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Abstract

In the knowledge based society, organizations often encounter problems as they seek to manage knowledge. Consequently, they try to identify the causes of these problems and find solutions. In this article, we develop a knowledge management problems-causes-solutions framework that encompasses: problems associated with knowledge creation, storage/retrieval, transfer and application; causes, including organizational, human-related and technical dimensions; and both IT and non-IT solutions. Survey data from 143 junior knowledge workers is analyzed in a preliminary verification of the framework. The importance of the framework and its implications for knowledge management research and practice are discussed.

Keywords: Knowledge management (KM), Knowledge management systems (KMS), Junior Knowledge Workers, Information Technology (IT)

Introduction

Knowledge management research and practice have grown at a dramatic pace in the last few years (Gray and Meister 2006). Given the intensively competitive climate, organizations position themselves as knowledge-driven companies, seeking to leverage their knowledge resources in order to achieve competitive advantage. However, organizations are confronted by a variety of knowledge management (KM) problems. These problems can be addressed both by identifying the causes and by developing solutions (Alavi and Leidner 2001). Prior research in the KM arena has tended to focus on organization-level initiatives, as well as senior management and their strategic application of KM (e.g. Gold et al. 2001). However, little attention has been paid to frontline and junior knowledge workers who constitute the majority of knowledge recipients and therefore whose perceptions of the KM process are likely to be critical to the success of any KM initiative.

In this paper, we report on a survey of junior knowledge workers in Hong Kong, exploring their perceptions of KM problems, their root causes and potential solutions. Following this introduction, we concisely review the literature related to KM problems. This literature is drawn upon in the development of a generic KM problems-causes-solutions (KM-PCS) framework. We then use this framework to guide the preliminary analysis and discussion of our data, before concluding with directions for future research as well as implications for research and practice

Literature Review and Research Framework

Grounded in the sociology of knowledge, scholars (Alavi and Leidner 2001; Pentland 1995) identify organizations as "knowledge systems", consisting of four sets of socially enacted "knowledge processes":

(1) Knowledge creation, which involves developing or constructing new content or replacing existing content within the organization's tacit and explicit knowledge;

(2) Knowledge storage/retrieval, which is also described as organizational memory because it refers to the storage, organization, and retrieval of organization knowledge;

(3) Knowledge transfer, which covers various levels including knowledge transfer between individuals, from individuals to explicit sources, from individuals to groups, between groups, across groups, and from the group to the organization;

(4) Knowledge application, which involves the application of knowledge in different contexts.

At any point and time, knowledge workers may engage in one or more aspects of the above KM processes (Alavi and Leidner 2001) and at each aspect, they may be confronted with certain KM problems (Sambamurthy and Subramani 2005). Junior knowledge workers, for instance, might experience problems in creating new knowledge that would be acceptable to their peers and seniors, and storing that knowledge in a format readily accessible and recontextualisable by others. As knowledge receivers, they would need to recontextualise the knowledge created by others, often with little assistance or training, and then apply it in their own context. "However, there are several discomforting questions about the conceptualizations related to the variety of problems that knowledge management solutions address within firms" (Sambamurthy and Subramani 2005). Hence, the lack of understanding of KM problems, causes and solutions indicates the difficulty of articulating the role of information systems (IS) in KM and so fully addressing the practical KM issues related to an individual's and an organization's performance.

The KM literature is fragmentary, providing a variety of explanations for the causes or contributing factors of some of the KM problems indicated above. Our synthesis of the literature suggests that organizational structure, as well as human and technical related causes, are all separately responsible for KM problems.

- Organizational structure factors that can explain KM problems could include structural capital (Wasko and Faraj 2005), and organizational climate and rewards (Bock et al. 2005; Kankanhalli et al. 2005).
- Human related factors for the KM problems could include motivational issues such as anticipated reciprocal relationships (Bock et al. 2005) and intrinsic stimulation (Bock et al. 2005; Ko et al. 2005; Wasko and Faraj 2005).
- Technical related factors for the KM problems could be related to ease of use, usefulness, insufficient information technology (IT) support, and incompatibility of systems (Joia 2001).

With this understanding of the possible causes of the above KM problems, organizations and researchers have recognized the critical roles of both IT (Sambamurthy and Subramani 2005) and non-IT (Joia 2001) solutions. Various IT tools have been drawn upon in support of different KM processes in organizations (Alavi and Leidner 2001; Joia 2001) such as intranets, extranets, the Internet, discussion forums, groupware, electronic data interchange (EDI), video-conferencing systems, workflow systems, data mining, and expert systems. Non-IT solutions to the KM problems surfaced by other researchers include communication (Joia 2001), involvement (Bock et al. 2005; Joia 2001), and deep analysis of the costs and benefits involved (Kankanhalli et al. 2005).

To summarize, scholars have provided various frameworks for classifying KM problems, identifying causes and developing solutions. However, most of these studies focus on a single, specific KM problem. In organizational reality, individuals and organizations are likely to encounter more than one KM problem at the same time. Therefore, from an

organizational perspective, it is desirable to present a comprehensive picture to explain KM problems, causes, and solutions since this can help organizations to achieve competitive advantage in the knowledge economy. Following this review of the literature, we present a generic KM problems-causes-solutions (KM-PCS) framework (as shown in Figure 1) with the primary categories of problems, causes and potential solutions indicated.
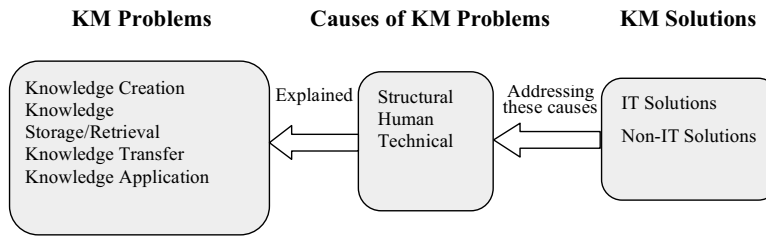
KM Problems   **Causes of KM Problems**   **KM Solutions**

Knowledge Creation
Knowledge Storage/Retrieval
Knowledge Transfer
Knowledge Application

Explained ← Structural Human Technical

Addressing these causes ← IT Solutions Non-IT Solutions

Figure 1: The KM Problems-Causes-Solutions Framework

Research in Progress – Research Plan

Following the generic KM-PCS framework in section 2, we developed a research plan (see Table 1) in order to investigate more specific issues in the framework.

Table 1: Research Plan

Detail Plan	Date
Review literature about each dimension in the framework	Finished
Collect the 1st round of open-ended interview/survey data in Hong Kong.	Finished
Analyze the 1st round data and conduct preliminary diagnosis	Finished
Develop the constructs and items based on the integration of literature review and the 1st round data analysis	By July 2007
Conduct pilot studies	By August 2007
Conduct a large-scale survey in Hong Kong (2nd round data collection)	By September 2007
Analyze data and conduct preliminary diagnosis of the second round data collection	By November 2007

Research in Progress – KM from the Perspective of Junior Knowledge Workers

The first round survey was conducted in Nov. 2006 with 143 junior knowledge workers. These knowledge workers came from different industries including banking, trading, manufacturing, financial investment, insurance and services. Their positions include clerk, secretary, officer, marketing assistant, customer service staff, etc. All the questions were open ended and were subjected to content analysis. In the first question, the respondents were asked to identify the major KM problems in their organizations. The second question asked about the possible causes of the problems which were classified according to the KM-PCS framework as structural, human or technical causes. The respondents were then invited to recommend how their organizations could resolve the KM problems, considering both IT and non-IT solutions. In the following subsections, we present our findings and illustrate them with quotations from the survey responses.

KM Problems

The problems identified cover the four KM processes of creation, storage/retrieval, transfer and application. As junior knowledge workers, most respondents expressed the importance of KM and KM problems in their organizations from a knowledge receiver perspective. As knowledge receivers, they desire standardized procedures and specific guidance from supervisors or the organization. In general, explicit knowledge is helpful but usually missing in their work, so the KM problems identified through this viewpoint are more related to explicit knowledge creation, storage, transfer and application.

Knowledge creation:
"Work procedures of work are not standardized"; "Staff seldom share knowledge"; "The information in the system is not enough"; "The skill of selling various products can only be learned by new employees when they face the clients".

Knowledge storage/retrieval
"Staff always repeat the same mistake in issuing credit letter; this kind of mistake should be stored in the system or as a working guideline. However, we did not have such practice"; "General staff cannot access Internet for work purposes. Only senior colleagues have Internet or email functions"; "The company loses knowledge after retirement of staff"; "The special selling skills cannot be learned from colleagues because of the high turnover rate".

Knowledge transfer
"Mentees can't get enough information from mentors in coaching"; "There is a wide communication gap between the senior and junior staff. They (senior staff) do not provide us (junior staff) sufficient knowledge"; "There is no training provided in the work, which leads a long time for new employees to catch up the job"; "Employees in different divisions have different work practices, so there is a lack of inter-division communication"; "Most of our colleagues are very dependent on me. I always spend a lot of time to communicate with them or answer their questions several times.. They feel convenient and have developed the habit of asking me questions by phone again and again"; "The company lacks a well organized computer system for checking or updating information".

Knowledge application
"There are different departments in my law firm. Staff cannot identify the major activities performed by each lawyer. For example, in a commercial department, there are different cases like trademark & patent, mortgage, listing, etc. Different lawyers are responsible for different practices although all these practices are classified into commercial cases. It is difficult for us (legal secretaries) to locate experts and apply different kinds of expertise in different contexts".

"Each officer possesses unique and specialist knowledge, but it is difficult for junior employees to understand and apply them to their work".

Causes of KM Problems

Though most organizations have recognized the existence of KM problems, the causes of problems need careful analysis if organizations are to conduct corrective actions. Our findings indicate that the causes attributed to the KM problems identified can be classified into three dimensions as below.

Structural (organizational) related causes

Many respondents mentioned that "lack of training", "limited resources" and "lack of dedicated time for discussion" contribute to knowledge creation, storage and transfer problems.

The lack of organizational incentive to create and transfer knowledge appears to be the major explanation for KM problems. One respondent pointed out that "The management does not apply the encouragement/punishment system properly".

The organizational structure is another root cause of KM problems. One respondent indicated "The hierarchy of my company is too flat and is not well managed. Such a structure makes knowledge transfer difficult". Similarly, "the bureaucratic way of work" is also considered as evidence for the establishment of barriers to knowledge creation and transfer.

The inherent organizational culture is a critical factor contributing to KM problems. Some respondents indicated that "there is no good communication atmosphere in the company, so there is not enough sharing among colleagues". "Inter-departmental conflicts hinder knowledge retrieval and transfer, especially for the knowledge transfer among different departments".

Human related causes

The respondents recognize that, in KM systems (KMS), the facilitator plays an important role. When this role is missing, the KMS is doomed to fail: "no specific person is responsible for the knowledge updating work. The information in the system is outdated and no longer applicable to current work practice".

According to the survey findings, individuals may not be willing to contribute documents to the KMS because they are "afraid to share their knowledge given the possibility of losing their power and position". Similarly, "each staff would like to keep their knowledge in their own place", which leads to a lack of standardized practice in knowledge storage and transfer.

Another significant concern related to the knowledge conversion problems lies in the knowledge externalization processes. The respondents thought that "staff feel too difficult to express their experiences, although they know their experiences are very useful for junior staff. Knowledge is too difficult to be translated to text". In China, guanxi or personal relationships, is a determining influence in most areas of human activity, including KM (Fu et al. 2006). Respondents pointed out that "inter-personal conflicts", "competition among staff", "lack of trust & relationships" and "intra-departmental conflicts" complicate knowledge transfer.

Technical related causes

The respondents agree that IT is useful in managing knowledge and consider it as an enabler for KM. However, it appears that from the junior knowledge workers' perspective, IT-based KMS have not yet been adopted in Hong Kong organizations, at least for low-level or operational-level work, as illustrated by the following quotations.

"The system is outdated and some work has to be done manually" which contributes to KM storage problems. "The current IT system cannot facilitate the changes of KM concepts in the company". "Organizational IT systems do not support knowledge management".

Although some organizations have used information systems (usually intranets), the poor ease of use and the non-usefulness of the KMS contribute to the lagging KM practice, as indicated by the quotations: "The capacity of the hardware and software support is not enough". "The system is slow and always busy; sometimes it hangs". "Security of the KMS is a big concern". "The flow of using the KMS is not convenient". "The KMS is too complex to use".

Potential Solutions of the KM Problems Identified

According to the survey findings, the respondents suggest various corrective actions that can be taken to resolve the identified KM problems, encompassing both IT and non-IT solutions. We discuss these solutions below.

With regard to IT solutions, for instance "organizational fragmentation", which is related to the problem of knowledge storage/retrieval and transfer, respondents suggest "systems to allow coordination/cooperation". The establishment of a knowledge expert list and corporate libraries is a starting point to solve the KM problems: "set up the expert system or knowledge database as so the junior employees can find a way to look for knowledge". Regarding the difficulties in knowledge creation and codification, they recommended "the use of multimedia to briefly describe what is the basic background knowledge". With respect to the lack of standardized work procedures, most junior knowledge workers suggested "uploading the memo in the e-portal systems, so everyone can retrieve and follow the guidelines", as well as "set up an electronic library to store the training materials or such training manuals". A customized KMS would also be appreciated: "the IT department can provide a user manual and appropriate systems fit for departmental requirements so that the company can better manage their knowledge". The identification shown in the KMS is also a critical concern in the IT solution as several respondents pointed out that "the company should provide a platform for staff to submit knowledge anonymously" and "the knowledge contributors should have the right to choose a real name or a pseudonym".

With regard to non-IT solutions, the encouragement of communication and involvement from the organization is most frequently mentioned by respondents. For example, they suggest "reward staff who are willing to share knowledge", "set up a compensation scheme for the time involved in contributing knowledge", "arrange more seminars and upload all these seminar materials online", and "schedule a time to share/contribute/read knowledge in the KMS". Some respondents also suggest ways to standardize work practices such as "all staff need to write a guideline of their work on paper and then file it", "the company should tell staff to put their knowledge and information in the same place before they start work", "managers can assign suitable staff to write down knowledge such as good working examples and store it properly".

Discussion and Conclusion

The perspective of junior knowledge workers is different from the general understanding of the management of knowledge development processes. Our findings indicate that this perspective focuses more on knowledge storage/retrieval and transfer than knowledge creation and application. As knowledge receivers, junior knowledge workers expect to follow standardized work practices or have some explicit knowledge to learn. Such KM should be done in the process of knowledge storage/retrieval and transfer.

Junior knowledge workers point out that knowledge is floating around in the organization, but there is a lack of effective knowledge communication and they are not involved in the various KM processes. We have already remarked on problems associated with knowledge transfer between junior and senior employees. Since organizations do not appear to have the culture of encouraging junior knowledge workers to get involved in the general knowledge sharing and receiving process, it takes time for junior knowledge workers to learn those common business procedures such as best practices. This slow learning process largely explains the organizational inefficiency. Junior knowledge workers have a strong desire to use the KM platform so as to obtain knowledge. Notwithstanding the wide choice of information technologies available for obtaining knowledge, the organizational and cultural obstacles to effective KMS use by junior knowledge workers are still very high.

Motivation, expertise and systems form the tripod of successful KM (Joia 2001). These three components will vary in their relative importance from organization to organization, but our preliminary analysis indicates that they are equally important for KM, since as soon as one leg of the tripod is shorter than the others, it will become unbalanced. From the technical perspective, a knowledge-driven organization should ensure that a KMS is designed with junior knowledge workers in mind, so that they can learn about the basic business processes. Such a KMS must be easy to use and its knowledge must be explicit and easily locatable. From the non-IT perspective, junior knowledge workers' communication and involvement in the KM processes deserves more organizational investment.

Our preliminary analysis has provided useful insights into the identification of KM problems, causes and solutions from the perspective of junior knowledge workers. Knowledge-oriented organizations demand new organizational forms, organic, flexible and coordinated enough to allow knowledge to be created, stored, retrieved, and reapplied through IT enabling. This article is a starting point that guides us to investigate the generic KM framework with a deeper understanding. We call for more research in the identification of KM problems, causes and solutions in different contexts.

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