

# An Information Behavior Approach to Knowledge Management: From Research to Practice

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In recent years, the concept of knowledge management (KM) has been promoted by business sectors. This article, based on an empirical case study, explores the practical issues of knowledge management from an information behavior research perspective. It is action research in nature and impacts teaching and business practice. Findings reveal why and what type of information and/or knowledge is considered important for daily work, as well as what and how different information resources are used. Suggestions for improving information services to achieve KM goals conclude the paper.

## Introduction

In recent years, the concept of knowledge management (KM) has been promoted by people in business sectors and may mean different things to different people. Many companies are committed to launching KM programs by purchasing commercial software such as CRM(customer relations management), ERP (enterprise resources management) or Data Mining systems. Some implement document management systems with establishment of a corporate portal. To those at the work place, there is no consensus on what actually constitutes knowledge management.

Knowledge as a concept in the organizational context has multiple meanings. In particular, the difference between the concepts of information and knowledge as well as information management and knowledge management is often debatable, and it has actually been debated in the discourse as in ASIS-L and in the literature.<sup>1</sup>

Some researchers contend that knowledge per se is not manageable but information is. To manage knowledge in organizations is meant to manage people who know how to do things better or who can exercise some expertise, although to exercise an expertise, one often needs data or information. Thus, there are two parts in KM: first, there is the management of supporting data and information; and second, there is the management of a particular expertise or of individuals with specific abilities.<sup>2</sup>

However, as Southon, Todd, and Senéque point out, what is little understood in the diverse KM literature is how people in the field perceive “what constitutes knowledge management and its relationship to information management.”<sup>3</sup>

For those who are trained in library and information science and are really involved in a knowledge management project team, what should be done and how KM can be accomplished effectively are not very clear. In particular, how can the graduates from library and information science contribute their knowledge and/or professional training to the KM practice?

This paper, based on an empirical case study of a well-known award-winning Electronic Commerce (EC) company, explores the practical issues of knowledge

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management from an information behavior research perspective, with a focus on the first part of KM: the management of supporting data and information, and the explicit knowledge in the organization.

### **Background**

The case under the investigation is a well-known EC company, a pure .com company established in 1995, with 70 employees distributed in nine organizational units in the year 2002. The company is mainly selling consumer goods online, such as books, magazines, musical compact disks (CD), etc. It is also affiliated with a large international corporate family. By virtue of the business, the company has an intranet in place with a business portal on the Internet.

This specific research was prompted by the fact that KM is part of the strategic plan of the EC company. Before the study began, the company surveyed and contacted for one year several software vendors and consultant companies who claimed to offer KM solutions. As a result of the survey, the team members from the KM initiative decided to explore other possibilities, including development of its own KM solutions.

The ultimate goal of KM is what the chief executive officer (CEO) of the company asserts, to extend the problem-solving abilities of the employees, which is the major competitive edge of the company. As Blair in a final analysis of KM points out, "For the goal of Knowledge Workers is not so much to 'manage knowledge' but to solve problems."<sup>4</sup> Nevertheless, as the first step, the organization needs to know what information is needed to support knowledge workers to work and solve problems effectively in this specific environment, and what needs to be done in terms of building a better information mechanism to facilitate the KM effort. It is in this context that this study was undertaken in order to understand how the managers and employees of the EC company work (or accomplish their major tasks on the job) and how this relates to the roles of information and knowledge at work.

### **Research Approach**

The research approach of this exploratory study was based on an understanding of the literature of information needs and use research (in general), and information seeking in organizations (in particular). The important concepts or models for studying information behavior include the information use environment, tasks, problems, information needs assessment, information seeking behavior, information search processes, information sources, environmental scanning strategies, etc.<sup>5</sup> The literature analysis served as basis for designing a survey questionnaire and interview guide for the study.

Using a questionnaire with open questions, a semi-structured in-depth interview, and the document analysis method, this study investigates the organizational information

seeking and use behavior of the company's employees, particularly the managers. Data collection of this study was conducted over several months, from October 2001 to May 2002.

The questionnaire was distributed to all 42 full-time employees who had worked with the company more than a half year, including 12 managers who had worked for the company more than one year. 40 copies of the questionnaire were returned to the researchers for analysis. The subjects of the survey were selected according to the minimum requirement of the length they worked with the case company for two reasons: as the literature points out, there is high turnover rate in the first four weeks for a person who starts a new job or joins a new organization;<sup>6</sup> and the personnel policy of most companies requires a trial period of the new employee before becoming a formal member. The second reason is that it takes time for a person to experience the process of socialization in an organization and to know the organizational ecology before he or she can fully exercise his or her expertise.

In-depth individual interviews were conducted with those in managerial positions. One member of the research team made the appointment with and interviewed each manager one at a time. Each interview lasted from 90 to 180 minutes. The interview schedule had four parts. The first part was about background related information, including questions such as the manager's tasks, his or her perception on organizational culture, the ways she/he became acquainted with the work on hand, and what she/he would tell the newcomers to help them work more efficiently and effectively in the department. The second part focused on problem related information, including questions such as how the manager could tell when problems occurred, what were the problematic situations the manager encountered in a typical week, how he/she would know when the problem had been solved, and what characteristics of information were needed to solve the problems mentioned. The third part dealt with information-related behaviors, such as the major strategies for gathering needed information, the weakness and strength of current strategies, channels used to communicate with people in the organization, and a description of the most impressive work experience of a project-based story. The last part posed questions related to activities of email use.

The interview data were transcribed into text and analyzed according to the research questions proposed. The research questions for the case study include: What are the employees' needs for information to work efficiently? What information resources and channels are used in the work environment? How do employees seek information and knowledge needed? What difficulties are encountered in searching for information? How do members in the organization deliver information and knowledge among themselves? These were also the major questions listed in the questionnaire.

Email is one of the most important communication tools for EC companies. It was estimated that more than ninety percent of messages and information in this case company were disseminated via email. Because it was impossible to collect all of the various electronic documents in the organization, the researcher chose two managers who had worked in the case company for at least three years to collect all the emails (roughly 6,000) they had saved, and then conducted subject analysis and content analysis of these emails to see what information and knowledge had been delivered and exchanged in the organization. In addition, six managers' directories of work email were examined to see how the emails were organized at the workplace.

The findings arose mainly from the thematic analyses of the interview and questionnaire. It was hoped that the answers to these questions would help the company identify the explicit knowledge at work and information sources for supporting the knowledge workers in the fast changing environment in which all EC companies must operate. As one member of this research team worked for the case company, the study was action research in nature, with the purpose of using the findings to propose suggestions for the basics of knowledge management.

## **Research Results**

The findings are presented here according to the issues of concern and the major themes emerged in this study, including the concept of knowledge, information needs, the information resources and channels used, the evaluation criteria applied when information and knowledge were sought, the difficulties encountered when seeking supporting information, and the principles of organizing in-coming emails as applied in practice by managers.

### **The Concept of Knowledge**

In spite of much debate on the concepts of information and knowledge in the literature and an issue of much concern when the study began, knowledge was seen as unproblematic. The managers referred to knowledge of products, markets, suppliers, customers, systems, etc. They talked about knowledge exchanged in emails and group meetings. They referred to the information and information objects needed to solve problems in their work, such as analytical reports from the in-house management information system (MIS), performance indicators from various business processes, and trends of the related industries and technology covered in the news media. Both information and knowledge are required to perform jobs effectively.

To the interviewees who worked in a knowledge intense environment on a daily basis, it was not important to differentiate the term information from knowledge, and yet they had no confusion with the two terms. As Southon, Todd, and Seneque point out in a recent study, it is important for researchers to recognize the natural play of the terms such as “information,” “knowledge,” and “management” at the workplace, and speak to current understandings in familiar terminology when developing models or theoretical frameworks of knowledge management.<sup>7</sup> This study supports this viewpoint.

### **The Needs for Information**

It was found that the employees had two general categories of information needs: work related and non-work related. Work related information needs were task-oriented. Three broad types of needs for information under this category included:

1. The information needed for daily operation or work tasks; i.e., information about how to do work more effectively or efficiently, especially information about the company’s regulations or systems.
2. The information needed for management purposes, or information about management.
3. The information needed for understanding the external environments, especially

information about the industry, and new developments and trends of computer and communication technologies.

4. Non-work related information needs were mostly interest-oriented and recreational in nature. But it can also be task-oriented for personal reasons. Employees with non-work related information needs sought information for hobbies, leisure, and for personal purposes (e.g., information about pregnancy).

### **Information Resources and Channels Used**

According to the source of information generated from inside or outside the company, the resources of the supporting information could be divided into two types: internal resources and external resources. Moreover, the internal resources and external resources could be further divided into two types by format: human resources and non-human resources.

1. **Internal, Non-Human Resources**

All the internal non-human information that the case company employees gathered could be classified into two categories by its format: numeric information and textual information.

The two kinds of information could be further subdivided according to their contents. The numeric information contains “managerial indicators” and “information on quality control of operations.” The textual information included organizational announcements, operational manuals, product information, industrial environment information, competitor information, manufacturer information, and social/recreational information.

2. **External, Non-Human Resources**

External non-human resources that case company employees collected could be categorized into four types by its medium: electronic resources, printed resources, audio-video resources, and physical objects/events/activities.

Electronic resources included websites and electronic newspapers. Printed resources contain books, newspapers and magazines, reference books, and research reports. Audio-video resources included tapes, videotapes, broadcasts, and television. Information resources of physical objects/events/activities were store/shop fronts, press conferences or seminars, and other activities.

A surprising finding about the type of information resources used by the employees in this company was that the reason of use was irrelevant to his/her work tasks for the most part. Although information professionals from information resource management (IRM) and library and information science (LIS) domains traditionally consider newspapers, magazines, books, reference books, and audio-video materials as important and necessary collections for organization use, the employees of the case company use these information resources mostly for personal, non-work-related purposes.

Compared with other forms of information resources, the case company employees depended on electronic information resources much more than other forms. The question on how frequently the employee uses every type of resource, revealed that in the case company all of the employees were used to looking for information via the Internet. Literally, each employee in this study had his/her own everyday visit to websites and every day read electronic newspapers for

work-related or personal reasons. Such a high usage of electronic resources is in sharp contrast to the use of other forms of information resources, indicating that as an EC company, the case company's employees were familiar with using electronic resources. This is the major difference with other companies.

### 3. Internal Human Resources

From the answer to the question "what documents and files do you produce, conserve, maintain, and frequently use," the researchers learned about the types of information that different work roles provided. Further, an employee of the case company not only produced information for others, but also used information resources from other sources, thus, not only being an information producer but also an information consumer.

The case company's internal resources could be grouped into five types of internal human resources according to the kinds of information that different work roles provided. The five types of human resources included copywriter/editor/publicist, customer service representative (CSR), financial analyst/accountant, website art editor/programmer/technician, and commodities purchasing agent.

The copywriters, editors, and publicists could provide product information, market survey reports, competitor information, industrial information, marketing events, and performance measures. The customer service representative could provide customer information and knowledge about customer management. A financial analyst and accountant could provide legislative information, management performance indicators, and organizational norms and standards. The information that website art editors, programmers, and technical staff could provide included programs and technical manuals, technical announcements, technical development, and technical product information. A commodities purchasing agent could provide supplier information, product information, competitor information, industrial information, and managerial information.

### 4. External Human Resources

Finally, the external human resources that the company employees gathered and contacted were of five types, including manufacturers or suppliers, colleagues of strategic alliance, family/friends, customers, and consultants (depending upon relationships to the organization).

As a result of the study, a more detailed list of supporting information and information resources, such as the specific indicators needed for a task and the most frequently consulted websites and electronic newspapers, were identified. The company can easily take a step further to build a shared pool of information and information resources in its intranet systems.

### **The Criteria of Information and Knowledge Sought**

The research results showed that the case company employees would evaluate the information they gathered according to certain criteria, and they would then decide whether they needed to look for other resources to satisfy their information needs.

As shown in analysis of the responses, data or information considered as good or important by the EC company employees should contain certain characteristics. Those are: 1) accuracy (75 percent); 2) usefulness (65 percent); 3) completeness (52.5 percent); 4) timeliness (37.5 percent); 5) accessibility (12.5 percent); and 6) others, including comprehensibility, synthesis, logicity, authority.

However, criteria actually used for evaluation of information they gathered were identified as follows: 1) usefulness (47.5 percent); 2) accuracy (37.5 percent); 3) timeliness (17.5 percent); 4) completeness (12.5 percent); 5) accessibility (7.5 percent); and 6) others.

In other words, the usefulness of information stands out as the most important evaluation criterion when information is presented to the employees. Accuracy follows. This result might imply that to accomplish the tasks on hand in such a fast paced environment full of time and interpersonal pressures, the accuracy of information might be traded for the face value of practicality in the information that was presented to the employees.

### **Difficulties Encountered in Seeking Supporting Information**

The problems that the case company employees encountered when they collected information through various resources were identified and grouped into five categories, including:

1. Information scattered and choppy: information scattered in different places so it was sometimes difficult to have a complete picture of a business phenomenon.
2. Too much information on the Internet to filter: did not know what the right keywords to use in order to find the information needed.
3. Insufficient Intranet functions: the data analysis functions were not sufficient, automation functions were not complete requiring the house engineers to process data or information for specific uses.
4. No sources of information: no professional advice available at the workplace, or did not know where to find the information.
5. Language barriers: information was presented in other languages not understood by the information user.

### **Information Delivery and Knowledge Exchange**

The major information channels through which the organization members shared knowledge and delivered information, as indicated by the employees included: email (77 percent), ICQ (46 percent), telephone (43 percent), face-to-face communication (37 percent), and official reports or other documents (31 percent). In other words, email was a dominant communication and information acquisition tool in such an organization. Face-to-face or oral communication channels in this case were often used as a supplementary means.

As an EC company, the information systems and intranet in the organization were more sophisticated than other kinds of industries and use of email was almost a daily practice to all. The members in the organization stated that they often exchanged knowledge or shared information via electronic channels. For example, when the employees were going to have a face-to-face meeting, they delivered the data, records, and reports beforehand, and shared their viewpoints with supporting information through email or ICQ (I Seek You).

Furthermore, it was identified that the following factors affected a manager's choice of the channels for knowledge delivery or information sharing: the characteristics of the

information receiver, the characteristics of the information, the task or purpose of delivering or sharing information, and the information sender's personal factors. For example, Interviewee L mentioned he usually chose delivery channels based on the receivers' department or personal characteristics. Interviewee L was in charge of the logistics department, however, the warehouse was not at the same location with the office, so he contacted the warehouse staff through ICQ due to its immediateness and lower cost than telephone. If he wanted to communicate with the personnel in the same office, he would also use email or face-to-face communication. Interviewee G mentioned that he usually delivered documents via email for formal announcements at work.

Interviewee F said, because he often needed to coordinate members across departments, he usually adopted the face-to-face method. In other circumstances, when collecting opinions for resolving certain problems, he chose to use telephone, reports, conference, or other written documents. Another interviewee explained that because she spent lots of time participating in all kinds of group meetings, she had little time to give feedback to others' opinions, so she was used to adopting those channels that were not necessary for immediate response, such as ICQ or email. She only communicated with others via telephone or face-to-face occasionally.

### **The Organizing Principles of Managers' Emails at Work**

Although business information and knowledge were mainly exchanged through the managers' emails, the findings of the study showed that the manager's emails were organized in a very intuitive, simple form.

According to the analysis of the six managers' email boxes, the managers tended to organize their emails in a very simple, intuitive way, which was very different from what a library and information professional would utilize. The managers in this organization did not organize their email on the basis of an academic classification structure or rigorous subject structure, but according to the mail sender or mail content, just as the way they filtered their emails according to the mail sender or mail subjects. On the other hand, some interviewees would further organize their emails by the date an email was received.

For example, when asked what methods were used to organize his or her emails, one interviewee stated that she classified her emails according to "the sender's department," the emails contents (such as goods information, market surveys, project progress reports, good articles, etc.), and the figures group (such as numbers of customers, website transaction logs, etc). Another interviewee divided his emails into "personal mails" and "company mails," and then he subdivided the company's emails by the department of the sender. Interviewee F mentioned that she would categorize emails by content or by the email sender's department. Further, she categorized emails by the time she replied to customers; and for contents in an email which she might share with others-these she would save in a "good articles" folder. Interviewee L said she would first categorize the emails by the email's content and sender, and then by the source of emails for specific webpages or electronic newspapers.

An analysis of six manager email folders revealed that about 84 percent of the email folders were named by mail content, and 15 percent by sender. Moreover, an analysis of 6,000 emails from two managers showed that about 90 percent of the emails were categorized by email content, and 10 percent by email senders.



## How managers organized their emails

Email Category	Sub-category	Examples
Senders	Department	Department of Marketing, Department of Customer Services
	Position	Product information, contracts, catalogs from suppliers
	Internal mails	Own company's newsletter or e-papers, internal personal mails
	External mails	Personal mails
Contents	Figures, statistics	Business turnover, members' numbers
	Market Survey, Industry developments	Reports or surveys E-Commerce
	Work-related information (Titles of) Project	Company's activities, product information Customer Relationship Management (CRM), Search Engine, etc.
	Recreational information	Good articles, e-papers
(Media) Source		E-papers, web-pages
Time		Time of receiving or response

As many important information resources are to be found in emails and attached files, interviewees remarked that they would like to know how to organize their emails more effectively for better access to email contents.

### Discussion

Practically speaking, the nature and results of the study, including the needs assessment and information seeking and knowledge resources survey, serve as a blueprint to start the knowledge management project for the company. Suggestions for providing information services and a knowledge exchange mechanism in the case company can be identified.

1. Pay more attention to the planning and management of electronic information resources

This study identified every type of information resource that the company's employees use. The employees use electronic information resources much more than other types.

Although the case company employees would still use non-electronic resources such as books, printed documents, and videotapes, the most important source of information is the electronic information gathering from the intranet, Internet, or email. Therefore, to manage information for knowledge workers of the company in E-Commerce, the emphasis should be placed on the consideration of how to

organize all kinds of electronic resources that the company employees gather. Specifically, how to effectively manage the complex contents of emails at the workplace to facilitate retrieval and reuse would be a primary challenge in this context.

2. Enhance the functions of internal information systems (intranet)

In planning information services for knowledge workers in E-Commerce, the KM team or information service provider in the company should take remarkable information use behavior into consideration and focus on how to plan better internal information systems, based on the understanding of types of information needed for supporting different work tasks.

On the other hand, despite the fact that the IT department regularly announced new functions of the information system, many employees in the company stated that they were not very familiar with all the functions or operations of the information system-and felt it was because of the frequent renewal of the information system. As a result, the information system was usually perceived not as useful as it was supposed to be. Thus, there are requests constantly to provide training courses for new system functions and operations.

3. Construct a cyberspace interactive mechanism for information sharing and knowledge exchange with both human and non-human information resources.

According to the findings, some case company employees know little about human resources within the organization. When they encounter problems at work, they do not know who to ask for help, or with whom they can discuss topics, partially because they are used to searching for information via information systems. Therefore, it is recommended that internal information systems should include a human resources database that describes in detail who knows what and who to contact.

To manage information for supporting knowledge workers in the light of the characteristics of their information behavior, the information service provider must consider not only how to organize and store information effectively and how to provide information retrieval/filtering services, but also how to match the non-human information with the human resources in order for the employees to share information and viewpoints online when they interact with each other.

In addition to providing easy access to all kinds of information resources, the system should also provide an information service mechanism (e.g., a corporate digital library) to consolidate answers to, or contact points for, meaningful questions from employees in order to better support the employee's daily work.

4. Provide training courses on information literacy for e-learning

Because the E-Commerce employees are very dependant on the information system, information retrieval skills deeply affect their ability to search information and the quality of information they collect. Therefore, the information service provider in such an organizational context not only should consider how to organize every type of information resource, but also should provide some training/education in information retrieval, introduction to Internet resources, and to achieve the best results, the training/education should be provided in electronic format as well (e-learning materials).

In addition, based on an understanding of the difficulties encountered by

employees in seeking information, the training should include information literacy-the knowledge and skills of how to search and evaluate information effectively. As the employees' abilities to use their internal information system strengthen, the company will create a competitive edge through its human capital.

The information service provider in an E-Commerce company should organize various kinds of electronic information that their employees often use, and provide a cyberspace for information sharing and interpersonal interaction to satisfy the employee's information needs, and to enhance the organization's performance in the long run.

### **Conclusion**

The study reported here was a collaborative effort between an academic researcher and a practitioner working in the company (with a master's in library and information science). It was action research in nature and has potential to affect teaching and business practice.

The findings of the study point to a need to teach information professions about classification of documents that have business-specific or industry-specific contents. This is not commonly taught in schools of library and information science (LIS). On the other hand, the knowledge and interview techniques taught in the "Qualitative Research" course in LIS schools prove to be helpful and useful at the planning stage of KM; as demonstrated in this study. The "Business Information Services" course, in which business resources on the Internet and information retrieval strategies are taught, is also useful for information professionals working in the business sectors, and such knowledge will be needed when they serve as trainers in providing employees education on information literacy as part of KM project.

From an information behavior perspective, this study also leads to important research issues for further investigation. For example, one interesting finding about Internet use that has some implication for information behavior theories is the reciprocal nature of non-work related information needs and information needs that grow out of job requirements. In other words, needs for work related information might lead to non-work related needs, and vice versa. Whether this is due to the nature of the web-based business to consumer electronic commerce industry or is this a common phenomenon across different organizational contexts, is an interesting research question itself.

A model of organizational information behavior for an EC company emerges from the data analysis, which also has the potential for theoretical contributions, and this will be addressed in a future work. Overall, the study serves as an example of research that grew out of practice and which has influenced practice to a significant extent.

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