. 1 : Architecture of a knowledge management system

Fig. 2: Architecture of the Knowledge Café



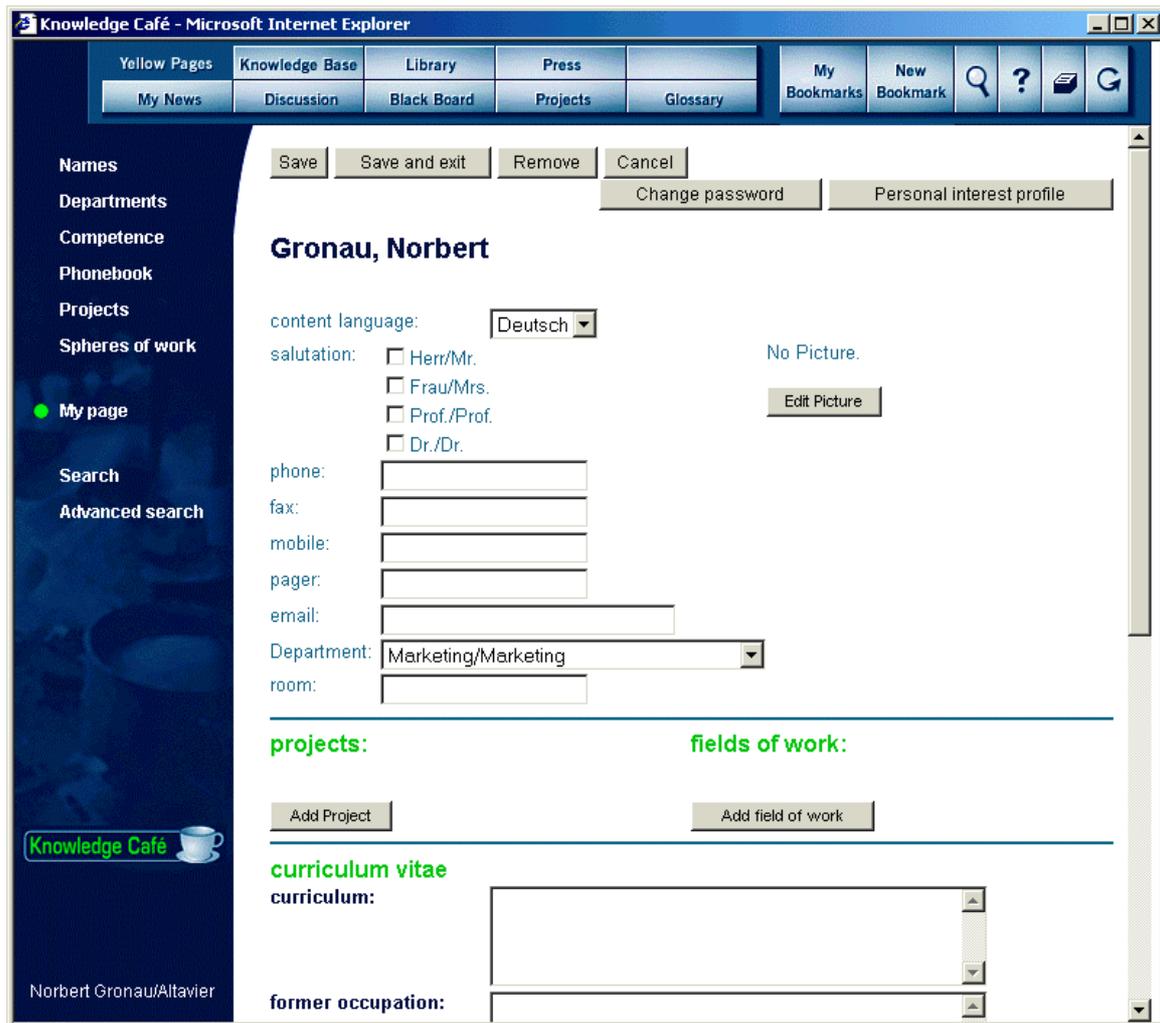


Fig. 3: Personal homepage in the Yellow pages module of the Knowledge Café

The screenshot shows a web browser window titled "Knowledge Café - Microsoft Internet Explorer". The browser's address bar and navigation buttons are visible at the top. The main content area displays a form for creating a new document. The form includes a sidebar on the left with navigation options like "Title", "Author", "Creator", "Company", "Catchwords", "New document" (highlighted), "My documents", "Search", and "Advanced search". The main form area contains the following fields and controls:

- Buttons: "Save and close" and "Cancel"
- Title** section:
  - content language: English (dropdown menu)
  - title: [text input field]
  - subtitle: [text input field]
  - created by: Norbert Gronau (text input field)
  - author: [text input field]
- documenttype: Sonstiges/Others (dropdown menu)
- companies:** [text input field] with an "Edit" button below it.
- validity** section:
  - expiration date: 19.09.2002 (text input field) with a calendar icon.
- hyper-link text: [text input field] address http:// [text input field]
- content:** [text area]

Fig. 4: Creation of a new entry in the knowledge base

Knowledge Café - Microsoft Internet Explorer

Yellow Pages Knowledge Base Library Press  
 My News Discussion Black Board Projects Glossary

My Bookmarks New Bookmark ? G

Save and close Cancel

Publications  
 Title  
 Author  
 Catchwords  
 ● **New Publication**  
 My Documents  
 Search  
 Advanced Search

content language: English

publicationtype: Buch/Book

title: Titel

author:

year of publication: 2002

isbn:

publisher:

page count:

location / contact person:

intranet publication:

internet publication:

remark:

Fig 5: Creation of a new virtual library entry