Review: Knowledge Management Literatures in China mainland From 2007 to 2011

CUI Li-li, PAN Min-xiang¹, LI Ling,
LI Shu-meng, LI Zhi-xiang
(School of Information Management and Engineering,
Shanghai University of Finance and Economics, No. 777 GuoDing Rd., Shanghai 200433, China)

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Abstract
Research on Knowledge management (KM) has a long history. In China mainland, KM research can be traced back to late 20th century. And in recent years, with the spreading use of KM in many fields, KM research in China mainland has been booming. Along with the practice and research developments in KM world-wide, questions like that what is the current situation in KM research fields in China, and is there any progress or particularity are not known yet. Thus, we try to find out the answers by examining the KM literatures in China mainland from 2007-2011. We first categorize the literatures according to KM related research topics, by doing so, we identified several important research topics. Then, current research situations have been discussed based on the most highlighted topics. Drawing upon the literature review, we also discuss the existing research problems in various respects. Future research directions are also been discussed.

1. Introduction
Knowledge management (KM) has a long history; its application area including library, corporation, laboratory, industry, government, national defense, etc. With the development of computers in late 20th century, the use of knowledge management is being much more highlighted.

In 1999, the term personal knowledge management was introduced which refers to the management of knowledge at the individual level(Wright, 2005). In terms of enterprise, KM becomes more important in strategy, process, and measurement, since its capability in benefits gaining(Maybury, 2002). More recently with the advent of the Web 2.0, the concept of KM has been more emphasized on people participation and emergence. Thus, KM can not only promise the effective use of knowledge, but also guarantee the knowledge creation, knowledge storage, knowledge transfer, and knowledge application in every field. Also KM can realize the externalization of tacit knowledge and transfer experiences and thoughts into knowledge easily.

Nowadays, KM is gaining more and more attention in the background of knowledge economy. Researchers from different disciplines have explored KM field from different angles such as sociology, economics as well as management science, and have got abundant research achievements. In order to make a clear understanding of KM researches in China mainland, we have studied KM related papers in the past five years. In this paper, we will first introduce the research approach and methods, and give an overview of KM literatures in China mainland in the past five years. Detailed current trends are discussed in the following section. Problems and questions which need to be observed in the future are given in part 4.

2. An Overview of KM Literatures in China mainland in the past five years
With topic or keyword KM, we searched total 7448 papers published between 2007 and 2011 in this area. Among them, 204 papers were published in CSSCI (Chinese Social Sciences Citation Index) journals. We adopt 3 classification schemes. We first classified the papers according to the knowledge type and the knowledge

¹ Corresponding Author
management process they concerned (see Table 1 and Table 2). Based on previous research (Li, 2007; Chen, 2008; Ding, 2008), we classified the papers according to the keywords or topics that used most frequently in knowledge management literatures (see Table 3).

In Table 1, we could see that **Knowledge Creation** and **Knowledge Transfer** are taken much more attention than the other two themes. While Table 2 reveals a particular interest in **tacit knowledge**, **explicit knowledge** and **personal knowledge**. Thus in the next section, the externalization of tacit knowledge will be discussed in details. Table 3 shows that enterprise and library is the main area involved in KM research. Also there are 466 papers (in total 7448 papers) about KM system, but we doubt the application of these theories, course its lack of positive analysis. In all, we found that KM model, KM system, KM strategy, KM & HR, Intellectual property, Tacit knowledge management, and Virtual Enterprise seems to be the most frequently discussed topics.

Table 1. **Distribution of research topics in the first level**

<table>
<thead>
<tr>
<th>Classification</th>
<th>knowledge creation</th>
<th>knowledge storage</th>
<th>knowledge transfer</th>
<th>knowledge application</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. of Papers in CSSC 204 papers</td>
<td>20</td>
<td>14</td>
<td>27</td>
<td>19</td>
</tr>
<tr>
<td>N. of Papers in Total 7448</td>
<td>533</td>
<td>32</td>
<td>431</td>
<td>96</td>
</tr>
</tbody>
</table>

Table 2. **Distribution of research topics in the second level**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Tacit knowledge</th>
<th>Explicit knowledge</th>
<th>Personal knowledge</th>
<th>Organizational knowledge</th>
<th>National Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. of Papers in CSSC 204 papers</td>
<td>16</td>
<td>17</td>
<td>11</td>
<td>78</td>
<td>2</td>
</tr>
<tr>
<td>N. of Papers in Total 7448</td>
<td>367</td>
<td>146</td>
<td>289</td>
<td>45</td>
<td>114</td>
</tr>
</tbody>
</table>
Table 3. Distribution of research topics in the third level

<table>
<thead>
<tr>
<th>Fields/Industries</th>
<th>N. of Papers in Third level</th>
<th>N. of Papers in Third level</th>
<th>N. of Papers in Third level</th>
<th>N. of Papers in Third level</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSSCI 204</td>
<td>Total 7448</td>
<td>CSSCI 204</td>
<td>Total 7448</td>
<td>CSSCI 204</td>
</tr>
<tr>
<td>Enterprise</td>
<td>65</td>
<td>1732</td>
<td>14</td>
<td>34</td>
</tr>
<tr>
<td>Library</td>
<td>13</td>
<td>909</td>
<td>7</td>
<td>466</td>
</tr>
<tr>
<td>IT</td>
<td>6</td>
<td>217</td>
<td>12</td>
<td>119</td>
</tr>
<tr>
<td>Knowledge Alliance</td>
<td>8</td>
<td>36</td>
<td>1</td>
<td>157</td>
</tr>
<tr>
<td>Government</td>
<td>11</td>
<td>127</td>
<td>KM Strategy</td>
<td>124</td>
</tr>
<tr>
<td>Logistics</td>
<td>2</td>
<td>48</td>
<td>Information Management</td>
<td>7</td>
</tr>
<tr>
<td>Intellectual Property</td>
<td>12</td>
<td>23</td>
<td>Research Type</td>
<td></td>
</tr>
<tr>
<td>Human Resources</td>
<td>10</td>
<td>68</td>
<td>Theory</td>
<td>6</td>
</tr>
<tr>
<td>Organizational Culture</td>
<td>7</td>
<td>31</td>
<td>KM Application</td>
<td>21</td>
</tr>
<tr>
<td>Customer KM</td>
<td>2</td>
<td>80</td>
<td>Literature Review</td>
<td>13</td>
</tr>
</tbody>
</table>

3. Current Situation:

The development of KM in China has achieved great progress in recent years. As the data list above, recent interest in KM’s research has shifted from the preliminary research to the application of KM in different areas, in which, enterprise KM is most discussed. Based on the classification method used in former literature (Lu, 2008), we summarized seven major topics (listed in Table 4) from recent KM literatures in China mainland. In the following part, we will discuss these issues in detail.

Table 4. Major topics & representative research issues

<table>
<thead>
<tr>
<th>Major topics</th>
<th>Representative research issues</th>
<th>Literatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge management model</td>
<td>Application of SECI model</td>
<td>(Chen, 2009)</td>
</tr>
<tr>
<td></td>
<td>Dynamic process-focused model</td>
<td>(Liang, 2007)</td>
</tr>
<tr>
<td></td>
<td>Technological innovation-based model</td>
<td>(He, 2009)</td>
</tr>
<tr>
<td>Knowledge management system</td>
<td>Distributive knowledge management system</td>
<td>(Liang, 2008)</td>
</tr>
<tr>
<td></td>
<td>Mechanism of evolution of organization KMS</td>
<td>(Xue, 2010)</td>
</tr>
<tr>
<td></td>
<td>Application of CAS theory to interpret KMS</td>
<td>(Li, 2007)</td>
</tr>
<tr>
<td>Knowledge management strategy</td>
<td>IT competency, environment and knowledge management strategy</td>
<td>(Du, 2010)</td>
</tr>
<tr>
<td>Knowledge management and human resource model of new entrants</td>
<td>(Xun, 2011)</td>
<td></td>
</tr>
<tr>
<td>Knowledge transfer mechanism in the view of human resource management</td>
<td>(He, 2009)</td>
<td></td>
</tr>
<tr>
<td>Analysis of human resource in knowledge management respect</td>
<td>(Shu, 2007)</td>
<td></td>
</tr>
<tr>
<td>Tacit knowledge management</td>
<td>Tacit knowledge management through context management</td>
<td>(Li, 2008)</td>
</tr>
<tr>
<td>Application of tacit knowledge management</td>
<td>(Li, 2007)</td>
<td></td>
</tr>
<tr>
<td>Intellectual property :</td>
<td>Government intervene and intellectual property</td>
<td>(Yang, 2010)</td>
</tr>
<tr>
<td>Intellectual property management strategy of transnational corporations</td>
<td>(Ya, 2008)</td>
<td></td>
</tr>
<tr>
<td>Function of intellectual property regime</td>
<td>(Yu, 2009)</td>
<td></td>
</tr>
<tr>
<td>Virtual Enterprise</td>
<td>Improvement of knowledge management flow in virtual enterprise</td>
<td>(Yu, 2010)</td>
</tr>
<tr>
<td>Knowledge management strategy of virtual enterprise</td>
<td>(Guo, 2010)</td>
<td></td>
</tr>
<tr>
<td>Tacit knowledge management of virtual enterprise</td>
<td>(Na, 2007)</td>
<td></td>
</tr>
</tbody>
</table>

### 3.1 Knowledge based model(KBM)

KM model is a fundamental theory which provides directions for researchers to build up their research framework. According to the international views, the KM model can be divided in three categories—knowledge based model (KBM), knowledge tools based model (KTBM), and organization performance based model (OPBM). One of the most representative KBM is presented by Nonaka (Ikjurio, 1991), who explicated two dimensions of knowledge in organizations: tacit and explicit. Besides, Nonaka and Konno (Nonaka, 1998) suggested that the essential question of knowledge creation is establishing an organization’s “ba”(defined as a common place or space for creating knowledge). Four types of “ba” corresponding to the four modes of knowledge creation discussed above are identified.

Of all the literatures we reviewed, many models used have taken shape based on classic theory or model. Most of the research is now mainly focusing on the process of management and expecting to provide organic, dynamic, technological innovation based models for the future study. Some of the models try to explore the relationship among learning, KM and innovation(Chen, 2009; Hou, 2010). And there’s literature intent to give out a model that describe KM from a process and dynamic view(Liang, 2007).

### 3.2 Knowledge management system(KMS)

Knowledge management systems (KMS) refer to a class of information systems applied to managing organizational knowledge. That is, they are IT-based systems developed to support and enhance the organizational processes of knowledge creation, storage, retrieval, transfer, and application. (Alavi, 2001). While not all KM initiatives involve an implementation of IT, and admonitions against an emphasis on IT at the expense of the social and cultural facets of KM are not uncommon, many KM initiatives still rely on IT as an important enabler(Davenport, 1998; Dell, 1998). Current study of KMS in China, examines more complicated factors such as context factors like behavior(Liang, 2008), which may actually have a vital impact.
However, from a “system” view, some of the scholars, quote classic mechanism to simulate the process of KMS. Xiong (Xue, 2010), based on entropy theory in complex science, makes creative achievements and conclusions on the induced mechanism of evolution of organization KMS. His study mainly concerns the non-linear dynamic mechanism of evolution of organization KMS pointing out that the self-evolution of public management system is a process of fluctuations and bifurcations. In addition, Li and Hao (Li, 2007) first use complexity adaptive system theory to interpret the system thought of KM, proposing a conceptual model of KM and provide some evolutionary strategies with high practical ability. Their study shows the paradigm can better analyze and describe the essence of the appearance, innovation, learning and adaptation behaviors of knowledge management.

3.3 Knowledge management strategy

Since knowledge-based resources are usually difficult to imitate and socially complex, the knowledge based view of the firm posits that these knowledge assets may produce long-term sustainable competitive advantage (Nelson, 1982; Grant, 1996; Grant, 1996; Spender, 1996; Spender, 1996). How to use advanced information technologies to systematize, enhance, and expedite large-scale intra-firm and inter-firm KM so as to help determine the knowledge management strategy brings out a constant question.

Literatures in this area mainly focused on exploring the relationship between environment, strategy and KM by using mathematic or empirical methods. The research results do improve out knowledge of strategic making when facing different environment situations. Although environment pressure has a direct negative impact on the organization performance, it can also affect organization performance indirectly and positively through IT competency and KM strategy (Du, 2010). Huang(Xun-jiang, 2011) suggests strategies should be adopted when new entrant knowledge level is lower than average level, whereas the independent innovation strategy should be adopted. Besides, it has been found by Li et al. (Li, 2008) that, when firms confronted with changes in dynamism, complexity and hostility, the effects of environment against the enterprise performance vary a lot.

3.4 Knowledge management and human resource

Considering the distributed nature of organizational cognition, an important process of knowledge management in organizational settings is the transfer of knowledge to locations where it is needed and can be used. However, this is not a simple process in that organizations often do not know what they know and have weak systems for locating and retrieving knowledge that resides in them (Huber, 1991).

Under the background of “innovation” nowadays, promoting the transfer of knowledge and integrating the knowledge is an absolute choice for modern enterprises. However, researchers pay more attention to the management of humanity factors rather than technological factors. Research found that social relationship can only improve the possibility and convenience of knowledge transfer, but can scarcely interpret the willingness to the formation of knowledge transfer mechanism. A new concept so-called “sense of support” for the organization is introduced in their study to reveal the impacts of the human resource management on knowledge transfer mechanism (Li, 2008). In another perspective, Li (Shu-ye, 2007) has substantiated that an individual-centered mechanism has been created for knowledge transfer, knowledge innovation and knowledge appreciation in the modern organization, thus reducing the risk of the depreciation of human capital.

In sum, the current study on this theme has made preliminary interpretations of the mechanism of knowledge management and human resource function interactively in the modern organization. Nonetheless, how to ameliorate the present mechanism is still a problem to explore in the future.

3.5 Intellectual property

Intellectual property regime optimizes allocation of knowledge resource through separation and transfer of rights. With intervene of government, the stability of environment can be ensured. Thus intellectual property
regime can show its effectiveness and peoples’ eagerness of knowledge creation can be stimulated (Yang, 2010).

Based on the fact that huge gap between Chinese and western enterprise on intellectual property, most of the research about the intellectual property are focus on the lack of intellectual property regime and ignoring by Chinese enterprise. They tried to give out strategies or policies for firms and government to change current situation in China, such as (Ya, 2008; Yu, 2009) while only few of them give a practical solution.

3.6 Tacit knowledge management
Not only can knowledge be categorized as individual and collective one (Nonaka, 1994), but also can be viewed as tacit knowledge and explicit knowledge (Polanyi, 1975). The two are not dichotomous states of knowledge, but mutually dependent and reinforcing qualities of knowledge: tacit knowledge forms the background necessary for assigning the structure to develop and interpret explicit knowledge. Tacit knowledge has received greater interest and attention than explicit knowledge has, and yet the former is not alone in providing both benefits and challenges to organizations.

In China, most of the recent studies on tacit knowledge are mainly conducted by firms and universities. For corporates, methods to create, restore, and share the tacit knowledge have aroused researcher’s attention. Researchers (Li, 2008) tried to find the methods to overcome the obstacles in tacit knowledge management by using context management tools, since tacit knowledge is context-dependent. Moreover, tacit knowledge management do affects firms’ innovation, especially sustainable and cooperative innovation (Tan, 2008). In Universities, tacit knowledge was found to be the cause of some serious problems (Li, 2007). This makes an emphasis on tacit knowledge as a key factor in the teacher assessment. But there are still many questions need to be investigated in the future, such as the causes and kickbacks, putting forward strategies on perspectives of tacit knowledge management.

3.7 Virtual Enterprise
With the rapid development of modern information technology, the organization forms of enterprises are changing. Virtual enterprise has become a new form for enterprises to expand the scope of resource utilization and optimize the allocation of resources. The virtual enterprise is a dynamic alliance that crosses time and space boundaries as well as organizational boundaries, which is based on the division of labor among partners, relies on the core competitiveness of the member enterprises, and makes full use of modern network technology to integrate the advantageous resources dispersed in different organizations and regions (Guo, 2010). The dynamic character of virtual enterprise decides the difference in knowledge management between virtual enterprises and traditional ones.

Hence, most of the research on this topic noticed the dynamic and life cycled character of virtual enterprise, and tried to explore the KM mode, strategies and knowledge sharing methods in this kind of firms in aim of core competitive improving. For example, there’s literatures discussed the characters of virtual enterprise (Na, 2007). Based on the characteristics of the life cycle of the virtual enterprise, Yu et. al (Yu, 2010) analyzed the problems which should be paid attention to in improving the virtual enterprise knowledge management process from the perspective of the knowledge gap of the virtual enterprise.

4. Limitations in Current Studies and Future Development
Although the scholars in the field of KM in China mainland covered a broad gamut of research questions, there are still some issues remains to be solved, especially empirical proofs to guide today’s KM practices (Alavi, 2001). Besides, literatures concentrate on individual or government KM is fairly rare. Even for the most flourish research field like enterprise KM, there’s still something need to be improved in future research. We believe that the exploration in questions like assessment system developing, learning organization establishing,
and cross-organizational activities, would be the future research trend in KM area.

4.1 Empirical studies use investigation should enhance data with more detailed classification in industries.

Investigation is a commonly used research method in KM research. Valid sample size, choosing right person to answer the questionnaire are important to get reliable results. In most of the papers we reviewed, the valid sample size is always less than 60. Even though the statistic result is proved to be reliable, but the generality could not be fully guaranteed. Furthermore, limited by the sample size, scholars aren’t able to make a detailed classification of different kinds of enterprises in China. Researches can make more specific variables and classify them from a more detailed standard in order to have further understanding of the strategies operated in Chinese enterprises (Wei, 2010).

While considered the respondents, scholars always chose the high-end targets such as executive board or the general engineers, excluding the viewpoints from literate-labors. The so-called non-random sample broadens the coverage of the sample, but the application scope still is at some extent affected (Li, 2009). Since the study of knowledge workers has been prosperous and kept booming these year, notions from literate-labors needs to be taken into consideration for future studying. Based on these discussions, we believe that future empirical research in this area should enhance the data with more detailed classification in industries.

4.2 In KM Models, the interactive effects between variables should be paid more attention to.

Considering the research model, we found that only impacts of factors to final conclusion are taken into account, while the cross-interfere between factors are neglected. which means that a notably static attribute and the research about dynamic system relation should be extended as a future direction (Zheng, 2008). On the purpose of studying the causal relationship between variables, the best way is to extend current data collection dimension from horizontal to vertical perspective, such as use a serial time data to verify the reliability (Du, 2009). There is no vivid evidence can be furnished to validate the correctness of the model aligned with lapsing of the time. Hence, the model can’t be guaranteed that is qualified to be applied to manage knowledge in the intending era. So, scholars should try to explore questions like: What will the model be like when considering the interactional factors? Will the dynamic model can only be applied to individual model or be universal? All these questions would better be included in the future researches.

4.3 KM effect assessment system, personal and government KM research needs to be conducted in the future.

Although the application of KM is increasing, the assessment systems and standards of KM effect still need to be improved. Developing an assessment system of KM will become the core essence of the KM process, with the workload of KM assessment increasing and the theory of KM developing (Ye, 2008).

In order to benefit from informal learning activities in formal settings, learners need to acquire specific personal knowledge management (PKM) skills if they are to be lifelong constructors of new knowledge (Pettenati, 2007). KM in human resource is a popular direction in recent years. However, the following questions are still unclear.

- how can a literate-labor manage his knowledge,
- how to use the knowledge to make better performance
- how can the executive personnel do to prevent the knowledge from being stolen or taken away with the labors,
- how to effectively deliver the tacit knowledge between literate-labors?
- Various kinds of aspect can be excavated in PKM.

Beside, as a terminal that holds over 80% of society’s information in hands, government is in need of making a balance between “information explosion” and “information isolation” (Yue, 2011). But little paper
makes a detailed research on this aspect. For instance, according to the combination of IT and KM, large amount of paper focusing on IT based KM strategy. While what’s the incentives to improve the application of IT in KM Strategy is not known yet. Such sort of problem is presently one of the main issues of all level government (Yue, 2011).

4.4 Enterprise’ ownership should be an important factor to be considered in future KM research.

Of all the enterprise’ ownership forms sino-foreign joint ventures have become an important organizational form of enterprises to absorb foreign capital in China (Chang, 2009). Studies have called on the pattern conservation. But in such a more complex enterprise, how can both sides of capital create, store, process, share, or even protect their knowledge? What can they do to efficiently conserve the knowledge pattern? And, if we consider it from a much more general angle, how to create the KM system in different structure of companies such as Limited, Partnership, Corporate? Moreover, with the background of knowledge economy, when enterprises should adjust themselves to adapt to the quickly-changing environment (Ling, 2007). how can they combine KM with organization learning theory. To date, these questions are still unclear, and call for investigation in the future.

5. Conclusion

In this paper, we present a review about knowledge and knowledge management literatures in China mainland of the past half decade. When reviewing 204 papers from the CSSCI (core journals), we discovered that as one of the most flourishing field, KM is catching more and more research interest in recent years. Enterprises, as most emphasized field in this area, have been studied more on the improvement of performance with the usage of KM. Some classic knowledge management models have already been built in modern organizations. On the other hand, problems among the studies should be noticed, such as the proper use of empirical research methods, interactive impacts of factors in KM models, the assessment of KM effect, KM on personal and government dimensions, etc. These conclusions were drawn based on our review on 204 CSSCI papers selected from total 7448 Chinese KM literatures. The total number of papers we reviewed may not provide solid evidence. Thus, a more sound review based on larger sample size should be made in the future.

References


Pettenati, M. C., E. Cigognini, et al. (2007). "using social software for personal knowledge management in formal online learning." *Turkish Online Journal of Distance Education-TOJDE* 8(3).


