

A MULTIPLE PERSPECTIVES REVIEW OF KNOWLEDGE MANAGEMENT LITERATURE

Rose Alinda Alias¹ and Nor Hasliza Md Saad²

¹ *Fakulti Sains Komputer and Sistem Maklumat
Universiti Teknologi Malaysia, 81310, Skudai, Johor Darul Takzim
Tel: 07-5532099, Fax: 07-5532210, Email: alinda@fksm.utm.my*

² *Pusat Pengajian Pengurusan
Universiti Sains Malaysia, 11800 Minden, Pulau Pinang
Tel: 04-6533888, Email: nor_hasliza@yahoo.com*

ABSTRACT

This paper reviews articles on knowledge management (KM) research published in journals within the disciplines of Information Systems (IS), Computer Science (CS), Information Technology (IT), Business & Management, and Sociology. Multiple Perspectives Theory (Mitroff and Linstone, 1993) was used as a theoretical framework to classify KM research into three perspectives, namely technical, organizational and personal perspectives. The multiple perspective classification of KM research is then used to analyze articles which discuss research issues related to KM. The review found that the most dominant perspective adopted mainly by researchers is the organizational (O) perspective. The O perspective is adopted mainly by researchers within the social science, and business & management disciplines. KM articles within the O perspective mainly discuss the organization's capability to manage knowledge as a resource for competitive advantage. The technical (T) perspective of KM research is mainly adopted by researchers within the CS, IT, and IS disciplines. The T perspective of KM research discusses the technology that can be used to support KM process in an organization. Very few articles approach KM from a personal (P) perspective, which discusses attitudes and behavior of KM stakeholders.

Keywords:

Knowledge management, multiple perspectives, research article classification

1.0 INTRODUCTION

The ability to generate and share knowledge is not a new concept. It has been practiced many decades ago, by individuals and organizational. For example, when a craftsman teach his heir to inherit his skills and become an expert (Hansen, 2002). Classically, the knowledge sharing process involves in unsystematic

process through observation, imitation and practice. These processes require a lot of time and may be needed several repeating same processes before the learner completely understand about the 'knowledge' from his master. Another example is sharing and learning in an organization through human interaction, codified information or organization's artifacts such as report, manual, document, and procedure (Alavi and Leidner, 2001).

However, in 1990s researchers and business communities begin to explore and exploit the potential use of 'knowledge' (Almashari and et al., 2002; Hansen and et al, 1999). What is new about knowledge management concept is the practical way to manage the 'knowledge' systematically so that it can be shared and reused across organization at any time. Cole-Gomolski (1997) asserted that "The idea behind knowledge management is to stockpile worker's knowledge and make it accessible to other via searchable application". This is correlated to widely accepted view of knowledge sharing process to execute individual knowledge and distributed among groups (Nonaka, 1994). Nonaka (1991) noted that, "New knowledge always begins with the individual".

There has been extensive research on KM, as shown by the rapid increase of articles published in various publications (Koenig and Ponzi, 2001). Their analysis of articles published from the year 1991 to 2001 on KM research revealed that there is a rapid increase of published articles on KM concept from the mid 1990s and 2000.

Consequently, several new research publication journals have published specific research issues related to KM, such as Journal of Knowledge Management and Knowledge, Journal of Information & Knowledge Management and Process Management. In addition, other eminent research journals have collected published special issue dedicated to KM research. These initiatives come form California Management Review (Vol.40, No.3, 1998), Organization Science (Vol.13, No.3, 2002), Strategic Management Journal (Vol.17, 1996), Journal of Management Information Systems (2001, 18,1), Journal of

Computer Information Systems (42, 5, 2002) and Decision Support System (1054, 2003).

KM is considered as a multidisciplinary field as it is discussed in a variety of disciplines from the harder and technical disciplines such as computer science and information technology, to the softer disciplines of humanities. KM has generated a lot of interest because it touches on a wide range of issues. The objective of this paper is to identify the dominant perspective of KM research. The increase in KM articles is related to the evolution of information technology. KM research has evolved through three distinctive stages. These stages are the technology stage, the human resource stage and the taxonomy and structure stage (Swartz, 2003).

1.1 Searching Method

This paper reviews and classifies knowledge management research articles published from January 1998 to June 2003. The reason choosing this period is chosen because according to Swartz (2003) 1998 is the peak period of KM articles that published by various publications. The objective is to identify trends of KM research within the communities of IS/CS/IT, business & management, and sociology. Each of the disciplines is represented in three related journals of knowledge management. The keyword 'knowledge knowledge' is used to explore what are the related research that has been published within this period.

The research articles in IS, CS and IT communities mainly are published in Journal of Management Information Systems, Journal of Computer Information Systems and Information Systems Research. On the other hand, a combination of Business & Management, and Sociology communities are represented in Harvard Business Review, Organization Science, and Academy of Management Journal. Knowledge Management research areas found in all the selected journals, 94 articles related to the knowledge management research. There are 16 articles from Journals of Management Information Systems, 23 articles from Journal of Computer Systems, 15 journals from Information Systems Research, 7 articles from Harvard Business Review, 26 articles from Organization Science and 7 articles from Academy Management Journal.

2.0 BACKGROUND

Technology revolution has changed the paradigm of the industrial economy traditionally based on assembly lines and hierarchy control to a global, decentralized and information-driven economy (Davenport and Prusak, 1998).The convergence of

industry and technology in the information age has evolved the function of technology in the industrial and economic sector. If we study the chronological the emergence of knowledge in the Information System community it is appeared in the earlier in 1990's after the burst of information systems in organization functional processes around the world (Griggs et al, 2002).

The function of technology in business environment today has evolved from information-centric to knowledge-centric. In the initial stage, the use of computer technology in an organization is to transform manual task to automated task. Then, network systems support the integration of business process from standalone machine to a cooperative concept where information can flow within organization, which allows data sharing across organizations. Recently, the information systems community has started to recognize that network technology (intranet, groupware) not only strongly supports the concept of data sharing, but can act also as tools to leverage information for knowledge sharing within an organization (Borghoff and Pareschi, 1998).

Griggs et al (2002) provide a brief chronology of KM efforts influenced by technology revolution. The technology evolution in KM efforts listed in Table 1 below:

Table 1: A Brief Chronology of Knowledge Management Efforts.

Period	Orientation
1960s	Data-centric, IT orientation
	<i>Knowledge captured in forms, reports and databases</i>
1970s	Information-centric, MIS orientation
	<i>Data converted to information via ad hoc database queries, graphics and presentations</i>
1980s	Decision Support System orientation
	<i>Knowledge encapsulated in models and simulations; more sophisticated statistical applications</i>
1990s	Web-based knowledge support
	<i>Capture, organization and dissemination of knowledge using web</i>
2000s	Advanced Computation Techniques
	<i>Convert information to knowledge using concept clustering, linking, searching, ontologisms, multimedia, AI and others</i>

2.1 Why Knowledge Management?

In this new millennium, to sustain competitive advantage, organizations have shifted from information focused to a new concept, namely knowledge management as to run business effectively and efficiently. Most organizations change their strategy to put primary focus on

intellectual asset rather than tangible resources from building, machine and land (Nonaka and Takeuchi, 1995). Consequently, global organizations from service and manufacture discipline also practice KM in their business operation. As a result, increasing number of organizations pay attention to the creation value through leveraging knowledge, for example Hewlett-Packard, Xerox, Skandia, Dow Chemical, British Petroleum, Dell, Ernst and Young and McKensy. KM strategy can act as a weapon to sustain competitive in the market. This strategy makes organizations unique and it can distinguish from their competitors (Choi and Lee, 2002)

Even though initially people consider knowledge management as a new fad, but Gartner Group review the report from BSI that, “80% of the large UK companies already practice KM and 96% predict that they will do so in the next 5 years”.

2.2 Knowledge Management Concept

The KM concept is more than an accumulation of information. Rather, it is a combination of information, social interaction and contextual situation (Gore and Gore, 1999). Thus, the knowledge concept should be investigated through studies that involve social and technological aspects. Chudnow (2001) illustrates this concept by referring to the social aspect that involves the human intellectual processes, and the technological systems aspect that act as tools to facilitate KM. He also highlights that there is an essential challenge at the managerial level of the organization to understand the information systems tools and to use it strategically to achieve organizational goals. This view illustrates the importance of organization capital in supporting development of knowledge creation and innovation outcomes of the organization (Nahapiet and Ghoshal, 1998; Cohen and Fields, 1999).

Alavi and Leidner (1991) provide three distinctive perspectives on KM. These KM perspectives are information-based, technology based and culture-based. Information-based perspective is about the characteristic of information in the systems, while technology-based perspective emphasizes how diverse information technology systems and tools support KM implementation. A culture-based perspective relates knowledge management with learning, communication and intellectual property cultivation.

There are many different perspectives of KM concept that come from various discipline of communities. Basically, knowledge management goal is concerned on how to manage organization’s knowledge both tacit and explicit so that it can be utilized across organization effectively and efficiently (Lai and Chu, 2002; Song, 2002). The process of managing organization’s knowledge is involved through acquisition, sharing and utilization (Tiwana, 2002). The

purpose of knowledge management is to make individual/groups knowledge available and utilize it and become organization’s knowledge (Nonaka, 1991).

The need for the appropriate knowledge management technologies has been discussed recently in terms of exploitation the information technology role in supporting and enhancing knowledge management process. Therefore, technologies become instrument to facilitate the knowledge managing process involving knowledge creation, knowledge store/retrieve, knowledge transfer and knowledge application within organization (Alavi and Leidner, 2001). Marvick (2001) asserted that, “The role of technology is often to overcome barriers of time or space that otherwise would be limiting factors”. Coleman and Shapiro (1992) illustrate this idea by referring to information technology is act as a tools to help people work together more effectively.

3.0 MULTIPLE PERSPECTIVE CLASSIFICATION OF KNOWLEDGE MANAGEMENT RESEARCH

A brief multiple classification of KM research is summarized in Table 2.

Table 2: Multiple Classification of Knowledge Management Research

	Technical	Organization	Personal
Classification of criteria	Computer science and information technology communities perspective on knowledge management: the technology, system design, system implementation.	Management and business communities perspective on knowledge management: enhance performance, increase collaboration, improve customer service, classified knowledge	Psychology and sociology communities perspective on knowledge management : attitude and behavior

The primary objective of this paper is to provide a critical review for KM research areas through three different perspectives: technical, organization and personal. Multiple perspectives theory has mainly been used to provide critical ways of thinking involving complex problems, concerning a multiplicity of actors, various scientific/ technical disciplines, various organizations, and diverse individuals (Mitroff and Linstone, 1993). The multiple perspectives theory can be adopted to classify KM research.

3.1 Technical Perspective

The technical (T) perspective on knowledge management research is mainly discussed by computer science and information technology researchers. KM is defined by as comprising of subsystems that interact and connect together to enhance organizational performance: database subsystem, organizational language subsystem,

networking subsystem, and transfer subsystem (Soo et al, 2000). According to Marvick (2001), knowledge becomes the focal asset of contemporary organization and technology plays an important role in assisting knowledge creation and sharing within an organization.

KM research within the T perspective focuses on the technology, system design and implementation of KMS. Technology issues include application, systems and infrastructure. System design issues include techniques, architecture, models and framework for developing KMS. In Table 3, forty studies have been identified within T perspective.

Table 3: KM Research: Technical Perspective

	Research Concern	Authors
System Design	Model	(Abou-Zeid, 2003); (Allard & Holsapple, 2002); (Bourdreau & Couillard, 1999); (Bowman, 2002); (Gottschalk & Khandelwal, 2002); (Mark Xu & Kaye, 2002); (Moody et al, 2003); (Ryan & Prybutok, 2001); (Shaft & Vessey, 1998); (Vail III, 1999); (Whitten & Stephens, 2002);
	Architecture	(Griggs et al, 2002); (Hackbarth & Grover, 1999); (Kochareka, 2001); (Lin et al, 2002); (Nissen, 2000/01);
	Framework	(Bose, 2002); (Becerra-Fernandez & Sabherwal, 2001); (Chen & Liou., 2002); (Lai & Chu, 2002); (Misra et al, 2003); (Song, 2002); (Sugumaran, 2002); (Samiotis & Poulymenakou, 2002)
	Systems	(Kanter, 1999); (Jones et al, 1998); (Mahapatra, 1997/98); (Mamaghani, 2002); (Nah et al, 2002); (Nidumolu et al, 2001); (Stenmark, 2000/01); (Van de Hovens, 2001); (Yoon, 1999); (Zahir, 2002);
	Strategy/ Theory	(Hicks et al, 2002/03); (Markus, 2001); (Toumi, 1999-2000)
	Methodology	(Liebowitz, 2002); (Massey et al, 2002); (Su et al, 2002)

The KM research articles in technical perspectives reveal the advancement of technology to improve, modify and integrate new elements to the traditional systems and invented innovative systems (Kanter, 1999; Jones et al, 1998; Mahapatra, 1997/98; Mamaghani, 2002; Nah et al, 2002; Nidumolu et al, 2001; Stenmark, 2000/01; Van de Hovens, 2001; Yoon, 1999; Zahir, 2002), theories (Markus, 2001; Toumi 1999-2000) and methodology (Liebowitz, 2002; Massey et al, 2002; Su et al, 2002) to support KMS

implementation. The research perspective also includes the analysis of knowledge management in E-commerce context (Nah et al, 2002). Since the explosion of the knowledge management concept, researchers have mainly focused on development of a new approach to develop systems model, architecture and framework as a guide to implement KMS (Bose, 2002). There are also research articles concerning knowledge management strategies and opportunities (Sharp, 2003; Hicks et al, 2002/03).

There are three categories of systems model found in this literature review in the area of KM process, interface and users. The KM processes research articles includes inter-organizational knowledge process model (Bourdreau & Couillard, 1999; Gottschalk & Khandelwal, 2002; Moody et al, 2003), knowledge adoption model (Ryan & Prybutok, 2001), knowledge chain model (Allard & Holsapple, 2002), expert system model (Whitten & Stephens, 2002), ontology engineering process model (Abou-Zeid, 2003), computer program comprehension process model (Shaft & Vessey, 1998) and knowledge repository model (Bowman, 2002), of KMS. These models connect systems integration with KM process to achieve congruence between business tasks and systems development to meet organizational goals. Another research articles concerns designing user interface as well as developing mapping model with Graphic User Interface (GUI) of data and relationship (Vail III, 1999) that can be accessible across multiple organizational levels. Finally, a research of KM user in information support model (Mark Xu & Kaye, 2002) shows the inter-related link between computer systems, and system user and information user.

KM research articles review multiple types of KM architecture linking various processes and their relationship to support KM implementation (Grigg et al, 2002; Nissen, 2000-01). For example, K-commerce architecture (Kochareka, 2001) that links community, management, support and transactional processes including organizational and external business players. Next example is KM architecture in collaborative supply chain management (Lin et al, 2002) that consists of five processes: knowledge storage, data exchange, information messaging, process collaboration, and knowledge sharing. These processes are supported by EDI/ XML, BBS, Email, video conference, data mining and web page technology. Finally, the architecture of organizational memory (Hackbarth & Grover, 1999) links the process of acquisition, retention, search, retrieval, maintenance knowledge repository, to support learning activities.

There are also research articles that concerning development of KM framework focusing on E-commerce of organization adoption (Samiotis & Poulymenakou, 2002) and environment (Bose, 2002, Chen & Liou, 2002; Lai & Chu, 2002; Misra et al, 2003; Song, 2002; Sugumaran, 2003). The framework of E-commerce organization adoption utilizes the XML web language and intelligent technology to support organization learning. On the other hand, the framework of E-commerce environment concerns both the adoption and environment using internet technology

with web client/server infrastructure. In addition, there is a research article concerning development of a framework for competence-based practice (Samiotis & Poulymenakou, 2002), internet knowledge sharing (Song, 2002), expert system adoption (Moody et al, 1998/99) and contingency of KM process (Becerra-Fernandez & Sabherwal, 2001). All of the frameworks utilize internet technology in supporting knowledge acquisition, storage and dissemination across organization.

There is no single best technology solution found to support KM, but various kinds of technologies are capable to facilitate KM implementation. Most of the research concern in technology is to manage knowledge management process in acquiring, storing and disseminating knowledge within organizations and disperse location areas. Different types of technologies with diverse systems capability and infrastructure requirement have been described to ensure the question of: How is technology used to make organizational knowledge available across the firm? How does technology capture, store and disseminate knowledge? What types of technology support the KM process to improve corporate performance?

3.2 Organizational Perspective

The organizational (O) perspective on KM research is discussed mainly by social science and business & management communities. Business sectors have begun to recognize the potential use of KM to support new organizational processes. As a result, an increasing number of organizations pay attention to the creation value through leveraging knowledge. Therefore, organizations start to recognize knowledge as one of the important elements of competitive advantage that needs to be utilized efficiently and effectively (Ginsburg and Kambil, 1999).

Throughout the last decade, various approaches and categories of knowledge have been identified in the organizational literature. The literature reveals the role of knowledge in facilitating and enhancing organizational business process. KMS success depends upon the combination of technology, organizational culture and organizational context issues.

Barnes (2002) illustrates that business strategy is influenced by two elements within the resource-based view of the organization. The first element is organizational resource consisting of equipment, skills, patents and financial capital. Another element is organizational capabilities which utilizing the organizational resource according to organizational operation business process. The emergence of knowledge makes it a new element in resource-based perspective and the function of organizational capabilities is to manage the knowledge strategically (Barnes, 2002). The O perspective mainly looks at KM

research in the areas of the organizations capability in managing their knowledge resource. Barnes (2002) identifies three dimensions of focus for capabilities of organizations in managing their knowledge:

- i) Enhance performance – reduced problem-solving time, faster result, faster delivery-cycle time.
- ii) Increase collaboration – improved communication, increased staff participation.
- iii) Improve customer service- better service, more customer focus

He also classified knowledge as an organizational resource. In Table 4, forty-five studies on O perspective are summarized.

Table 4: KM Research: Organization Perspective

Research Concern	Knowledge Characteristic	
	Knowledge Classification	Without knowledge classification
Enhance Performance	(Berman et al, 2002);	(Almashari et al, 2002); (Carr, 1999); (Gold et al, 2001); (Hansen,2002); (Levin, 2000); (Levine, 2001); (Massey et al, 2002); (Purvis et al, 2001); (Pomerol et al, 2002); (Tsai, 2001)
Increase Collaboration	(Birkinshaw et al, 2002); (Brown & Duguid, 2000); (Carlie, 2002); (Inkpen & Dinur, 1998); (Kwok et al, 2002); (Takeishi, 2002)	(Almeida et al, 2002); (Bieber et al, 2002); (Cramton, 2001); (Larsson et al, 1998); (Okhuyen & Eisenhardt, 2002); (Schulz, 2001); (Shenkar & Jiatao Li, 1999); (Thomas et al, 2001)
Enhance Performance & Increase Collaboration	(Postrel, 2002)	(Lee, 2003); (Shenkar & Li, 1999); (Straub & Karahanna, 1998); (Tsai, 2002)
Enhance Performance & Improve customer Service	(Van den Bosch, 1999)	(Davenport & Glaser, 2002); (Shane, 2000)
Strategic Planning/ Theory	(Autio et al, 2002); (Cook & Brown, 1999); (Coff, 1999); (Fanelli & Hargadon, 2002); (Hansen et al, 1999)	(Adler, 2001); (Coff, 2003); (B rown & Duguid, 2001); (Deetz, 2000); (Earl, 2001); (King, 1999); (King, 2000); (Rivin, 2001); (Sharp, 2003)

In order to explore and exploit the potential value of knowledge as an organizational asset, it is important to identify and classify the organizational knowledge according to its function. Organizational knowledge is embedded in human resource, business activities and processes, and

organizational artifacts. From the research articles reviewed about organizations, many of them try to identify and classify knowledge from various perspectives including human resource, (Berman et al, 2002; Boland et al, 2001; Bosch et al, 1999; Brown & Duguid, 2001; Coff, 1999; Cook & Brown, 1999; Fanelli & Hargadon, 2002; Hansen et al, 1999; Inkpen & Dinur, 1998; Postrel, 2002; Shenkar & Jiatao Li, 1999) business activities (Bosch et al, 1999; Brown & Duguid, 2001; Carlie, 2002; Fanelli & Hargadon, 2002; Shane, 2002; Takeishi, 2002) and organizational artifacts (Birkinshaw et al, 2002; Bosch et al, 1999; Hansen, 1999). On the other hand, IS, IT and CS communities distinguish knowledge from data and information (Kwok et al, 2002). This approach helps organizations to strategize knowledge management influence in their business activities and functions to meet common goals.

There has been a growing interest in utilizing organizational knowledge to support business activities in gaining competitive advantage (Almashari et al, 2002; Berman et al, 2002; Gold et al, 2001). Therefore, organizational knowledge needs to be managed so that the precious knowledge value will be fully utilized by individuals, groups and units/functions within internal or internal organizations. In addition, other factors such as information technology and decision makers play a significant role in supporting knowledge management processes influenced by various business activities (Carr, 1999; Davenport & Glaser, 2002, Levine, 2001). The information technology capability is to generate four basic knowledge management processes in acquisition, sharing, and utilization across organization (Tiwana, 2002). Each of these processes is interrelated to each other to support KM in organizations. The most challenging part of an organization is to have strategic knowledge management strategy to facilitate knowledge management processes with support by information technology (King, 1999; King 2000). Another research concern in the O perspective is on knowledge-based theory (Adler, 2001; Autio et al, 2000; Brown & Duguid, 2000; Fanelli & Hargadon, 2002; Deetz, 2000). In addition, other research provide model, framework or review previous research example as strategic managerial concerns in exploring intellectual capital capabilities to enhance organizational performance (Cook & Brown, 1999; Coff, 1999; Coff, 2003; Hansen et al, 1999; Rivin, 2001; Sharp 2003).

Knowledge management function in enhancing organization performance focuses on business activities (Brown & Duguid, 2001; Shane, 2000; Almashari et al, 2002) and managerial function (Davenport & Glaser, 2002; Pomerol et al, 2002) in problem solving and delivery-cycle time. Other influencing factors to be considered include allocation of knowledge worker experience (Postrel, 2002; Berman et al, 2002; Hansen, 2002), and enabling technologies (Carr, 1999; Hansen, 2002; Purvis et al, 2001, Tsai, 2001) to support business activities. To achieve the desired result, management

strategy needs to align information technology support with the existing business tasks so that business performance will improve (Van den Bossch, 1999). In conclusion, organizational performance strategy requires harmonizing business tasks with technology support activities and organization learning (Almashari et al, 2002; Levin, 2000; Thomas et al, 2001; Postrel, 2002, Shenkar & Li, 1999) to understand the improvement of new business activities supported by technology capabilities.

Knowledge management sharing process is the dominant research issue because knowledge can gain its value when it can be shared by others and become organizational knowledge. Collaboration activities play a significant role to improve communication among staffs (Okhuysen & Eisenhardt, 2002; Postrel, 2002) from various knowledge foundation and multiple organization levels (Birkinshaw et al, 2002; Schulz, 2001). In addition, collaboration activities not only focus within inter-organizational levels (Larsson et al, 1998) but also intra-organizational level from dispersed geographical locations (Brown & Duguid, 2001) within the same country and across the border (Ameida et al, 2002; Cramton, 2001; Inkpen & Dinur; Thomas et al, 2001; Shenkar & Jiatao Li, 1999). These activities also include external business player knowledge (Takeishi, 2002) to collaborate with organizational knowledge. Organizations use collaborative technology tools to support knowledge sharing process (Straub & Karahanna, 1998).

3.3 Personal Perspective

Personal (P) perspective in KM is discussed by psychology and sociology researchers. The main concern is on human aspects that relate to attitude and behavior that influenced by environment and experience as well as the manager's role in facilitating KM process (Nonaka, 1991). This perspective is mainly employed by the psychology and social research community. Table 5 listed nine articles found to be within the P perspective.

Table 5: KM Research: Personal Perspective

Research Concern	Author
Attitude and behavior	(Boland Jr et al, 2001); (Changchit, 2003); (Drazin & Hayagreeva, 2002); Mao & Benbasat, 2000)
Leadership	(Kim & Mauborgne, 2003); (Osterloh & Frey, 2000); (Sutcliffe & Weber, 2003); (Swap et al, 2001); (Swap et al, 2001)

The Overall research issues concerning the P perspective reveal the managerial role to motivate knowledge sharing and learning experience. Managerial role seems to be significant aspects to motivate knowledge sharing culture within the organization. Managers need to provide various kind of motivation such as extensive and

intensive promotion of knowledge sharing (Osterloh & Frey, 2000; Swap et al, 2001). In addition, managers also need to regularly update competitive information of the uncertain changes in their business environment that influence managers to make business decisions (Kim & Mauborgne, 2003; Sutcliffe & Weber, 2003). There are also research concerns in staff learning experience from different types of knowledge (Boland Jr et al, 2001), sharing knowledge (Drazin & Hayagreeva, 2002) and using information technology to facilitate learning process (Changchit, 2003; Mao & Benbasat, 2000).

4.0 DISCUSSION

The majority of knowledge management research is approached within an O perspective. KM research highlights on how knowledge management serves as a weapon for competitive advantage, as well as an IS/IT strategy to improve organization performance. Other issues include exploitation of information technology to facilitate knowledge management sharing and to use knowledge strategically to achieve organizational goals. Few research in knowledge management is found to be within the P perspective. More KM research needs to concentrate on the softer issues within the P perspective.

5.0 REFERENCES

- Abou-Zeid, E. (2003)**, "What can ontologists learn from knowledge management?", *The Journal of Computer Information*, Vol. 43, Issue 3, p. 109-117.
- Alavi, M and Leidner, D. E. (1999)**, "Knowledge Management Systems: Emerging Views and Practices from the Field", *Communication of the AIS* (1:5) February.
- Alavi, M. and Leidner, D. E. (2001)**, "Knowledge Management And Knowledge Management Systems: Conceptual Foundations and Research Issues", *MIS Quarterly*, Vol. 25, No. 1, p. 107-136.
- Adler, P. S. (2001)**, "Market, Hierarchy, and Trust: The Knowledge Economy and the Future of Capitalism", *Organization Science*, Vol. 12, Issue 2, p. 215.
- Allard, S., and Holsapple, C. Y. (2002)**, "Knowledge management as a key for e-business competitiveness: From the knowledge chain to KM audits", *The Journal of Computer Information System*, Vol. 42, Issue 5; p. 19-25.
- Almashari, M., Zairi, M. and Alathari, A. (2002)**, "An Empirical Study of The Impact of Knowledge Management on Organizational Performance", *The Journal of Computer Information Systems*, 42, 5, p. 74-82.
- Almeida, P.; Song, J. and Grant, R. M. (2002)**, "Are Firms Superior to Alliances and Markets? An Empirical Test of Cross-Border Knowledge Building", *Organization Science*, Vol. 13, Issue 2, p. 147-161.
- Autio, E., Sapienza, H. J. and Almeida, J.G (2002)**, "Effects Of Age At Entry , Knowledge Intensity, And Imitability On International Growth", *Academy of Management Journal*, Vol. 43, Issue 5, p. 909-924.
- Becerra-Fernandez, I and Sabherwal, R. (2001)**, "Organization Knowledge Management: A Contingency Perspective", *Journal of Management Information Systems*, Vol. 18, Issue 1, p. 23-55.
- Berman, S.L.; Down, J., and Hill, C. W. L (2002)**, "Tacit Knowledge As A Source Of Competitive Advantage In The National Basketball Association", *Academy of Management Journal*, Vol. 45, Issue 1, p. 13-31.
- Bieber, M.; Engelbart, D.; Furuta, R.; Hiltz, S. R.; Noll, J.; Preece, J.; Stohr, E. A.; Turoff, M. and Van de Walle, B. (2002)**, "Toward Virtual Community Knowledge Evolution", *Journal of Management Information Systems*, Vol. 18, Issue 4, p. 11-36.
- Birkinshaw, J., Nobel, R. and Ridderstrale, J.(2002)**, "Knowledge as a Contingency Variable: Do the Characteristics of Knowledge Predict Organization Structure? ", *Organization Science*, Vol. 13, Issue 3, p. 274-289.
- Boland Jr, R. J.; Singh, J. ; Salipante, P.; Aram, J. D; Fay, S. Y and Kanawattanachai, P. (2001)**, "Knowledge Representations And Knowledge Transfer", *Academy of Management Journal*, Vol. 44, Issue 2, p. 393-419.
- Borghoff, U. M. and Pareschi, R. (1998)**, "Information Technology for Knowledge Management", *Springer-Verlag Berlin Heidelberg*.
- Bose, R. (2002)**, "Knowledge management capabilities & infrastructure for e-commerce", *The Journal of Computer Information Systems*, Vol. 42, Issue 5, p. 40-49.
- Bourdreau, A. and Couillard, G. (1999)**, "Systems Integration and Knowledge Management", *Information Systems Management*, Vol. 16 Issue 4, p. 24-32.
- Bowman, B. J. (2002)**, "Building Knowledge Management Systems", *Information Systems Management*, Vol. 19 Issue 3, p. 32-40.
- Brown, J. S. and Duguid, P. (2000)**, "Balancing Act: How to Capture Knowledge Without Killing It", *Harvard Business Review*, Vol. 78, Issue 3, p. 73-78.

- Brown, J. S. and Duguid, P. (2001)**, “Knowledge and Organization: A Social-Practice Perspective”, *Organization Science*, Vol. 12, Issue 2, p. 198-213.
- Carr, N. G. (1999)**, “A New Way to Manage Process Knowledge”, *Harvard Business Review*, Vol. 77, Issue 5, p. 24-25.
- Carlile, P. R. (2002)**, “A Pragmatic View of Knowledge and Boundaries: Boundary Objects in New Product Development”, *Organization Science*, Vol. 13, Issue 4, p. 442-455.
- Changchit, C (2003)**, “An investigation into the feasibility of using an internet-based intelligent system to facilitate knowledge transfer”, *The Journal of Computer Information Systems*, Vol. 43, Issue 4, p. 91-99.
- Chen, M. and Liou, Y. I. (2002)**, “Building a knowledge-enabled electronic commerce environment”, *The Journal of Computer Information Systems*, 2002. Vol. 42, Issue 5, p. 95-101.
- Choi, B. and Lee, H. (2002)**, “Knowledge Management Strategy and Its Link to Knowledge Creation Process”, *Expert Systems with Applications*, 23, p. 173-187.
- Chudnow, C, (2001)** , “ Knowledge Management Tools”, *Computer Technology Review*, Los Angeles, Vol. 21, Issue 11, p. 28-29.
- Coff, R. (2003)**, “Bidding Wars Over R&D-Intensive Firms: Knowledge, Opportunism, And The Market For Corporate Control”, *Academy of Management Journal*, Vol. 46, Issue 1, p. 74-85.
- Coff, R. W. (1999)**, “How buyers cope with uncertainty when acquiring firms in knowledge-intensive industries: Caveat Amptor”, *Organization Science*, Vol. 10, Issue 2, p. 144-161.
- Cohen, S. S. and Field, G, (1999)** , “Social Capital and Capital Gains in Silicon Valley”, *California Management Review*, Vol. 44, No. 2, pp. 108-130.
- Cole-Gomolski, B. (1997)**, “Users Loathe to Share Their know-how”, *Computerworld*, Vol. 31, No. 46.
- Coleman, D., Shapiro, R., (1992)**, “Defining Groupware. Special Advertising Section to Network World”, June 22, 1992.
- Cook, S. D.N.; Brown, J. S. (1999)**, “Bridging epistemologies: The generative dance between organizational knowledge and Organizational Knowing”, *Organization Science*, Vol. 10, Issue 4, p. 381-400.
- Cramton, C. D. (2001)**, “The Mutual Knowledge Problem and Its Consequences for Dispersed Collaboration”, *Organization Science*, Vol. 12, Issue 3, p. 346-371.
- Davenport, T. H. and Glaser, J. (2002)** , “Just-in-Time Delivery Comes to Knowledge Management”, *Harvard Business Review*, Vol. 80, Issue 7, p. 107-111.
- Davenport, T. H, and Prusak, L, (1998)** , “Working Knowledge: How Organizations Manage What They Know”, *Harvard Business School Press*, Boston/Massachusetts.
- Deetz, S. (2000)**, “Putting the Community into Organizational Science: Exploring the Construction of Knowledge Claims”, *Organization Science*, Vol. 11, Issue 6, p. 732-738.
- Drazin, R. and Rao, H. (2002)**, “Harnessing Managerial Knowledge To Implement Product-Line Extensions: How Do Mutual Fund Families Allocate Portfolio Managers To Old And New Funds? ”, *Academy of Management Journal*, Vol. 45, Issue 3, p. 609-619
- Earl, M. (2001)**, “Knowledge Management Strategies: Toward a Taxonomy”, *Journal of Management Information Systems*, Vol. 18, Issue 1, p. 215-233.
- Fanelli, A. and Hargadon, A. (2002)**, “Action and Possibility: Reconciling Dual Perspectives of Knowledge in Organizations”, *Organization Science*, Vol. 1,3 Issue 3, p. 290-302.
- Gartner Group**, in http://www.knowledge-portal.com/knowledge_management_technologies/gartner_group_perspective.htm
- Gold, A. H.; Malhotra, A.and Segars, A. H.(2001)** , “Knowledge Management: An Organizational Capabilities Perspective”, *Journal of Management Information Systems*, Vol. 18, Issue 1, p. 185-214.
- Gore, C., and Gore, E, (1999)**, “Knowledge Management: The Way Forward”, *Total Quality Management and Business Excellence*, Vol. 10, July, NOS 4&5, p. S554-S560.
- Gottschalk, P. and Khandelwal, V. K. (2002)**, “Inter-organizational knowledge management: A comparison of law firms in Norway and Australia”, *The Journal of Computer Information Systems*, Vol. 42, Issue 5, p. 50-58.
- Griggs, K. A.; Wild, R. H and Li, E. Y (2002)**, “A Web-based knowledge management environment for consulting and research organizations”, *The Journal of Computer Information Systems*. Vol. 42, Issue 5, p. 110-118.
- Hackbarth, G. and Grover, V. (1999)** , “The Knowledge Repository: Organizational Memory Information Systems”, *Information Systems Management*, Vol. 16 Issue 3, p21-30.

- Hansen, M. T. (2002)**, “Knowledge Networks: Explaining Effective Knowledge Sharing in Multiunit Companies”, *Organization Science*, Vol. 13, Issue 3, p. 232-248.
- Hansen, M. T., Nitin, N, and Tierney, T, (1999)**, “What’s Your Strategy for Managing Knowledge?” *Harvard Business Review*, March-April, p. 106-116.
- Hicks, R. C.; Dattero,R. and Galup, S. D. (2002/03)** , “A verification-based conflict resolution strategy for knowledge management systems”, *The Journal of Computer Information Systems*, Vol. 43, Issue 2, p. 36-41.
- Inkpen, A. C. and Dinur, A. (1998)**, “Knowledge Management Processes and International Joint Ventures”, *Organization Science*, Vol. 9, Issue 4, p. 454-468.
- Jones,B. L; Cramton,C. D.; Gauvin,S. and Scott, D. (1998)** , “Virtual learning enviroment: Preparing for the knowledge age work in the 21st century”, *The Journal of Computer Information Systems*, Vol. 38, Issue. 4, p. 1-8.
- Kanter, J. (1999)** , “Knowledge Management, Practically Speaking”, *Information Systems Management*, Vol. 16 Issue 4, p.7-15.
- Kim, W. C. and Mauborgne, R. (2003)**, “Fair Process: Managing in the Knowledge Economy”, *Harvard Business Review*, Vol. 81, Issue 1, p. 127-136.
- King, W. R. (2000)**, “Playing An Integral Role In Knowledge Management”, *Information Systems Management*, Vol. 17 Issue 4, p. 59-60.
- King, W. R. (1999)** , “Integrating Knowledge Management Into Is Strategy”, *Information Systems Management*, Fall99, Vol. 16 Issue 4, p. 70-72.
- Kocharekar, R. (2001)** , “K-Commerce: Knowledge-Based Commerce Architecture With Convergence Of E-Commerce And Knowledge Management”, *Information Systems Management*, Vol. 18, Issue 2, p. 30-35.
- Koenig, M and Ponzi, L, (2001)**, “Knowledge Management: Another Management Fads? Perhaps Rather More”, *Ph.D dissertation* ., Long Island University.
- Kwok, R. C-W; Ma, J. and Vogel, D. R.(2002)**, “Effects of Group Support Systems and Content Facilitation on Knowledge Acquisition”, *Journal of Management Information Systems*, Vol. 19, Issue 3, p. 185-229.
- Lai, H and Chu, T-H. (2002)**, “Knowledge management: A review of industrial cases”, *The Journal of Computer Information Systems*, Vol. 42, Issue 5, p. 26-39.
- Larsson, R; Bengtsson, L.; Henriksson, K. and Sparks, J. (1998)**, “The Interorganizational Learning Dilemma: Collective Knowledge Development in Strategic Alliances”, *Organization Science*, Vol. 9, Issue 3, p. 285-305.
- Lee, H. (2003)** , “Knowledge Management Enablers, Processes, and Organizational Performance: An Integrative View and Empirical Examination”, *Journal of Management Information Systems*, Vol. 20, Issue 1, p. 179-228.
- Levin, D. Z. (2000)**, “Organizational Learning and the Transfer of Knowledge: An Investigation of Quality Improvement”, *Organization Science*, Vol. 11, Issue 6, p. 630-647.
- Levine, L. (2001)**, “Integrating Knowledge And Processes In A Learning Organization”, *Information Systems Management*, Vol. 18 Issue 1, p. 21-33.
- Liebowitz, J. (2002)**, “Facilitating innovation through knowledge sharing: A look at the US Naval surface warfare center-cardrock division”, *The Journal of Computer Information Systems*, Vol. 42, Issue 5, p. 1-6.
- Lin, C.; Hung, H-C.; Wu, J-Y. and Lin, B (2002)** , “A knowledge management architecture in collaborative supply chain”, *The Journal of Computer Information Systems*, Vol. 42, Issue 5, p. 83-94.
- Mahapatra, R. K (1997/98)**, “Case-based reasoning: Extending the frontiers of knowledge-based systems”, *The Journal of Computer Information Systems*, Vol. 38, Issue 2, p. 87-94.
- Mamaghani, F. (2002)** , “Information Technology Knowledge Sharing Using Case-Based Reasoning”, *Information Systems Management*, Vol. 19, Issue 4, p. 13-20.
- Mark Xu, X. and Kaye, G. R. (2002)** , “Knowledge Workers For Information Support: Executive' Perceptions And Problems”, *Information Systems Management*, Vol. 19, Issue 1, p. 81-87.
- Markus, M. L. (2001)** , “Toward a Theory of Knowledge Reuse: Type of Knowledge Reuse Situations and Factors in Reuse Success”, *Journal of Management Information Systems*, Vol. 18, Issue 1, p. 57-93.
- Marwick, A. D, (2001)** , “ Knowledge Management Technology”, *IBM Systems Journal*, Vol. 40, No 4, 2001.
- Massey, A. P.; Montoya-Weiss, M. M. and O'Driscoll, T. M. (2002)** , “Performance-Centered Design of Knowledge-Intensive Processes”, *Journal of Management Information Systems*, Vol. 18, Issue 4, p. 37-58.
- Mao, J-Y and Benbasat, I. (2000)**, “The Use of Explanations in Knowledge-Based Systems: Cognitive

Perspective and a Process-Tracing Analysis”, *Journal of Management Information Systems*, Vol. 17, Issue 2, p. 153-179.

Misra, D.C.; Hariharan, R. and Khaneja, M. (2003), “E-Knowledge Management Framework For Government Organizations”, *Information Systems Management*, Vol. 20, Issue 2, p. 38-48.

Mitroff, I. I and Linstone, H. A. (1993) , “The Unbounded Mind: Breaking the Chains of Traditional Business Thinking”, *Oxford University Press*.

Moody, J. W., Blanton, J. E and Will, R. P. (1998/99) , “Capturing expertise from experts: The need to match knowledge elicitation techniques with expert system types”, *The Journal of Computer Information Systems*, Vol. 39, Issue 2, p. 89-95.

Nah, F.; Siau, K.; Tian, Y. and Ling, M. (2002), “Knowledge management mechanisms in e-commerce: A study of online retailing and auction sites”, *The Journal of Computer Information Systems*, Vol. 42, Issue 5, p. 119-128.

Nahapiet, J and Ghoshal, S. (1998), “Social Capital, Intellectual Capital, and the Organization Advantage”, *Academic of Management Review*, Vol. 23, No. 2, p. 242-266.

Nidumolu, S. R.; Subramani, M. and Aldrich, A. (2001) , “Situated Learning and the Situated Knowledge Web: Exploring the Ground Beneath Knowledge Management”, *Journal of Management Information Systems*, Vol. 18, Issue 1, p. 115-150.

Nissen, M. E. (2000/01), “An Experiment to Assess the Performance of a Redesign Knowledge System”, *Journal of Management Information Systems*, Vol. 17, Issue 3, p. 25-43.

Nonaka, I. (1991), “The Knowledge-Creating Company”, *Harvard Business Review*, pp. 96-104, Nov-Dec.

Nonaka, I. (1994), “ A Dynamic Theory of Organizational Knowledge Creation”, *Organization Science*, Vol. 5, No. 1, p. 14-37.

Nonaka, I and Takeuchi, H (1995), “ The Knowledge-Creating Company, How Japanese Companies Create the Dynamic of Innovation, Oxford University Press.

Okhuysen, G.A. and Eisenhardt, K. M. (2002), “ Integrating Knowledge in Groups: How Formal Interventions Enable Flexibility”, *Organization Science*, Vol. 13, Issue 4, p. 370-386.

Osterloh, M and Frey, B. S. (2000), “Motivation, Knowledge Transfer, and Organizational Forms”, *Organization Science*, Vol. 11, Issue 5, p. 538-550.

Pomerol, J-C; Brezillon, P. and Pasquier, L. (2002), “Operational Knowledge Representation for Practical Decision-Making”, *Journal of Management Information Systems*, Vol. 18, Issue 4, p. 101-116.

Postrel, S. (2002), “Islands of Shared Knowledge: Specialization and Mutual Understanding in Problem-Solving Teams”, *Organization Science*, Vol. 13, Issue 3, p. 303-320.

Purvis, R. L.; Sambamurthy, V. and Zmud, R. W (2001), “The Assimilation of Knowledge Platforms in Organizations: An Empirical Investigation”, *Organization Science*, Vol. 12, Issue 2, p. 117-136.

Rivkin, J. W. (2001), “Reproducing Knowledge: Replication Without Imitation at Moderate Complexity”, *Organization Science*, Vol. 12, Issue 3, p. 274-293.

Ryan, S. D and Prybuto, V. R. (2001), “Factors affecting the adoption of knowledge management technologies: A discriminative approach”, *The Journal of Computer Information Systems*, Summer 2001. Vol. 41, Issue 4, p. 31-37.

Samiotis, K. and Poulymenakou, A. (2002) , “Knowledge management in e-banking: A competence-based perspective”, *The Journal of Computer Information Systems*, Vol. 42, Issue 5, p. 102-109.

Schulz, M (2001), “ The Uncertain Relevance Of Newness: Organizational Learning And Knowledge Flows”, *Academy of Management Journal*, Vol. 44, Issue 4, p. 661-681.

Shaft, T. M. and Vessey, I. (1998), “The Relevance Of Application Domain Knowledge: Characterizing The Computer Program Comprehension Process”, *Journal of Management Information Systems*, Vol. 15, Issue 1, p. 51-78.

Sharp, D. (2003) , “Knowledge Management Today: Challenges And Opportunities”, *Information Systems Management*, Vol. 20, Issue 2, p. 32-37.

Shane, S. (2000), “Prior Knowledge and the Discovery of Entrepreneurial Opportunities”, *Organization Science*, Vol. 11, Issue 4, p. 448-469.

Shenkar, O and Jiatao Li. (1999), “Knowledge search in international cooperative ventures”, *Organization Science*, Vol. 10, Issue 2, p. 134-143.

Song, S (2002), “An Internet knowledge sharing system”, *The Journal of Computer Information Systems*, Vol. 42, Issue 3, p. 25-30.

- Soo, C, Devinney, T, Midgley, D, Deering, A, (2000)**, “Knowledge Management: Philosophy, Processes and Pitfalls”, *California Management Review*, Vol. 44, No. 4, p. 129-150.
- Stenmark, D. (2000/01)**, “Leveraging Tacit Organization Knowledge”, *Journal of Management Information Systems*, Vol. 17, Issue 3, p. 9-24.
- Straub, D and Karahanna, E. (1998)**, “Knowledge Worker Communications and Recipient Availability: Toward a Task Closure Explanation of Media Choice”, *Organization Science*, Vol. 9, Issue 2, p. 160-175.
- Su, C. T; Hsu,H-H. and Tsa, C-H (2002)** , “Knowledge mining from trained neural networks”, *The Journal of Computer Information Systems*, Vol. 42, Issue 4, p. 61-70.
- Sugumaran,V. (2002)**, “An agent-based knowledge management framework for the e-commerce environment”, *The Journal of Computer Information Systems*, Vol. 42, Issue 5; p. 63-73.
- Sutcliffe, K. M. and Weber, K. (2003)**, “The High Cost of Accurate Knowledge”, *Harvard Business Review*, Vol. 81, Issue 5, p. 74-82.
- Swap, W.; Leonard, D.; Shields, M. and Abrams, L. (2001)** , “Using Mentoring and Storytelling to Transfer Knowledge in the Workplace”, *Journal of Management Information Systems*, Vol. 18, Issue 1, p. 95-114.
- Swartz, N, (2003)**, “The ‘Wonder Years’ of Knowledge Management”, *The Information Management Journal*, May-June, pp. 53-57.
- Takeishi, A. (2002)**, “Knowledge Partitioning in the Interfirm Division of Labor: The Case of Automotive Product Development”, *Organization Science*, Vol. 13, Issue 3, p. 321-338.
- Thomas, J. B.; Sussman, S. W. and Henderson, J. C. (2001)**, “Understanding ‘Strategic Learning’: Linking Organizational Learning, Knowledge Management, and Sensemaking”, *Organization Science*, Vol. 12, Issue 3, p. 331-345.
- Tiwana, A (2002)**, “The Knowledge Management Toolkit: Orchestrating IT, Strategy and Knowledge Platforms, (2nd Ed)”, Prentice Hall.
- Tsai, W. (2001)**, “Knowledge Transfer In Intraorganizational Networks: Effects Of Network Position And Absorptive Capacity On Business Unit Innovation And Performance”, *Academy of Management Journal*, Vol. 44, Issue 5, p. 996-1004.
- Tsai, W. (2002)**, “Social Structure of 'Coopetition' Within a Multiunit Organization: Coordination, Competition, and Intraorganizational Knowledge Sharing”, *Organization Science*, Vol. 13, Issue 2, p. 179-191.
- Tuomi, I. (1999/00)**, “Data Is More Than Knowledge: Implications of the Reversed Knowledge Hierarchy for Knowledge Management and Organizational Memory”, *Journal of Management Information Systems*, Winter99/2000, Vol. 16, Issue 3, p. 103-117.
- Vail III, E. F. (1999)**, “Knowledge Mapping: Getting Started With Knowledge Management”, *Information Systems Management*, Vol. 16 Issue 4, p. 16-23.
- Van den Bosch, F A.J.and Volberda, H. W. (1999)**, “Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and Combinative Capabilities”, *Organization Science*, Vol. 10, Issue 5, p. 551-568.
- Van den Hoven, J. (2001)**, “Information Resource Management: Foundation For Knowledge Management”, *Information Systems Management*, Vol. 18 Issue 2, p. 80-83.
- Whitten, D and Stephens, C. (2002)**, “A meta-analysis of emerging infomediary knowledge management systems: An expert systems application in the e-tailing environment”, *The Journal of Computer Information Systems*, Vol. 43, Issue 1, p. 48-54.
- Yoon, Y. (1999)** , “Discovering Knowledge in Corporate Databases.”, *Information Systems Management*, Vol. 16 Issue 2, p64-72.
- Zahir, S. (2002)**, “Designing a knowledge-based interface for intelligent shopping agents”, *The Journal of Computer Information Systems*, Vol. 43, Issue 1, p. 31-41

