A New Trend of Knowledge Management: A Study of Mobile Knowledge Management

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Abstract

Recent years, knowledge management has developed rapidly in the field of management science and practice. With the evolution of mobile internet technology, it seems to be more prevalent and more important about the research of mobile knowledge management (mKM). Firstly, based on the literature of mKM, different perspectives of mKM research are concluded and analyzed in this paper. Secondly, we make comments on the different literature of mKM. Then, this paper elaborates the strategies and measures to realize mKM under the environment of mobile internet. Finally, this paper provides prospects for the directions in future research.

Key words: Knowledge management; Mobile knowledge management (mKM); Mobile internet technology

INTRODUCTION

No matter business or non-business, the most valuable asset in the 21st century is knowledge worker and their productivity. The powerful impact of knowledge has already become a consensus among various industries, and the management emphasis of many organizations has been shifted from the traditional function management to knowledge management.

After a general review of knowledge management study, we found that some research focus on the concept and influence of knowledge management in organizations, some research put emphasis on the driving factors and obstacles of the implement of knowledge management, some research focus on the measurement tools during the knowledge management procedure. However, even if scholars dig into the study of knowledge management, they ignore a kind of knowledge management under a particular situation which is called mobile knowledge management (mKM). Nowadays, business is not limited to a fixed place and workers in mobile also need knowledge support. Once workers need to complete tasks out of the office, there will be problems about the utilization of knowledge database in organizations (Derballa et al., 2004). Mobile knowledge management can be applied in many industries, such as sales, medical industry, education, tourism and so on. It is an expansion of traditional knowledge management (Chu, 2011). The new trend of knowledge management is mKM.

1. LITERATURE REVIEW

Mobile knowledge management becomes a new practice in organization. Grimm demonstrated that we must include mKM into the organization knowledge management cycle especially when the assignment need communication or must be performed out of the office (Grimm, 2005). The necessity of mKM has aroused the attention of researchers. The research directions of mKM have different focuses. In this paper, we classify the study of mKM into three perspectives.

1.1 The Perspective of Mobility

When it comes to the cognition of mKM, a lot of research points out that the difference between mKM and traditional knowledge management is the "mobility". The study of mobility reveals the characteristic of the situation under the circumstance of mobile work. Some research about mKM focused on timely knowledge (Fragell, 2000). The so-called timely knowledge refers to the knowledge about the tasks at hand or the upcoming tasks, for example, when a salesman visits a customer, he must know the latest interaction and agreement information with the customer in advance.

Table 1
KM subsets

Acronym	Meaning	Focus
KM	Knowledge Management	The totality
m[KM]	mobile "Knowledge Management"	Environmental mobility
[mK]M	"mobile Knowledge" Management	Knowledge mobility
[mKM]	Intersection of m[KM] and [mK]M	Both knowledge and environmental mobility

Mobility means that there is no arranged infrastructure beforehand which is a great challenge to the knowledge acquisition and sharing in organization. Lehner (2002) described that the mobility of knowledge includes the mobility of its source, the mobility of its formation place, and the change of the place in which knowledge-intensive processes take place. Zhang and Jasimuddin (2008) classified knowledge management into three subsets, (mK)M, m(KM), and (mKM) as special knowledge management processes with different focuses in organizations as shown in Table 1. The subset m(KM) focuses on the mobile KM environments of organizations. In particular, this subset deals with the management and integration of mobile processes of knowledge in mobile environments. The subset (mK)M emphasizes the knowledge mobility in organizations. Specifically, this subset manages and leverages knowledge assets by considering the mobile nature of knowledge. The subset (mKM) the intersection of m(KM) and (mK)M, incorporates the mobility issues of both organizational knowledge and corporate environments.

1.2 The Perspective of Technique

It is not enough to study mKM from the perspective of mobility. Grimm proposed a cross-subject view that mKM was to embed a seamless integration of mobility into knowledge management cycle. This viewpoint means that mKM is a combination of mobile computer processing technology and knowledge management. Zuga (2006) also believed that mKM relied on mobile information technique and tools. So the research priority turned to the combination of mobile technology and management. Generally speaking, they regarded mKM as a subset of knowledge management and emphasized the added value which mobile wireless technology brought to traditional knowledge management tools and methods.

With the development of mobile and communication technology, the processing capacity, extended function and multiple wireless connections of mobile terminals create a broad application space for mKM. Mobile devices like PDA, smart phone, tablet PC all change the communication and learning style of people. The era of 4G also supplies mKM with convenient network support. To put it simply, mKM is an activity using appropriate mobile information technology to manage mobile knowledge resource. According to Grimm, the core concept of mKM is "context". Context is a general term of time, personal, organization, environment and overall situation around the user. On the one hand, the combination of knowledge management and mobile technology can extend knowledge management to anywhere and anytime. On the other hand, mobile technology will be customer-centered under mobile knowledge intensive environment.

Table 2
Mobile Added Value

MAV	CONTENT
Ubiquity	Ubiquity is the possibility to send and receive data anytime and anywhere and thus eliminates any spatiotemporal restriction.
Context sensitivity	Personalization: On one hand a mobile device is typically used by a single user only and on the other hand one user in a certain context typically uses only one mobile device, resulting in data of high accuracy.
	Interactivity: allows creating specific services through direct information exchange. Both sides can react without any delay on actions or requests of the other.
	Location determination: Allows creating specific products and services for the user in his current location or by referencing on the location of other users.
Identifying functions	The ability to authenticate the user as well as the device is already immanent to a mobile network. Together with the typical 1to1attribution of a mobile device to its user this provides a capability to authenticate the actual user with feasibility. Where necessary, biometric identification or mobile signatures can easily be applied.
Command and control	Mobile devices can be used as remote control for almost any application or device. Control may be realized by using networking capabilities via ubiquitous computing technology or embedded mobile devices.

Derballa (2004) put forward a theory of mobile added value (MAV) which described the contribution of mobile technology in the process of knowledge management. According to their research, the content of MAV is summarized in Table 2.

MAV verified the impact of mobile technology. Some literature explored how to utilize mobile technology in mKM. Loutchko and Birnkraut (2005) applied mobile knowledge web portals to mKM. Fagrell proposed relative problems about mKM from the perspective of information systematic include the technical support, design and application of mKM system. Grimm also presented a technical framework and built a reference model of mKM.

1.3 The Perspective of the Characteristic of Mobile Knowledge

This perspective makes a detailed description about mKM and mKM strategy. It classified knowledge categorizations from three dimensions: tacitness of knowledge, mobility of knowledge and location of knowledge. Sixteen organizational settings can be generalized in accordance with their mKM strategies with different focuses (Jasimuddin, 2008).

The characteristic of mobile knowledge can be better understood by investigating the meaning of knowledge mobility, that of environmental mobility, and their relationships. The mobility of knowledge is captured from two aspects: Detachability and volatility. Detachability denotes the degree of knowledge to be detachable and applicable in the mobile environment. Volatility means that knowledge may not be captured and retained in a timely manner in its completeness. According to the detachability and volatility, the relationship between knowledge mobility and environmental mobility can be denoted by UGLI, that is, upgradeability, generality, longevity, and immutability, as shown in Table 3.

Then strategic framework of mKM can be categorized as CLIC, that is, conservation, leverage, integration, and combination. Conservation means that when both the mobility of knowledge and that of environment are low, the firm should focus on its original main KM strategy. Leverage denotes that when the mobility of knowledge is high and that of environment is low, the firm should modify its original strategy to leverage its mobile knowledge assets. Integration specifies that when the mobility of knowledge is low and that of environment is high, the firm should adjust its original strategy to integrate its mKM processes into its main processes. Combination implies that when both the mobility of knowledge and that of environment are high, the firm should combine both the leverage and integration strategies into its original knowledge management strategies.

Table 3
Relationship between Knowledge Mobility and Environmental Mobility

UGLI	Meaning
upgradeability	knowledge detachability against the time dimension under a mobile environment
generality	the connectivity of modularized knowledge with various situations
longevity	the stability of knowledge over certain periods of time as well as knowledge sensitivity of being captured against time
immutability	the volatility of knowledge against the location dimension of mobile environment.

2. COMMENTS ON THE LITERATURE REVIEW

In general, it is obvious that people pay great attention to mKM and explore mKM from different perspectives. However, scholars cannot reach a consensus on the concept of mKM and research from one perspective is incomplete.

Firstly, the study from the perspective of mobility highlighted the peculiarity of mobile knowledge resource. It pertinently presented some mKM strategy which is obviously different from traditional knowledge management. But, this point of view put too much emphasis on "mobility" and the part of "management" was inadequate. Secondly, although the theory of mobile added value verified the contribution of mobile technology, it ignored the knowledge peculiarity and human factor during the mKM process which is a defect of the perspective of technique. Mobile technology is important but not all. Finally, the empirical study is relatively limited. We need more practical research about mKM instead of theory research.

3. STRATEGY OF MKM UNDER THE ENVIRONMENT OF MOBILE INTERNET

It is more significant and practical to learn how to conduct mKM in organizations. Nowadays mobile internet technology is widely used in mKM which means that the knowledge acquisition and knowledge sharing of mobile workers are increasingly promoted by mobile internet technology. So the application of mobile internet technology through the mKM process is a breakthrough point of the strategy to implement mKM.

3.1 Interaction Between Mobile Workers and Knowledge Base

Knowledge management activities are usually conducted via all kinds of knowledge management platforms. Knowledge database is a typical platform. So under the circumstance of mobile internet, the construction of knowledge database and the connection between mobile workers and the knowledge database become a crux.

With the development of mobile terminal device and the coming era of 4G, many functions, which only can be realized on desktop computer or laptop before, can be realized easily through mobile terminal device now. Many organizations build knowledge database by use of web3.0 technology which makes the knowledge database more intelligent and humanization. Multi-terminal is a feature of web3.0 technology which can realize the universality of information service and make public display device and personal mobile terminal device in common use. With the use of cloud computing and cloud storage, knowledge management will get rid of the restriction of local software and hardware.

3.2 Interaction Among Mobile Workers: mKM Portals

Besides the real communication, every mobile worker is a virtual network subject under the environment of mobile internet. Take advantage of command and control function of mobile technology, the mKM can be implemented conveniently. Lueg (2001) denoted that knowledge portals were aimed at offering timely information access and supporting knowledge worker groups with the same purposes. The subprocedure of mKM such as knowledge acquisition, knowledge distribution, knowledge sharing and knowledge application can obtain immense support from mKM portals.

People used to collect information via traditional knowledge management portals. And it is a self-motion activity to look for the relationships between the information. Compared with other knowledge management tools, mKM portal will provide knowledge navigation service and interactive environment more rapidly and more accurate, because it has an integration of storage and retrieval technology. University of Regensburg established a system named U-Know is a typical practice of mKM portal.

Personal mKM portal serves as a personal information center. Mobile workers can update own mKM portal via mobile terminal device and build communication bridges through information platforms e.g. blog, wiki, RSS. So mKM portal will become a node where personal social relations and daily activities aggregate. Through this node, mobile workers can choose the scope and profundity of knowledge management. Then all the nodes form a social net which will promote the application of mKM.

3.3 Supervision Measures of mKM

The supervision measures are necessary to insure the implementation consequence of mKM. When mobile workers require for knowledge outside of the organization, the identity of mobile workers must be verified because of the mobility and virtuality under the circumstance of mobile internet, or the information in knowledge database will be leaked. The communication among mobile workers via mobile terminal devices may be anonymous. The fuzziness and unauthentic will affect the accuracy and credibility of information in mKM portals. With the concept of controllable, we can inspect the real information of personal portals and provide authentication service. Then when searching knowledge on the internet, people can choose information which is offered by verified users.

Normally the mobile terminal device and its user are corresponding. According to the MAV theory, the identification function can be used to manage the authority of knowledge database. When there is an external request of visiting knowledge database, the mKM system must confirm the identification and authority of the user who requires knowledge support. Identification methods like account password and biometric identification or mobile signatures can easily be applied.

CONCLUSION AND PROSPECT

On the basis of previous research, we have a certain comprehension of what mKM is, the importance of mKM, and how to implement mKM. But some problems still exist and wait for solutions. We propose that the future research on mKM can be expanded from the following aspects:

(a) The empirical study about mKM is weak. Future research can make a further step to verify key factors that affect mKM through empirical study. In addition, even though the MAV theory demonstrates the contribution of mobile technology, we need more empirical studies to prove how deep the influence will be.

(b) Mobile knowledge management and traditional knowledge management is not irrelevant. Future research need to combine mKM with traditional knowledge management and implement mKM strategies based on full consideration of the identity, goals, time, tasks and other situational factors of knowledge management instead of excessive application of mobile technology.

(c) At present many enterprises reconstruct the internal business processes according to their operation target. If the integration of mKM and internal business processes can come true, it will bring huge upgrade effect to the management and operation of organizations. Sequential studies can focus on this aspect.

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