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Strategy in Knowledge Network

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Abstract: Firstly, the thesis analyses the demand gap of enterprise knowledge. Besides, it gives the definition, its features and system structure of the enterprise knowledge network. And then, on the basis of enterprise knowledge management process support model in Knowledge network, this thesis study support strategies of knowledge network for enterprise knowledge management process.

Keywords: Knowledge network, Knowledge management, Knowledge sharing, Knowledge acquisition

1.   INTRODUCTION

In recent years, knowledge network (Sheng Xiaoping [1], 2004) has become a research hot in field of enterprise knowledge management. The strategic value of knowledge has been realized, especially the tacit knowledge in social network. Knowledge is an important element embedded in the social network. Only in social network, knowledge can perform its strategic value and function better. However, the dispersion of knowledge and rapid polytropism of enterprise knowledge demand, which make it difficult for enterprise to play the power of knowledge effectively and reasonably in the reality. Based on the demand of knowledge and its management, enterprises need to establish linkage among all kinds of internal and external knowledge resources, realizing knowledge sharing and knowledge transfer internal and between enterprises and achieving knowledge integration and knowledge innovation. This can support enterprises to realize knowledge management network structure is called knowledge network.

This thesis puts forward three-layer enterprise knowledge network model that aims at some basic problems like "How to construct enterprise knowledge network system", and "How to use the knowledge network system to support and solve the enterprise knowledge management requirement of knowledge". And then it studies support strategies of enterprise knowledge network to enterprise knowledge management process, which makes reference to the enterprise knowledge management practice.

2.   ENTERPRISE KNOWLEDGE DEMAND AND KNOWLEDGE NETWORK

Enterprise knowledge management is a flow process that relates to knowledge acquisition, grouping, preservation, transmission and innovation, which comes from internal and external enterprise. And in the process, it turns knowledge into enterprises important "capital", improving the enterprise competitive advantage in the market. But in reality, most enterprises are faced with some problems like limited effective knowledge or knowledge chaos and disorder, which results in enterprises enabling to carry out scientific and reasonable production management decision-making activities. And it is difficult for enterprises to obtain and maintain long-term competitive advantage. Building enterprise knowledge network contributes to solve most enterprises' problem like the knowledge demand gap.

2.1 Enterprise knowledge demand gap

At present, about the knowledge gap, it mainly has two representative definitions: Michael H·Zack thinks knowledge gap is the gap between the knowledge that enterprise strategy implementation needs and the actual

knowledge it has. At the same time, he stressed that strategy was the most important background for enterprises to guide knowledge management. On the one hand, the enterprises strategic goals will deeply influence competitive advantage through gaining the knowledge; On the other hand, the knowledge reservation that enterprises own could affect their strategic choices. Therefore, the knowledge gap derives from strategic gap, and at the same time, it is with the strategic gap "hand in hand". Haider studies the cause of formation of the knowledge gap and its types are analyzed on the basis of two enterprises field survey in Pakistan. He pointes out that the knowledge gap is the knowledge that organizations current lacking of, however, it is very important for organizations to the survival and growth. So the Knowledge gaps must be filled.

From the above two definitions, we can reach the following conclusion: Knowledge gap derives from the need of enterprises to some knowledge, and knowledge demand may come from market opportunities for enterprises to adapt to the changing environment or the enterprises' long-term development strategy requirements; In the era of knowledge economy, knowledge has become an important strategic resource for enterprises to keep sustainable competitive advantage, and the lack of key knowledge resources may lead to the loss of enterprises' competitive advantage. Therefore, it is very important for enterprises' survival and growth to discover and make up for the knowledge gap in time. The existence of the knowledge gap doesn't mean that enterprise knowledge resources are not abundant enough. It may be lack of some knowledge. Or the enterprise existing knowledge reserve doesn't match with the knowledge requirements.

Through analysis above, we can describe knowledge gap as follows: because of the exogenous or endogenous causes, organization produces the demand of certain knowledge, but the organization's knowledge reservation does not match with the knowledge demand, which results in the shortage of some knowledge, and it is called knowledge gap.

2.2 The concept of enterprise knowledge network

Knowledge is considered to be strategic resource for organizations to seek sustainable competitive advantage; this means that the organization should have not only the ability to update and create knowledge, but also the ability to apply the knowledge. On the other hand, the organizations' knowledge management environment is becoming increasingly complex, global competition, the uncertainty of the environment, and decentralization of organizations' business, which requires organizations to have the corresponding mechanism and facilities to ensure the knowledge diffusion and co-ordination of various business activities. And knowledge network is considered to be solution for the above questions.

Knowledge network has different definitions: definition one: Knowledge network can make enterprises exert their potential cognitive synergies based on the knowledge (Chen Z, LI H, Kong S C W [2], 2006); definition two: Knowledge network is a collection of relationship among entities (individual, team and organization), which have common concerns and they embed in dynamic work environment of collective and system of knowledge asset creation and sharing (Andreas Seufert et al [3],1999); definition three: The knowledge network is a organization system of modular structure; it can make enterprises transferring and sharing the available intangible assets, especially their own knowledge (Wang Jun et al [4], 2009).

In spite of the different expression above the three definitions, the main point of the expression is the same: First of all, from the static perspective, knowledge network is a kind of organizational structure, the "relationship" in first two definitions and the "organizational system" in definition three; Secondly, from the dynamic perspective, knowledge network is a working system, which contains knowledge creation and sharing process. Compared to its static attribute of "organization structure", the dynamic attribute is more important; because knowledge network is "work" rather than "net". Lastly, the knowledge network is goal-driven, and it participates in knowledge network entity with a common concern.

3.   ENTERPRISE KNOWLEDGE NETWORK SYSTEM STRUCTURE

Structure knowledge in enterprises knowledge network system exists in the flow process of knowledge acquisition, generation, transmission, and use. In this process, the knowledge internal and external enterprises through mutual transmission and integration create new knowledge, which brings new development opportunities and competitive advantage for enterprises. Knowledge flow needs the help of a certain carrier that is called node, and the nodes using for knowledge transfer and knowledge sharing system constitutes the knowledge network (Zhao Rongying [5], 2007).

3.1   The hierarchical structure of the enterprise knowledge network

In the long-term production, operation and management activities, enterprises form their own set of distinctive business process on the basis of market and the characteristics of themselves. All kinds of knowledge, funds, personnel and products of enterprises' daily activities in every link of enterprise business process flow continuously, and they ultimately create value for the enterprise. In the overall framework of the enterprise knowledge management, all business process are inseparable from the knowledge, so the activities like the knowledge creation, dissemination, update, and application are closely linked with the development of the enterprise. In order to highlight the role of subject knowledge, so as to better study the abstract concept of knowledge network, the thesis divides enterprise knowledge network model into three-layer model structure based on knowledge main body structure (Zhang Fanghua [6], 2006). Concrete structure is shown in table 1.

Table 1.   The hierarchical structure of the enterprise knowledge network

Knowledge nodes	Knowledge correlation
Individual knowledge network (Knowledge experts, Knowledge demanders)	Formal association, such as working relationship; Interpersonal association, such as interpersonal association based on family and blood; association based on the daily communication; relationship based on free community, etc
Business knowledge network (the core enterprises, relevant organizations)	The relationship between core organizations and affiliate organizations like other enterprise, government, academia, consumers and market, such as "core enterprise-related enterprise", "enterprise-government", "enterprise-university/research institutions", "enterprise-financial institutions", "enterprise-intermediaries" and so on.
Organization knowledge network (local knowledge, external knowledge)	Connection between Local organizations and external organizations, such as the relationship based on the global value chain.

In the individual knowledge network, the basic nodes are individual main knowledge, and it includes knowledge experts and knowledge demanders. Knowledge experts are the people who have a specific professional knowledge. For some practice activities, knowledge demanders are people who pursue the knowledge that they lack. Knowledge correlation in individual knowledge network can be divided into two types: formal association and interpersonal association. Formal association forms through actual relations like work and cooperation, and it is relative stable. Interpersonal association is a more common individual association form, for its rich varieties like "interpersonal association based on blood", "interpersonal association based on the daily interpersonal communication", "interpersonal association based on free community" and so on.

In the business knowledge network, the organizations and institutions with the relationship of cooperation and collaboration constitute the basic nodes. It refers to suppliers, competitors, cooperation institutions, government departments, institutions, intermediaries and other enterprises when enterprises carry out various business activities. According to the different position in the knowledge network, organizations can be divided

into network core organizations and network affiliate organizations (Xie Kefan et al [7], 2005). The network core organizations actively guide the knowledge sharing activities in the core organizations, and all the knowledge management activities it carried out are throughout the whole process of organizational knowledge network. Network affiliate organizations refer to organizations that carry out the knowledge sharing activities with the core organizations based on a field of knowledge; it includes enterprises, enterprise groups, universities, consulting institutions and research institutes. Knowledge correlation is consist of the connection between the core organizations and enterprises, government, academia, consumer and market affiliate organization, such as "core enterprise-related enterprise", "enterprise-government", "enterprise-university/research institutions", "enterprise-financial institutions", "enterprise-intermediaries" and so on.

In the background of globalization division of labor system, in order to absorb foreign advanced technology and resources, enterprises establish extensive and complex networks with local organizations and organizations outside of the Multi-National Corporation and other institutions, and it is called organization knowledge network. The association is an expansion of the business knowledge network (Wen Youkui et al [8], 2004; He Liu et al [9], 2004).

3.2 Enterprise knowledge network system structure

According to definition and model of enterprise knowledge network above, we gives a two-dimensional hierarchical structure of enterprise knowledge network system based on current information technology and network technology, as shown in figure 1.

The direction of the arrow in Figure 1 is used to show the flow direction between the various components of the system knowledge. From lengthways, the framework is corresponding to the three-hierarchical structure of the enterprise knowledge network previously introduced. Its main components reflect the level of enterprise knowledge network. Besides, analysis components, retrieval components and operating components are throughout enterprises knowledge network of three levels. In order to take advantage of knowledge network fully, it needs to combine these three levels of effective integration in the enterprise knowledge management activity process. From the horizontal, according to the system function, knowledge network can be divided into three levels: knowledge analysis, knowledge storage and knowledge interaction (He Liu et al [9], 2004; Zhao Lin et al [10], 2007; Li Dan et al [11], 2002; Chen Hong [12], 2005). The specific functions of each of the components are as follows:

Analysis components: it analyses various of data in log database and all kinds of effective information in the knowledge network system, such as frequency be linked in retrieval log database and the points of attention of user to their knowledge (attention statistics include clicks, the page residence time)and so on. Combined with the corresponding subsystem function, it submits the related operation opinions to operating components. Retrieval components: it refers to the main module of interaction between enterprise users and knowledge network system, and it can help users finding the needed knowledge. Search interface of retrieval components is based on the company's core business, and it associates the entire knowledge carrier together through the enterprises' core business. This form of knowledge network conforms to the staff's working habits, and the staff can be convenient and quick access to the knowledge that they want to. It plays an important role in the realization of the business, but also making knowledge really used. Forum components: it is a place for enterprise users to exchange and publish suggestions about business knowledge. Their contents are automatically stored in the forum log database. Operating components: it is an interactive module between knowledge network system and the administrator, according to conclusive opinions analyzed by system analysis components, if the system administrator to permit instructions, it can carry on the corresponding operation. Operating components provide some functions like adding, deleting knowledge node and its correlation, which achieve knowledge classification and storage, improving the knowledge retrieval efficiency. Forum log
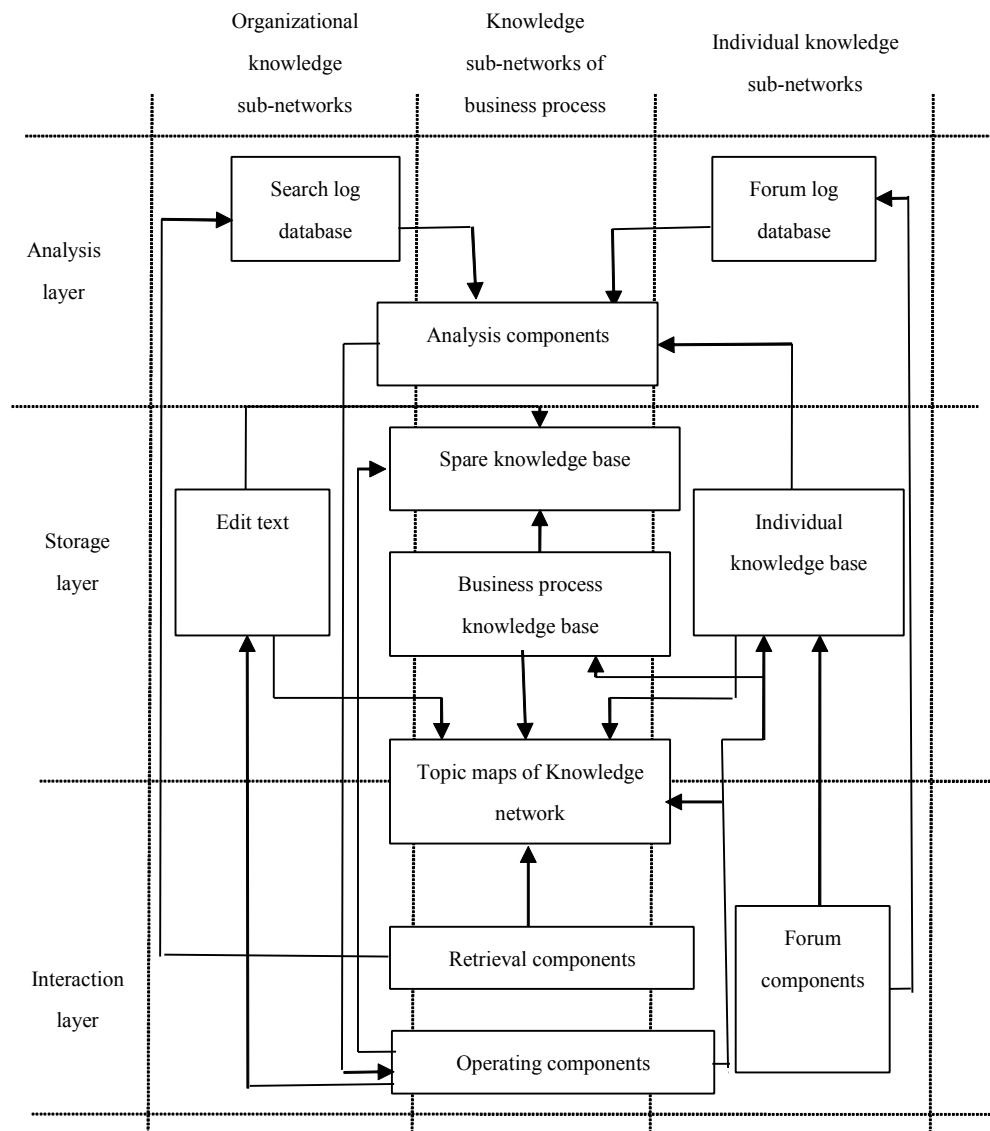
Figure 1.   Knowledge network system structure

database: It stores relevant information that produced in the process of users and system interaction, such as users' question and question answering, etc. Search log database: it stores log information that produced in the process of the use of system retrieval components. Individual knowledge base: it stores individual layer of knowledge network related knowledge and its relevance. Business process knowledge base: it stores enterprise business process knowledge node and its correlation in enterprise knowledge network. At the same time, the knowledge base also stores connection between business process knowledge nodes and nodes in tissue layers and individual layers. Organizational knowledge base: it stores related organizational knowledge and its relevance in enterprise knowledge network. Spare knowledge base: It stores the conservatory knowledge node and its knowledge chain which belongs to organization layer knowledge base and individual layer knowledge base. Topic maps of Knowledge network: it locates in repository location and its associated mapping chart of the knowledge node in organizational layer knowledge base, business process knowledge base and individual base, and Enterprise knowledge map is written in a standardized and standardized description language (eXtensible Markup Language.XML)..

4. THE SUPPORT OF KNOWLEDGE NETWORK TO ENTERPRISE KNOWLEDGE MANAGEMENT PROCESS

Knowledge network is the basic form of enterprises to carry out knowledge activities, Knowledge flow mechanism embodies in two forms: a single network level of knowledge learning mechanism and network level of knowledge transformation mechanism (Chen Hong [12], 2005). The knowledge network system is the use of its core components, working together and alternate application, to achieve the effective support of enterprise knowledge management process. From the perspective of enterprise knowledge value, the increase of knowledge network nodes is knowledge acquisition behavior, but also the beginning of the life cycle of the body of knowledge. Similarly, the delete of knowledge node means the end of the life cycle of body of knowledge (Sigvald Harryson [13], 2003). According to the above analysis, this thesis puts forward enterprise knowledge management process support model based on the knowledge network system, as shown in figure 2 shows.
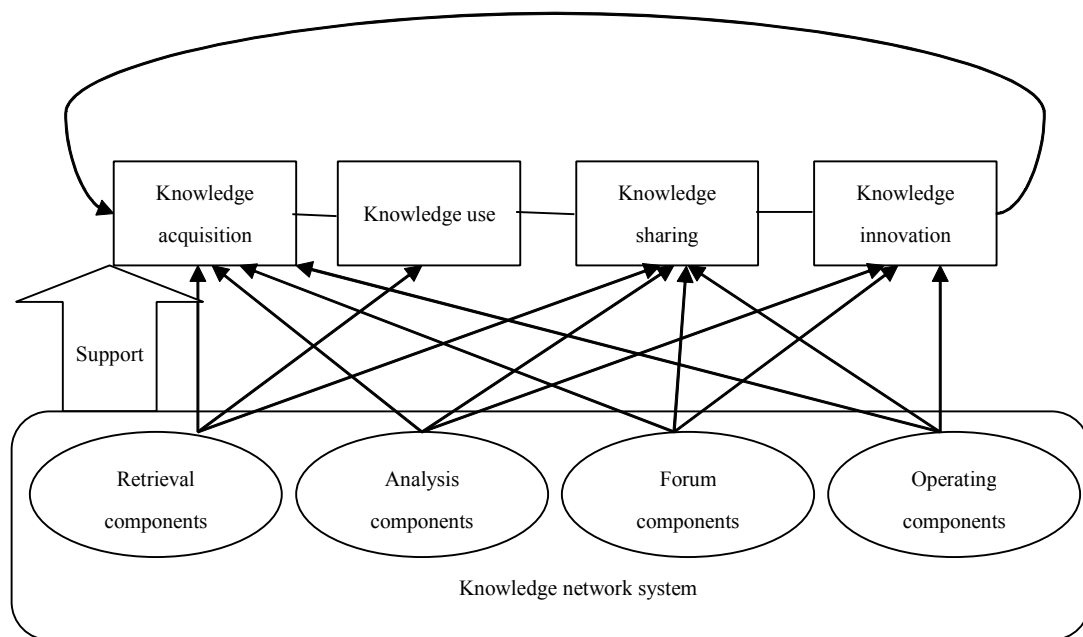

Figure 2.   Enterprise knowledge management process support model based on the knowledge network system

4.1 Support knowledge acquisition process

Knowledge network system can support the process of knowledge acquisition through the four basic function components. Through the interactive community function of forum components, the system records all the tacit knowledge in the forum log database, which hide in the minds of employees excitation and inspire by discussion and questions. At the same time, it records the users' daily various retrieval request operation data in retrieval log database. Then through analysis components, it analyzes extract and fuses forum log data effectively, thus forming the new knowledge node. At the same time, it lists the knowledge node list that user often inquires but local knowledge base unable to provide answers. According to the analysis results submitted by analysis components, administrator adds the approved new knowledge node to the existing knowledge network, getting associated with existing knowledge node, so as to realize the effective acquisition of knowledge, promoting the tacit knowledge to explicit knowledge conversion, supporting base's continuously updated and expanded of enterprise knowledge.

4.2 Support the knowledge sharing process

Knowledge sharing is the most important purpose of knowledge network system. The knowledge network system can accurately reflect the association among people, physical medium storing knowledge and enterprise

business process, enabling employees overcoming geographical and time constraints, Through effective integration of knowledge acquisition, development, transfer and use, and the interactive community interaction, it expands the channels of communication of the employees and corporate bodies, so as to promote the sharing of knowledge.

4.3 Support knowledge utilization process

Knowledge utilization is new knowledge enterprise adopted absorbed and applies it to the actual work flow, which is the premise of organizational knowledge can produce value, and most importantly the "final ball". Knowledge network system mainly completes support for knowledge utilization through the retrieval components (Ma Jie, et al [14], 2006). Users can able to use retrieval components provided by knowledge network system to search for all kinds of knowledge in the existing knowledge base when they produce knowledge demand gap.

4.4 Support knowledge innovation process

First of all, the forum components provide real-time, cross-regional and span class and number of limited communication platform for employees. It can effectively arouse the enthusiasm of the staff's knowledge innovation, and promote the new knowledge constantly generation, while taking advantage of the log data analysis component extraction forum valuable originality, integrated into the new node's knowledge (Cheng Dejun [15], 2004). Secondly, through induction, statistics and analysis log data recorded in retrieval components, it finds out all kinds of knowledge the enterprise lacked, and automatically submitting to the operating components. Administrator examines the classification word of knowledge to publish an issue of knowledge in accordance with the operating components of the feedback information. Enterprise staff and relevant user give answers to these issues through forum integrating them into a new knowledge node. Operating components add the new knowledge node to the knowledge network in order to achieve the knowledge innovation.

5.   CONCLUSION

Support model of enterprise knowledge management process based on the knowledge network is specific application of based model of knowledge management. On the basis of knowledge acquisition, storage, organization, sharing and innovation in the internal enterprises, it expands enterprise knowledge connotation. In order to expand enterprise the connotation of knowledge management and scope from the time and space perspective, it requests the enterprise to proceed a new round of restructuring and reforming around the platform of the conversion from the organization structure, enterprise culture, knowledge management infrastructure, human capital structure, external relations knowledge level. But the specific application of enterprise knowledge network is still a new research topic and its basic theory and implementation technology is not yet mature, therefore, this research work is to do a preliminary exploration for enterprises to achieve efficient application of knowledge and effective management.

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