Association for Information Systems
AIS Electronic Library (AISeL)

AMCIS 1999 Proceedings

Americas Conference on Information Systems (AMCIS)

December 1999

How are Knowledge Management Systems Different from Information Systems,and Who Cares?

Molly McLure-Wasko
University of Maryland at College Park

How are Knowledge Management Systems Different from Information Systems, and Who Cares?

Molly McLure Wasko email: mmclure@rhsmith.umd.edu

Abstract:

Knowledge has long been identified as a key resource for organizations. Due to recent technological convergence and cost reductions, information and communication technologies (ICT) have renewed focus on organizational knowledge assets and how to manage them. Knowledge management systems (ICT systems that capture, store and distribute the knowledge of the firm) have been popularized in the national press, and consulting firms are racing to market technical knowledge solutions to their clients. However, what is the difference between a knowledge management system and a traditional information system, and does this distinction matter? The purpose of this paper is to clearly delineate the similarities and differences between these systems, and I argue that in fact, the distinctions are critical to both the performance of the knowledge management system as well as the success of the organization.

Introduction:

How can organizations improve the quality of products and services, develop and promote new products and services, and at the same time, improve the efficiency of the organization? Anyone keeping up with the current trade press knows that these key factors leading to organizational success stem from improved knowledge management. Advanced information and communication technologies, in the form of knowledge management systems (KMS) are touted as the key to effective organizational knowledge management. However, the underlying dimensions of *how* to effectively manage knowledge and transform knowledge into actionable outcomes using KMS are critical questions both practitioners and researchers are currently facing.

To date, researchers have not clearly defined the basic terms such as: what is organizational knowledge, what are organizational knowledge management systems, and how do these systems differ from traditional information systems. This paper examines these questions, and proposes that there are fundamental distinctions critical to understanding KMS relating to organizational success. In addition, the paper proposes a preliminary framework that highlights the expected outcomes and critical underlying components of a successful knowledge management system.

What is Knowledge:

I adopt the definition of knowledge used by Grant (1996), or "that which is known". The critical feature of knowledge for organizations is not so much its definition , rather understanding where the knowledge resides. I support the view that knowledge is embedded within individuals, and only individuals are capable of storing and creating knowledge. Organizational knowledge is simply the sum of the knowledge held by the individuals of the firm. Individual knowledge can be unique, knowledge may overlap between individuals (explaining why if one person leaves the company, all of their knowledge is not forgotten by the firm), and knowledge may be common across all individuals (Grant, 1996). Therefore, there are basically two ways to increase organizational knowledge: by the learning of its members, or by adding new members to the firm that bring in new knowledge that the firm did not already have (Simon, 1991).

Once a person "knows" something, they are able to apply their knowledge and perform action. Actions often result in the codification of that person's knowledge. Of course there are two characteristics of knowledge, tacit and explicit (Polanyi, 1962), that impact a person's ability to codify and express their personal knowledge. Codification does not have to be written but also occurs when people articulate verbally, create a product (through action), develop software, or write something down. Once knowledge is codified and separated from the individual, the knowledge becomes information. Only when another individual is able to absorb the information in their own mind, does the information become knowledge again. When this happens, the knowledge doubles (and also has the potential to expand across individuals exponentially). The underlying process requires that knowledge transfer occur through information. Therefore, codified knowledge becomes a critical asset to the firm since once generated, it can be used an infinite number of times, and potentially increases in value the more it is used.

Knowledge Management Systems:

If knowledge only resides in individuals and is transferred through information, what is the difference between and KMS and a traditional information system? I define a traditional information system as ICT that handles the information generated by processes in the value chain. Typical examples are: EDI, ERP systems, on-site scanning devices and data warehousing, financial systems, etc. First, KMS and IS systems are similar in many ways. They capture, store, process and make information available to anyone with access to the network. In addition, both systems are aimed at improving firm performance through operational efficiency and service quality, and both deliver

information that has the potential to uncover opportunities for new products and services.

Alavi and Leidner (1999) define KMS as "information systems designed specifically to facilitate the sharing and integration of knowledge". I agree with this definition and its emphasis on knowledge sharing and integration as a means for learning and new knowledge creation. However, the goal of most information systems is to facilitate the sharing and integration of information. I would add the emphasis that knowledge sharing and integration through an information system depends upon the *codification* of individual knowledge. The fundamental and critical difference between a KMS and an information system is the ownership of the information. IS applications are used to handle information typically considered to be owned by the organization (inventory, production, billing etc.). A KMS, by design, handles information that is owned by the individuals of the organization. Organizations want to have personal, valuable knowledge (an individual asset) codified and available in a KMS (an organizational asset). Once codified in the KMS, individual knowledge can be leveraged throughout the entire firm, regardless of time, space, geographic and storage constraints.

Individuals have always created and maintained their own, personal knowledge management systems. When faced with uncertainty and ambiguity, people seek out knowledgeable others for help. People generally share knowledge with people they know, people they like, and people who are in close proximity. Studies have consistently found that knowledge sharing is positively related to factors such as: co-location (Allen, 1984; Kraut, Egido et al., 1990), demographic similarity (Pelled, 1996), status similarity (Cohen and Zhou, 1991), and a history of prior relationship (Krackhardt, 1992). Nahapiet and Ghoshal (1998) propose that social capital is a critical dimension underlying new knowledge creation. Their model of social capital includes: motivations for sharing, anticipating value from the exchange, trust, obligation, norms, and identification. Therefore, knowledge sharing is typically embedded in complex social relationships.

Implications for KMS Success:

Organizations are interested in KMS for one reason: increased profitability. This is achievable through increased customer satisfaction, increased efficiency, decreased operating costs, and providing new products and services to new markets. These impacts are realized through individual actions within the firm. Therefore, individuals must improve their efficiency, increase the quality of their work, and generate/implement new ideas and innovations. In order for individuals to change their action repertoire, new knowledge must be created (i.e. individuals must learn). This is the point where the KMS and individuals interface in a way that has the potential to create value, in the form of new intellectual capital.

Intellectual capital is the knowledge base held by an individual. New intellectual capital is created when new knowledge is created (knowledge not known by any other individual), when knowledge is combined across organizational functions (such as development of a new product), and when an individual learns (ability to perform a new task, or finds a better way to perform an existing task).

The act of creating new intellectual capital is accomplished through the combination and exchange of existing knowledge. The role of the KMS is to provide the information conveying existing knowledge to individuals throughout the organization. When this information is integrated into another individual's mental model, new intellectual capital is created.

There are two ways that a KMS can organize information and promote combination and exchange, and both are critical to the creation of new intellectual capital. These are: the generation of knowledge flows which enhance the development of new ideas, and the storage of knowledge stocks which provide the research capability needed for learning. Knowledge flows enable individuals to access experts quickly and efficiently when they have a question, and promote discussion between experts when answers are not readily available. This can be accomplished through e-mail, if the expert is known, or through on-line discussion groups. Discussion groups are advantageous because the experts do not have to be identified individually (recognizing that all individuals may potentially provide critical input), they provide discussion and collaborative capability, and they create an electronic record of the conversations.

The second functionality provides individuals with access to knowledge stocks such as current best practices of the firm, stored in a database. When faced with uncertainty on how to complete a task, individuals need to be able to access a library/electronic resource to research how the task has been handled in other areas of the organization. Knowledge stocks improve efficiency by decreasing redundancy such as "reinventing the wheel". However, a KMS is useless if people do not actively codify and share their knowledge with others electronically. In order to be effective, a KMS depends upon *usage*.

Given the complex motivational and social relationships underlying knowledge exchange, implementing a KMS will be fundamentally different from other IS applications. The Technology Acceptance Model (based on the seminal work of Davis, Bagozzi et al. (1989), has identified two characteristics critical in

predicting usage of an IS: ease of use and usefulness. These factors will continue to be critical in a KMS. People typically "satisfice" when searching for information, and take what is readily available over the highest quality (March and Simon, 1993). Therefore, a KMS must be integrated seamlessly and efficiently into current organizational processes.

However, in addition to system characteristics, environmental and social factors also play a key role in determining usage. These are: personal characteristics, motivation factors (inlcuding reputation), and the development of social capital. The environmental factors are critical determinants of whether people will codify their valuable, personal knowledge and make it readily available to all within the organization.

A last critical factor underlying the usage of a KMS, which is often overlooked, is the availability of slack combined with focused attention. Individuals must have the time to participate and assimilate new information. There must be time allocated to access and add to the system, to participate in discussions and answer questions, and to reflect on what is gleaned from the information flows. In conjunction with slack, though, is the necessity to use slack time towards productive outcomes through focused attention. Attention is the key to understanding the intellectual capital *capability* of individuals (absorptive capacity). Just like knowledge, attention is an asset that is wholly owned by the individual, and there are many ways in which individuals use this asset at work (thinking about their marriage, their babysitter, the big game on Friday, or completing the project for the customer). Balancing the need for slack while competing for individual attention will have important implications for the success of a KMS.

Conclusion:

There is a fundamental difference between KMS and traditional information systems, and the difference is the perception of who owns the information. In a traditional IS, most view the information as belonging to the organization. However, a KMS requires that individuals codify their personal knowledge, belonging to them, and make it accessible to others. Why should we care? In order to successfully implement a KMS, organizations must realize this difference has tremendous implications. While both must be easy to use and be useful, a KMS depends on what is outside the system as well. There are personal, organizational, and social factors (which are not simple to manage) that must be considered when designing, implementing and managing a KMS.

Alavi, M., and Leidner, D. Knowledge management systems: Issues, challenges and benefits. *Communication of the Association for Information Systems*, 1, (1999), 1-28.

Allen, T. J. (1984). Managing the Flow of Technology. Cambridge, MA, MIT Press.

Cohen, B. P. and X. Zhou (1991). "Status processes in enduring work groups." American Sociological Review **56**(179-188).

Davis, F. D., R. P. Bagozzi, et al. (1989). "User acceptance of computer technology: A comparison of two theoretical models." Management Science **35**: 982-1002.

Grant, R. M. (1996). "Toward a knowledge-based theory of the firm." Strategic Management Journal **17**(Special Issue): 109-122.

Krackhardt, D. (1992). The strength of strong ties: The importance of philos in organizations. Organizations and networks: Structure, form, and action. N. Nohria and R. Eccles. Boston, Harvard Business School Press**:** 216-239.

Kraut, R. E., C. Egido, et al. (1990). Patterns of contact and communication in scientific research collaboration. Intellectual Teamwork. J. Galagher, R. E. Kraut and C. Egido. Hillsdale, NJ, Lawrence Erlbaum Associates.

March, J. G. and H. A. Simon (1993). Organizations. Cambridge, MA, Blackwell.

Pelled, L. H. (1996). "Demographic diversity, conflict, and work group outcomes: An intervening process theory." Organization Science **7**: 615-631.

.Polanyi, M. *Personal Knowledge: Towards a Post-Critical Philosophy*. New York: Harper & Row, 1962

Simon, H. A. (1991). "Bounded rationality and organizational learning." Organization Science **2**: 125-134.