Impact of Knowledge Management Strategy on Organizational Learning: A Simulation Study

Aditi Mukherjee
Purdue University

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Abstract:
This study examines the relationship between an organization’s knowledge management strategy and its learning culture and environment. Knowledge management strategies are often perceived as technological solutions; however, their effectiveness is the outcome of how effectively the behavioral changes that these strategies pertain are brought about. The first part of this study aims at identifying the learning cultures that are most conducive to the acquisition and sharing of both tacit and explicit knowledge. The second part of this study focuses on implementing incentive mechanisms within the organization that induce the optimal learning behaviors identified in the first part of the study. March’s (1991) model for organizational learning is employed in the context of knowledge management systems (KMS) to analyze the effectiveness of the various knowledge management strategies in different organizational settings.

Keywords: Knowledge Management, Organization Learning, Simulations

Introduction
Today’s competitive business environment requires firms to develop innovative products and services on faster cycle times. This has led to a gradual replacement of capital and labor intensive firms by knowledge intensive firms (Starbuck 1992), where knowledge is a strategic asset. Consequently, organizations are increasingly adopting knowledge management systems (KMS) to effectively manage knowledge within the organization (Davenport and Prusak 1998). However, many knowledge management initiatives result in less than desirable outcomes (Fahey and Prusak 1998; McDermott 1999). The success of a KMS implementation within an organization largely depends on how well it fits with the organization’s culture, how effective it is in capturing the knowledge that is essential to the organization’s operations and the nature of this knowledge. While existing research has addressed vital issues
pertaining to the functions and implementations of KMS (Alavi and Leidner 2001), the effectiveness of a KMS in a particular environment in optimizing these function calls for deeper investigation. Our lack of understanding of the relationship between the characteristics of a KMS, the organization’s knowledge culture and external environment contributes to the varying levels of the success of knowledge management strategies employed in different organizational settings.

Organizations can realize performance benefits in the competitive marketplace by leveraging its ability to learn and transfer knowledge (Senge 1990; Slocum and McGill 1994). There are two ways in which an organization may approach this objective. First, given an organizational context (i.e., environmental condition and organization learning culture), the firm may choose the most appropriate knowledge management strategy and system. Second, given a knowledge management strategy and system already in place, an organization may create (or change) its knowledge culture so that the KMS is effective. In either case, we need to understand the relationship between the KMS, the organization and the environment. The purpose of this research is to explore the relationship between knowledge management strategies and systems on organizational effectiveness. Naturally, these effects will be moderated by organizational culture and environmental context. We also seek to identify incentive mechanisms for different knowledge management strategies that can induce the optimal acquisition, dissemination and sharing of knowledge within organizations. Ultimately we seek to understand the organizational and environmental conditions under which various knowledge management strategies and systems will be most effective.

In the first part of this study, we conduct an exploratory analysis of the relationship between different knowledge management strategies and the learning culture of an organization. In the second part of this study, the results of the exploratory analysis are applied to study the effectiveness of various incentive mechanisms for different KMS with respect to the long- and short-term knowledge levels of the knowledge workers and the organization in the presence of environmental and organizational dynamism.

We focus on the two primary knowledge management strategies, namely codification and personalization (Hansen et al. 1999) and compare their effectiveness in terms of knowledge acquisition at the individual and the organization level. The extension of March’s (1991) model of organizational learning by Miller et al. (2006) is used as the base model to instantiate the implementations of the codification and personalization knowledge management strategies in the first part of the study. We further extend this model to incorporate the cost element to incorporate incentive mechanisms in addition to the implementation of the KMS in the second part of the study. This model is
employed in the mathematical simulations to compare the performances of the various KMS and the effectiveness of incentive mechanisms for the different KMS in the long term and the short term.

**Codification Strategy**

The process of codifying explicit knowledge by individuals and storing it in repositories, from where it can be accessed, applied and reused by all members of the organization is codification. The codification process can be either continuous, as part of each individual’s primary job function, or episodic wherein knowledge is codified periodically. Furthermore, organizations can choose to update their knowledge repositories with knowledge of all the individuals or with the knowledge of the best performing individuals in the organization only.

The results of the simulations indicate that when the organization’s knowledge repositories are updated by all the individuals in the organization, the knowledge acquired by the organization is significantly lower in the long term than when only the superior performing individuals update the knowledge repositories. Episodic updating of the knowledge repositories also leads to higher longer term knowledge levels of the organization and its members than continuous updating of the knowledge repositories. When the codification process is concurrent with interpersonal learning, individuals augment their knowledge by learning from each other and this knowledge is then codified. Consequently, when the knowledge repositories are updated less frequently, they are updated with superior knowledge, leading to better long term knowledge levels of the repositories and the individuals. Therefore, while it may be cheaper for an organization to invest in extensive knowledge capture and storage technologies and integrate the updating of the knowledge repositories into the work flow of the organizations, it is more beneficial in the long term to invest in filtering mechanisms and control what knowledge is actually stored in the knowledge repositories.

**Personalization Strategies**

Personalization strategies, on the other hand, provide means of identifying individuals who possess knowledge and provide a medium for communicating both explicit and tacit knowledge directly between individuals rather than storing it in knowledge repositories. Individuals typically work and interact within small networks, and share knowledge within these networks (or local neighborhoods or searches) and seek out knowledge outside these networks (or perform distant searches) when it is unavailable within the local neighborhoods. Personalization strategies aim at increasing the size of the local neighborhoods (by allowing individuals to perform local and distant searches simultaneously) as well as increasing the scope and effectiveness of distant searches.
The simulation results indicate that performing local and distant searches simultaneously has a detrimental impact on the knowledge levels of the individuals in the long term, but is beneficial in the short term. On the other hand, increasing the scope and effectiveness of distant searches (when local and distant searches are performed sequentially) leads to higher levels of knowledge of the individuals in the long term and lower levels in the short term. The implications of these results are that implementing highly efficient personnel directories that reduce the cost and effort to locate experts result in high short term gains but are inefficient for knowledge acquisition in the long term.

When we compare the effectiveness of the codification and personalization strategies, we find that personalization strategies lead to higher levels of knowledge of the individuals in the long term that the codification strategies. However, with the exclusive implementation of the personalization strategies, the knowledge resides with the individuals and the organization is unable to retain knowledge in the presence of employee turnover. Codification strategies, on the other hand, are able to facilitate the retention and transfer of explicit knowledge alone as there is no systematic approach for the transfer of tacit knowledge among individuals in the organization.

Incentive Mechanisms

The second part of this study will focus on the design and analysis of the performance of incentive mechanisms implemented by organizations in order to optimize the functions of the KMS. By identifying the most favorable conditions for the KMS described above, we will design appropriate incentive mechanisms that replicate these conditions in other organizational settings.

In order to incorporate the implementation of incentive mechanisms into the above model, we propose to introduce a cost element into the model. Incentive mechanisms imply a certain remuneration structure to encourage individuals to share their knowledge, either with other individuals directly or by contributing to the knowledge repositories, or both. For example, if the organization wants to increase member contributions to the codification process while limiting interpersonal interactions, it can structure the remuneration system such that the individuals’ perceived benefit from contributing to the code is higher than their perceived benefit from sharing knowledge directly with another individual. Additional considerations also have to be made to ensure that the incentive mechanism is not lucrative enough to cannibalize the individual’s primary tasks.

Therefore, an individual’s decision to share his knowledge will be moderated by the perceived benefits entailed by the incentive mechanisms. By including this decision process into the model of organizational learning,
we will be able to observe the impact of implementing different incentive mechanisms for the various KMS outlined above on the long term and short term knowledge levels of the individuals and the organization. In the final analysis we will also be able investigate the tradeoffs between the costs of implementing these incentive mechanisms and the marginal improvement in the organization wide knowledge acquisition and sharing behaviors.

Expected Contributions

The two studies outlined above will add to the understanding of how different knowledge management strategies alter the organizational learning patterns and how these behaviors can be manipulated by implementing incentive mechanisms. In addition to developing insights into the effectiveness of KMS in different organization environments we also add to the understanding of the learning behaviors of individuals in the presence of such systems. Furthermore, we will be able to identify the tradeoffs that have to be considered when an organization considers implementing a KMS and its corresponding incentive mechanisms.

References