December 2001

Measuring the Validity of Task Technology Fit for Knowledge Management Systems

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Abstract

The theory of task technology fit states that for information technology to have a positive impact on the performance of an individual then it must be utilized and be a good fit for the task that it supports. If the technology provides features that support the task, then performance will be impacted. Goodhue and Thompson's (1995) research linked information systems impact on performance only when there is a relationship between the task requirements of the user and the functionality of the system.

Knowledge management is an emergent strategic technology that seeks to make both tacit and explicit knowledge available to an organization in order to improve overall performance. Information technology provides a competitive advantage when it can be demonstrated that it adds real value to an organization. This poses several questions for firms that invest in knowledge management, including do knowledge management systems meet the task requirements of users, how to transform the culture of the organization to want to share information, and how to ensure that knowledge databases are kept up to date with current and relevant information.

This paper presents a framework to investigate the rationale for why further study on the importance of analyzing the validity of task technology fit for knowledge management systems will be conducted.

Theoretical Foundation

One of the essential emerging information system strategies is the transition from competitive advantage based information into optimization based knowledge management (Malhotra, 1998). Knowledge can be defined to be information combined with experience, context, and interpretation. Knowledge management is the transformation of knowledge into a format that can be utilized effectively and efficiently throughout an organization (Davenport, Delong and Beers, 1998); knowledge management is a set of processes for transferring the intellectual assets of the firm to value processes such as innovation and knowledge acquisition (Knapp, 1998); or stated simply knowledge management is making shared information useful (Bushko & Raynor, 1998).

Knowledge management involves a strategic commitment to improving the organization's effectiveness as well as improving its opportunity enhancement. The goal is not cost control (Davis, 1998). Knowledge management as a process improves the organization's ability to execute its core processes more efficiently.

Holsapple and Whinston (Mirchandani, 1999) define six types of knowledge that knowledge management applications, such as decision support systems should possess. These include: descriptive, procedural, reasoning, linguistic, presentation and assimilative. Descriptive knowledge is information about the past, present, future or hypothetical states of relevance that are concerned with *knowing what*. Procedural knowledge is concerned with *knowing how* and specifies step by step procedures for how tasks are accomplished. Reasoning knowledge is concerned with *knowing why*, evaluating conclusions which are valid given a set of circumstances. Presentation knowledge facilitates communication. Linguistic knowledge interprets communication once it has been received. Assimilative knowledge helps maintain the knowledge base by improving upon existing knowledge. It is important to distinguish between knowledge types in order to understand how to act upon the knowledge.

Informal knowledge repositories seek to capture the knowledge that resides in the minds of experts within the organization but has not been put into a structured format. This is commonly referred to as tacit knowledge. Tacit knowledge requires a high degree of interpretation (Cliffe, 1998). In contrast to tacit knowledge is explicit knowledge, which requires little interpretation and can be transferred quickly. Market data, research and analyst reports are examples of explicit knowledge. Explicit knowledge is easier to transfer electronically because it does not have the added complexity of needing to provide explanation and interpretation.

Knowledge management projects that involve establishing a knowledge environment conducive to the transfer, creation or use of knowledge attempt to build cultural receptivity. These attempts are centered on changing the behavior of the firm to embrace the use of knowledge management. Behavioral centric projects require a high degree of support and participation from the senior management of the organization in order to facilitate their implementation.

Task-Technology Fit

Goodhue and Thompson (1995) proposed that for an information technology to have a positive impact on individual performance the technology must be utilized and it must be a good fit with the task that it supports. Task- technology fit provides a stronger theoretical basis for a number of issues related to the impact of information technology on individual performance, including understanding the impact of user involvement on performance. Performance impacts will result when a technology provides features and supports the fit of the requirements of the task. The higher the fit, the higher the performance increase will be. Goodhue and Thompson's research proposes that information systems impact performance only when there is a relationship between the task requirements of the user and the functionality of the system. The system must satisfy the business requirements of the user. Task-technology fit then is the degree to which a technology assists an individual in performing their tasks. As an emergent technology, knowledge management systems have not yet been validated against the task-technology fit model. Goodhue and Thompson (1995) developed eight measurement components of task-technology fit:

(1) Data quality
(2) Locatability of data
(3) Authorization to access data
(4) Data compatibility between systems
(5) Training and ease of use
(6) Production timeliness
(7) System reliability
(8) Information systems relationships with users.

Performance impacts relate to the accomplishment of tasks by an individual. Improved efficiency, effectiveness or quality implies higher performance. High task-technology fit improves not only performance but also the likelihood of utilization, regardless of why the system is utilized. Utilization may be on a voluntary or mandatory basis. Goodhue and Thompson (1995) proposed that the characteristics of the technology and the characteristics of the task will affect user evaluations of task-technology fit. It will be necessary to evaluate this proposition for knowledge management systems to determine if the technology leads to higher task-technology fit, and subsequently higher utilization and performance. The evaluation should take into account the eight measurement components. Task-technology fit (Goodhue, 1998) has been used to provide the basis for a user evaluation instrument aimed at an organizational assessment of information systems utilization for managerial decision making. Measures of system usage have problems because it may not be clear if the utilization is a result of an effective system yielding greater efficiency or a poor system that requires greater effort to use. The heart of the task-technology fit model, Goodhue (1998) proposed is the assumption that information systems that give value to users will be reflected in a user's evaluation of the systems. Information systems also need to change, as task needs change. Task characteristics will moderate the strength of the link between information system characteristics and user evaluations. In order to be effective, knowledge management systems must continuously adapt to new knowledge which will improve the overall system effectiveness. According to Goodhue (1998), in the analysis of tasks, information systems and services need to support users along the following dimensions:

(1) Identification subtask – the right data, the data element definition, right level of detail.
(2) Acquisition subtask – accessibility of information, ease of use of hardware/software, training, reliability flexibility and cost.
(3) Integration/Interpretation subtask – compatibility, accuracy, presentation and currency.

Each dimension ascertains the degree to which users believe that task needs have been met by the information systems and services available to them. It will therefore be necessary to validate that each of these dimensions affects the utilization and

performance of knowledge management systems. The task-technology fit model should lead to five propositions (Goodhue, 1998). Information systems and service characteristics, task characteristics, and individual characteristics should influence user evaluations of information systems. Task and individual characteristics should interact with or moderate the relationship between user evaluations and information systems. Higher task-technology fit should lead to higher individual performance. The amount of non-routine and unanalyzable technologies are expected to require a high amount of information processing for effective performance (Keller, 1994). Knowledge management systems look to support non-routine tasks. Further research is needed to validate if they provide a task-technology fit.

Ferratt and Vlahos (1998) described the implications of task-technology fit on managerial decision-making. In their analysis they used four different views of managerial decision-making:

(1) Anthony's view of decision making relative to the three traditional management functions, strategic management, management control and operational control.
(2) Mintzberg's view of decision making in terms of the four decision roles of entrepreneur, disturbance handler, resource allocator, and negotiator.
(3) Broad view of managerial decision making including identifying problems, determining alternative courses of actions, ranking the alternatives and choosing an outcome.
(4) Isenberg's and Rockart and Delong's view that the manager uses a mental model of the organization as the basis for decision making and that a critical role of information systems is to support that mental model.

Research Questions

For a knowledge management system to have a positive impact on an organization then it must be utilized and be a good fit for the task that it supports. Knowledge management systems will support individual performance improvements when there is a relationship between the task requirements of the user and the functionality that is provided by the system. Current research has not yet validated that knowledge management systems actually do support the task requirements of the user.

The basic research questions to be investigated are as follows:

(a) To what extent do organizations that have implemented knowledge management systems actually use them?
(b) Is task-technology fit for knowledge management systems a positive indicator of performance impact?
(c) Is the use of a knowledge management system as a decision support tool related to the user evaluation of the system?
(d) Do knowledge management systems support the task requirements of their users?

Data Collection

It was essential that the theoretical foundation for task-technology fit be examined to determine if it were appropriate to apply this concept to knowledge management systems. Once this foundation was established, the preliminary research instrument was developed. The preliminary research instrument was developed with information collected from the literature review. The content analysis of the survey instrument utilizes constructs that were originally developed by Goodhue and Thompson (1995) and subsequently updated by Dishaw and Strong (1998). The target audience for this survey is users of knowledge management systems. Manufacturing, financial services, consulting and government firms are targeted to participate in this survey. The theoretical model that the survey is designed to test questions that address the independent variables of accuracy, ease of use, reliability of the knowledge, timeliness, training and usefulness of the knowledge. These are designed to evaluate the task and individual characteristics of knowledge management systems and are adapted directly from the original work by Goodhue and Thompson (1995) and validated by Ferratt and Vlahos (1998), Dishaw and Strong (1998, 1999), Shirani, Tafti and Affisco (1999), and Zigurs and Buckland (1998). Several of the questions were modified to more accurately reference the use of knowledge management systems within an organization. Most organizations do not refer to their knowledge management applications using that terminology, so an explanatory note was included in the instructions to define possible terms that are used to describe knowledge management (e.g. best practices, e-Learning). In some cases, the specific knowledge management application was referenced within the instructions (e.g. *Planet Peoplesoft*). Additional questions were added that asked the interviewee about his/her background, experience within the organization, organization type, gender, age and position within the organization. The instrument was designed to provide clarity of content to avoid any ambiguity or misunderstanding of the questions. Survey research was chosen as a technique because of the ability to be able to draw inferences about the population of knowledge management users within organizations from a sample. Additionally, attention will be paid to the type of knowledge management

infrastructure that is utilized. This will include an evaluation of the differences between firms that utilize groupware or intranet applications.

Data Analysis

Results of the analysis will be analyzed using factor analysis and regression techniques. Confirmatory factor analysis, which has proven effective in other measures of task-technology fit, will be utilized. This allows only those items that fit the scale of the model to be selected, yielding more reliable results. We anticipate presenting some results in August.

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