



Research on the framework of tire enterprises tacit knowledge management based on web 3.0

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ABSTRACT

This article starts from the current status of tacit knowledge management in tire industry, discusses the framework and key technology in tacit knowledge management in Web 3.0 environment in tire industry, offers new ideas for tacit knowledge management in the industry.

Key words: Web 3.0; tacit knowledge; knowledge management

INTRODUCTION

Chinese tire industry production capacity has far exceeded demand. Expansion of production capacity helped enterprises to grow in size but not competitiveness. In the process of cultivating an enterprise's core competitiveness, an important resource is often overlooked – an enterprise's tacit knowledge [1]. In the forms of work experience, technical know-how, patterns of thinking, team dynamics, and enterprise culture, such intangible knowledge resources play critical roles in an organization's development. Relative to explicit knowledge, tacit knowledge is more difficult to be copied and imitated, hence, have become an important source of an enterprise's core competitiveness.

KNOWLEDGE MANAGEMENT AND TACIT KNOWLEDGE

1.1 Knowledge management

Knowledge management is a new area of management in the era of knowledge economy. It thrives to optimize knowledge dissemination and sharing in the most appropriate time to pass to the right people, so that they can make the most appropriate decision to achieve maximum value and create new knowledge

1.2 Tacit Knowledge in an Organization

Tacit knowledge is the subjective knowledge found in individual employees and at all levels of an organization (team, department, enterprise-level, etc.) It is complex, hidden, highly individualized, hard to formalize, and hard to share. It also includes tacit knowledge acquired through communication and sharing from external sources. Usually in the forms of personal experience, impressions, insights, team understanding, technical know-how, corporate culture, customs etc., it is hard to be expressed in words, language, data, or image [2]. Enterprise as a collection of tacit knowledge, its competitive advantage and market position depends primarily on its own stock of tacit knowledge and the ability to use it.

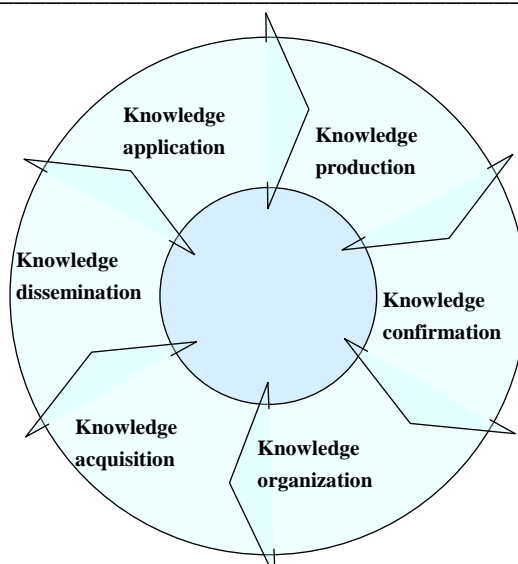


Figure1. Knowledge Management

APPLICATION OF WEB 3.0 IN ACQUISITION OF TACIT KNOWLEDGE

Tacit knowledge is elusive by nature, hence, acquisition of tacit knowledge is potentially challenging. Tacit knowledge management system needs to provide appropriate technical support to acquire tacit knowledge. For different tacit knowledge, there are different methods of acquisition. We can use the following ways to acquire tacit knowledge:

2.1 Online communication

For the tacit knowledge that is hard to be formalized, it is hidden in the owners' minds but hard to be expressed in oral or written communication. It needs to be brought out via dialogues between people, so as to exchange tacit knowledge, to facilitate comprehension and stimulate learning and innovation. Hence, we can provide platforms such as BBS, Instant Messaging (IM), and blogs to facilitate communications. On one hand, in the discussion forums in BBS or bulletin boards, valuable information can be found in user communications, which could be distilled and acquired through certain techniques, e.g. a knowledge transfer model for FAQ (Frequently Asked Question) format by Wang Li [3]. On the other hand, chat rooms and IM could serve as information exchange channels for users. In a chat room, users can communicate and discuss on a particular topic, and tacit knowledge could be extracted from the discussions. Moreover, via IM, users can communicate directly with the owners of tacit knowledge in order to obtain the knowledge from them.

2.2 Acquisition of tacit knowledge via knowledge retrieval

In the Web 3.0 environment, tacit knowledge management system could combine semantic web and artificial intelligence technology. Based on semantic analysis, the system can collect data from a user's search and web browsing history in order to learn his interests and preferences. This allows the system to filter the search results and provide intelligent search results that he may be interested in. This knowledge acquisition mechanism significantly reduce users' burden to repeatedly search and sort information, meeting one's need to acquire knowledge.

2.3 Building knowledge map

Tacit knowledge is related to individuals' ability, patterns of thinking, past experience etc., which could be hard to be expressed in language or image, but could be identified by knowledge map. A knowledge map is a new knowledge management technology that combines knowledge base management and Internet. A knowledge map has two functions:

- I. To express tacit knowledge explicitly, for instance, in written language;
- II. To show relationships between tacit knowledge and explicit knowledge. According to Davenport, knowledge maps are a guidebook for knowledge distribution. Its main function is to provide guidelines to find desired knowledge, assess the stock and relevance, while the map per se is not a collection of knowledge, but a guidebook providing the source of knowledge. Establish specific knowledge team, formed by appropriate personnel with the right knowledge, search and discover the tacit knowledge in the field and build an explicit document for employees to browse and use. Meanwhile, actively tap sources of tacit knowledge, acquire more tacit knowledge and document it as the form of knowledge map, and keep this map constantly updated and improved.

TACIT KNOWLEDGE CONVERSION AND SHARING BASED ON WEB 3.0

Conversion of tacit knowledge can also be called extraction, i.e. the process of tapping into the knowledge owners' minds to extract tacit knowledge via incentive mechanism, so that such knowledge becomes useful resources at the

enterprise level. Scholars from different countries offer a variety of thoughts on tacit knowledge conversion, and SECI model is one of the most famous models of all 4].

In the SECI model, tacit knowledge transformation includes four processes: socialization, externalization, organization and internalization. These four processes occur in consequence and follow one another in a cycle, converting tacit knowledge into explicit knowledge which in turn develops new tacit knowledge. In order to promote tacit knowledge transformation in an enterprise, so as to achieve more efficient tacit knowledge management, an enterprise has to provide both hard and soft environment, the former refers to the platform on which tacit knowledge transformation would take place, while the latter refers to the incentive mechanism and enterprise culture to stimulate tacit knowledge transformation and resource sharing.

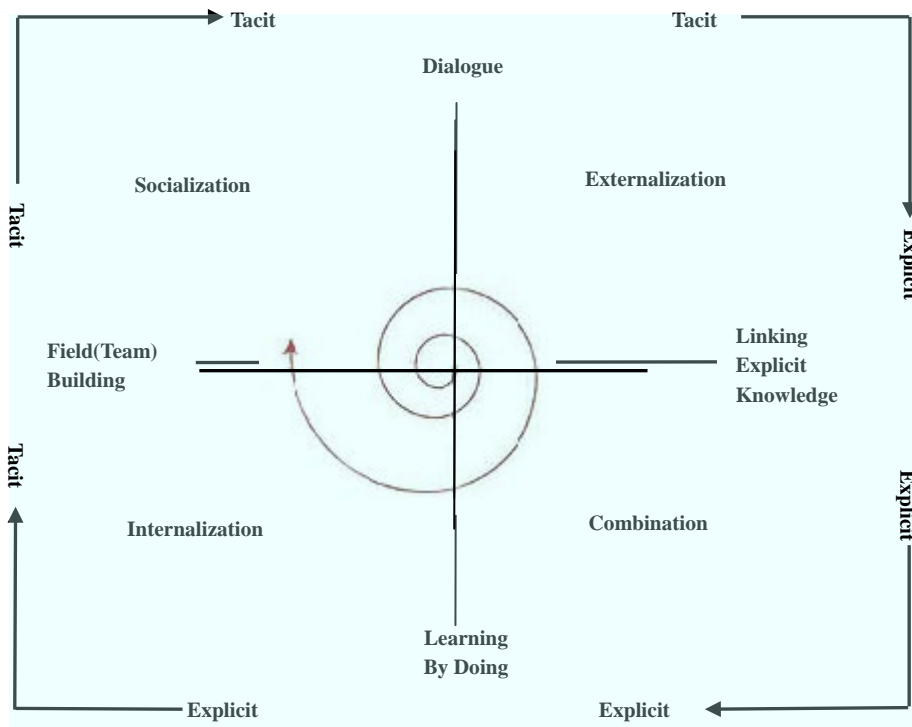


Figure 2. SECI model

The ultimate goal of enterprise knowledge management is to promote innovation by combining knowledge and practices through knowledge sharing and application. The knowledge innovation process in an enterprise is a cycle in which tacit knowledge and explicit knowledge is constantly transforming into each other, i.e. enterprise achieves innovation through the process of tacit knowledge transformation. Hence, tacit knowledge is the key resource for an enterprise to achieve knowledge innovation, an important resource of knowledge. In order to better utilize the value of knowledge, an enterprise needs to effectively manage tacit knowledge. However, due to the implicit, dependent and hard-to-imitate nature of tacit knowledge, considerations on personal interest and potential obstacle in an enterprise environment, it is relatively difficult to manage enterprise tacit knowledge, especially the transformation of tacit knowledge.

TACIT KNOWLEDGE MANAGEMENT SYSTEM BASED ON WEB 3.0

Tacit knowledge management system is the tool to achieve tacit knowledge management, a system to externalize and organize tacit knowledge. It facilitates the collection, transformation, sharing and application of enterprise tacit knowledge. Web 3.0 enables the underlying connections between the databases with complete exchange mechanism. Meanwhile, Web 3.0 provides filters based on different needs, with strong aggregation capacity and accurate personalized service [5]. Combined with the above, this paper proposes an enterprise tacit knowledge management system framework, as show in Figure 3 on the next page.

4.1 Data storage

It is located in the bottom layer of the framework, providing basic data support, including enterprise knowledge base, ontology base, and user information base. Ontology base stores enterprise-specific ontology, while knowledge base stores enterprise knowledge with mappings to ontology through a structure process. There are matching relationships between the two, and for knowledge in the knowledge base there exists corresponding semantics in the ontology base. User information base stores related user information, include: I. personal information provided by users; II. Information collected via analysis on user access paths, search quests and so on. There are primarily two functions of

user information base. Firstly, it helps to improve search efficiency by leveraging on user preference to filter search results and improve search accuracy. Secondly, to push for knowledge based on user interests.

4.2 Data processing

Integrate information in the enterprise knowledge management system with the help from intelligent filtering and personalized information aggregation technology based on Web 3.0. One can use UGG screening filter based on credibility and Mash up technology to integrate information published by users, in order to integrate tags that accurately describes the characteristics of the information. This makes the features of the information more obvious, the retrieval process more convenient, and information retrieval more accurate. In fact RSS is an information aggregation technology based on XML format, an easy way to share information among sites. Through RSS, users can aggregate related contents from various sources while filtering out irrelevant information, to achieve information aggregation and filtering.

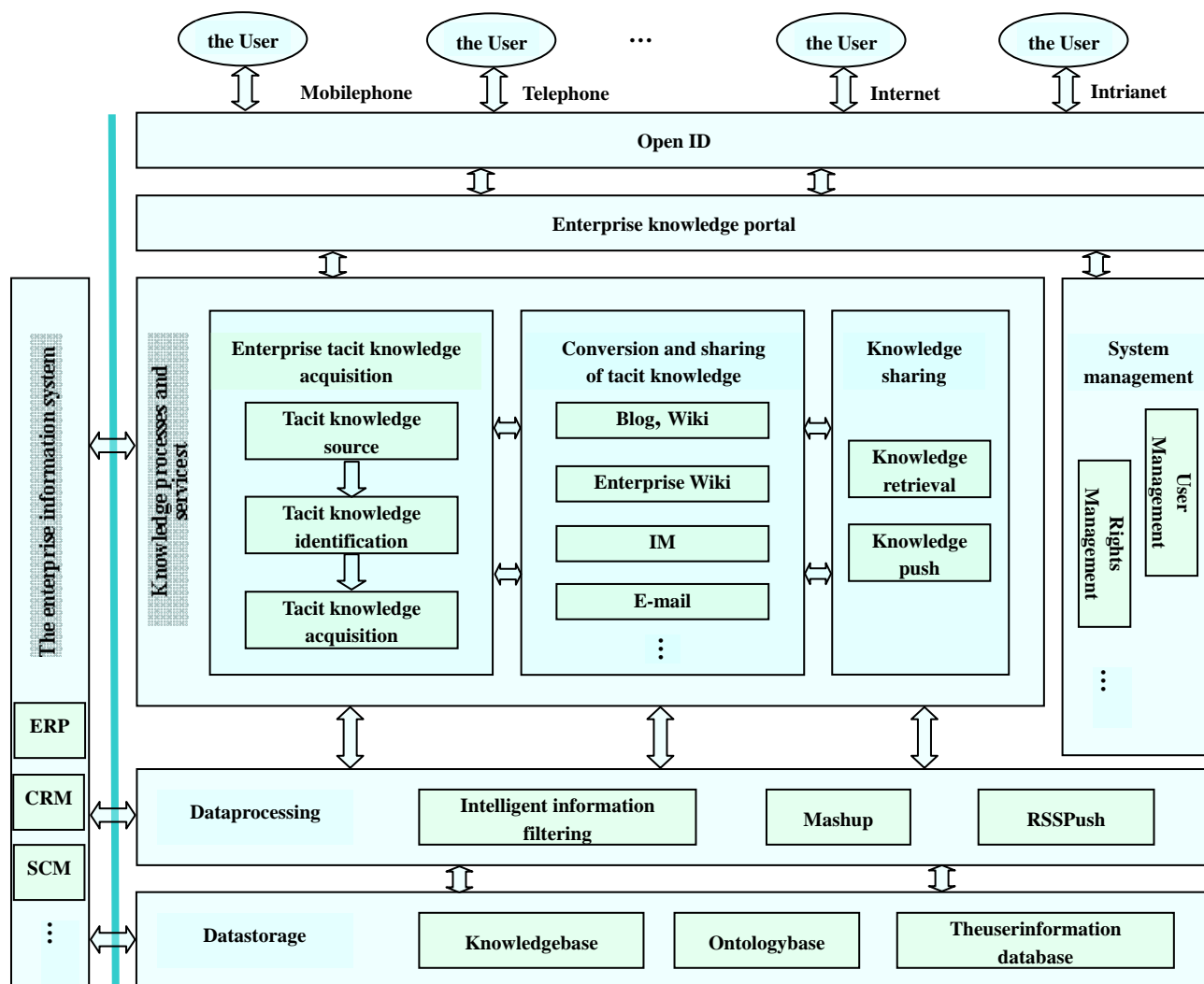


Figure.3. Tacit knowledge management system based on Web 3.0

4.3 Tacit Knowledge processes and services

Around contents on tacit knowledge management flow, providing users with relevant operational processes and serving system users on information acquisition and sharing. There are several schools of thoughts across existing research around world. From this paper's point of view, enterprise tacit knowledge management could be broken down into four steps: knowledge acquisition, transformation, storage and sharing. Enterprise knowledge management system managed to enable the core processes. Applications such as blog, wiki, and SNS enable the enterprise tacit knowledge system to better achieve knowledge acquisition, transformation and sharing; IM and BBS provide communication channels for tacit knowledge owners; through semantic-based knowledge representation and knowledge base, enterprise realizes the semantic level of knowledge sharing and retrieval and improves the depth of sharing and accuracy of retrieval; Web 3.0 offers information filtering based on user preference, the system collects, analyzes and integrates user information on browsing and searching, acquires user interests, filters information based on user interest, and pushes relevant contents

to users, so as to make enterprise knowledge sharing and application more convenient, improving the value of enterprise knowledge.

4.4 Enterprise knowledge portal

Enterprise knowledge portal provides access to enterprise tacit knowledge management system. Because tacit knowledge is difficult to be described, some even elusive in nature, it is critical to effectively capture tacit knowledge. In order to do so, an enterprise needs to provide multiple channels for users to record the tacit knowledge the users possess. Web 3.0 supports information exchange on multiple terminals. Users can access the systems via a variety of devices, such as mobile phones, telephone, PC terminals etc., enjoying the latest information published on the terminals and timely message exchanging services, achieving universality of information services and providing great convenience to enterprise knowledge acquisition, communication, and sharing. Meanwhile, Open ID provides unified portal for enterprise tacit knowledge management system based on Web 3.0. Users only have to provide unique digital identifications in order to enjoy blog, wiki, personalized information retrieval, information push and other one-stop service, which improves users' impression of the system and a good start for using enterprise knowledge management system.

OpenID provides a convenient solution to integrate and share the resources in knowledge management system [6]. Via OpenID, an enterprise can achieve integration with other platforms, connecting various systems across the enterprise, contents from website together, to form a unity. Furthermore, users can customize web applications via open API, putting interested information together to meet his personalized demand[7]. Therefore, enterprise knowledge portal based on Web 3.0 provides protection to a systematic, tacit knowledge transformation and sharing focused knowledge management system.

4.5 System management

Includes user management, rights management etc., to management users and user rights in settings in the tacit knowledge management system. Right settings play an important role in the knowledge base in the system. The system could manage users to visit the knowledge base by controlling user rights and number of visits.

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