Journal of Knowledge Management

Research on knowledge transfer in organizations: a morphology

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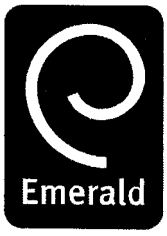

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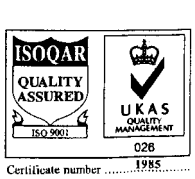

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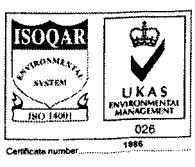

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Abstract

Purpose – *The purpose of this paper is to present and describe a morphology of the research literature on knowledge transfer in organizations.*

Design/methodology/approach – *This morphology, which is a comprehensive framework characterizing the knowledge transfer literature in terms of dimensions and options, was developed by an extensive scanning of the pertinent literature.*

Findings – *Eight dimensions were found suitable to characterize the knowledge transfer research literature. Corresponding to each dimension, two to six options were found.*

Research limitations/implications – *The morphology demonstrates the extensiveness and variety of knowledge transfer research. To academics, the morphology can serve as a map of the knowledge transfer territory. Using the morphology, researchers can easily assess how an existing study fits in with the entire body of knowledge transfer research. Secondly, they can discern areas that have received less attention in comparison to others and thus identify gaps they may wish to address in a new study. KM practitioners can use the morphology to assess their knowledge transfer strategies in terms of the dimensions it currently has/lacks, and take appropriate decisions.*

Originality/value – *To the best of the authors' knowledge, a morphological approach has not been attempted so far to characterize KM research literature. The approach used can be applied to other areas of management as well, for similar purposes.*

Keywords *Knowledge transfer, Knowledge management*

Paper type *Research paper*

Introduction

Knowledge and its management have received increasing attention in the recent years. Considered core to managing knowledge are two processes: knowledge creation and knowledge transfer (von Krogh *et al.*, 2001; Ofek and Sarvary, 2001). Knowledge creation is akin to exploration, in which individuals and teams generate new ideas and concepts, by combining existing knowledge (Kogut and Zander, 1992; Nahapiet and Ghoshal, 1999). The creation of knowledge is closely tied to the innovation of products and services (Subramaniam and Youndt, 2005).

Knowledge transfer on the other hand, enables the exploitation and application of existing knowledge for the organization's purposes. In firms, varieties of specialized knowledge are distributed among individuals, teams and units. In fulfilling its purpose of producing goods and services, a firm has to bring together specialized knowledge from different sources. Grant (1996) called this the "integration of knowledge", an outcome of which, is the manifestation of organizational capabilities. For example, the capability of a product development team at the Ford Motor Company to design an improved engine depends on integrating the knowledge bases of automobile, mechanical, electronic and computer engineers, graphic artists, and several technicians. Effective integration leads to the development of unique and idiosyncratic capabilities that can bestow a firm with long-term competitive advantage. Grant (1996) proposed that knowledge integration be seen as the

primary role of the firm. Integration happens when knowledge that originates in one context or location is used and applied in another, and this in essence is the purview of knowledge transfer.

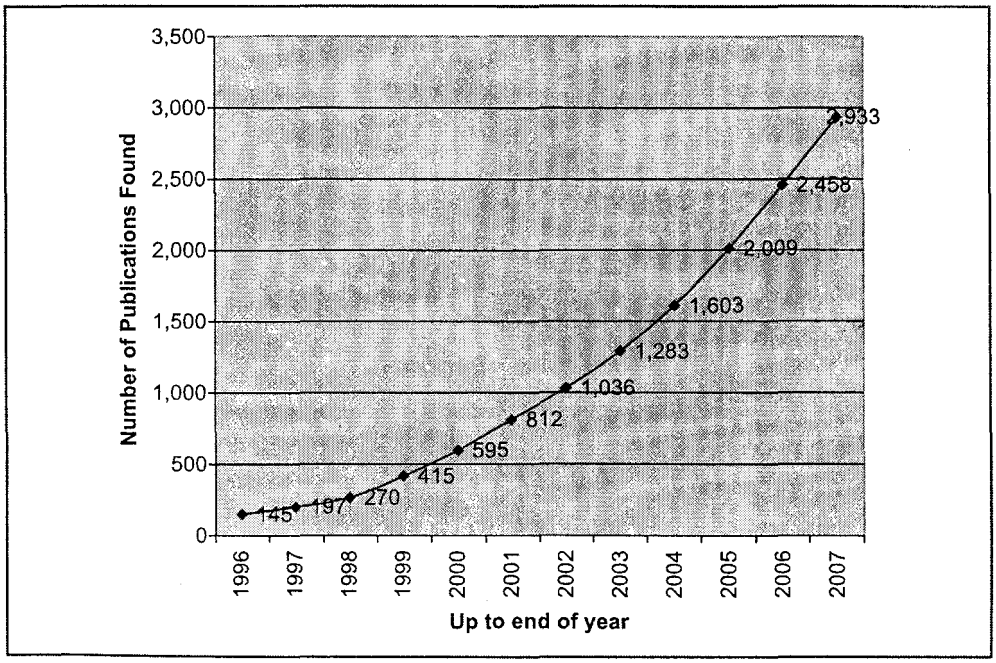
Much research pertaining to knowledge and learning in organizations has touched on knowledge transfer. A rough indication of the pattern of growth of the research on the topic was obtained using queries on the EBSCO database. The total numbers of papers and articles on this online database, which satisfy the criterion: "knowledge transfer" OR "knowledge sharing" OR "knowledge flow", in the "abstracts" field, were noted for the time period upto the end of each year, from 1996 to 2007. Figure 1 suggests that research on knowledge transfer has been continuously increasing over the years, and is in fact burgeoning.

Literature on knowledge transfer appears not only extensive, but also highly variegated. Despite this, an encompassing framework that can succintly capture this variety, was not found in the literature. This paper attempts to fill this gap and offers a morphological framework (or simply, a "morphology") of the same. The chief objective was to identify dimensions in knowledge transfer research, using which areas where more work has been done could be distinguished from those where more attention is needed. Before developing the morphology however, it was felt that it would be useful to examine terminological distinctions between the terms "transfer", "sharing" and "flow" of knowledge and elicit a working definition of knowledge transfer.

Terminological distinctions

What exactly is "knowledge transfer"? To answer this, the definitions of previous researchers were first examined. Some researchers defined knowledge transfer as the process through which one unit (e.g. group, department, or division) is affected by the experience of another (Argote and Ingram, 2000; Inkpen and Tsang, 2005; Watson and Hewett, 2006). This definition suggests that at least two entities are involved in the process. Further, the use of the term "experience" to denote knowledge distinguishes the transfer of knowledge from the mere transfer of data or information. However, the definition does not tell us – in what way does one unit affect the other? Darr and Kurtzberg (2000, p. 29) seem to have resolved this, by defining knowledge transfer as an event through which one entity learns from the

Figure 1 The growth of research on knowledge transfer in organizations



experience of another, suggesting thereby that the effect of one unit on another is in terms of the learning that the second unit experiences. Organizational learning can thus be seen as an intended outcome of knowledge transfer. The question arises, what type of learning is brought about?

Broadly speaking, learning can happen in two ways. An entity (organization, team, individual) can learn from its own experiences, or from the experiences of others (Gray and Meister, 2004). The learning brought about by knowledge transfer belongs to the latter category. While one entity might have obtained knowledge by its direct experience with the work environment, another is able to apply this knowledge, without having to go through the same experience. Thus, in the knowledge transfer process, the second entity's knowledge is one level removed from the work environment, having been interpreted by at least one other entity (Gray and Meister, 2004).

Does this mean that knowledge transfer amounts to a replication of knowledge? No! According to Foss and Pedersen, 2002, p. 54), knowledge transfer is not an *in toto* replication of knowledge in a new location, rather, it involves the modification of some existing knowledge to a different context – "what is transferred is (usually) not the underlying knowledge but rather applications of this knowledge in the form of solutions to specific problems". Although this observation was made in the context of knowledge transfer between units of a multi-national corporation (MNC), it was felt that the understanding could be borrowed into other knowledge transfer contexts as well.

Can knowledge transfer be considered distinct from "knowledge sharing" and "knowledge flow"? Majchrzak *et al.* (2004, p. 174) opined that knowledge transfer can be subdivided into knowledge sharing and knowledge reuse, where sharing refers to "the process by which an entity's knowledge is captured". Here, sharing takes the connotation of giving or contributing, and is included under transfer, but does not include the receiving and reuse aspect of transfer. Almost the same distinction was made by Darr and Kurtzberg (2000, p. 29) when they stated:

> ... our research argues that transfer has occurred when a contributor shares knowledge that is used by an adopter. Our definition differs from others that equate knowledge transfer simply with sharing (Huber, 1991) and that do not include the condition that knowledge transfer must involve use on the part of the adopter.

Despite this, as Renzl (2008) also noted, the terms "knowledge sharing" and "knowledge transfer" are often used interchangeably in the literature.

"Knowledge flow" has been used with a meaning very similar to that of "knowledge transfer". This can be seen, for instance, in Gupta and Govindarajan (2000) and Nissen (2005-2006). In fact Nissen's (2005–2006, p. 226) definition subsumes sharing and transfer together under "knowledge flow", "by using the term flows, we refer to dynamic knowledge, and we subsume similar concepts such as knowledge conversion, transfer, sharing, integration, reuse, and others that depict changes, movements, and applications of knowledge over time."

This interplay in the implied meanings of "transfer", "sharing" and "flow" seemed to suggest that attempting to frame a definition of knowledge transfer that does not overlap with knowledge sharing and knowledge flow may be impractical. Rather, it was noted that "knowledge transfer", "knowledge sharing" and "knowledge flow" have a common trait – that of "an exchange of knowledge" – whereby, knowledge is given by one or more entities and received by others. They are thus essentially similar. For this reason, "knowledge transfer" has been used in an inclusive sense in this paper, subsuming the connotations of "knowledge sharing" and "knowledge flow".

Based on the above discussions, knowledge transfer was defined as: "a process of exchange of explicit or tacit knowledge between two agents, during which one agent purposefully receives and uses the knowledge provided by another". "Agent" can refer to an individual, a team, an organizational unit, the organization itself or a cluster of organizations. The exchange process involves two complementary acts: the act of giving or

delivering knowledge by one agent (the source), complemented by the act of receiving and using knowledge by another (the recipient). Without either, the process of transfer is incomplete. This idea is depicted in Figure 2.

The morphology

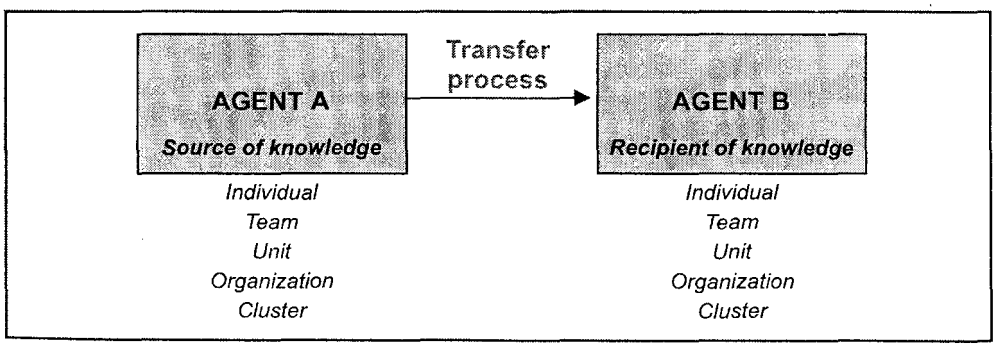
With this background, a morphology of the literature on knowledge transfer was developed. The term morphology comes from antique Greek (*morphe*) and means shape or form. According to the American Heritage Dictionary, "morphology" refers to the form and structure of an organism (as in biology) or of a word (as in linguistics). Although traditionally, biology and linguistics were two fields that used morphologies extensively, today morphologies are associated with a number of other disciplines as well. An early significant contribution to this development was made by Zwicky (1969) with a method known as the general morphological analysis (GMA), for structuring and investigating the total set of relationships contained in multi-dimensional, non-quantifiable, problem complexes.

Put in simple terms, "morphology" refers to the underlying structure of an entity in terms of dimensions and options. The entities can be physical (e.g. an organism, an anatomy) or conceptual, such as a body of knowledge (e.g. algebra, thermodynamics, organic chemistry). The morphology and the analysis based on it are particularly useful where identifying the dimensions of an entity is more important than estimating quantities. Shekhar and Ganesh (2007, p. 359) explained morphological analysis with an example:

> . . . suppose the entity being studied is a toothbrush. It has four "dimensions" or structural parts – the handle, the neck, the head and the bristles. For each of these dimensions, there are sub-dimensions. The handle can be described in terms of its geometric dimensions and characteristics such as length, longitudinal and cross-sectional shapes, each of which can have many "options" such as "varying length" and "round" cross-section. The neck could be described in terms of its structural interface with the handle, which could include a fixed type, angled type, or flexible type interface and so on. When a complete morphological analysis is carried out on the toothbrush, it should be possible and easy to identify every existing toothbrush as one of the thousands of possible design variations within the morphology. Also, newer design alternatives could then be identified for manufacture.

The "entity" in this paper is the body of literature on knowledge transfer in organizations. As the notion of transfer invoked here encompasses those implied by "sharing" and "flow", literature that addressed these processes was also included. The dimensions of the above morphology were identified by systematically browsing through literature published from 1990 onwards, sourced mainly through the popular online databases – EBSCO, Proquest, Emerald and Sciencedirect – and looking for characteristics in terms of which each study can be described, and can be distinguished from other studies: For example, the nature of Darr and Kurtzberg's (2000) study is described as "empirical" and differs from that of Argote and Ingram (2000) which is "conceptual" or "theoretical". The dimensions and options of the morphology identified are listed in columns 2 and 3 of Table I and are described below. Column 4 lists one representative study corresponding to each option.

Figure 2 A simple model of knowledge transfer



Dimensions and options of the morphology

The morphology of knowledge transfer developed recognizes eight distinct dimensions as shown in Table I. Corresponding to each of these dimensions, two or more possible sub-dimensions or options could be listed. Each of the dimensions is described below.

Study

This refers to the underlying design of the study. Studies on knowledge transfer have followed theoretical, case study based, cross sectional and longitudinal designs. Two examples of theoretical studies are Tallman *et al.* (2004), who developed a set of propositions on knowledge transfer in regional clusters on firm competitiveness, and Inkpen and Tsang (2005), who developed frameworks relating the social capital dimensions of inter-firm networks and knowledge transfer within these networks. Cross sectional designs include those of Reagans and McEvily (2003) who used primary survey data from a R&D contract firm to examine how network structure influences knowledge transfer, and Darr and Kurtzberg (2000), who gathered primary and secondary data on production volume, costs and sales of pizza franchise stores. While both these studies used a cross-sectional design, Dyck *et al.* (2005) used a longitudinal design to explore how knowledge transfer occurs in a small product design and manufacturing company during periods of redesign. Case study based research is most prominent in the knowledge transfer literature, as for example, Hoopes and Postrel (1999) and Boh (2007). While experimental research on knowledge in organizations does exist (e.g. Okhuysen and Eisenhardt, 2002), no such study addressing

Table I A morphology of the research on knowledge transfer

1 *S No*	*2* *Dimension*	*3* *Possible options*	*4* *Representative work*	*5* *Rating*
1	Study	Theoretical	Tallman *et al.*, 2004	3
		Case study based	Boh, 2007	4
		Cross sectional	Reagans and McEvily, 2003	2
		Longitudinal	Dyck *et al.*, 2005	2
		Experimental	–	1
2	Knowledge	Explicit	Kankanhalli *et al.*, 2005a, b	4
		Tacit	Subramaniam and Venkatraman, 2001	2
3	Agents	Individuals	Renzl, 2008	1
		Teams	Gibson *et al.*, 2007	2
		Units of a diversified firm	Miller *et al.*, 2007	2
		Units of a MNC	Gupta and Govindarajan, 2000	4
		Firms	Inkpen and Tsang, 2005	3
4	Flow	Internal flow	Srivastava *et al.*, 2006	2
		Inflow	Schulz, 2003	3
		Outflow	Schulz, 2001	3
5	Mechanism	Movement of people	Takii, 2004	1
		Movement of tools	Berry, 2003	2
		Movement of tasks	Winter and Szulanski, 2001	1
		Movement of networks	Argote and Ingram, 2000	1
		Codification	Watson and Hewett, 2006	3
		Personalization	Borgatti and Cross, 2003	3
6	Contextual factor	Cognitive	Borgatti and Cross, 2003	3
		Social-psychological	Bock *et al.*, 2005	2
		Social	Collins and Smith, 2006	4
		Structural	Gold *et al.*, 2001	4
		Administrative	Lee and Choi, 2003	2
7	Geography	Across countries	Birkinshaw and Arvidsson, 2007	3
		Within regional clusters	Dahl and Pedersen, 2004	1
8	Business context	Product development	Hoopes and Postrel, 1999	2
		Hotel industry	Srivastava *et al.*, 2006	1
		Semiconductor industry	Appleyard, 1996	2
		R & D	Rothaermel and Thursby, 2005	2
		Retail Franchises	Darr *et al.*, 1995	1

knowledge transfer could be found. But such a study is not inconceivable and a hence, a corresponding option is provided in the morphology.

Knowledge

Knowledge has two dimensions – explicit and tacit. Explicit knowledge is articulable, can be expressed in the form of words and numbers and is easy to transmit, but tacit knowledge, being implicitly held in the minds of people, is difficult to articulate and requires observation, demonstration and experience for its transfer (Nonaka and Takeuchi, 1995). While some studies on knowledge transfer have dealt exclusively with one of these dimensions, others have dealt with both. For example, Kankanhalli *et al.* (2005a) examined factors surrounding the usage of electronic knowledge repositories, which store explicit knowledge while Subramaniam and Venkatraman (2001) examined the transfer of tacit knowledge during transnational product development activity. On the other hand, Haas and Hansen (2007) considered both explicit, as well as tacit knowledge.

Agents

This dimension is about, "between whom does the knowledge transfer take place"? As discussed earlier, knowledge transfer essentially involves two agents: a source and a recipient. Pertinent research has examined various source-recipient combinations, the most prominent of which, are listed as the options of this morphological dimension, along with an example. An example of knowledge transfer between individuals is Renzl (2008), who examined how individuals' trust in their management affects the level of knowledge sharing between them. Knowledge transfer between teams has been studied to a relatively greater extent, as for example, by Gibson *et al.* (2007), whose theoretical framework depicts how variations in time perspectives among team members significantly influences the speed of knowledge transfer, and Eskerod and Skriver (2007), who examined cultural factors that inhibit knowledge transfer. Knowledge transfer between units of a diversified firm has also received some interest, as for example Miller *et al.* (2007), wherein the firms were innovation-oriented and had diversified interests. But a greater extent of interest seems to have been drawn by knowledge transfer between units of a multinational corporation (MNC), as seen in Gupta and Govindarajan (2000) and Schulz (2001, 2003). Finally, at an even higher level, are studies that explore knowledge transfer between firms, as for instance the study of Inkpen and Tsang (2005) mentioned earlier.

Flow

This dimension describes the nature of the flow associated with knowledge transfer. Three possible options are evident in the literature: Internal flow, Inflow and Outflow. Internal flow describes knowledge transfer within the boundaries of a "focal entity" which, depending on how it is conceived in a given study, could be a team, a unit/division of an organization, the organization itself, or a cluster of organizations in a region or a network. For example, in Srivastava *et al.* (2006), the focal entity was a management team in a hotel and knowledge transfer (sharing) internal to the team (i.e. between the team members) was examined. This study corresponds to the option internal flow. Inflow refers to knowledge transfer from outside a focal entity to within, whereas outflow describes a transfer from within to outside. Schulz (2003) was concerned with knowledge inflows into the subunits of a multinational corporation, while Schulz (2001) with knowledge outflows from these subunits. In both cases, the focal entity was a subunit of the MNC. Some studies considered both inflow and outflow together, such as Kessler *et al.* (2000) and Gupta and Govindarajan (2000), whose focal entities were product development teams and MNC subsidiaries respectively. Whereas internal flow describes knowledge transfer within the focal entity, inflow and outflow describe knowledge transfer across its boundaries.

Mechanism

The term "mechanism" represents the "how" of knowledge transfer. Different approaches to understanding knowledge transfer mechanisms are evident in the literature. For example,

"The morphology of knowledge transfer developed recognizes eight distinct dimensions: study, knowledge, agents, flow, mechanism, contextual factor, geography, and business context."

Argote and Ingram (2000) provided a knowledge transfer framework which holds that knowledge in the organization is embedded in three basic elements – its members, tools, and tasks – and the various sub-networks formed by combining or crossing these elements. Knowledge transfer happens either by the movement or by the modification of these elements. Another classification of knowledge transfer mechanisms is popularly seen: codification vs. personalization (Hansen *et al.*, 1999; Bordia *et al.*, 2006; Boh, 2007; Scheepers *et al.*, 2004; Child and Shumate, 2007; Haesli and Boxall, 2005). Combining ideas from the literature, six distinct knowledge transfer mechanisms were identified.

The "movement of people" option refers to knowledge transfer that happens when knowledge that resides in a person moves with him/her from one location to another. For example, Takii (2004) studied the transfer of tacit knowledge from a developed country to a developing country, in terms of the physical movement of skilled workers.

The "movement of tools" option is reflected in work on technology transfer. Berry (2003), for example, discussed the concept of technology transfer and its application in international business sectors, and the difficulties and challenges associated with it. Zhao and Reisman (1992) provided an overview of the research on technology transfer to study the effect of moving tools from one site to another on outcomes at the organizational, inter organizational, and societal levels.

Knowledge transfer through the movement of tasks usually happens when an existing firm opens a branch, a subsidiary or a franchise outlet. The vision, goals, routines and operating procedures of the firm are likely to be transferred almost wholly to the new unit and replicated. McDonalds is well-known for its replication capabilities. Winter and Szulanski's (2001) study deals with issues related to this type of knowledge transfer.

The "movement of networks" option includes all the six types of networks discussed by Argote and Ingram (2000), who also noted that only a few studies have been carried out in this category. This suggests scope for more contributions here.

Codification involves connecting people to documents stored in repositories. An example of this is the study of Watson and Hewett (2006). Organizational members contribute documents containing explicit knowledge to a centralized repository, and reuse documents from it when necessary. This can also be seen as the "movement of documents". As today's organizations deal mostly with electronic documents, "movement" here has a virtual connotation, rather than a physical one.

Personalization involves connecting people to other people within or outside the organization. People receive and provide suggestions, advice, instructions, formal training and mentorship to other people through personal contact. Borgatti and Cross (2003) is one example of a study that addresses this type of knowledge transfer.

Contextual factors

Various contextual factors are believed to favor/inhibit knowledge transfer in organizations. Five options have been identified against this dimension: Cognitive, Social-psychological, Social, Infrastructural and Administrative.

Cognitive factors include transactive memory, knowledge base, expertise, the nature of knowledge itself, absorptive capacity and learning orientation (Cohen and Levinthal, 1990; Szulanski, 1996; Borgatti and Cross, 2003; Gray and Meister, 2004; Wasko and Faraj, 2005). Transactive memory refers to the meta-knowledge that individuals have about "who knows what", or "which knowledge is where" in the organization. Knowledge bases include the breadth and depth of knowledge they possess in their areas, and expertise refers to the know-how they posses with regard to various skills. The ability of an individual/firm, to recognize the value of new knowledge, assimilate it, and apply it to useful ends, is called its absorptive capacity. The learning orientation of an individual/firm pertains to the inherent inclination to acquire new knowledge and continuously develop the knowledge base by learning.

The discipline of social psychology is concerned with how social contexts and situations influence people's thoughts, feelings and causes of behavior (Allport, 1985; Baron and Byrne, 2004). Hence, factors pertaining to an individual's psyche that influence his behavior in social settings are known as social-psychological factors (SPFs). An example of an SPF is evaluation apprehension, or the fear that one's knowledge contributions may be negatively evaluated by others in the organization (Bordia *et al.*, 2006). This may inhibit one from sharing his knowledge. Other examples of SPFs include interpersonal trust (Renzl, 2008), anticipation of a reciprocal relationship due to exchanging knowledge, and sense of sense-worth (Bock *et al.*, 2005).

Social factors are characteristics of the social context of the organization. Factors such as the degree of cooperation between employees, shared understanding, social norms and the density and strength of network relationships (ties) are examples of social factors that have been studied in relation to knowledge transfer in organizations. For example, in Hansen (1999), the strength of the network ties was considered an important determinant of knowledge flow between a firm's units.

Elements such as the availability of suitable technology (e.g. PCs, intranets and repositories), and the physical layout of the workplace in terms of spaces marked for formal and informal interaction, comprise infrastructural factors. Soderquist (2006) explored and found that the manner in which KM activities are structured and organized, influenced knowledge transfer during PD activity. Gold *et al.* (2001), Lee and Choi (2003) and Kulkarni *et al.* (2006-2007) considered technology as an important factor in knowledge sharing and transfer. Also included here is the ease with which individuals have access to each others' knowledge either personally (Borgatti and Cross, 2003), or through repositories (Watson and Hewett, 2006).

Administrative factors in the organization include its business and people policies, the presence of a clear organizational intent, the degrees of centralization (versus autonomy) and formalization, the reporting structures and role definitions. Alavi *et al.* (2005-2006), found that formalization and autonomy were both favorable to knowledge work in an exploratory case study of a global information services company. Srivastava *et al.* (2006) found that empowering leadership plays a role in knowledge sharing between team members.

Geography

Does the transfer of knowledge occur within, or across, geographical areas? Past studies have dealt with the "geography" dimension at least at two levels: across countries and across regional clusters. Knowledge transfer across countries is evident in Gupta and Govindarajan (2000), whose sample was constituted by foreign subsidiaries of firms headquartered in the USA, Japan and Europe. A part of this study addressed knowledge transfer between the subsidiaries and the headquarters. Likewise, Foss and Pedersen's (2002) sample was made up of foreign-owned subsidiaries in seven countries: Austria, Denmark, Finland, Germany, Norway, Sweden and the UK. The study was concerned with examining knowledge transfer between the sampled units and other units of the MNC, some of which are located in other countries. Birkinshaw and Arvidsson (2007) sampled six large Swedish MNC firms, each of which had operations in more than 30 countries across the

world, and studied knowledge sharing between the subsidiaries and within the MNC as a whole.

Knowledge transfer within regional clusters has also received some attention. The Silicon Valley and Route 128 in the USA, and the City of London in the UK are some examples of large and popularly known industrial clusters. For example, Tallman *et al.* (2004) addressed how knowledge transfer between firms within regional clusters induced differences in the competitiveness of the clusters. Similarly, Dahl and Pedersen (2004) were concerned with interfirm knowledge flows between informal contacts within clusters. Although knowledge transfer within clusters has been examined, no study was found by this researcher that focused on knowledge transfer between the clusters.

Business context

This dimension describes the business context in which the knowledge transfer is being studied. It is possible to conceive of knowledge transfer in almost any business context. Knowledge transfer research has been conducted in a variety of contexts, although only a few have been listed in the morphology. Some of these are product development (Hoopes and Postrel, 1999), Hotels (Srivastava *et al.*, 2006), Semiconductor manufacturing (Appleyard, 1996), R & D (Rothaermel and Thursby, 2005) and Retail Franchises (Darr *et al.*, 1995).

By Zwicky's (1969) method, the eight dimensions constitute eight axes of a "morphological matrix", located in eight-dimensional space. Each option of a dimension of the matrix constitutes a "row". Thus, the study dimension has five rows, one each for "theoretical", "case study based", "cross-sectional", "longitudinal" and "experimental". Each row is parallel to the other rows of the dimension to which it belongs, but is orthogonal to the rows of all the other dimensions. Thus, rows of different dimensions intersect each other to form cells in eight-dimensional space. According to the options that a given study corresponds to, it must belong to at least one of the cells of this matrix.

How many such cells constitute the knowledge transfer morphology? This is determined by multiplying the number of options along the eight dimensions, in a single product term: (5) × (2) x × (5) × (3) × (6) × (5) × (2) × (5) (Table II). This results in 45,000 cells! In other words, this is the number of combinations along which research studies on knowledge transfer can be distinguished from each other, on the basis the above knowledge transfer morphology.

Estimating extent of work

Armed with this structure, an exercise was performed to estimate the extent of work on knowledge transfer, against each of the morphology's options. It was decided to seek a qualitative estimate that can give a "feel" for the extent of work done, and not a quantitative one which reveals the exact numbers of studies. Given the volume of existing work on the topic and the rate at which it is growing, computing exact numbers may be impractical, laborious, time consuming and not advisable, particularly when a qualitative estimate may

Table II Estimating the number of cells in the knowledge transfer morphology

Dimension	*Number of options in the morphology*
Study	5
Knowledge	2
Agents	5
Flow	3
Mechanism	6
Contextual factor	5
Geography	2
Business context	5
Total number of cells	45,000

serve the purpose equally well. Column 5 of Table I provides a rating done by the authors, meant to reflect an estimate of the extent of work done with regard to each option.

Rating was done following a two-step procedure. First, search queries were systematically conducted on the EBSCO Business database against each of the options, using alternative terms. For example, in relation to the "Knowledge – explicit" option, queries were conducted using terms such as "knowledge" + "explicit" in Abstract, "knowledge" + "codified" in Abstract, and "knowledge" + "documents" in Abstract. This was done for all the options, in each of the dimensions. Second, a systematic, deliberate and brisk scanning of a set of over 300 oft-cited KM-related publications in scholarly journals was conducted. This second exercise was conducted primarily to assess the extent of scholarly and academic work done in the area. This was important as the first exercise returned a large number of articles in practitioner publications and magazines, many of which were reports of knowledge management initiatives in specific companies.

As arriving at a qualitative estimate was the objective of the two exercises, no rigorous mathematical or statistical analyses were done. Instead, the extent of work was assessed using a five-point Likert scale, listed in column 5 of Table I. The markings on the scale mean: 1 = None or very little; 2 = Some; 3 = Moderate; 4 = Good and 5 = A lot. It was noted that some of options, such as "Entities-Units of a MNC", received a relatively high rating of 4 and above. Indeed, studying MNCs in knowledge terms has become popular in recent years, as Foss and Pedersen (2004) also noted. On the other hand, "Study-experimental" received a rating of 1 indicating that very little, or no evidence of experimental research could be found. Further, a number of options received a rating of 2, suggesting that although some work has been done in these areas, there is much scope for further contribution. It is also noted that the overall average of all the ratings, across all dimensions, is 2.30. This suggests that, despite the seemingly burgeoning volume of work on the whole, there exists abundant scope for further research on knowledge transfer.

Discussion and contributions

This paper is probably one of the first to use a morphological approach to characterize and understand the body of research on knowledge management. But, how is the above morphology useful to researchers? The morphology depicts the structure and demonstrates the diversity of the existing body of literature on knowledge transfer, in terms of dimensions and options. Each option in general, indicates two things:

1. that a study which reflects this option, exists in the literature; and/or
2. a study reflecting this option is possible in the future.

Thus it provides a map for researchers in this area to explore the literature and frame their research work.

For the purposes of illustration, only one study has been mentioned against each option in Table I. It is however noted that more than one study may fit a particular option. Likewise, a given study can fit against more than one dimension, and against more than one option of a dimension. For example the study of Gupta and Govindarajan (2000) is seen to fit into the following dimension-option combinations:

- study-empirical;
- knowledge-explicit;
- flow-inflow, outflow;
- mechanism–movement of documents;
- factor-social psychological, structural;
- entities- Units of a MNC; and
- geography- across countries.

"The morphology depicts the structure and demonstrates the diversity of the existing body of literature on knowledge transfer, in terms of dimensions and options."

Thus, an existing study on knowledge transfer can be mapped onto this morphology indicating how and where it fits into the overall research on the topic.

In addition to this benefit, a new study being planned can be designed by selecting a suitable combination from the various dimensions and options that the morphology offers. A research study usually begins by examining the current literature to identify and understand the issues that have been addressed by previous researchers. Then it proceeds to identify the "gaps", issues or problems in the literature which previous researchers have insufficiently addressed, or not addressed at all. While addressing these gaps and framing his own study, the researcher evaluates potential contributions that can be made. The above morphology can help the researcher in creatively scoping his study, and can be a very helpful tool in future knowledge transfer research.

Limitations and future directions

The dimensions of the above morphology were identified on the basis of literature sourced mainly through the popular online databases: EBSCO, Proquest, Emerald and Sciencedirect. A large volume of knowledge management research is available through these databases, and it is believed that this morphology has benefited from the extensiveness they offer. Yet, this does not preclude the existence of valuable and relevant work pertaining to knowledge transfer published in other places such as institutional and individual-held web sites, which this search might have missed. Further, the above morphology lists only the dimensions and options that seemed the most prominent in the authors' perspective. It is acknowledged that new dimensions and/or options can emerge if a similar exercise is repeated independently by others. Indeed, it is expected that if other researchers in this area examine and use this morphology in their studies, additions or modifications to this morphology will result, which may foster its evolution in terms of exhaustiveness and usefulness.

References

Alavi, M., Kayworth, T.R. and Leidner, D.E. (2005-2006), "An empirical examination of the influence of organizational culture on knowledge management practices", *Journal of Management Information Systems*, Vol. 22 No. 3, pp. 191-224.

Allport, G.W. (1985), "The historical background of social psychology", in Lindzey, G. and Aronson, E. (Eds), *The Handbook of Social Psychology*, McGraw Hill, New York, NY.

Appleyard, M.M. (1996), "How does knowledge flow? Inter-firm patterns in the semiconductor industry", *Strategic Management Journal*, Vol. 17, Winter Special Issue, pp. 137-54.

Argote, L. and Ingram, P. (2000), "Knowledge transfer: a basis for competitive advantage in firms", *Organizational Behavior and Human Decision Processes*, Vol. 82 No. 1, pp. 150-69.

Baron, R.A. and Byrne, D.E. (2004), *Social Psychology*, Prentice-Hall of India, New Delhi.

Berry, H. (2003), "Leaders, laggards and the pursuit of foreign knowledge", Academy of Management Best Conference Paper 2003, IM: D1-D6.

Birkinshaw, J. and Arvidsson, N. (2007), "Learning to share what everyone knows", *European Business Forum*, No. 29, pp. 28-33.

Bock, G., Zmud, R.W., Kim, Y. and Lee, J. (2005), "Behavioral intention-formation in knowledge sharing: examining the roles of extrinsic motivators, socio-psychological factors, and organizational climate", *MIS Quarterly*, Vol. 29 No. 1, pp. 87-111.

Boh, W.F. (2007), "Mechanisms for sharing knowledge in project-based organizations", *Information and Organization*, Vol. 17 No. 1, pp. 27-58.

Bordia, P., Irmer, B.E. and Abusah, D. (2006), "Differences in sharing knowledge interpersonally and via databases: the role of evaluation apprehension and perceived benefits", *European Journal of Work and Organizational Psychology*, Vol. 15 No. 3, pp. 262-80.

Borgatti, S.P. and Cross, R. (2003), "A relational view of information seeking and learning in social networks", *Management Science*, Vol. 49 No. 4, pp. 432-45.

Child, J.T. and Shumate, M. (2007), "The impact of communal knowledge repositories and people-based knowledge management on perceptions of team effectiveness", *Management Communication Quarterly*, Vol. 21 No. 1, pp. 29-54.

Cohen, W.M. and Levinthal, D.A. (1990), "Absorptive capacity: a new perspective on learning and innovation", *Administrative Science Quarterly*, Vol. 35 No. 1, pp. 128-52.

Collins, C.J. and Smith, K.G. (2006), "Knowledge exchange and combination: the role of human resource practices in the performance of high-technology firms", *Academy of Management Journal*, Vol. 49 No. 3, pp. 544-60.

Dahl, M.S. and Pedersen, C.Ø.R. (2004), "Knowledge flows through informal contacts in industrial clusters: myth or reality?", *Research Policy*, Vol. 33 No. 10, pp. 1673-86.

Darr, E.D. and Kurtzberg, T.R. (2000), "An investigation of partner similarity dimensions on knowledge transfer", *Organizational Behavior and Human Decision Processes*, Vol. 82 No. 1, pp. 28-44.

Darr, E.D., Linda, A. and Epple, D. (1995), "The acquisition, transfer and depreciation of knowledge in service organizations: productivity in franchises", *Management Science*, Vol. 41 No. 11, pp. 1750-62.

Dyck, B., Starke, F.A., Mischke, G.A. and Mauws, M. (2005), "Learning to build a car: an empirical investigation of organizational learning", *Journal of Management Studies*, Vol. 42 No. 2, pp. 387-416.

Eskerod, P. and Skriver, H.J. (2007), "Organizational culture restraining in-house knowledge transfer between project managers – a case study", *Project Management Journal*, Vol. 38 No. 1, pp. 110-22.

Foss, N.J. and Pedersen, T. (2002), "Transferring knowledge in MNCs: the role of sources of subsidiary knowledge and organizational context", *Journal of International Management*, Vol. 8 No. 1, pp. 29-67.

Foss, N.J. and Pedersen, T. (2004), "Organizing knowledge processes in the multinational corporation: an introduction", *Journal of International Business Studies*, Vol. 35, pp. 340-9.

Gibson, C.B., Waller, M.J., Carpenter, M.A. and Conte, J.M. (2007), "Antecedents, consequences, and moderators of time perspective heterogeneity for knowledge management in MNO teams", *Journal of Organizational Behavior*, Vol. 28 No. 8, pp. 1005-34.

Gold, A.H., Malhotra, A. and Segars, A.H. (2001), "Knowledge management: an organizational capabilities perspective", *Journal of Management Information Systems*, Vol. 19 No. 1, pp. 185-214.

Grant, R.M. (1996), "Prospering in dynamically-competitive environments: organizational capability as knowledge integration", *Organization Science*, Vol. 7 No. 4, pp. 375-87.

Gray, P.H. and Meister, D.B. (2004), "Knowledge sourcing effectiveness", *Management Science*, Vol. 50 No. 6, pp. 821-34.

Gupta, A.K. and Govindarajan, V. (2000), "Knowledge flows within multinational corporations", *Strategic Management Journal*, Vol. 21 No. 4, pp. 473-96.

Haas, M.R. and Hansen, M.T. (2007), "Different knowledge, different benefits: toward a productivity perspective on knowledge sharing in organizations", *Strategic Management Journal*, Vol. 28, pp. 1133-53.

Haesli, A. and Boxall, P. (2005), "When knowledge management meets HR strategy: an exploration of personalization-retention and codification-recruitment configurations", *International Journal of Human Resource Management*, Vol. 16 No. 11, pp. 1955-75.

Hansen, M.T. (1999), "The search-transfer problem: the role of weak ties in sharing knowledge across organization subunits", *Administrative Science Quarterly*, Vol. 44 No. 1, pp. 82-111.

Hansen, M.T., Nohria, N. and Tierney, T. (1999), "What's your strategy for managing knowledge?", *Harvard Business Review*, Vol. 77 No. 2, pp. 106-16.

Hoopes, D.G. and Postrel, S. (1999), "Shared knowledge 'glitches' and product development performance", *Strategic Management Journal*, Vol. 20, pp. 837-65.

Huber, G.P. (1991), "Organizational learning: the contributing processes and the literatures", *Organization Science*, Vol. 2 No. 1, pp. 88-115.

Inkpen, A.C. and Tsang, E.W. (2005), "Social capital, networks and knowledge transfer", *Academy of Management Review*, Vol. 30 No. 1, pp. 146-65.

Kankanhalli, A., Tan, B.C. and Wei, K. (2005a), "Contributing knowledge to electronic knowledge repositories: an empirical investigation", *MIS Quarterly*, Vol. 29 No. 1, pp. 113-43.

Kankanhalli, A., Tan, B.C. and Wei, K. (2005b), "Understanding seeking from electronic knowledge repositories: an empirical study", *Journal of the American Society for Information Science and Technology*, Vol. 56 No. 11, pp. 1156-66.

Kessler, E.H., Bierly, P.E. and Gopalakrishnan, S. (2000), "Internal vs external learning in new product development: effects on speed, costs and competitive advantage", *R & D Management*, Vol. 30 No. 3, pp. 213-23.

Kogut, B. and Zander, U. (1992), "Knowledge of the firm, combinative capabilities, and the replication of technology", *Organization Science*, Vol. 3 No. 3, pp. 383-97.

Kulkarni, U.R., Ravindran, S. and Freeze, R. (2006-2007), "A knowledge management success model: theoretical development and empirical validation", *Journal of Management Information Systems*, Vol. 23 No. 3, pp. 309-47.

Lee, H. and Choi, B. (2003), "Knowledge management enablers, processes, and organizational performance: an integrative view and empirical examination", *Journal of Management Information Systems*, Vol. 20 No. 1, pp. 179-228.

Majchrzak, A., Cooper, L.P. and Neece, O.E. (2004), "Knowledge reuse for innovation", *Management Science*, Vol. 50 No. 2, pp. 174-88.

Miller, D.J., Fern, M.J. and Cardinal, L.B. (2007), "The use of knowledge for technological innovation within diversified firms", *Academy of Management Journal*, Vol. 50 No. 2, pp. 308-36.

Nahapiet, J. and Ghoshal, S. (1999), "Social capital, intellectual capital and the organizational advantage", *Academy of Management Review*, Vol. 23 No. 2, pp. 242-66.

Nissen, M.E. (2005-2006), "Dynamic knowledge patterns to inform design: a field study of knowledge stocks and flows in an extreme organization", *Journal of Management Information Systems*, Vol. 22 No. 3, pp. 225-63.

Nonaka, I. and Takeuchi, H. (1995), *The Knowledge Creating Company*, Oxford University Press, New York, NY.

Ofek, E. and Sarvary, M. (2001), "Leveraging the customer base: creating competitive advantage through knowledge management", *Management Science*, Vol. 47 No. 11, pp. 1441-56.

Okhuysen, G.A. and Eisenhardt, K.M. (2002), "Integrating knowledge in groups: how formal interventions enable flexibility", *Organization Science*, Vol. 13 No. 4, pp. 370-86.

Reagans, R. and McEvily, B. (2003), "Network structure and knowledge transfer: the effects of cohesion and range", *Administrative Science Quarterly*, Vol. 48, pp. 20-267.

Renzl, B. (2008), "Trust in management and knowledge sharing: the mediating effects of fear and knowledge documentation", *Omega*, Vol. 36, pp. 206-20.

Rothaermel, F.T. and Thursby, M. (2005), "University-incubator firm knowledge flows: assessing their impact on incubator firm performance", *Research Policy*, Vol. 34, pp. 305-20.

Scheepers, R., Venkitachalam, K. and Gibbs, M.R. (2004), "Knowledge strategy in organizations: refining the model of Hansen, Nohria and Tierney", *Journal of Strategic Information Systems*, Vol. 13, pp. 201-22.

Schulz, M. (2001), "The uncertain relevance of newness: organizational learning and knowledge flows", *Academy of Management Journal*, Vol. 44 No. 4, pp. 661-81.

Schulz, M. (2003), "Pathways of relevance: exploring inflows of knowledge into subunits of multinational corporations", *Organization Science*, Vol. 14 No. 4, pp. 440-59.

Shekhar, S. and Ganesh, L.S. (2007), "A morphological framework for virtual organizations", *IIMB Management Review*, Vol. 19 No. 4, pp. 355-64.

Soderquist, K.E. (2006), "Organizing knowledge management and dissemination in new product development: lessons from 12 global corporations", *Long Range Planning*, Vol. 39, pp. 497-523.

Srivastava, A., Bartol, K.M. and Locke, E.A. (2006), "Empowering leadership in management teams: effects on knowledge sharing, efficacy and performance", *Academy of Management Journal*, Vol. 49 No. 6, pp. 1239-51.

Subramaniam, M. and Venkatraman, N. (2001), "Determinants of transnational new product development capability: testing the influence of transferring and deploying tacit overseas knowledge", *Strategic Management Journal*, Vol. 22, pp. 359-78.

Subramaniam, M. and Youndt, M.A. (2005), "The influence of intellectual capital on the types of innovative capabilities", *Academy of Management Journal*, Vol. 48 No. 3, pp. 450-63.

Szulanski, G. (1996), "Exploring internal stickiness: impediments to the transfer of best practice within the firm", *Strategic Management Journal*, Vol. 17, Winter special issue, pp. 27-43.

Takii, K. (2004), "A barrier to the diffusion of tacit knowledge", *Review of Development Economics*, Vol. 8 No. 1, pp. 81-90.

Tallman, S., Jenkins, M., Henry, N. and Pinch, S. (2004), "Knowledge, clusters, and competitive advantage", *Academy of Management Review*, Vol. 29 No. 2, pp. 258-71.

von Krogh, G., Nonaka, I. and Aben, M. (2001), "Making the most of your company's knowledge: a strategic framework", *Long Range Planning*, Vol. 34, pp. 421-39.

Wasko, M.M. and Faraj, S. (2005), "Why should I share? Examining social capital and knowledge contribution in electronic networks of practice", *MIS Quarterly*, Vol. 29 No. 1, pp. 35-57.

Watson, S. and Hewett, K. (2006), "A multi-theoretical model of knowledge transfer in organizations: determinants of knowledge contribution and knowledge reuse", *Journal of Management Studies*, Vol. 43 No. 2, pp. 141-73.

Winter, S.G. and Szulanski, G. (2001), "Replication as strategy", *Organization Science*, Vol. 12 No. 6, pp. 730-43.

Zhao, L. and Reisman, A. (1992), "Toward meta research on technology transfer", *IEEE Transactions on Engineering Management*, Vol. 39 No. 1, pp. 13-21.

Zwicky, F. (1969), *Discovery, Invention, Research Through the Morphological Approach*, The Macmillian Company, Toronto.

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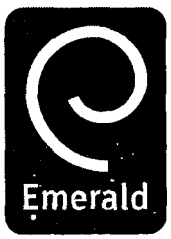

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