Study of Semantic Web Based Library Knowledge Management System

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Abstract: This study firstly proposes a structure of semantic grid by combining the advantage of semantic web with the research of the grid technology and discusses the key technologies and services of knowledge management under semantic grid environment. Then not only discusses semantic notes and knowledge discovery on the basis of ontology but also the model transformation tacit knowledge based on ontology. Then based on the above, it describes the ideas about the knowledge management model under the semantic grid environment. Lastly it analyzes this model from application layer and semantic space layer and knowledge grid services layer and the distributed resources.

Key words: Semantic web, grid technology, semantic grid, knowledge integration, knowledge management system

INTRODUCTION

Along with the further deepening information technology revolution and the advent of the era of knowledge-based economy, the development of libraries is facing brand new challenges and knowledge is increasingly becoming the key factor that determines the fate of libraries. Only by carrying out knowledge innovation can libraries occupy a dominant position in the fierce competition. Therefore, the libraries in the era of knowledge-based economy not only need to understand knowledge management but also need to establish corresponding strategic measures for concrete implementation.

As the broad social context evolves, the existing form and management model of organizations change accordingly. The management model of traditional libraries is literature management, that of digital libraries is information management, while that of hybrid libraries evolves into knowledge management. Table 1.

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<th>Social context</th>
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CONSTRUCTION OF THE KNOWLEDGE MANAGEMENT SYSTEM OF UNIVERSITY LIBRARIES

The knowledge management of university libraries is a systems engineering process, which permeates various aspects and the overall process of library management activities and is characteristic of diffusion of responsibility. For this reason, a set of effective organizational system must be established to support the library knowledge management activities. The library knowledge management system is based on the network and it is an all-around decision-making system of developing, acquiring and applying knowledge established by using advanced knowledge management technologies. The system conducts intelligent management over information resources so as to realize multiple functions such as remote information communication, knowledge-based classification, intelligent procurement and the service for readers, to promote rewarding knowledge sharing, to stimulate librarians' innovation consciousness and ability, to enrich the knowledge assets of libraries and finally to help libraries realize the information appreciation in the knowledge chain (Zhang, 2004).

Implementation tools of the knowledge management system of university libraries: The knowledge management tools are the assembly of all technologies...
Main functions of the library knowledge management system: The knowledge management system is a complicated system which contains a cyclic process of knowledge, as shown in Fig. 1. The system has four basic functions, namely knowledge acquisition, knowledge organization, knowledge sharing and knowledge services, which are also the main contents of knowledge management.

Construction of the library knowledge management system: The knowledge management system is an integrated multifunctional and multi-disciplined system which can support all main knowledge management and processing activities, including knowledge acquisition, knowledge organization, classification and comprehension, editing and retrieval, passing and sharing, etc (Zhang, 2006). The successful construction of knowledge management system involves organizational, procedural and technical factors. Among them, technical factors include creating knowledge base system, introducing knowledge map and equipping other necessary supporting technologies.

When new information is input in the knowledge base, the information with little value in use or the information that has been internalized into users' tacit knowledge by sharing should be eliminated. By type of use, knowledge base can be divided into literature knowledge base, self-built knowledge base, expert retrieval knowledge base, intelligent knowledge base, conceptual knowledge base, characteristic knowledge base, etc. The knowledge base within libraries is the storage center of the knowledge evaluation of readers and librarians obtained by the libraries and the selected and effectively organized knowledge. It must include personal data of librarians, the knowledge summarized and generated in the user service process, the analytical results of the users' information and knowledge needs, as well as the data of subject specialists. The tacit knowledge of librarians should be excavated as far as possible and be made explicit. Subject specialists are the major readers of libraries and thus the emphasis when libraries collect readers' information. Firstly a frame should be constructed by the goal of developing learning-oriented libraries and the structure, retrieval interfaces and model of the knowledge warehouse should be built by the organizational goal. Secondly, relevant knowledge such as readers' information, personal knowledge and organizational knowledge should be extracted by the construction goal and the knowledge should be organized, indexes be established and the Internet be connected by the framework (Bai, 2010). The establishment of knowledge base must rely on powerful technical support. The library knowledge base is established on the intranet of libraries, with its system constituted by a set of software installed on the server to support the required knowledge.

Library intranet-based knowledge management system model: The implementation of knowledge management system needs the help of IT technology, information base and data base. The library knowledge management system is an application system based on Web interfaces. Readers and librarians can have access to the library knowledge management system through Internet in any place (Fig. 2).

IMPLEMENTATION STEPS OF THE KNOWLEDGE MANAGEMENT SYSTEM

The implementation of the library knowledge management system includes the following five steps, namely cognitive appraisal, planning and design, development and testing, system import and maintenance and feedback(Fu, 2006). The whole process is accompanied with the reform of organizational culture, adjustment of organizational structure, restructuring of business process and the establishment of incentive mechanism within university libraries so as to ensure the implementation of knowledge management strategies, as shown in Fig. 3.
Cognitive appraisal: University libraries should further comprehend knowledge management theories to make it clear that why knowledge management is needed and how to implement it, make sure which knowledge is truly needed by the organization and which knowledge is the most valuable by knowledge assessment and strengthen the library staff’s understanding of knowledge management by means of various media seminars, case analysis and educational knowledge assessment and training, so as to be prepared for implementing the knowledge management.

Planning and design: Set up a project group of knowledge management implementation, formulate specific knowledge management strategic blueprint, describe knowledge management strategic objectives, determine how to reform the libraries in terms of organizational culture, organizational structure, business process and the adjustment of incentive mechanism so as to promote the function module of knowledge management and plan the software and hardware requirements of system development.

Development and testing: Conduct the software development modeling for the knowledge management system, input the test data, draw out a knowledge importing plan and carry out the system testing.

System import: Construct a complete knowledge management system according to the above planning, import initial knowledge, implement the importing plan and carry out corresponding user training.

Maintenance and feedback: Maintain the system by handling the arising problems and improve and perfect the system functions.

IMPLEMENTATION COUNTERMEASURES OF THE LIBRARY KNOWLEDGE MANAGEMENT

The library knowledge management needs more than one set of IT system. Only with a series of organizational and institutional strategies and measures can the library knowledge management be carried out effectively.

Reconstruct the organizational structure: remake the traditional organizational structure and establish a set of flexible knowledge-based organizational system, i.e. flat organizational structure, namely flatten the original pyramid shaped vertical management hierarchical organization to reduce longitudinal hierarchies and increase horizontal links. Realize the rapid and accurate delivery of knowledge and information by means of the optimized library business segments and workflow.

Set up a cko system and appoint a cko (chief knowledge officer): The library CKO is responsible for formulating a uniform policy to normalize the knowledge intensivism and innovation and promote the knowledge communication and application so as to ensure the
orderly knowledge flow within libraries; creating an environment of knowledge accumulation and sharing; supervising and guaranteeing the quality, depth and width of the contents of knowledge warehouse by constantly keeping up with the knowledge needs of the society, libraries and librarians, continuously injecting new ideas into the knowledge base and timely updating it; and ensuring the normal operation of the knowledge base facilities. The knowledge involved in the management activities conducted by the library CKO is not only data but more importantly the public feeling of librarians and the intellectual capital stored in their mind and publications.

Establish the “people-oriented” management idea: The knowledge management is always conducted for people because the objects of knowledge services are people—readers and the subjects who provide knowledge services are also people—librarians. Therefore, libraries should firstly carry forward the spirit of humanistic care for readers and provide various and more humanistic services in accordance with the user needs. Secondly, libraries should take full consideration of the desire, needs and ideal of librarians, respect their personalities, provide sufficient trust in their innovation, create favorable work and study atmosphere and continuously stimulate their creativity and potential.

Cultivate the knowledge management-based new library culture: Enhance librarians’ sense of responsibility and honor, promote their creative spirit and develop their team awareness and sharing awareness by cultivating the innovation culture, team culture, learning culture, sharing culture, humanistic culture and network culture, so as to strengthen the core competitive advantages of libraries through collective innovation.

Establish new-style learning-oriented libraries: The learning-oriented libraries emphasize organizational learning by making learning an organizational behavior and lay stress on the entire staff, whole process and group learning as well as lifelong learning, which can foster knowledge-based librarians and improve their qualities all-roundly, inculcate advanced ideas and service concepts in the mind of librarians, reduce the man-made obstructions in the knowledge management process and create a study atmosphere of mutual cooperation and communication. Organizations of this type have the ability to learn continuously and generate an integrated performance better than the sum of individual performances.

Fig. 4: Library collaborative knowledge management figure

Establish the knowledge sharing mechanism: The knowledge sharing mechanism is a necessary condition for implementing the knowledge management. Establish a reasonable incentive mechanism and promote and reward knowledge sharing to make librarians see and enjoy the benefits brought by sharing their knowledge with others and make them eager to enrich their tacit knowledge to the greatest extent and consciously contribute it to the collective knowledge base, thus forming an environment where knowledge can flow freely, as shown in Fig. 4.

Strengthen the construction of library values: Lead and collaborate from a strategic height to make libraries go a step further in the aspect of knowledge collection, knowledge restructuring and innovation, knowledge mining and knowledge services and to make it clear what libraries are for and how librarians should do.

CONCLUSION

For this reason, this article defines its concept according to the characteristics of the digital library and referencing to the theory of knowledge management of the enterprise, putting forward its double layers meaning, namely the meanings based on the service and on the talents. The former includes organizational management development management, service management, propagation management, marketing management, application management and innovation management of explicit knowledge; the latter includes research, development and application of librarians’ tacit knowledge of digital library. In order to ensure the digital library to realize knowledge management effectively, the
author proposes to establish the advanced mechanisms of knowledge management and to apply the knowledge management tools. There are mechanisms of knowledge management such as mechanism of organizational management, technological mechanism, cultivation mechanism of environment and incentive mechanism; the tools of knowledge management are divided into three kinds: knowledge produce tools, knowledge transfer tools, knowledge encoding tools.

REFERENCES


