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# **Investigating knowledge transfer: A preliminary model to improve our understanding of the literature**

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## **Abstract**

Knowledge transfer is a critical activity in every organization and an essential component of knowledge management. Previous research has identified that of the four key knowledge management processes (i.e. creation, storage/retrieval, transfer, and application) transfer is discussed most often in the literature. What remains unclear is the nature and structure of knowledge transfer. Research in knowledge transfer has foundations in a variety of reference disciplines. This paper outlines research-in-progress in developing a model to improve our understanding of knowledge transfer. A proposed three-dimensional model with axes of channel richness, organization level, and context is discussed and illustrative examples of recent research are provided.

**Keywords: Knowledge Transfer, Knowledge Management, Model**

## **Introduction**

Knowledge transfer is an incredibly diverse and dynamic topic. Researchers in management, information systems, and knowledge management have examined this topic from a variety of perspectives. Although some authors have stated that “knowledge transfer has been treated by most researchers as a black box” (Kwan and Cheung 2006, p. 17), a broad look at the literature suggests that research on knowledge transfer ranges from a focus on the use of technology as a facilitator to the importance of organization culture, structure, and process to the attributes of the recipient and knowledge itself. Recent knowledge management research (Peachey and Hall, 2005, Harp, Bartczak, Peachey, and Heminger, 2006), identified that a disproportionate amount of the information systems and knowledge management literature discusses knowledge transfer as opposed to other knowledge management topics such as creation, storage/retrieval, and application (Alavi and Leidner, 2001).

Despite the amount of literature on knowledge transfer, there has been little effort to examine the extant literature to determine its state. To further investigate this area, it is important to understand potential trends and gaps that may be evident after investigation of knowledge transfer literature. The purpose of this study is to detail an overview of the knowledge transfer literature and to develop an initial model to further guide the research. The full study will be to delve

further into the information systems and knowledge management research, using management research as a starting point, in order to characterize the nature of the knowledge transfer research.

## **Knowledge Transfer**

Knowledge has been recognized as the most important organizational resource (Drucker, 1994; Grant, 1996) and its proper management said to be essential a firm's survival. King (2006, p. 538) suggested that knowledge transfer is a fundamental process of civilization and the focus of learning. Knowledge transfer has been identified as an important process in knowledge management (e.g., Alavi and Leidner, 2001, Teece 1998). Alavi and Leider (2001) suggest that knowledge transfer can occur at various levels such as between individuals, between individuals and groups, and between groups and organizations. More specifically, Argote and Ingram (2000, p. 151) state that knowledge transfer is the "process through which one unit (e.g., group, department, or division) is affected by the experience of another." In a slightly different conceptualization, it is understood that knowledge transfer happens at the individual level; however, many of the benefits are manifested at higher levels of analysis (Svieby, 2001; Argote, 2000).

The study of knowledge transfer can be complicated. In addition to the variety of perspectives offered on knowledge transfer, there are also other related streams of research such as organizational learning and collaboration. Furthermore, given the multidisciplinary nature and broad applicability of the topic of knowledge transfer, such research appears in a variety of journals with different reference disciplines. While this diversity improves the coverage of the knowledge transfer topic by bringing a variety of perspectives and theoretical foundations, it also complicates research of it by hampering the development of integrative and overarching theory.

## **A Proposed Knowledge Transfer Research Model**

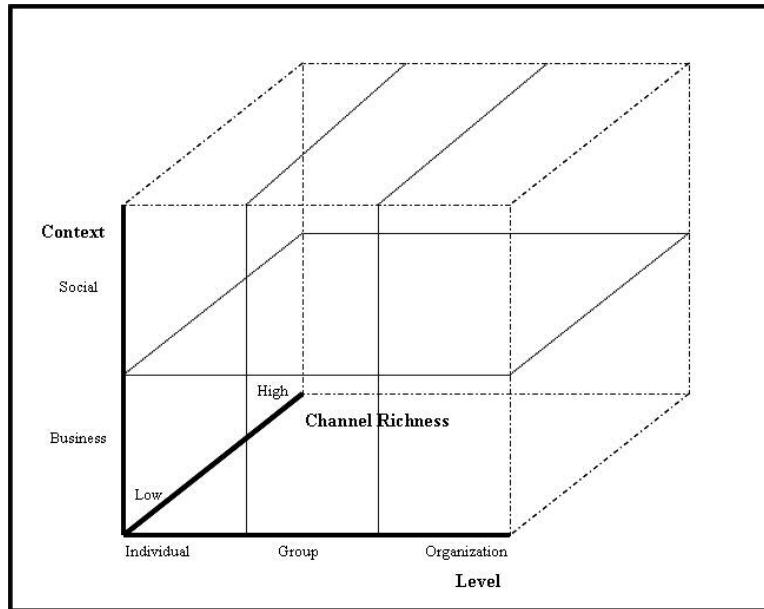
To begin to better understand knowledge transfer as it is discussed in the information systems and knowledge management literature, we pose a three-dimensional model consisting of organizational level, context, and channel richness. This model captures the spectrum perspectives that we uncovered in the initial literature review highlighted previously. The model is based on themes that seemed to appear consistently in the literature. Once populated, the model should give researchers a better idea of what areas current research in knowledge transfer has addressed. Additionally, the model will show which interactions between the three major areas are most commonly studied. Note that interaction is used in the relational sense of the word, not the statistical sense.

The axes are operationalized as follows. Organizational level includes research regarding individual, group, and organization levels of analysis that addresses the differences in the transferor and transferee. Context includes research regarding social context issues such as culture, climate and trust, as well the business context issues such as task, process, and performance. The last dimension, channel richness, includes the literature that describes the communications channel, whether human-to-human or technology mediated, used to transfer knowledge. The model, Figure 1, gives a visual representation of the axes. We believe this model provides a good starting point for a further investigation of the knowledge transfer literature.

Evident in the literature is indication that organizational level is an important consideration in the study of knowledge transfer. Grover and Davenport (2001) include the level of analysis in their framework for knowledge management research (Figure 1, page 13). Additionally, Markus and Robey (1988) outline the importance of understanding the level of analysis and not mixing levels haphazardly without thoughtful consideration of the effects.

Context is consistently mentioned as an important consideration in knowledge transfer (Argote, 1999; Leonard-Barton, 1990, Rogers, 1983). The context axis is divided into two areas: social and business. The social context is comprised of constructs such as culture and climate. Culture in the organizational context is the set of values, beliefs, and assumptions shared by members of the organization (Dennison, 1996). However, culture in the national context, may also affect knowledge transfer (Straub, 1994). Research suggests that organizational climate when operationalized as fairness and affiliation (Bock et al, 2005) or trust (Lee and Choi, 2003) can also affect knowledge transfer. The business context is comprised of constructs such as performance, task, and process.

The channel richness axis is included to include research efforts that address how the characteristics of the channel affect knowledge transfer. This concept is similar media richness as discussed by Draft et al (1987). The transfer of tacit knowledge is more likely to be successful in a rich channel such as face to face communication than in a less rich channel such as email. Conversely, explicit knowledge is easily transferred through email and other technology-based channels. However, this channel includes more than just the communication aspect knowledge transfer. The richness (or lack thereof) of codified knowledge must be considered in parallel with the channel.



**Figure 1 – Model of Knowledge Transfer**

The model, as developed, allows the categorization of knowledge transfer research on more than one axis. This compensates for what appears to be a common theme in the management journals, for example, categorization of research at the group level and focusing on a business task (Shrader, 2001, Hass and Hansen, 2005, and Tsai, 2001). Other examples include research focused on combinations such as the social context at the organization level (Kostova, 1999) or business task at the organization level (Inkpen and Beamish, 1997).

The diversity in research topic coverage extends to the information systems and knowledge management journals as well. Griffith et al (2003) and Markus et al (2003) both examined group level and the differences in the channel richness and their affect on knowledge transfer. Another study focused on the business task at the group level similarly to some of the studies in the management journals (Massey et al, 2001). Conversely, Dezousa (2003) examined game room's effect on knowledge transfer at the individual level.

## **Knowledge Transfer Research at the Intersection of Context and Level**

A large segment of knowledge transfer research studied phenomena that exist on the level and context axes. Examples of such issues include task and process related organizational issues and traditional social issues such as climate and culture. Instances of such research are discussed below.

Haas and Hansen (2005) found that the benefits of knowledge transfer depend on the task situation. Specifically, performance depends not on how much an organization knows, but rather on how they use what they know (Haas and Hansen, 2005). The primary finding of their study was that organizational unit performance is not always improved by obtaining and transferring more knowledge. Haas and Hansen (2005) suggest that there could be declining returns from seeking and transferring more knowledge. Experienced teams that had access to a wealth of codified knowledge won fewer contracts in consulting bids than did teams with less access to codified knowledge. While the authors acknowledged the counter-intuitive effect, they offered the explanation that when team members relied too heavily on codified knowledge (previous bids in this research), new bids often lacked a level of tailoring or customization that clients expect (Haas and Hansen, 2005). They concluded that the value of knowledge can vary greatly depending on the learning and differentiation needs of the unit.

Network position is based on a unit's (group's) ability to access external information and knowledge; a unit's absorptive capacity is its ability to assimilate and replicate knowledge obtained from external sources. Tsai (2001) examined the effects of network position and absorptive capacity on innovation and performance in addition to the moderation effect of absorptive capacity on network position. As hypothesized, innovative capability was increased by centrality of network position (Tsai, 2001). However, there was no evidence to support the idea that there is a positive relationship between

network position and performance. Tsai (2001) also found the interaction between network position and absorptive capacity significantly affected both innovation and network performance.

In looking at knowledge transfer through an organizational learning lens, Schulz (2001) examined how organizational learning affects outflows of knowledge in subunits. This research was designed to examine the vertical flows from subunits to supervisory units and the horizontal flows between peer subunits that report to the same supervisory unit. These flows are examined in a context similar to Tsai's (2001) work on network position. The key findings in this study were that exposure to internal and external sources of knowledge intensify vertical knowledge flows while reciprocation and substitution affect horizontal flows. Learning process affect outflows in that process related to collecting new knowledge primarily affect vertical flows, while learning processes related to combining old knowledge primarily affect horizontal flows (Schulz, 2001).

Kostova (1999) also developed a theoretical framework on how social, organizational, and relational contexts affect transfer of strategic organizational practices. Strategic organizational practices are those deemed to be core competencies of the firm that provide competitive advantage. The social context is operationalized as the institutional distance between the organizations, where the distance is defined by regulatory, cognitive, and normative issues. The organizational context was operationalized as the organizational culture of the recipient unit and how likely the unit was to be receptive to new practices. The relational context was operationalized as the commitment, identity with, and trust in the parent organization. This model was posed as a starting point for researchers to further examine the phenomenon and to present factors for organizations to consider when trying transferring knowledge (Kostova, 1999).

In an example of examining a social issue, Hansen (1999) investigated how weak ties between organizational subunits can impede the transfer of complex knowledge. He explored whether strong or weak relationships between people in different organizations lead to efficient knowledge sharing. The research was based on the study of the relationship between the strength of the tie and the complexity of the knowledge to be transferred. The key finding was that neither weak nor strong ties lead to efficient knowledge sharing. The net effect on success, as operationalized in this study (project completion time), was dependent on the complexity of knowledge transferred across subunits. When the complexity of knowledge is a factor, strong ties had the most effect when knowledge was complex, but weak ties had the strongest effect when knowledge was not complex (Hansen, 1999).

Abou-Zeid (2005) concentrated on the impact of culture in inter-organizational knowledge transfer. He offered that knowledge transfer is a multi-stage process and closely examined how cultural factors affect each stage of the transfer process. The results provided a "culturally aware multi-stage model" of inter-organizational knowledge transfer where cultural impacts are categorized into two main categories—monadic and dyadic.

Sherif and Sherif (2006) argued that "successful transfer of knowledge within organizations will depend on the accumulated social capital embedded within organization social networks" (p. 21). Using data collected from Egypt, they tested a model that hypothesized that structural, relational, and cognitive dimensions of social capital must exist within an organization so that knowledge transfer might impact organization performance. The results supported these ideas and highlighted for organizations "the need for a change in network relationships and efforts to build the relational dimension of social capital" (p. 29).

Goh (2002) explored the key factors that influence the ability to transfer knowledge. He integrated these factors into a conceptual framework in hopes to explain how organizations can better manage knowledge transfer. His conceptual model included a broad range of factors to include: leadership, problem-solving/seeking behaviors, support structures, absorptive and retentive capacity, and types of knowledge. His discussion of managerial implications offered managerial practices that might address the factors.

Finally, Inkpen and Beamish (1997) examined knowledge transfer by investigating the acquisition of local knowledge by a foreign partner and the impact of the acquisition on the stability of the joint venture. In a joint venture, firms contribute a variety of knowledge and skills to each other. Another key issue in this study is how the acquisition of knowledge by the local partner can affect their perception of whether or not they still need to foreign partner. Therefore, knowledge acquisition by either partner can contribute to the instability of the joint venture. This framework outlined other issues where the transfer of knowledge can have consequences beyond what was originally intended by the transferring organization (Inkpen and Beamish, 1997).

## **Knowledge Transfer Research in Channel Richness**

Another stream of knowledge transfer research examined channel richness and the relationship with factors on the context or level axes. Hansen et al. (1999) stated that knowledge management strategies fall into two general categories—people-based strategies (personalization) and technology-based strategies (codification). Much of the knowledge management research found in IS journals understandably addresses the technological aspects of the phenomenon. Instances of such research, with a focus toward knowledge transfer specifically, are discussed below.

Teigland and Wasko (2003) examined the effects of employees searching for knowledge outside their firm and the effects on productivity and creativity. The authors found that trading knowledge with coworkers and people in other organizations increased individual performance. However, people who only relied on immediate coworkers showed lower levels of creativity than those who went outside their organization for knowledge. Technology was acknowledged as a critical enabler of the process of searching and exchanging of knowledge. This research has implications for both the formality of the borders in organizational structure and the technological capability to work with people outside the primary organization.

Massey et al. (2001) examined a four-year initiative by IBM to re-engineer its customer relationship processes and capitalize on knowledge assets. The case illustrated how effective use of information technology integrated with organizational processes can improve the performance of customers and an organization's support staff. This research provided a detailed example of how information technology when treated as a key enabler to overcoming physical and organizational boundaries by transporting the knowledge to the right person at the right time. The ability to access, acquire, assemble, and disseminate knowledge can improve performance in organizations (Massey et al. 2001).

Markus et al. (2003) examined the design problem of providing information technology support for emergent knowledge processes such as new product development, strategic business planning, and organizational design. The authors pose that their design theory was important because it addresses the information technology support and development processes, the features of many systems can be effectively integrated, and information systems development practices.

In a case study of Nortel Networks, Massey et al. (2002) developed a model of KM success based on managerial, resource, and environmental factors. The authors specifically studied the new product development process described as knowledge intensive work based on the expertise of the organization's employees. One of their key findings was how managers should precisely specify the role of information technology. Knowledge transfer is arguably a small part of this research; however, the implications for a better understanding of the role of information technology are clear (Massey et al., 2002).

Another reference to social issues involved with knowledge transfer is discussed by Boland et al. (2001). They state that knowledge representations, whether abstract or concrete based on cognitive theory can be interpreted literally by the recipient of the knowledge (Boland et al, 2001). These authors used cognitive theory and learning theory to examine how different knowledge representations affected knowledge transfer. However, in some cases such as storytelling, the intended meanings may be interpreted in a more figurative manner. The authors' primary finding was that different knowledge representations can have different effects on decision outcomes. Specifically, concrete representations were more effective at producing decisions. More general knowledge representations were found to produce fewer favorable decisions (Boland et al 2001).

Within recent years, "knowledge management (KM)-specific journals have begun to appear on the scene" (Harp et al., 2007, p 1); this research also indicates that articles included in these journals cover the spectrum of knowledge management issues. Similar to the findings regarding IS journals (Peachey and Hall, 2006), however, much of the KM research concentrates on the topic of knowledge transfer. An initial review of such literature indicates a concentration on "softer issues" such as culture, organization structure, individual characteristics, etc.

Syed-Ikhsan and Rowland (2004) studied knowledge management, and more specifically knowledge transfer, in a public organization context. They examined the relationship between organizational elements and the performance of knowledge transfer. Five independent variables were identified—organization culture, organizational structure, technology, people/human resources, and political directives—and were tested against creation of knowledge assets and knowledge transfer performance. The results showed some significant relationships between independent variables and the outcomes and demonstrated that organizations must take certain elements into consideration when deciding to implement KM.

Berends (2005) investigated knowledge sharing using speech act theory and the interpretation for research work as problem solving theoretical foundations. His study "yielded taxonomies of knowledge sharing moves and the effects of knowledge sharing" (p. 97). The results indicated that knowledge sharing is a heterogeneous process of "moves and effects" by individuals, and depending on the desired result, knowledge sharing should be facilitated in different ways.

Two articles examined constructs on all three axes of the proposed model in their study. Desouza (2003) noted that much research has concentrated on how information technology can serve as an enabler of knowledge management, particularly in the exchange of explicit knowledge. He then examined a people-centered perspective to better facilitate the exchange of tacit knowledge. While information technology can overcome many boundaries to the exchange of explicit knowledge, the exchange of tacit knowledge is much more difficult if information technology is viewed as the only requirement. Desouza's (2003) initial work on the contributions of game rooms or recreation centers to the exchange of tacit knowledge set the stage for further examination of their effects on tacit knowledge exchange.

Griffith et al. (2003) examined the interaction between information technology and virtual work in organizations. They found that teams in virtual settings will focus on the transfer of explicit knowledge which is easier to transfer with information technology. Much of the tacit knowledge in individuals will not be converted to organizational knowledge. Organizations should take certain actions such as the development of technologies to better transfer tacit knowledge, the development of individualized tacit knowledge, and experience building opportunities between team members (Griffith et al., 2003).

## **Conclusion**

Previous research has proposed an examination of the knowledge transfer research so that trends and gaps might be identified. The preceding examples are an illustrative, but not all-inclusive sample of recent research in knowledge transfer. The proposed model will be used to initially guide this study in hopes of better understanding the nature of the knowledge transfer literature. It is fully expected, however, that as the research progresses that the conceptual model may change significantly to better accommodate the body of literature. Given the importance of knowledge transfer to all organizations, it is critical that we have a better understanding of these phenomena to guide research in the discipline and to improve the effectiveness of knowledge transfer in organizations.

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