Computer-mediated knowledge systems in consultancy firms: do they work?
Reihlen, Markus; Ringberg, Torsten

Published in:
Professional service firms

DOI:
10.1016/S0733-558X(06)24012-6

Publication date:
2006

Document Version
Early version, also known as pre-print

Citation for published version (APA):
COMPUTER-MEDIATED KNOWLEDGE SYSTEMS IN CONSULTANCY FIRMS: DO THEY WORK?

Markus Reihlen
University of Cologne
Department of General Management, Business Policy and Logistics
Albertus-Magnus-Platz
D-50923 Köln, Germany
Phone: ++49 (0)221 470 4318/-4316
Fax: ++49 (0)221 470 5007
E-mail: reihlen@wiso.uni-koeln.de

Torsten Ringberg
Area of Marketing
University of Wisconsin, Milwaukee
School of Business Administration
3202 N. Maryland Ave.
Milwaukee, WI 53201, USA
Phone: ++1 414 229-5508
Fax: ++1 414 229 5999
E-mail: ringberg@uwm.edu

Acknowledgment: The authors greatly appreciate the support of Jan-Florian Schlapfner for his assistance in empirical fieldwork and his comments during manuscript preparation. We would also like to thank editors Royston Greenwood and Roy Suddaby as well as Natalia Nikolova for their helpful comments. Furthermore, we are grateful for the collaboration with Herrmann & Partners. The financial support by the German Ministry of Education and Research (research grant 01HW0168) is also acknowledged.
Abstract

Computer-mediated knowledge transfer has been at the forefront in consultancy research. The underlying idea is that individual knowledge can be externalized into disembodied symbols and codes, which can then be disseminated and accessed electronically within and across organizations. Although the process of externalization and transfer of knowledge has been investigated from various theoretical perspectives (positivism, social constructionism, pluralism), little research has addressed the role of cognition in computer-mediated knowledge transfer. Based on a case study within an international technical consulting firm, we argue that the success or failure of computer-mediated knowledge transfer is influenced to a large degree by embodied mental frames, social networks, and individuals’ creative and explanatory use of artifacts in real-world situations.
INTRODUCTION

Mastering knowledge management is particularly important for professional service industries, such as management consultancy, accounting, and law firms, whose market propositions depend primarily on the creation and exploitation of intellectual resources and their effective transfer in advisory service constellations (Empson, 2001; Greenwood, Cooper, & Hinings, 2003; Lowendahl, 1997; Morris & Empson, 1998; Suddaby & Greenwood, 2001). Furthermore, the ability to transmit individual expertise is essential in establishing a competitive edge, especially in professional services, which are often governed by a dispersed team environment. Consequently, identifying means through which knowledge can be gathered, stored, and transferred has been a focal point for consultancy companies and led to the development of computer-mediated knowledge systems.

According to a survey conducted by Ofek and Sarvary (2001) of the top 40 management consultancy firms in the United States, over 90% of the respondents claimed to have a computer-based knowledge management system in place. Most firms reported that the knowledge management system was an integral part of their business strategy; consulting companies, especially, have invested heavily in their knowledge infrastructure. For example, Ernst & Young claims to have invested over $500 million in their knowledge infrastructure, dedicated knowledge centers, and people (Ofek & Sarvary, 2001). The underlying rationale is that individual knowledge can be externalized, converted, and combined as portable artifacts that can subsequently be accessed and disseminated electronically within and across organizations (Davenport & Prusak, 1998: 68; Hansen, Nohria, & et al., 1999).
Identifying experience from prior consulting projects and adapting it to new client problems is especially effective for consulting firms focused on commodified services, or services that allow for a replication of existing knowledge endowments, best practices, and proven methods in order to address recurrent tasks (e.g., Hansen et al., 1999; Maister, 1993; Werr, 2002; Winter & Szulanski, 2002). This follows Morris and Empson (1998), who point out that codification of organizational knowledge is particularly relevant for firms that pursue standardization of roles and work tasks because codification allows for the efficient reuse of electronic knowledge repositories. As Davenport and Prusak (1998, p. 68) emphasize, codification converts knowledge into accessible and applicable formats that can be easily inputted and transmitted through computer-mediated knowledge systems, leading to faster and lower priced solutions that are already fine-tuned and have been proven successful.

However, the codification and externalization of knowledge into symbols and codes that can be accessed and disseminated electronically within and across organizations (Davenport & Prusak, 1998, p. 68; Hansen et al., 1999) rests on a theoretical assumption shared by positivism, social constructionism, and to a large degree by pluralist positions - namely, that knowledge is disembodied, embedded in data, practice and/or institutional structures and thus easily accessible to individuals, either through reading or participating in related activities.

Contrary to previous research into the influence of organizational design, corporate culture, and human resource management on knowledge sharing (e.g., Davenport & Prusak, 1998; Greenwood et al., 2003; Hansen et al., 1999; Karsten, 1999; Osterloh & Frey, 2000), we find that much of the current research on computer-mediated
knowledge transfer overlooks the influence of the cognitive frames individuals apply to make sense of sensory inputs. More recently, research have illustrated that individuals use a range of interpretive strategies to issues, producing divergent representations. For example, Werr and Stjernberg’s (2003) analysis of knowledge systems in global management consultancies shows the construction of meaning from documents diverge according to consultants’ interpretive frames. Similarly, Petersen and Poulfelt (2002) show that no shared frame could be established for the codifying of data into computer repositories causing difficulties in transmitting knowledge between consultants. Indeed, Werr and Stjernberg’s (2003) and Petersen and Poulfelt’s (2002) initial findings problematize the general claim that computer-mediated knowledge systems increase efficiency in consulting companies.

This paper contributes to this emerging line of research by showing how consultants’ cognitive dispositions (i.e., mental frames), social networks (competence, reputation), and creative and explanatory use of artifacts significantly and negatively impact the efficiencies of computer-mediated knowledge transfer in real-world situations. These findings have wide managerial implications for the implementation of computer-mediated knowledge systems.

The paper is structured as follows. First, we address the epistemological limitations in existing knowledge-transfer research. Then we empirically investigate and discuss the efficiencies of computer-mediated knowledge transfer in an international consultancy firm whose market proposition rests on its collective experience derived from past engagements. Finally, we discuss the influence and relevance of cognition in
knowledge transfer and establish a conceptual framework for knowledge transfer and the use of electronic knowledge repositories.

EXISTING VIEWS ON KNOWLEDGE-TRANSFER RESEARCH

Currently, three major theoretical approaches - positivism, socio-constructionism, and pluralism - dominate the ways in which knowledge transfer is conceptualized. Each approach is based on a unique set of assumptions that guide both inquiry into knowledge transfer and our understanding of computer-mediated knowledge-transfer systems (see Ringberg & Reihlen, 2004).

In brief, positivism relegates knowledge production to a linear process that assumes knowledge (the meaning of data) is embedded in text and numbers as objectified data that contains its own codes for its interpretation. The view that knowledge is a thing “out there” for which we can gain positive facts is generally derived from positivist theory (e.g., Donaldson, 1996). The objectification of knowledge has construed data as a commodity or resource to be traded, stored, and/or developed. More precisely, it is assumed that knowledge can be identified and characterized without referring to the specific cognitive conditions (i.e., memory capacity and intellectual acumen) that distinguish one knower from another. In general, positivism claims that if two individuals were provided with the same inputs, then, given the same training and experience, they would know exactly the same thing (see Antony, 2002). As a consequence, knowledge is understood, as Stigler makes clear, “as an abstract commodity ... flowing along the channels of communication defined by the organizational structure of the firm” (Stigler cited in Casson, 1999, p. 78). Knowledge transfer becomes a process of transmitting words or signals with prescribed meanings and feelings embedded.
Knowledge is assumed to be easily and univocally codified, accessed, and disseminated through impersonal means within and across organizations (Davenport & Prusak, 1998; Hansen et al., 1999). As such, organizations may be viewed as repositories of knowledge that provide templates for thinking as well as action, thus making relatively unskilled workers productive on a higher skill level (Alvesson & Kärreman, 2001, p. 1007).

Social constructionism views knowledge as embedded within socio-cultural codes. Since this view assumes that native speakers and individuals who share practice and social backgrounds have been collectively exposed to and thus share the required encoding and decoding strategies for knowledge transfer to occur smoothly, social constructionism, like positivism, defines knowledge transfer as a disembodied process that depends largely on non-cognitive processes (structures, practice, and social norms). This position embraces knowledge as socially constructed and suggests that knowledge exists within a “thought collective” (Fleck, 1979) and is acquired through a “community of practice” (Brown & Duguid, 1991, 2001). From this perspective, knowledge is defined through its social use. That is, words take on their meaning within the context of ongoing practice and relationships (Gergen, 1994). It is the “ongoingness” of these practices that make them appear meaningful and separated from the knower. For example, in a highly influential article, Brown and Duguid (2001, p. 198) suggest that practice serves as a basis for establishing a shared conceptual framework. In this view, practice (activity, routines, gestures, language) works as a carrier of meaning (concepts, values, etc.) that provides order in social life (McCracken Grant, 1988; Sahlins, 1985). For social constructionists, cognition is located in socio-cultural practices embedded in stable “webs of significance” allowing knowledge to travels along disembodied networks that can be
studied and unraveled without engaging the cognizing individuals and their social networks (reputation, competence, power). More specifically, organizations as systems possess a sort of communitized, collective expertise - a cohesion and coherence of the collective (Glynn, Barr, & Dacin, 2000, p. 727) - and thus a capacity for organizational learning (Willke, 1998, p. 6). It is to this end that computer-mediated knowledge systems are considered new and exciting means that may contribute to increased efficiency and competitiveness, as well as to reduced vulnerability to employee attrition.

The pluralist perspective introduces a more nuanced position because it sensitizes researchers to the presence of disparate interpretive frames, leading to potential differences in the understanding of similar data. Other researchers have explored the dispersedness of interpretive strategies. Abbott (1988), for example, shows that experts frame problems according to professional categories and overlook information that does not fit neatly into these categories. Tsoukas (1996, p. 13) identifies divergent organizational knowledge across organizational entities reflecting different normative and collective enculturation processes (e.g., education, practice, and organizational structures) at play suggesting that a firm’s knowledge cannot be surveyed as a whole. This speaks to Watson’s (1994; 1995; 1997) identification of rival discourses among which managers confusingly and confusedly switch back and forth. Similarly, Palmer and Dunford’s (2002, p. 1065) study of co-existing discourses in a flight centre shows how these discourses are anchored in ideological subtexts as well as power relationship that hamper communication.

Although cognitive issues have surfaced in the knowledge transfer research, such as the effect of absorptive capacity (Cohen & Levinthal, 1990; Zahra & George, 2002)
and knowledge tacitness (e.g., Brown & Duguid, 2001; Nonaka, 1994), these approaches in general disregard the role of cognitive dispositions, such as acumen, memory, creativity, experience, and life trajectory, on knowledge transfer. The following case study illustrates the inadequacy of shared practice, training, and experience in facilitating knowledge transfer and shows the influence of cognition (i.e., individuals’ interpretive strategies, creativity and reasoning), informal social networks, and reputation of sender on computer-mediated knowledge transfer.

**KNOWLEDGE TRANSFER IN AN INTERNATIONAL CONSULTING FIRM: AN EMPIRICAL INQUIRY**

**Site**

A case study investigating computer-mediated knowledge management systems was conducted at Herrmann & Partners (H&P), a leading international technical consulting firm specialized in a niche market. The firm was founded in Germany in the early 1970s and expanded rapidly as a result of its expertise in planning and implementing technical infrastructure. Its early engineering focus was gradually complemented with know-how in strategy consulting and change management, which enabled the firm to offer its clients integrated solutions. The partners believed that the principal element of their value proposition was based on H&P’s broad experience and long-term history in the chosen market domain. Although the firm was also involved in innovative engagements that moved it into new markets and led to the subsequent creation of new competency fields, the largest proportion of the business was conducted within the scope of what was considered a “typical H&P project.” These projects allowed
the firm to apply case-proven methods and exploit their experience gained in prior engagements.

Following the cross-border move of client firms, H&P founded its first international office in the early 1980s. Today, H&P is composed of a network of 18 offices located in Europe, North and South America, and the Asia Pacific region. The firm employs about 215 consultants worldwide and generates approximately 40% of its revenues in its foreign subsidiaries. The firm is organized as a federated partnership in which the primary locus of decision-making and structural differentiation is at the local level. While smaller offices (less than 30 consultants) are organized as small entrepreneurial firms (Mintzberg, 1979), the German headquarter, which covers a large variety of functional capabilities and competes in multiple client industries, is structured as a matrix organization. This structure institutionalizes a “constructive conflict” between industry requirements enforced by market segment managers and the firm’s existing experience, technologies, and methods represented by functional capability managers. The formal organizational structure on the national and international level is complemented by informal networks established through international training programs, cross-functional and cross-cultural project teams, and office rotations of consultants. These networks help build up an organizational culture that is consistently described as open, trustful, communicative, and collegial. One core value in H&P’s culture is a cooperative work climate that gives consultants free access to information and stimulates participative problem-solving across H&P’s network of offices.

Historically, H&P’s knowledge management practices rested on a network of personal contacts. Knowledge search and exchange took place through social networks of
acquainted consultants. With a growing and regionally dispersed business, network-based knowledge transfer was increasingly perceived as difficult and ineffective. In 1997, following an introduction and discussion at H&P’s annual partners meeting, it was decided that the firm would implement a computer-based knowledge management system. The new system was part of an ambitious goal to capture and disseminate knowledge (experience) among its consultants. As one of the knowledge operators remarked:

The system has to capture knowledge that is stored in the heads of people because we don’t want to reinvent what is already known in the firm. Especially nowadays, where experienced consultants retire or leave the firm, we recognize that we are losing expertise. Our objective is to make this expertise available independently of the persons who acquired it.

**Data Sources**

We were interested in describing and explaining perceptions involved in knowledge management practices rather than in identifying relationships between varying levels of inputs and outputs. Thus, the case study method, which involves tracing processes in their natural contexts, appeared most appropriate (Eisenhardt, 1989; Yin, 2003). Seven case studies of consulting projects within H&P were carried out to gain insights into the use of computer-mediated knowledge management systems in supporting the firm’s consultancy practices.

The case studies involved multiple data sources, including in-depth interviews, observations, and documents. Primary data were collected through 25 in-depth semi-structured interviews with consultants from different hierarchical levels. The interviews lasted from one to three hours each and focused on consultants’ reflections on their experience with H&P’s computer-mediated knowledge management system and the
system’s support of the company’s client acquisition and consulting processes. Project
data were supplemented by interviews with the founder (once), the partner responsible
for knowledge management (twice), and the knowledge operators (twice) who administer
the system and service the consultants. All interviews were taped and transcribed.

Secondary data sources included full project documentations, company, client,
and staff data, full access to H&P’s knowledge management system, internal reports,
quality assessments of projects, and company publications. These data were used to
prepare interviews, validate informants’ statements, and recast questions to interviewees.

**Data Analysis**

The analysis follows what Strauss and Corbin (1998) refer to as grounded theory
framework, which is essentially an open-ended discovery of emerging themes or essential
types as explicated in Husserl’s phenomenology. For Husserl phenomenology is not a
science of facts but an investigation of themes embedded within narratives. These
themes, though conveyed through the interviews, are often latent to practitioners. An
open-ended coding allows both explicit and tacit themes to be identified. Following a
hermeneutical process (going back and forth between already identified themes and new
ones), the interpretation of past constructs and their contribution to the larger meta-
narrative were continually modified and further clarified. We maintained a practice of
rigorous questioning of our interpretations throughout the analysis in order to assure our
interpretations’ continued grounding in the text.

The open-ended coding process generally produces a large number of constructs -
in this case, more than 120 constructs. Interestingly, while new constructs emerged
throughout the interviews, the number of additional insights diminished after the tenth
interview. That is, the additional interviews added context and depth to issues that had already been raised by previous interviewees. This follows, to a large degree, Zaltman and Coulter’s (1995) findings that the majority of insights surrounding a given topic are generally covered during the initial eight to ten in-depth interviews.

Through the iterative process of coding, grouping, and re-coding, semantic linkages emerged between meta-constructs, pointing to underlying and constitutive parts of thematic orientations. This process of identifying and keeping track of constructs and linkages throughout the hundreds of pages of transcripts was greatly facilitated by the computer-aided qualitative software program Atlas.ti 5.0 (Muhr, 1997). The Atlas platform is developed around the open-coding analysis, a technique used in grounded theory (Strauss & Corbin, 1998), and facilitates the arduous process by which underlying themes are identified. Three major subjects were identified: (1) the role of embodied knowledge, (2) the varied use of knowledge artifacts, and (3) the significance of social networks.

**Findings**

In a dispersed organization like H&P, knowledge resides in different regional locations. Consultants’ project-related learning experiences were encoded in knowledge artifacts like documents, computer programs, or benchmarking data and disseminated to others via electronic media. H&P’s computer-mediated knowledge system offered common features like storage and retrieval of project-related documents; staff information, including professional background, project experience, and contact information; and communication support through online chat and e-mail. Additionally, knowledge sources were arranged according to functional competence centers and
industry-related target groups. The computer-mediated system offered special query functions on the central document database and provided supplementary industry and functional information. Furthermore, commonly shared resources - including company presentations, drawing standards, newsletters, press information, forms, professional know-how, etc. - were entered into and disseminated through the computer-mediated system. Management emphasized formal training of consultants in the functions and use of the system and how to enter, distribute, and access information (i.e., knowledge).

We identified three types of knowledge artifacts the consultants were referring to when using the system to support their advisory practices. These were contacts, cases, and methods & tools. This categorization parallels earlier findings from Werr and Stjernberg (2003), who identified cases and methods & tools as elements of computer-based knowledge management systems in large consultancy firms. Each knowledge artifact and its use in practice are described below.

**Contacts**

Getting into contact with dispersed experts within the H&P network was considered crucial for improving problem-solving abilities. Two computer-mediated instruments, Yellow Cards and a central documentation center, were used to identify experts. The Yellow Cards, which include contact information and a professional profile of consultants, are hosted on an intranet application. To protect data privacy, the consultants administered Yellow Cards themselves. This resulted in very heterogeneous personal and professional profiles that were not always up-to-date. In practice, Yellow Cards offered information that was too rudimentary and of little use for evaluating
professional skill sets of experts - a fact that basically reduced the function of Yellow Cards to that of an online telephone register.

The second and more important instrument was the central documentation center, which included information on consultancy cases as well as information on each consultant’s previous projects. The latter was used as an indicator for his or her field/s of expertise. Before the introduction of computer-mediated knowledge management, information including earlier consultancy projects was stored in an old-fashioned archive and rarely used for identifying experts within the firm. This changed with the new system. As the founder, Dr. Herrmann, remarked:

Contrary to ten years ago, the central documentation center is a great advantage. Today, at least we know which projects we have conducted, what the projects are about, and who was involved. Together with the fact that we have a relatively low fluctuation of consultants, there is a high likelihood of finding the appropriate person.

Cases

As consultants gained new experience during their advisory engagement with clients, the knowledge was partially codified and stored in the central documentation center. At the end of each project, project managers wrote up a ten-page summary of the consulting problem that included a brief outline of the results and a list of members of the consulting team. Additionally, most project documentations also included proposals, offerings, reports, presentations, data, and references to applied tools (mathematical models for analyzing client problems). Figuratively, each project left memory traces in the knowledge management system that were picked up by others to help them understand and learn from the case experience. However, our interviews with consultants
showed that case information served multiple purposes in supporting advisory practices and was used and interpreted in quite different ways.

*Cases as creative devices.* Consultants were interested in identifying possible framings, solutions, and lines of thoughts that would inspire their own understanding of their client’s problems. As one senior consultant put it:

> For me, project content is a vehicle to learn from other cases and get inspirations for my own solutions.

Another senior consultant explained:

> [Cases] offer possibilities to learn something and to gain insights into possible solutions to my problem. For example, if you are concerned with robot transportation systems, which pick up pallets from the materials handling equipment and deliver them at the central pallet location, then you can see how it was done before. Such a description creates ideas for potential solutions.

Here, the computer-mediated system basically functioned as a pond for creative exploration with little regard for the intended use by the originator of the information.

*Cases as resources.* Consultants also used cases to develop new solutions as well as to strengthen existing ones through an evaluation of the merits of opposing arguments. Contrary to the creative use, consultants needed to understand the cases in order to draw genuine analogies between their current problem and the solutions documented in the computer-mediated system’s case repository.

As a project manager pointed out:

> Our first project with General Pharma was in Spain. We had been looking through the material to gain a broader picture of possible solutions. Our problem was very related. This enabled us to take large parts of the solution and refine it.
Similarly, cases often included benchmarking data, best practices within an 
industry, performance indicators, or cost figures that were used by consultants to control 
and validate their ideas for problem solving. Furthermore, consultants used cases as a 
resource of templates for well-formulated proposals, presentations, and/or procedures.

Cases were also exploited as a resource for acquisition purposes because they 
reflected the firm’s history with a specific client. Partners studied client histories derived 
from the case repository to help them understand the past and shed some light on the 
present behavior of clients. Client histories were then used to support claims of 
competence offered in discussions with potential business partners. As a managing 
partner commented:

> When I have a contact person of a client with whom we had a project in 
> South America, then I want to know with whom we worked together. In 
> acquiring a project, it is important to show the client that we worked together on 
> several projects before and give them names with whom we were involved.

**Methods and Tools**

Various methods and tools supported consulting practices in analyzing client 
problems, evaluating alternatives, and supporting implementation. In general, methods 
were interpreted as “check lists,” “generic procedures,” or “catalogs of questions” whose 
basic function was to aid the structuring of a consulting problem and to offer clues for its 
resolution. Methods represented “rules of thumb” generated and preserved from previous 
projects. Similar to case knowledge, methods were a source of inspiration to stimulate 
creativity or a resource consultants used to develop a stance for problem-resolution.

Tools, on the other hand, were mostly interpreted as instruments of conducting 
“calculations.” With H&P’s traditional engineering focus, these calculations were
perceived as an important part of its advisory work. Tools helped consultants work out practical problems by formally modeling, analyzing, and interpreting client issues. They allowed fine-grained problem investigation and evaluation and were mostly programmed within an ACCESS or EXCEL application. Contrary to generic methods, tools required in-depth and detailed background knowledge of the model’s formal structure and areas of application. Even for experienced consultants, tools were not self-explanatory. Mastering them required intensive and personal interaction, practical training, and application before consultants could use the tools properly for problem-solving. Consultants spoke about extended periods - ranging from six month to one year - of intensive practice with a tool before they felt that they could comfortably apply that tool to a client problem and competently evaluate the results.

Because of the complexity of a model’s structure and formalism, tools appeared as a system of “local knowledge” shared only within small groups of experts. Tools were cultivated at the interplay between specific client needs and the existing methodological background of consultants. Even for the same type of client problem as many as five different tools with various creators coexisted. This is explained by a senior consultant:

Tools are a special issue for H&P. Since we love to analyze problems into the last details, we have difficulties with the use of generic tools. . . . The problem you have to deal with always differs. You start to tinker around and adjust the tool until it becomes a new customized solution.

Mastering tools required very specialized methodological skills and substantive case knowledge. While tools were broadly accessible through computer-mediated systems, they were not commonly shared within the firm. This stands in contrast to Werr and Stjernberg’s (2003) argument that tools and methods in consultancy firms create a shared framework and terminology (i.e., language).
Problems with Computer-Mediated Knowledge Transfer in Practice

Although the computer-mediated knowledge system was enthusiastically supported by the company founder and had been in place for some time, consultants were still faced with the challenge of identifying useful knowledge artifacts. Computer-assisted knowledge search at H&P was supported by various functions, like a full-text search engine, a catalog of keywords in various languages as well as industry and competence classifications. Consultants found that the computer-assisted knowledge search that was supposed to match case experience with the current consulting problem was rather cumbersome and difficult to engage. As one consultant explained:

Working on a project requires me to identify projects with a similar task. This is already a difficult issue. . . . I may find, in the ten-page summary, that a project matched my problem. However, then I explore how the problem was solved and recognize that despite task similarities, a method was chosen that cannot be applied to my case. I do this project by project. This is very time consuming and showed only moderate success.

Based on our analysis, an additional set of categories emerged that speak to underlying challenges facing computer-assisted knowledge search and transfer. We identify them as problems of finding relevant content and problems of comprehension.

Problems of finding relevant content

Although content search in the central documentation center was supported by common research tools, consultants had difficulties locating relevant documents. Net searching was viewed as time-consuming and difficult. Besides some technical issues of user-unfriendliness, consultants complained about the system’s classification scheme. A classification scheme maps the body of knowledge a firm uses to diagnose problems and screen solutions (Abbott, 1988; Manville, 1999). The value of classifying knowledge
evolves from making it identifiable by knowledge seekers. H&P implemented various methods to catalog prior experience from consulting engagements. One dimension represented the industries H&P was serving. Since each industry was unique, projects were easily assigned to particular markets. Another dimension represented the knowledge acquired by individuals located in functional competence centers like strategy, operations, or change management. Grouping knowledge according to functional criteria became especially difficult when complex client problems were solved in ways that involved multiple competence centers. Consultants would use standard queries to search the collective knowledge base, but industry and competence center classifications were generally rather crude and did not give consultants an easy recognition of relevant project-related experience.

H&P also established a catalogue of keywords in order to facilitate identification of relevant knowledge - basically a dictionary of the firm’s consulting knowledge. The system of descriptors became quite complex and included over 3,300 keywords in German and over 1,700 keywords in English. However, identifying documents through comprehensive keyword searches did not improve the ease of access. Although consultants could make proposals for new keywords, knowledge operators who had professional training as librarians but no experience in consulting work administered them as part of their task, which also included the development of relevant classification schemes for each functional area. Because of the operators lack of experience in consulting, the resulting classification system was often at odds with how consultants would categorize documents for future retrieval; divergent understandings of how to
catalog documents caused difficulties in prioritizing and finding knowledge artifacts.

Illustrative of this is the remark of a consultant who stated that

the people who developed the system and assigned keywords think
differently than I do. . . . The whole strategic [practice] area is not well
developed. I either have no hits at all or a mess that is only loosely related with
my inquiry.

As a consequence, finding relevant content became very problematic as a senior
consultant pointed out:

The structuring is not well done. When a project is archived, you can
find it through the client, if you know something about the project. If you just
look for a topic, it is hardly possible to find anything. The reason is that the
archived documents are not classified.

Interestingly, to avoid the classification system administered by the knowledge
operators, consultants developed and maintained a parallel system hosted on a local file
server. This local file server was structured in a simple, hierarchical system of directories,
and consultants preferred this system because its underlying classification followed a
structure that was more logical and comprehensible to them. Based on a backward
technological infrastructure, practice groups preferred to cultivate their own
classification, terminology, and language, which were stored outside the central
knowledge management system.

Problems of comprehension

The aim of a knowledge management system is to facilitate mutual
comprehension because “there clearly cannot be a cognitive productive community where
people do not understand one another” (Rescher 1998: 13). Problems of comprehension
occurred when consultants had difficulties in understanding knowledge artifacts (e.g.,
documents, tools, etc.) or misinterpreted them. Our analysis discovered three main problems of comprehension: idiosyncratic meaning, lack of context, and lack of process knowledge.

**Idiosyncratic meaning.** Although consultants were trained in and followed a shared protocol on how to document (enter) previous project work, the consultants who entered the data often ended up including context and references to issues that were difficult to understand for other consultants who accessed the computer-mediated system to search for insights into their own upcoming projects. The difficulties arose because what was relevant and meaningful to the consultant who entered the data was not necessarily sufficient for the consultant who was trying to make sense of the project insights. Thus, the transfer of experience (knowledge) from one consultant to another through the computer-mediated system was difficult because what is considered generically cogent depends on the cognitive framework a consultant applies. As one consultant put it, “You put a summary, a couple of tables together, but for outsiders it is difficult to understand its core.” Another consultant suggests that in addition to the problem of anticipating the reader’s framework, time and other logistics (space) also play a role.

If you think about, what is not only interesting from your own standpoint, but what is relevant for third parties, then you quickly recognize that there is not much preservable knowledge. Many issues require so much explanation. You either give up right away or you have to invest days to generalize from your single case.

This quote speaks to the problem of not having sufficient contextual information to envision what the consultant who entered the data had in mind.
Lack of context. The ten-page summary written up after each project provided only a brief overview of the project, making it difficult to understand the true nature of the project, as made clear in the following quote.

After each consulting project, be it two years or two months, we are required to prepare a summary. Spending so much time [with a project] makes it difficult to briefly formulate what was important so that others get a good idea of what we had been doing. If you copy 10 out of 200 pages, upload them as a briefing on the net, then read these 10 pages removed from the context, it becomes difficult for others to understand them in any meaningful way.

Consultants repeatedly missed the emotional and less tangible aspects of a consultancy experience. The consultants referred to this type of information as the “soft aspects of the projects,” “the color commentary from the person involved,” “emotions,” or “political issues.” This broad range of information is perceived as vital for comprehension about processes and challenges dealt with in a particular project.

Another dimension of missing context that emerged throughout our interviews was related to the quality of artifacts. Although consultants shared project-related documents, methods, and tools, very little effort was made to ensure internal quality control of knowledge artifacts. The artifacts were neither assessed before being uploaded into the computer-mediated system by competence field managers or peers nor evaluated afterwards by internal users (consultants). This was quite surprising, since internal and external quality control of client projects played a crucial role in H&P’s quality management. However, quality control was not implemented for the computer-mediated knowledge system. With no way to access the relevance, significance, or success of an implemented project in order to decide whether or not to rely on another consultant’s experience, consultants have established informal search criteria to acquire a “feel” for
these attributes (relevance, significance, success) to help them select the best set of cases, tools, or methods for their own projects.

*Lack of process knowledge.* When entering project information, the consultants rarely included background information that described the activities involved in planning (research) and executing (process) the project nor did they include information about problems encountered, technology choices, and underlying assumptions. Information about the process was particularly useful as a learning tool for subsequent consultancy projects, yet the consultants who entered the data spent very little effort in describing the process. This could be attributed to lack of time, resources, and space and possibly to difficulties with recollection. Paradoxically, the consultants extracting information from the computer-mediated system viewed the lack of process knowledge as largely impeding the replication of other consultants’ successful projects. A managing partner illustrates this:

> In the end you receive a PowerPoint page, which says what we did. I would raise the question, how did you approach this topic? It is not enough to state that we bought a production technique from this and that company. I’m rather interested in the description of the methodic leading to the results. But I think that this cannot be covered by an electronic medium.

The lack of relevant information led consultants to view the system as a less useful source of knowledge for their advisory practices. Consultants felt that the system was not and could not be adapted well enough to their needs in order to avoid experiences with the knowledge management system that were often described as frustrating or inefficient. At H&P’s annual partners meeting in 2004, the failure of the system to measure up to its initial aims was officially recognized and became a key topic of the agenda. From the interview statements included in this paper, it is obvious that
externalizing consultancy expertise in a computer-based repository for future reuse was much more challenging and problematic than originally thought. Given the problems with computer-mediated knowledge transfer described above, H&P’s consultants recognized the importance of creating a more informal network that emphasized the production of meaning through dialogue. We describe this network next.

Social Network–Based Knowledge-Transfer Practices

Historically, knowledge transfer within H&P was based on networks of acquaintances. These networks were cultivated by various formal and informal instruments within an organization that was consistently described as open, communicative, and collaborative. The primary reference group of a young consultant was the initial working group through which knowledge was transferred on a person-to-person basis. This network was extended further through international training programs that brought consultants of equal levels together for intensive “skilling,” training, and socialization. These training programs were perceived as very useful for developing network ties used for knowledge searching by dispersed offices. Personal networks were also extended through cross-functional or cross-border project work and international office rotation. Consequently, the longer consultants were employed by a firm, the stronger the personal networks that emerged. Thus, senior consultants were able to draw on a tightly woven network of contacts for knowledge search and transfer. All the senior consultants we interviewed preferred network-based knowledge transfer, and many of them believed that the computer-based repository supported mainly the unskilled junior advisors. A South American office manager illustrated this as follows:
I think the intranet is good for the younger engineers. The people who have less experience in the company know how to get started. … I guess we higher level consultants, . . . should bother for soft aspects.

The social networks often served as an alternative knowledge-transfer system because they provided consultants with measures to interact and ask about issues that are not easily captured by a formalized system. Personal social networks were repeatedly described as superior, especially when complex knowledge (e.g., framings of advisory problems, conditions for the application of tools) was transferred. In particular, we were able to identify three main factors why social network-mediated knowledge transfer was viewed as advantageous to the computer-mediated one. First, consultants felt obligated and committed to respond in greater details to personally articulated inquiries from acquaintances. This resulted in more constructive and problem-oriented assistance. Second, consultants found that personal contacts provided more contextualized knowledge, including consultants’ competence, problems, feelings, emotions, political issues, and methodologies. Contextualization was perceived as vital in order to learn from earlier cases and provide instructions for problem solving. Third, the interactiveness of network-based knowledge transfer allowed a dialog-based investigation of issues where consultants jointly framed and reframed new advisory problems, thus enabling brainstorming and targeted advising. Illustrative of this is the following statement by a senior consultant:

[An acquaintance] gives me advice and helps me to find a possible solution, while [the computer-mediated system] presents only what was done and I still have to find a resolution by myself.

Social network–based knowledge transfer provided a forum for consultants where both consultee and consulter could engage in dynamic exchanges that brought to the
surface otherwise unarticulated issues that were relevant to the resolution of a project at hand. The network interaction provided unforeseen inputs as well as opportunities to follow leads that were otherwise unavailable in the computer-mediated system. Our observation indicates that the network of acquaintances was especially useful for more complex problems that benefited from the collaborative exploration of contextual and procedural information.


discussion

H&P is an experience-driven consulting firm with dispersed national and international operations and has the ideal characteristics of a firm where a computer-mediated knowledge management system would improve its consulting practices. Yet, as the case analysis shows, few benefits are materializing, even after years of top management support and extensive consultant training. In the following section, we discuss three core shortcomings in computer-mediated systems designed to facilitate knowledge transfer, and we provide a theoretical explanation for why these shortcomings have been overlooked in knowledge-transfer research. The core insights are as follows: (1) knowledge is embodied and evolves from a co-production between text and the decoder’s interpretive frameworks; (2) knowledge artifacts are used for a range of unrelated purposes (inspiration, substantiation, mutual understanding), which may differ from their original intended use; and (3) social networks eclipse computer-mediated systems in facilitating knowledge transfer.
The Embodiment of Knowledge

The claim of disembodiment - that knowledge exists and can be stored apart from a cognizing individual - runs across current knowledge management research (Blackler, 1995; Reihlen, 2003; Spender, 1996, 1998). Yet our case-analysis suggests that even with a high degree of sharedness (practice, background, training), the consultants we interviewed had persistent difficulties in making sense of one another’s computer-mediated artifacts, leading to either miscommunication or a creative but unrelated usage of the information. The contextual information deemed relevant and important for the conveyance of a consulting experience differs from individual to individual and is based largely on the conceptual framework consultants operate within. Current research approaches are largely inattentive to the influence of individuals’ interpretive framing. Moreover, as computer-mediated knowledge systems typically function in decontextualized discursive environments even when users become aware of such discrepancies few, if any, opportunities exist for the involved parties to clarify the implicit as well as explicit meaning intended in knowledge transfer. Shore (1991, p. 10) speaks to the importance of personal interaction, when arguing that meaning construction involves the perpetual encounter of meaning-seeking subjects and a culturally conventionalized object-world (also see Bunge, 1998, p. 223-225). The challenges involved of establishing intersubjectivity is well documented in research within psychological anthropology (D'Andrade, 1993; Lutz, 1988), social psychology (Gergen, 1994; Resnick, Levine, & Teasley, 1991), cultural psychology (Shore, 1991), social linguistics (McClamrock, 1995), sociology (Goffman, 1974), and communication (Carey, 1989). Building on this literature and on our findings, we argue that current investigations of the efficiency of computer-mediated knowledge transfer misidentifies knowledge
transfer breaches as attribute-based rather than due to divergent cognitive frames among meaning-seeking individuals. The lack of attention to these frames may be a result of their tacitness; they appear wholly natural and transparent to the individual - as if they were obvious facts of life (D'Andrade, 1993; Polanyi, 1966) leading to a lack of challenging of the assumption that other’s interpretation is in accordance with one’s own (D’Andrade, 1992, p. 79). This lack of immediate awareness among users of computer mediated knowledge transfer systems may have misled researchers to primarily focus on protocols, training, etc. as culprits in ineffective computer-mediated knowledge transfer systems. What remains largely overlooked is that artifacts do not carry their own decoding strategies, that is, meaning can never be assumed to be obvious from the data itself but always rests within the meaning seeking individual. For knowledge transfer to be successful information cannot be understood in absence of the cognitive background of both sender and receiver - a requirement that computer-mediated knowledge systems were not and cannot be built to accommodate.

The Production of Meaning from Artifacts

In our case study we see how H&P consultants had to resort to extensive, informal, and personal interaction to reconstruct the intended meaning to understand what the encoding (information-entering) consultant had in mind. This challenge is only somewhat lessened when the consultant (entering the data) is careful to include descriptive narratives of the experiences surrounding a consulting project. Alternatively, other consultants preferred using the information for creative and inspirational purposes whose overlap with the intended meaning was purely coincidental. The latter consultants, ironically, were the ones who expressed most satisfaction with the system. While both
approaches (reconstructive and creative) may appear opportunistic in character they are theoretically explainable.

The creative use of artifacts suggests that any interpretation is equal in merit as long as it serve the decoder’s purpose. This ‘egality’ is explained by Derrida (1976) in his deconstructionist theory of text interpretations because text (information), or in a broader sense, knowledge artifacts, allows a variety of possible interpretations that have to be viewed as equal in merit. According to this theory, the understanding of artifacts in a computer-mediated system cannot be assumed a priori and inevitably leads to a plurality of variants, each interpretation equal in terms of plausibility and justification.

The attempts by several consultants to reconstruct the intended meaning (before resorting to a creative use of the data) reflect an approach that differs from Derrida (1976) because these individuals were seeking (albeit unsuccessfully for the most part) to remove the ambiguity of the meaning of artifacts. We refer to this type of meaning production as reconstructive interpretation - a process that is committed to a rational analysis of statement contents in the wider context of authorship (Rescher, 1998, p. 159).

The effort to sieve through plausible explanations and derive the most reasonable one based on the available context speaks to Weber’s (1922) early argument that the meaning of communicative efforts is not necessarily omnipotent but is constrained by reason and normative rules that encourage individuals to assign a degree of plausibility to potential interpretive outcomes (see also Bunge, 1996). Rescher (1997; 1998) also explored this objectivist concept of the evaluation of meaning in his reconstructionist theory of text interpretation, in which rationality is considered the only tool to understand the thought worlds and positions of others with whom we have communicative contact.
The core idea of Rescher’s (1998) rational analysis of statements is based on the principle of contextuality which, in turn, is predicated on two theses. First, the ultimate idea of interpretation is geared toward finding the best possible meaning of a text. Second, optimizing interpreting practices is best achieved when the whole range of hermeneutical factors, such as context and authorship (reputation, power, experience), are enumerated. Although context can be treated as yet another text open to interpretive representations - additional information serve as mediator with which individuals can hone in on one another’s mindset. From this perspective context is considered essential as point of reference, both enabling and confining the interpretive possibilities.

Our case findings demonstrate that a contextual coherence of information is vital for the reconstruction of knowledge and consultants effort to understand other consultant’s projects. When consultants relied entirely on the computer-mediated knowledge system the reconstruction process was largely impeded. As a result, the consultants developed alternative and informal routes for acquiring contextual information, what they variously referred to as “soft information,” “color commentary,” “political relations,” “reputation,” and “experience.” While vaguely conceptualized in the minds of the consultants these cues were essential for their ascertaining of the content and relevance of other projects. The personal character of these cues makes them difficult to capture in a formal vocabulary, protocol, or computer-mediated data environment. Even what constituted as relevant features in ascertaining the reputation of the information-entering consultant was difficult to codify and formalize.

When looking at these activities from current theoretical perspectives, we see that the positivist approach is largely unable to account for both the creative and
reconstructive efforts practiced by the consultants. With the meaning presupposed to be evident from the text, the presence of creative and explanatory reconstruction processes by consultants easily becomes seen as derived from technical shortcomings or lack of factual knowledge (training, experience, and education). Similarly, the social constructionists’ assumption of the presence of shared rules of signification among co-practitioners (in organizational settings) leads to the argument that any breakdown in the computer-mediated system must stem from inadequate job rotation, lack of sharing of tools, and insufficient teamwork. However, based on our case analysis it appears difficult to garner support for seeing organizational practices as sufficient for establishing shared cognitive frames among the consultants. The social constructionist researchers’ investigation of knowledge as “networks” and practice as “meaning-carriers” is insufficient in theoretically explaining what it takes for knowledge transfer to be successful and especially why computer-mediated knowledge transfer is likely to suffer.

The pluralist approach, which argues that meaning production is bound to be multifold because of the presence of differing interpretive frameworks, appears to be better off in avoiding the theoretical shortcomings of the other two perspectives. Yet, even the pluralist position falls short in providing a fulfilling theoretical answer as to why consultants who share experience, training, and practice communities feel they have to invest time and effort into the reconstruction of meaning of codified data. From the pluralist position such efforts are only necessary for consultants who move between interpretive communities - which is not an issue here, since they all belonged to the same community. The pluralist position would not fair much better when trying to explain consultants’ creative use of information since, from a pluralist position, interpretive
strategies are bounded by (disembodied) discourses and practices all which suggest that creativity is an accidental outcome of inadequate training, practice, education or, alternatively, is the result of a particular perspective within a dominant discourse, in which case we cannot make sense of individual creativity, per se.

**Reflective Conversations**

The literature on professions argues that advisory problems represent “wicked” (Mason & Mitroff, 1981; Rittel, 1972) or “multi-context” (Kirsch, 1988) issues that require professional judgment (Abbott, 1988) and reasoning (Toulmin, Rieke, & Janik, 1979). The complexities facing consultants necessitate that the professional advisor be a thoughtful practitioner who try to establish knowledge-in-practice through reflective conversations that stimulates reasoning (Schön, 1983). H&P’s consultants saw these reflective conversations as vital to their exploration of the contextuality and particularity of earlier cases with fellow advisors as carriers of local case experience. The exchange of complex knowledge, as our findings indicate, could not be easily facilitated through traditional computer-mediated means.

At H&P the consultants had to switch to social network–based knowledge-sharing practices. This allowed them to engage in participative construction and negotiation of meaning, which provided them the opportunity to compare their own clients’ problems with other consultants’ experiences in prior projects in order to comprehend the proper application of tools and explicate tacit background assumptions. In short, a dialogue was necessary to enrich consultants understanding of other consultants’ meaning structures.

Deetz (1992) explored the challenges involved in dialogue in accordance with Gadamer’s (1972) theory of hermeneutics and Habermas’ (1981) theory of
communicative action. Both theories claim that understanding is best established when participants have adequate and equal opportunities for placing questions, expressing claims, or stating interests during communicative interactions. Accordingly, in order to embrace others’ points of view, consultants have to collaborate and coordinate conditions for interpersonal communication that allow for the conveyance and explication of tacit knowledge and taken-for-granted assumptions (Brown & Duguid, 2001; Polanyi, 1966). Deetz (1992) also speaks to this point when explaining that conversation is what drives the process of creating mutual understanding and helps establish the conditions of future unstrained formation of experience. We see how consultants intuitively engage in such activities and social networking becomes an expression of communicative theory in action; yet this fundamental aspect of human interaction remains uninvestigated and unaccounted for in current knowledge-transfer research.

Facilitating the negotiation of meaning, which is crucial for the transfer of complex knowledge, was not well supported by H&P’s computer-mediated system. Although fractions of local knowledge were captured and stored as cases, methods, and tools in the computer-mediated repository for future relearning, these artifacts were useful for consultants only when their interpretation was simultaneously negotiated through social networks. Although the computer-mediated system could convey raw facts (Searle, 1995), such as prices, product attributes, address data, and fee income, the system was unable to communicate underlying points of view or interpretative schemes, which turned out to be integral to the understanding of the proper use of artifacts.

Our case findings provide a rather sober picture of computer-based systems as repositories of knowledge and experience for future use. From the consultants’ point of
view, the choice between engaging the electronic or the social knowledge-transfer system was obvious to them; they ended up more or less abandoning the computer-mediated system and focusing on informal social networks that allowed for a reflexive interaction with other consultants’ frames of reference.

**CONCLUSION**

While the current debate about computer-mediated knowledge transfer for professional service firms asserts that these systems can effectively capture and diffuse expertise throughout an organization, even on a global scale, few case studies exist that explore this claim in detail. Our case study of an experience-driven consulting firm - an environment in which one would expect to identify great benefits of knowledge codification - provides insights into the pitfalls of computer-mediated knowledge systems as well as theoretical reasons for why such pitfalls have evaded current theoretical perspectives. We see a great need for future research to creatively engage in approaches that investigate the influence of cognition and social factors in the transfer of knowledge. The understanding of computer-mediated knowledge transfer constitutes an important area of scientific and technological research, but any study remains incomplete without the consideration of knowledge as constituted through and through by the interpreting mind (i.e., cognition).

**REFERENCES**


Knowledge and Value Development in Management Consulting. Research on Consulting Series I (pp. 33-60). Greenwich, CT: Information Age Publications.


NOTES

1 To maintain the confidentiality of the firm, we have changed its name and some key data.
2 A fourth category - client exchange - emerged, but it did not play a role in internal knowledge management practices.