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MEASURING KNOWLEDGE MANAGEMENT EFFECTIVENESS: A TASK-CONTINGENT ORGANIZATIONAL CAPABILITIES PERSPECTIVE

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Abstract

Since the declaration of the information economy (Toffler 1990, Drucker 1993) there has been a rush to develop theory to explain how information is captured, stored, accessed, transferred and applied in organizations. Another goal has been to quantify the results of organizational efforts to manage knowledge. Two recent theories have been developed to explain the processes of knowledge management in organizations. Gold, et al. (2001) introduced a theory relating organizational effectiveness with two necessary capabilities; knowledge infrastructure capability and knowledge process capability. Becerra-Fernandez and Sabherwal (2001) have developed theory relating knowledge management processes and knowledge management satisfaction in a task-contingent manner. This research in progress presents the next step in development of these theories by combining the perspectives of both. In addition, this research in progress lays the groundwork for an instrument to measure knowledge management effectiveness in organizations based on the balanced scorecard (Kaplan and Norton 1992).

Keywords: Knowledge management effectiveness, organizational effectiveness, balanced scorecard

Purpose of Research

The theory presented here unites two independent theories into a single, task-contingent organizational capabilities perspective. Additionally, it is proposed that the outcome, knowledge management effectiveness, should be measured based on the four dimensions of organizational effectiveness addressed by the balanced scorecard: customer satisfaction/loyalty, internal business processes, learning and growth, and financial performance. (Kaplan and Norton 1992)

Theory Evaluation

Assumptions for Both Theories

Both theories assume an organization can obtain gains from specialization, and specialization requires knowledge acquisition, storage, and transfer. Thus, organizational capabilities can be viewed as the outcome of knowledge integration. In this framework, the purpose of the organization is to create conditions under which multiple individuals can integrate their specialist knowledge, or to become what Grant (1996) refers to as a “knowledge integrating institution.”

Spender and Grant (1996) suggest that the key to synthesis lies in understanding the relationship between abstract knowledge and individual and organizational practices. The power of this suggestion is that it implies that the concept of knowledge can remain abstract while the knowledge practices are evaluated. This shifts the focus of study away from knowledge and to the *relationship* between knowledge and practice, and this focus becomes the context for researching knowledge management.

The organization is structured to achieve coordination and collaboration, but effective coordination is problematic due to interdependencies. As coordination and cooperation occur, individuals add to their knowledge, and the processes of converting inputs to outputs become more efficient. In this manner, the firm creates knowledge that is stored and applied within the firm, and the ability to further apply this knowledge is the goal of organizational learning.

The underlying theories will be presented individually and followed by the presentation of the combined theory.

Organizational Capabilities Perspective

Description

As stated by the authors, “the quest to move beyond information management and into the realm of knowledge management is a complex undertaking involving the development of structures that allow the firm to recognize, create, transform, and distribute knowledge.” (Gold, et al. 2001 p. 186). Thus, the focus of their research has been those organizational structures that are critical to knowledge processes. They seek to aid the study of the success or failure of knowledge management within organizations by providing definitional and empirical context for assessing organizational knowledge management capabilities.

Conceptual Level

There are two fundamental independent concepts underlying this theory: social capital and knowledge integration. A more thorough review of the social capital literature has been provided by Nahapiet and Ghoshal (1998). Social capital theory recognizes the value of networks of relationships in conducting social affairs. These networks become a resource for social action, and in the knowledge management context, the network of relationships is where the “collective” knowledge is stored. The authors define social capital as “the sum of actual and potential resources embedded within, available through, and derived from the network relationships possessed by a social unit.” This is a fundamental independent concept because new knowledge is created through combination and exchange (Polanyi 1966), and both require the existence of social capital.

The other independent concept is knowledge integration. A great deal of research has been conducted in an attempt to determine how organizations manage knowledge. Many key processes of knowledge management have been identified. Most studies evaluate varying combinations of the following knowledge activities: create, use, exploit, assemble, experiment, capture, transfer, acquire, collaborate, and integrate (DeLong 1997, Leonard 1995, Ivers 1998, Skyrme 1998, Spender 1996, Teece 1998). The common element is that successful knowledge management requires that the process be integrated into the organization.

The dependent concept in this framework is knowledge management success. This concept is not clearly defined by the authors. Instead, they point out that the field as a whole is struggling to define “effectiveness.”

It is predicted that knowledge management success requires both social capital and knowledge integration. No other concepts, such as knowledge, organizational structure, or organizational purpose are postulated to influence knowledge management success. In addition, the boundary of the theory is not defined, but through inference is determined to be an organization or a unit within an organization.

Construct level

Each of the concepts is represented by construct that closely approximates it. The model is provided in Figure 1. Social capital (network of relationships) is represented by the knowledge infrastructure capability. Knowledge integration is represented by knowledge process capability, and knowledge management success is represented by organizational effectiveness.

Knowledge infrastructure capability is operationalized through three dimensions: Technology, Structure, and Culture. Technology provides the network, structure provides the relationship, and culture provides a shared context. Thus, the combination of these dimensions provides an excellent match between the construct and the concept.

Knowledge process capability is operationalized through four dimensions: Acquisition, Conversion, Application, and Protection. These dimensions were chosen because they comprise the minimum set that cover all of the knowledge process activities

investigated in exploration of the concept. Acquisition comprises all of the management processes oriented toward obtaining knowledge. Conversion is necessary to illustrate that existing knowledge must be made available. Application recognizes that knowledge must be useful. Protection has not been frequently studied, but must be included to signify the extreme importance knowledge holds with regard to the competitive advantage of a firm. Thus, the match between the operationalization of this construct and the concept is also very good.

The outcome construct, organizational effectiveness, has the weakest relationship to its concept, knowledge management effectiveness. This is partially due to the ambiguous definition of the concept, but more importantly due to the implicit assumption that knowledge management effectiveness and organizational effectiveness represent the same thing. The match would be very good for companies that consider themselves “knowledge companies,” but may suffer significantly if a company has a pure production orientation.

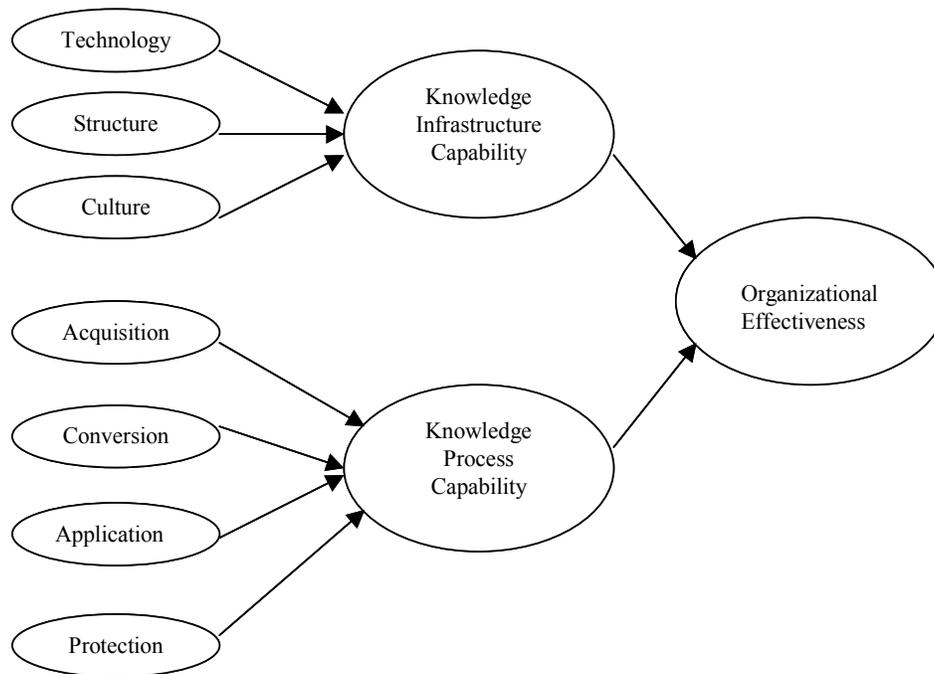


Figure 1. Organizational Capabilities Perspective Constructs
Source: Gold, Malhotra, and Segars (2001)

A Contingency Perspective

Description

Becerra-Fernandez and Sabherwal (2001) claim to diverge from nearly all other perspectives on knowledge management by proposing that the effectiveness of a knowledge management process is dependent upon the context for use of that knowledge. By showing that task characteristics moderate the outcome of knowledge processes, they establish incentive for an organization's management to determine which processes best fit the particular tasks within their unit, and then structure the organization for maximum benefit. This theory is extremely simple; its major contribution is that it creates an awareness of the possible necessity for a contingency-based theory.

Conceptual Level

There are two fundamental concepts to underlying this theory, knowledge sharing and task characteristics. In this theory, which is based on the concept of the collective mind, knowledge sharing is the critical activity. The collective mind is postulated to exist only due to human action. Weick and Roberts (1993) stated, “We conceptualize mind as action that constructs mental processes.” Those mental processes result specifically in knowledge sharing, which reinforces the collective mind.

Task characteristics are conceptualized to moderate the knowledge sharing process. This concept is derived from organizational structure research and acknowledges that the organization is composed of individuals and units with specialized skills and processes. This specialization requires that units perform specialized tasks, and do so using a variety of processes. To more effectively manage the knowledge used and produced by a unit within the organization, it is postulated that specialization of knowledge processes is necessary.

The outcome concept in this framework is knowledge management satisfaction. At a conceptual level, the theory postulates that task characteristics moderate the relationship between knowledge sharing and knowledge management satisfaction.

Construct Level

The model for the theory is presented in Figure 2. It states simply that the relationship between knowledge management processes and knowledge management satisfaction is moderated by the characteristics of the tasks performed by the unit. That is, implementation of processes that suit the tasks performed by the unit will provide more knowledge management satisfaction than implementation of those that don't.

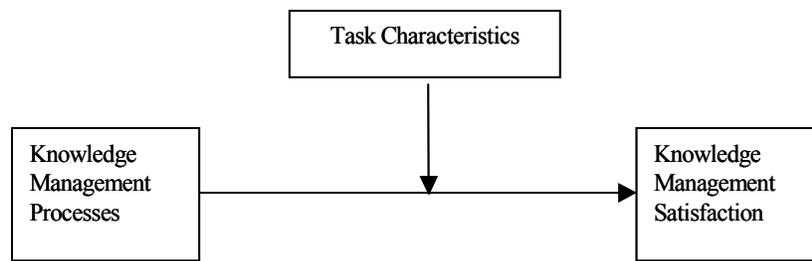


Figure 2. Contingency Perspective Constructs
Source: Becerra-Fernandez and Sabherwal (2001)

The operationalization of task characteristics is a two-dimensional matrix that describes the tasks performed by a unit, based on task orientation and task domain. Task orientation recognizes that some units are process-oriented and some are content-oriented. This view is consistent with research on knowledge that distinguishes between “know-what” (content-oriented) and “know-how” (process-oriented) (Kogut & Zander 1992). Nonaka has identified four distinct modes of knowledge sharing: socialization, externalization, internalization, and combination (Nonaka 1994). “Know-what,” descriptive of explicit knowledge, is better shared through externalization and combination. “Know-how,” associated with tacit knowledge, is better shared through socialization or internalization. Thus, due to differences in task orientation, some knowledge sharing techniques will be more effective than others.

Task domain is the other dimension used to describe a unit’s tasks. This dimension is necessary to capture the variety of tasks that a unit performs. Units with low task variability are described as focused, while units that perform a variety of tasks are described as broad. Work in units that are focused in their task domain requires a great deal of individual knowledge, which is best shared through internalization and externalization. Work in units that are broad in their task domain requires collective knowledge, which is best shared through socialization and combination. This operationalization of this concept is very good, and draws from a rich history of accepted thought regarding knowledge sharing and organizational task evaluation.

The operationalization of knowledge management processes was included in the description of the operationalization of task characteristics. Use of Nonaka’s modes of knowledge sharing fits extremely well with the task characteristics construct.

The final construct, knowledge management satisfaction, is not operationalized very well. Due in part by the lack of accepted measures of user acceptance and satisfaction, this theory does not attempt to advance the field in this area. However, using the rationale “I can’t define it, but I know it when I see it,” their experiment simply asks participants “how satisfied are you with this process?”

Combined Theory

The major drawback organizational capability theory has is its failure to recognize the moderating effect that task characteristics has on the relationship between knowledge management processes and knowledge management effectiveness. The major drawback of the task-contingent theory is the ambiguous nature of the outcome, knowledge management satisfaction. By combining these theories, a single theory emerges which overcomes both of these drawbacks. Recall that in the organizational perspective, knowledge process capabilities lead to organizational effectiveness. Failure to consider the match between the processes and the tasks performed by a unit could limit theory validation because of conditions that seemed spurious, but could be explained by the contingency theory. Figure 3 illustrates the combination of both theories into a single theory that accounts for all constructs presented, with the added considerations shown with dashed lines.

There has not yet been any research to verify the validity of this combination, however, knowledge process capability closely matches knowledge management processes, and knowledge management effectiveness is a much more practical dependent variable than is knowledge management satisfaction.

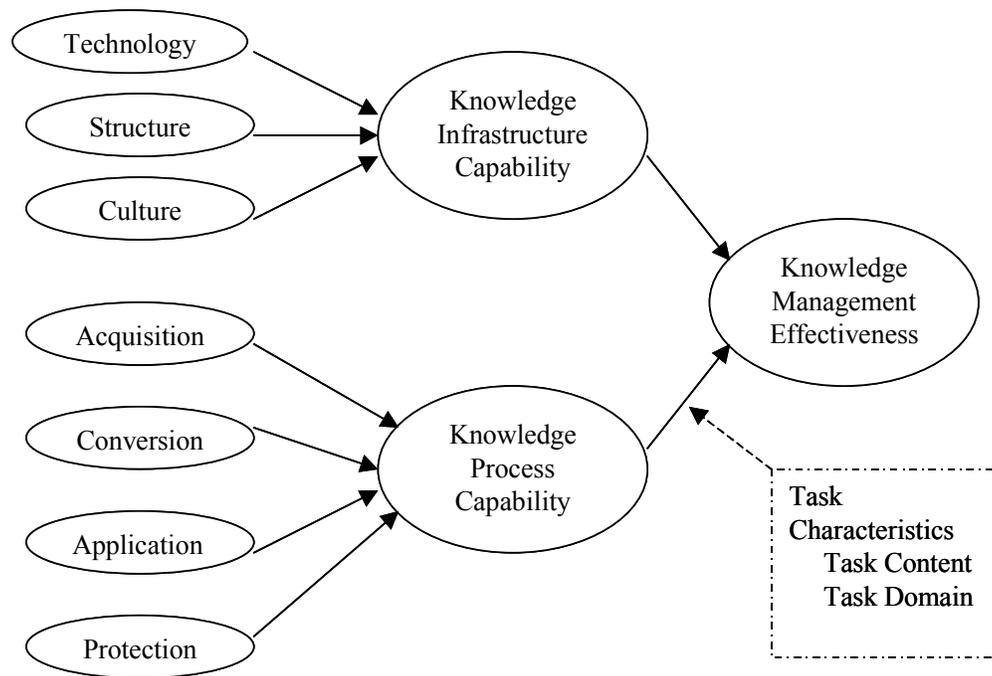


Figure 3. Combined Theory Constructs

Research Agenda

The first direction should be to precisely define the boundary of the theory. Once established based on theoretical grounds, it can be validated by surveying differing types of organizations (profit/non-profit, public/private, “knowledge-based”/product-based, etc) to determine how the theory impacts decision-making and organizational structures within each organization. Research in this area will help extend the generalizability of the theory.

The most critical requirement of this theory is the development of quantitative measures for the outcome construct – knowledge management effectiveness. Research for both of the underlying theories used surveys to determine managers’ perceptions of these outcomes. Validation of this theory will be conducted in a similar manner.

The primary difficulty will be identification of measures of knowledge management effectiveness. The absence of consensus in information systems research necessitates use of a similar construct in a different field. It is at this point that the ideas from the strategic management school should be introduced.

The productivity paradox has made business owners and managers wary of investing in any innovative programs that won't favorably affect a company's profitability. In addition, a tool developed by strategists to measure organizational effectiveness has already gained wide acceptance. So, for both of these reasons, knowledge management effectiveness should be measured along the four dimensions developed for the balanced scorecard: customer perspective, financial perspective, innovation and learning perspective, and internal business perspective. This choice for measuring the construct of knowledge management effectiveness is appropriate because all knowledge management programs have at least one of these areas as a goal. In addition, the parallel between organizational effectiveness and knowledge management effectiveness is clear. Any existing surveys developed for the balanced scorecard will have to be modified somewhat to narrow the focus from the organization to the knowledge management programs within the organization. As measurement scales are developed and the generalizability of the theory is established, the theory's predictive ability will be established. Currently both of the underlying theories only concern themselves with whether or not organizational effectiveness or knowledge management satisfaction exists. By developing valid and reliable scales for the outcome construct, we can begin to measure the strength of each of the relationships and start to make predictions such as "to improve the *level* of knowledge management effectiveness, one should first evaluate this element of the task domain..." This type of information would be extremely valuable to organizations, and having it is a key element to understanding knowledge management.

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