Research on Architecture Design and Key Methods of Knowledge Management System

Jiang Meilei[a,*], Liu Tong[b], Zhao Peng[c]

China Satellite Maritime Tracking and Control Department, Jiangyin, China

[a] 77156270@qq.com, [b] sunuy@sina.com, [c] zpxb211@163.com

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Abstract: With the rapid development of knowledge economy, knowledge assets have become an important strategic resource for organizations. As a classic learning and knowledge intensive organization, some organizations can integrate explicit knowledge and tacit knowledge, promote the acquisition and processing of knowledge, exchange and share, innovate and add value. It is of great significance to improve the level of scientific research and the ability of measurement and control at sea. Therefore, this paper studies how to design a set of knowledge management system, and provides a practical platform to explore the suitable knowledge management system, and gives a specific design framework.

1. Introduction

In the late 1980s, in order to meet the needs of the knowledge economy, knowledge management theory came into being. In a nutshell, knowledge management is the management of the entire process of effective identification, acquisition, processing, storage and dissemination of knowledge resources (including explicit knowledge and tacit knowledge) owned and accessible by an organization. The Knowledge Management System (KMS) as a means of implementing knowledge management, its construction and function realization is directly related to the implementation of knowledge management. KMS is a comprehensive software system that integrates management methods, knowledge processing, intelligent processing, and development planning.

In China, most of the research and application of knowledge management is concentrated in enterprises. In fact, knowledge management is more suitable for colleges and universities and similar groups such as the China Satellite Maritime Monitoring and Control Department (hereinafter referred to as the Measurement and Control Department). Compared with other groups, its biggest feature is a learning-type, highly knowledge-intensive group. For such groups, the experience and knowledge that exist in the minds of experts, post masters, and post-masters are tacit knowledge, and the proportion in knowledge is very large, which is also crucial to its development. How to transform this tacit knowledge into explicit knowledge that can be exchanged and shared is an important research topic. Therefore, from the perspective of knowledge management practice, this paper discusses and studies the model framework of knowledge management system and the key technologies and problems realized, so that such groups in the continuous production knowledge, distribution knowledge and inheritance knowledge chain have effective ideas and The method is to complete the historical mission.

2. System Requirements Analysis

2.1. Analyze system requirements from different aspects of knowledge management

Unlike other organizations, knowledge-intensive organizations are mainly engaged in knowledge-based work, with a large amount of explicit knowledge and tacit knowledge accumulated over a long period of time. Therefore, establishing a knowledge management system within it is particularly important for the implementation of knowledge management. This paper extracts some common requirements of knowledge management, and then designs the knowledge

management system according to its own characteristics. From the analysis of the various aspects of knowledge management, the functional requirements of the knowledge management system mainly have the following four aspects:

Knowledge acquisition: The acquisition of knowledge includes the acquisition of explicit knowledge and the acquisition of tacit knowledge. The tacit knowledge hidden in the minds of experts, post masters and post-masters is even more important. For the acquisition of explicit knowledge, the knowledge management system needs to have a powerful and complete knowledge base, which can meet the functions of different users for querying and retrieving explicit knowledge, and present the results to users in time; for the acquisition of tacit knowledge, You can use the navigation of knowledge maps to find relevant papers, materials, and online experts who can solve problems.

Knowledge storage: For the knowledge that has been acquired, the knowledge management system needs to create an appropriate environment to store it explicitly. For explicit knowledge, it can be directly stored accordingly. The middle may involve the construction process of the data warehouse, that is, the data needs to be extracted, converted, and loaded. For tacit knowledge, it generally exists in an individual form and is difficult to store, so it is possible to focus on the efficient acquisition of explicit knowledge. To this end, the system can build a knowledge base, mainly storing various explicit knowledge.

Knowledge Sharing: On the one hand, the knowledge management system can enable people with knowledge to easily share knowledge. On the other hand, people who need knowledge can quickly and easily query and retrieve the knowledge they need. For explicit knowledge, knowledge sharing can be realized through functions such as query and retrieval of the system, but for tacit knowledge, there are many things related to individual characteristics. To change the default, adjust the template as follows.

Knowledge utilization and creation: At this stage, the knowledge management system mainly re-creates the knowledge acquired, and promotes the dissemination and utilization of knowledge through effective forms. Inspire personal creative thinking through knowledge exchange, maximize the explicit knowledge of tacit knowledge, and finally promote the renewal and development of knowledge base.

2.2. Analyze system requirements from a business logic perspective

The previous section introduces the functional requirements of the knowledge-based and knowledge-intensive organizational knowledge management system from the various aspects of knowledge management. The design and implementation are not only for the measurement and control department, but also for any organization or group, such as knowledge application. Retrieval technology and push-pull technology, organization's knowledge map, automatic classification of knowledge discover, association rule mining, classification prediction, case-based reasoning technology and other technologies. For the measurement and control department, its knowledge management system also has its special business management mode. Such as: personnel training system, assessment system, scientific research results management system, book (electronic data) management system. To this end, the process of constructing the knowledge management system of the measurement and control department should also include some special business management modules, and some of the business logic is implemented based on knowledge management. Therefore, the various functional modules of knowledge management are embedded in the process of business management. Support the business operations of the measurement and control department.

3. System Architecture Design

3.1. System Framework Model

The research and construction of knowledge management system is closely related to new knowledge and new technology. The research process is also accompanied by the integration of

knowledge and knowledge innovation in various disciplines. The framework model of the knowledge management system of the measurement and control department constructed in this paper is shown in Figure 1. It is based on the background of the informationization construction of the measurement and control department and the characteristics of the knowledge management system.

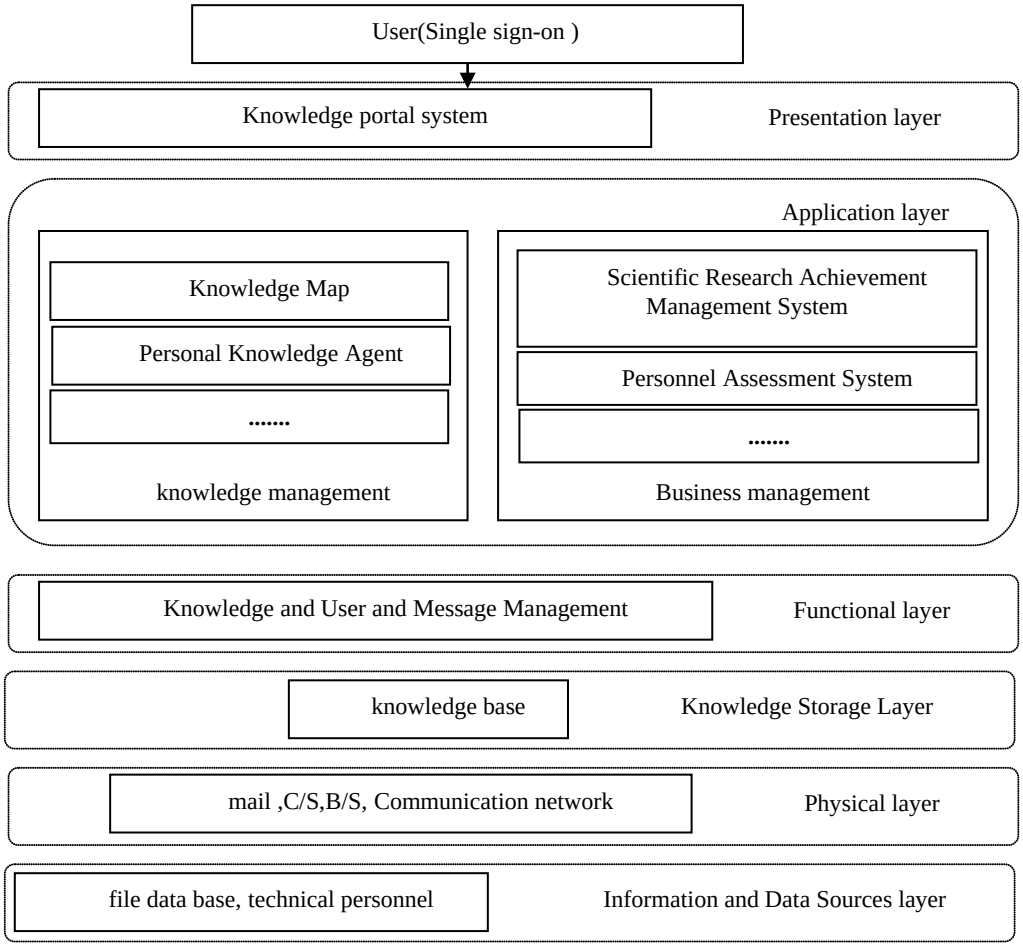

Figure 1 framework model

Layer 1: Information and data source layer

It is the key layer of the knowledge management system. Experts, post masters and other personnel can make the tacit knowledge in their own positions, scientific research and other work explicit and submit them to the system for sharing by the measurement and control department, through personal homepage, email, etc. achieve. It forms a high-performance database and data warehouse with a client/server or browser/server to support various information transformation and knowledge applications.

Layer 2: physical layer

The physical layer can be further divided into two sub-levels. The first layer is the communication network to support the dissemination of information; the second layer is the client/server or browser/server layer, which is one of the important links to access the information, the physical structure of the data and the physical layer, and the communication network. Together provide hardware support for knowledge management.

Layer 3: Knowledge Storage Layer

This layer contains various knowledge storage technologies. It consists of a unified knowledge base and is responsible for responding to retrieval requests, knowledge storage management and security management. A unified knowledge base is for the user, and all information is stored in a logically unified knowledge base. The interface between the layer and the data source layer includes technologies such as knowledge discovery and data mining.

Layer 4: Functional Layer

The functional layer is the fourth layer of the model, including knowledge process management, message management, and unified user management. The functional layer has no user interface and does not directly implement specific knowledge management operations. Instead, it provides tools or platforms for further development of knowledge management applications.

Layer 5: Application layer

It is divided into two parts from the logical level: knowledge management module and business management module. The functions implemented by the knowledge management module are independent of the business and can be used by any organization, such as personal knowledge agents, knowledge maps, and real-time online communication systems. The business management module is closely integrated with the specific business of the measurement and control department, such as: personnel training system, assessment system, scientific research results management system, and book (electronic data) management system. The functions in the knowledge management module are embedded in the business process of the measurement and control department, and directly support the work operation of the measurement and control department.

Layer 6: Presentation layer

The presentation layer is the interface between the user and the system and is used to implement the user interface. This layer is mainly responsible for responding to user operations and displaying processing results, which can usually be implemented by the Liferay Portal technology of the knowledge portal. The knowledge portal system is the only entry point for users to access the knowledge management system. By adopting the single sign-on technology, users can reduce the number of logins and switch freely among various subsystems. The knowledge portal optimizes and integrates the existing internal and external information of the measurement and control department, enabling users to access, extract, analyze and store the personalized knowledge they need from a single platform, which can greatly improve the efficiency of each organization in the measurement and control department.

3.2. System Architecture

The knowledge management system of the measurement and control department constructed in this paper adopts the B/S-based architecture, as shown in Figure 2, to facilitate human-computer interaction and collaborative work.

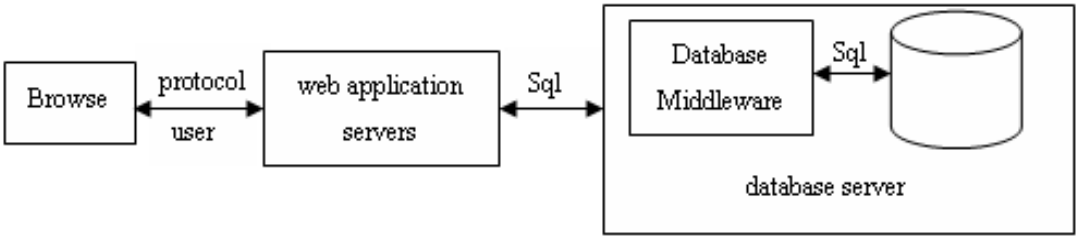

Figure 2 System Architecture

The database server can be Oracle or Microsoft SQL Server or MySQL. The WEB application server provides access to business logic for use by client applications. It is the core of the entire system. The client layer is a standard web browser. The client layer runs programs such as ActiveX and XML stored on the Web server.

4. Research on Key Method of the System

4.1. Knowledge Map

Knowledge map technology is a kind of knowledge management technology used to help people know where to find knowledge. Its essence is the general catalogue of knowledge resources made by information technology and the combination of the relationships between various knowledge items. It is a diagram showing the distribution of knowledge by means of lists, diagrams, etc. It is a guide for knowledge within the organization, clearly indicating the location of important knowledge, and giving the carrier of people, documents, databases, etc. that store knowledge. The knowledge

map not only indicates the storage place of knowledge, but also reveals the dynamic connection between knowledge. It is a dynamic knowledge navigation system, and the connection between knowledge often stimulates new knowledge.

4.2. Knowledge push and proxy technology

The use of knowledge push technology to automatically pass some information makes end users more and more valued. Although E-mail plays this role to a certain extent, Web-based push technology can transmit information more efficiently and in a timely manner. Intelligent agent is a special knowledge push technology, controlled by the end user, and intelligently pushed according to its needs and functions. In today's complex and complex space, it is an important indicator to measure the knowledge management system to facilitate and effectively enable knowledge users to acquire the required knowledge. Knowledge push technology and agent technology are especially important.

4.3. Knowledge warehouse and knowledge mining technology

The knowledge warehouse contains a variety of knowledge, external knowledge, structured internal knowledge, informal internal knowledge, and this knowledge. In the measurement and control department exists in a variety of ways, such as documents, Web pages, database forms, can effectively organize, classify, and then analyze and mine its inherent hidden knowledge, so that the knowledge warehouse is more organized and knowledgeable, knowledge The wider scope and better retrieval and utilization are the effective basis for the entire knowledge and control system of the Ministry of Measurement and Control. The knowledge mining technology and knowledge warehouse technology are organically combined to improve the deductive and reasoning ability of the database, and realize the storage, management and control of knowledge, so that users can directly query, analyze and apply data and knowledge.

5. Conclusions

The measurement and control department is the place where knowledge resources and knowledge human resources are the most concentrated. The implementation of knowledge management in the measurement and control department can effectively improve the utilization ratio of explicit and tacit knowledge, promote knowledge exchange and sharing, innovation and value-added, form a good open resource management environment, and cultivate excellent learning organizations and teams. On the whole, it will improve the marine capability of the measurement and control department.

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