



**KNOWLEDGE CODIFICATION IN AUDIT AND CONSULTING FIRMS: A CONCEPTUAL AND EMPIRICAL APPROACH**

**Author:** corinne janicot - Email: corinne.janicot@univ-montp2.fr

**University:** Université Montpellier II/ IAE

**Track:** 17. Knowledge renewal in social networks

**Co-author(s):** Sophie Mignon (Université Montpellier II/ IAE)

*Access to this paper is restricted to registered delegates of the 2009 EURAM  
(European Academy of Management) Conference on Renaissance and Renewal in Management Studies.*

Organisers:



# KNOWLEDGE CODIFICATION IN AUDIT AND CONSULTING FIRMS: A CONCEPTUAL AND EMPIRICAL APPROACH

## ABSTRACT

Although knowledge codification makes it possible to exchange and disseminate knowledge throughout the organization and reduce access time, enhancing the quality of engagements and relationships with clients remains problematic. We propose a model for knowledge codification built on the concepts of the service's time-related value and cognitive value, assessed with the aid of integrative information technologies (network of knowledge bases) and interactive information technologies (shared workspaces). The model, applied to a consulting firm involved in knowledge codification strategy, shows a significant improvement of time-related value and a significant partial improvement cognitive value of the service.

Keywords: knowledge codification, integrative technologies, interactive technologies, value

## I INTRODUCTION

In a strategic value-building perspective, certain groups have decided to develop knowledge-sharing strategies by encouraging knowledge codification with the help of information technologies, as shown by Empson (2001 a). Transfer of knowledge is vital for consulting firms, which must be able to respond to each specific new request by drawing on the knowledge accumulated from past engagements. As Brown et al (1991), Morris et al (1998) and Nonaka (1994) stress, individuals and groups can generate new knowledge in an ad hoc way, responding to new client problems by improvising and using existing methodologies and know-how. The objective of knowledge management is to facilitate the transfer of knowledge between services, in order to draw maximum profits from the knowledge created and benefit from the internal knowledge market. The main problem facing a firm engaged in a "knowledge strategy" is ensuring that the knowledge created by individuals or by a team belonging to one of the firm's departments can be reused by other actors in

other contexts, and thus contribute to an overall performance enhancement. In practice, use of knowledge by others (departments or individuals) is hindered by certain number of obstacles: for example, adjustment to the new situation (Huber, 1990), the danger of relying on knowledge created in the past that can inhibit innovation, standardization of tasks in a differentiation-oriented world (Hansen et al, 2005), or the sheer proliferation of information (Nightingale, 2000).

There are two methods for sharing knowledge within organizations: through electronic documents (Hansen et al, 2007, Connolly et al, 1990) and through interpersonal communication (Hansen et al, 2001, Reagans et al, 2003). What is the best system to improve firm performance?. The answer is complex and depends on the type of knowledge and the nature of tasks. Some research (Hansen et al, 2007) has shown that sharing codified knowledge in the form of electronic documents saves time but does not improve the quality of work or improve competence as perceived by clients. Conversely, the same authors showed that sharing advice between individuals improves the quality of work and signals competence to clients, but does not save time. These results show the complementary nature of the two systems for value creation based on “knowledge strategies”, which take the form of codification strategies or personalization strategies (Hansen et al, 1999). According to some studies, the debate over knowledge codification must take into consideration the advances in Information Technologies (IT) that are spreading to all sectors and have significantly reduced the cost of access to information (Cohendet, 2000). We distinguish two forms of codification via information technologies: electronic documents in the form of knowledge bases, and shared workspaces (groupware technologies).

The aim of this article is to study the knowledge strategies of firms in the audit and consulting business, and to understand the knowledge codification arrangements introduced to manage knowledge. The main research question is the following: how do codification systems foster knowledge sharing, and do they lead to improvements in consultants’ performances or not? To answer this question, a model of knowledge codification is proposed, based on the concepts of the time-related value and cognitive value of the consulting service, distinguishing between two types of codification technologies: integrative and interactive.

The methodology chosen consists of a study of the Knowledge Management System (KMS) used by a large international audit and consulting firm, and conduction of semi-directive interviews. The first section is devoted to knowledge codification as a type of knowledge management, and the second section presents the proposed model and its validation through a case study.

## **I. KNOWLEDGE CODIFICATION IN KNOWLEDGE MANAGEMENT STRATEGIES**

In the firm studied, the dominant strategy is knowledge codification, based on a network of knowledge bases and interactive technologies of group work<sup>1</sup>.

In the opinion of Lowendahl (1997) and Starbuck (1992), professional service firms see a strong link between expert knowledge rooted in services or intangible products and their competitiveness. Knowledge codification is thus a key element of knowledge strategies for the consulting sector. It is intended to increase the firm's responsiveness, the quality of the services offered and the "cognitive" dimension of the solution to the client question, by incorporating more knowledge into execution of engagements. For a better grasp of the issues involved in knowledge codification in the audit and consulting business, the nature of knowledge that can be used is defined, before presenting the types of codification, the role of ITs and the associated value models.

### **I.1. Can consultants' knowledge be coded?**

First, we must define what we mean by coding. Initially, codification must be considered in its strictest sense. An item of codified knowledge has its source in some part of the organization. Once identified, the knowledge is formalized (represented in a written language), stored, indexed and distributed to the rest of the organization through data bases. Codification can be defined as a process of storage, indexation, and distribution of formal knowledge independently of any context. To complete this definition, the concept of codification can be broadened to include standardization of knowledge. In the consulting sector in particular, staff recruitment is based on a set of required formalized knowledge. This minimum foundation of knowledge, sanctioned by a formal qualification

---

<sup>1</sup> Section II.2.1 discusses the bases and interactive technologies in more detail.

(external control) is a requirement to enter the accredited professions such as law or consulting (Empson 2001 a). Some of the knowledge necessary for a career as a consultant is already contained in the stocks of individual knowledge: this is a kind of *a priori* coding or pre-formatting of behaviors. The culture, language, and mentoring of junior consultants by senior consultants are also broader, indirect ways of codification of knowledge on the profession. For the purposes of this presentation the focus is on codification in the strictest sense, i.e. based on knowledge bases and shared workspaces.

#### I.1.1. Nature of the knowledge used

Knowledge management systems based on knowledge codification ignore the context and the role of social interaction in the individual decision-making process. They are designed to provide bases of indexed, structured knowledge, with no information on the context in which the knowledge was created. Despite its undoubted relevance and use, consultation of the knowledge bases is insufficient in itself to execute a service or engagement. A whole section of individual knowledge is used in past experiences, in exchanges with colleagues (peers or experts in other fields), and is often constructed through relationships with clients. The problem faced by knowledge-based organizations is how to promote management systems that cover all knowledge. The coexistence of formal and informal KM is a fundamental problem in knowledge strategies. There are two potential pitfalls for firms: on one hand, knowledge in the consulting sector is largely comprised of subjective, socially constructed knowledge, dependent on a context and sometime ambiguous, and therefore difficult to formalize (Morris 2001, Tsoukas, 1996); on the other hand, professionals are reluctant to "give up" their expertise for sharing (Lowendahl 2001). The challenge is to have the capacity to extract and make explicit the most knowledge possible in appropriate structures (data bases) while simultaneously encouraging sharing of tacit knowledge.

Consultants use different types of knowledge, and it is relevant to list them.

#### I.1.2. Typology of consultants' knowledge

Knowledge in the consulting business exists in various forms, depending on the characteristics of engagements (standard or specific), the industries concerned (industrial, commercial, services),

client segments (large, medium-sized or small companies) and the type of consulting service (management consulting, auditing, legal advisory, financial advisory, etc). Many researchers have sought to develop a typology of knowledge in the consulting sector, or more generally in the professional services industries. For Empson (2001), knowledge can take one of two distinct forms: **technical knowledge and client knowledge**. Technical knowledge comprises: sector-specific knowledge (generic, widely available and shared with other firms in the industry, formally coded in the syllabuses of professional exams), organizational knowledge (specific to the firm, related to distinct processes, procedures or products, formalized or tacit) and individual knowledge (resulting from the individual's past experiences, education and his unique combination of client engagements) (Morris and Empson, 1998). The aim of the audit and consulting businesses is to create value for the firm itself, but also for the client. This dual dimension of value must be taken into account in the choices and strategic options involved in knowledge management. It is just as important to focus on the quality of relationships with clients, and the stability and durability of those relationships, as on improvement of the consultant's working environment. Focusing knowledge strategies on codification can be dangerous, because it ignores a whole section of knowledge mobilized at individual level (experiences, contacts specific to a given person, etc).

Knowledge codification is an aspect of knowledge management that can be a source of value creation in the right circumstances. Although ITs act as facilitators and accelerators in the dissemination of codified knowledge, the persistence of informal tacit and interpersonal knowledge in consultants' work contributes to the development of an informal knowledge base that is difficult to code. This is why it is important to specify the required conditions for knowledge codification, distinguishing between value in terms of the service time and "cognitive content" of consulting engagements, while taking into account the different types of IT (integrative and interactive).

## I 2: Codification strategy: role of IT and value model

Information technologies will play a decisive role in application of the codification strategy. Therefore, before specifying the value model associated with the codification strategy, a discussion of the central role of ITs is required.

### I.2.1 The role of information technologies in codification of consultants' knowledge

Two technologies are used to codify knowledge: **integrative** technologies disseminate knowledge through a network in the form of a database, and **interactive** technologies develop shared workspaces (Zack, 1999).

Among factors that influence the frequency of use of the knowledge, Watson and Hewett (2006) identify technical factors such as ease of access to the technology, IT self-efficiency, and cognitive factors such as trust in the source of the knowledge, the value of knowledge, and training in the use of formally stored knowledge. The technological factor plays a major role in the success of knowledge management systems. Many firms, for instance, have set up knowledge-oriented technologies such as “Lotus note” type networks, intranet systems, etc. Another aspect of the technological infrastructure concerns the electronic communications facilities that enable people to exchange documents very easily.

To make knowledge more easily accessible and available, firms introduce knowledge integration technologies by creating and developing knowledge bases. The international management of the audit and consulting firm studied has invested considerable resources in the development, adaptation and updating of its knowledge system as a strategic, competitive tool<sup>2</sup>. It is in the audit and consulting sector that the value added of knowledge management is the greatest, due principally to the nature of its resources, which are built on the cognitive capacities of personnel, and accumulation of experience and client knowledge (Davenport, De Long, Beers (1998), Awazu, Desouza (2004)). Mergers in the sector reflect the search for size effects that can accumulate knowledge, increase the group's expertise and support expansion in several fields. KM systems that can store, disseminate, and provide access to all the knowledge accumulated at international and national level, are becoming one of the most important critical success factors, and the most promising for the future. But in parallel, they are one of the most difficult management systems to introduce, largely because of the irreducibly tacit nature of the knowledge. Furthermore, the effectiveness is difficult to measure (Sarvary, 1999).

---

<sup>2</sup> “Our audit and consulting group is one of the acknowledged leaders in Knowledge management, with introduction of an organization and development of internal solutions for emulation of the knowledge and knowhow of more than 100,000 firm members worldwide” (Announcement on the Group's official website)

As an illustration, the audit and consulting group studied has set up a very elaborate system containing more than 5.000 bases. Given the juxtaposition of several lines of business (consulting, audit, legal and tax advice, etc), the bases are segmented according to different criteria (technical, sector, marketing, intern, extern, administrative...).

The theoretical foundations of the proposed codification model are now discussed.

## I 2 2: Codification value model

The time-related value and the cognitive value of the service will be designated using the model proposed by Argote et al (1995) for the productivity of service or manufacturing organizations, as adapted by Hansen et al (2007) to knowledge-intensive firms. This research identified three critical indicators of the productivity of knowledge-based work: the time saved by using organizations' cognitive resources (time value), the enhanced quality of work and the ability to signal competence to clients as a result of leveraging knowledge (cognitive value).

The time effect can be seen simultaneously in a reduction in costs, mainly related to the existence of learning effects (Argote et al, 1990), and a reduction in the time taken to execute the services (Hansen, 2007). The concept of the learning curve traditionally developed in strategic analysis can be adapted to the context of knowledge management. KM-centered research has demonstrated learning and experience effects that can be measured by the decrease in unit cost as output increases. Argote, Darr and Epple (1995), in a study of a pizza business with several franchised stores, find evidence of a learning curve and a significant decrease in production cost. Despite depreciation of knowledge acquired through "learning by doing", mainly due to the high staff turnover (more than 300% in the case examined), the existence of learning specific to service activities facilitates the transfer of knowledge between stores in the same franchise chain. Regarding the shorter time to carry out engagements, the effects of learning to use the information system and its development must be taken into consideration. The technological factor plays a key role here. Some research has shown that knowledge rooted in technology is more resilient than knowledge rooted in the individual (Argote, Darr and Epple, 1995). ITs play a central role in speed of access to knowledge bases, both at the level of optimization of access time and the relevance of search engines and base indexation. Regular

updating of knowledge bases and data security, for instance by restricting access, are also important factors for improvement in the time value.

From a cognitive point of view, improving the service value relates to transfer of knowledge and its reuse in other contexts. The problem of knowledge transfer has been widely studied in KM research (Alavi and Leidner, 2001, Argote L., Ingram P., 2000). In a knowledge codification context, knowledge transfer is intricately bound up with the issue of trust in the IT (bases, electronic exchanges). Trust in the content of the knowledge transferred electronically is also central to successful knowledge transfer. Once the knowledge transfer has taken place, reuse of the knowledge in different contexts does not happen immediately, and in some cases requires significant adjustments (Markus, 2001). The concepts of time-related value and cognitive value, identified from a theoretical standpoint, will be used to construct a model of knowledge codification applied to the audit and consulting sector.

## **II CODIFICATION OF CONSULTANTS' KNOWLEDGE: PROPOSED MODEL**

For a better grasp of the determinants of knowledge codification, we propose a model of the time-related value and cognitive value of the service, assessed through the integrative and interactive IT used as a channel for codification. This model and its validation by reference to the audit and consulting group studied are presented in the following sections.

### **II 1. The model for codification of consultants' knowledge**

Our aim is to define the determinants of improvements in the time-related value and cognitive value of the service, by identifying the integrative and interactive technologies that appear to play different, complementary roles in knowledge codification. The proposed model (table 3) is examined with regard to enhancement of the duration of the service (time-related value), then enhancement of the cognitive content of the service (cognitive value).

Table 3: Model of the axes of enhancement for codification of consultants' knowledge

		TIME-RELATED VALUE	COGNITIVE VALUE
INTEGRATIVE TECHNOLOGIES	Electronic documents, bases	Reducing access cost Reducing access time - Indexation - Organization	Trust in use and relevance of sources: - technical and sector-specific bases - methodology and best practice bases
INTERACTIVE TECHNOLOGIES	Personal workspaces	Secure exchange of client information  Capitalization of client knowledge	Trust in "electronic" socialization of communication with clients
	Collective workspaces	Structuring of exchanges  Memorization of exchanges	Taking into account the range of different expertises  "Electronic" socialization of communication

#### II.1.1. Enhancement of the service duration (time-related value)

To improve the time indicator, the model must incorporate both a reduction in the cost to access to knowledge and knowledge codification processing costs, and a reduction in the access time to retrieve the knowledge. Reducing access costs is made possible by improving the technical features of the information technologies. The rapid progress in these technologies have created incentives to identify the sources of knowledge in organizations, and to develop systematic procedures for dissemination of knowledge (Empson 2001, a). Firms engaged in codification strategies make significant investments in information technologies in order to connect people through reusable codified knowledge (Hansen et al 1999). In the case of large firms, the reduction in access costs is also due to IT investments being spread across a large number of users<sup>3</sup>. Similarly, an improvement in the systems' response time is also noted, attributable to technological progress but also to the organization and segmentation of bases. When actors are faced with an abundance of information, the existence of

<sup>3</sup> Mergers and acquisitions in the audit and consulting sector are partly driven by the search for economies of scale, including at the level of ITs and knowledge systems.

too many bases is a factor of discouragement and non-use (Hansen et al, 2001). For this reason, segmentation of bases by business lines, industries, etc. can target and orient access to knowledge bases. Setting up portals and appropriate search engines is also crucial for speed of consultation.

At the level of interactive technologies, enhancing time-related values associated with individual capitalization of knowledge. The possibility of storing and organizing files by client gives the consultant more rapid access to past engagements, without having to go through paper files. Moreover, creating secure, electronic personalized workspaces makes it easier and faster to exchange and share information and knowledge with clients. At collective level, collaborative working technologies result in creation of shared workspaces that structure communications (forum) and memorize exchanges (traceability). People working on the same project can exchange information with a time lag, such that incompatible schedules are no longer a problem, and this reduces the overall time needed for the project. Through knowledge codification, ITs thus play a central role in improving the time-related value of the service, although codification-related improvements in the cognitive value of the service are less obvious (Hansen, 2007, Morris 2001).

#### II.1.2. Enhancement of the cognitive content of the service (cognitive value).

When a firm has technology-based knowledge management systems, efficiency will depend on the right combination of personal incentives and cultural norms of trust and cooperation (Amit and Schoemaker, 1993, Morris and Empson 1998, Starbuck, 1992). This is why knowledge codification can improve the cognitive value of the service, if the circumstances are favorable to development of trust: trust by the consultant in the codified knowledge contained in the bases, but also trust between colleagues (when working together on a collaborative project), and finally trust between the consultant and his clients (professional trust, client confidentiality). In electronic exchanges of documents via integrative technologies, trust of use must be developed between the consultant and the rest of the organization (knowledge bases are created by other actors in the organization and made available by the knowledge department). Similarly, the purpose of measures designed to improve the relevance of sources, for example through appropriate indexation of bases, is to encourage a good match between the codified knowledge and the needs of the consultant.

With interactive technologies, workspaces shared with clients can help to consolidate “electronic” socialization trust through discussion forums. In collective workspaces, building up an electronic file facilitated the involvement of a wide range of expertise types, which is necessary for complex engagements. “Electronic” socialization of communication leads in such circumstances to construction and enhancement of the solution through discussions and exchanges of opinions. Detailed identification of each technology type’s differentiated contributions to enhancing the service’s cognitive value is difficult. Some studies suggest that interactive codification technologies are more promising than integrative technologies (Cohendet and Steinmueller, 2000). These results show a combination of codification and socialization (in electronic form) of collective work solutions. The model for analysis of the time-related value and cognitive value of the service was applied to our case study and produced certain findings which will be presented after a description of the methodology used.

## II.2. Methodological choices

We chose to observe an organization that has developed a knowledge management system focused on making knowledge and knowhow available, and on capitalizing that knowledge and knowhow. We directed our attention to the audit and consulting profession, where the quality of knowledge management systems is a major strategic area. The selected firm is one of the “Big 4” consulting firms, with recognized expertise in knowledge sharing between consultants through sophisticated systems of knowledge bases.

<p><b>Key figures</b>  Workforce: 103,000 employees  Established in 140 countries  689 offices</p> <p><b>Strategic areas of business</b>  Legal &amp; tax, audit, management consulting, corporate finance  Small and medium-sized businesses  Large businesses</p>
---

Concentrating on a specific geographical area of the group, the Mediterranean area, we seek to identify the impacts of the declared strategy (as announced by management) and the resources applied (knowledge bases) to spread knowledge as far as local level. We undertook an initial exploratory

interview, followed up with seven semi-directive interviews (lasting 2 to 3 hours each) with the following people (using an interview guide).<sup>4</sup> The experiences described by the interviewees concerned one Senior Manager specializing in consulting (Senior Manager, Consulting), one Junior Manager specializing in consulting (Junior Manager, Consulting), one Senior Manager specializing in audit and with duties as a Knowledge manager (Senior Manager, Audit, Knowledge Manager), one marketing and communications executive with duties as a knowledge facilitator (Marketing and Communications Executive, Knowledge Facilitator), one Senior Manager specializing in audit (Senior Manager, Audit) and two junior managers specializing in audit (Junior Manager, Audit). Our main focus was thus on two fields, audit and consulting, with a distinction between Senior and Junior managers.

This qualitative and interpretivist methodology aims to identify the actors' opinions through detailed accounts of their perceptions of the knowledge management system and the impact on the various fields of specialization. The interviews were recorded, transcribed in full, coded then summarized into role matrices (Miles and Huberman, 1994) which provide a representation centered on recurring themes identified from a large volume of information.

### II.3 Validations of the model

The group openly applies a knowledge codification strategy. It encourages and promotes knowledge sharing and transfer through codification ITs. This article is interested in knowledge codification from the point of view of the time-related value and cognitive value of the service. In line with the literature, it was observed in our study that there are many obstacles to knowledge codification which affect the quality of engagements, such as a lack of trust in sources, corporate culture based on internal competition, highly independent employees or a lack of incentives: all these seriously reduce the benefits of knowledge codification. Also, the continuing existence of informal knowledge sharing outside the existing formal KM systems limits the scope of codification strategies. Nonetheless, the staff like the knowledge facilities and use them intensively. The bases are consulted

---

<sup>4</sup> The interview guide was divided into four parts: the purpose of Knowledge Management, the organizational, relational and cultural aspects of knowledge transfer, the impact of Knowledge Management on performance, the ideal vision of Knowledge Management.

daily, and the electronic workspaces are used at both individual and collective level. The use of codified knowledge and electronic communication has an influence on enhancement of the time-related value and cognitive value of the audit and consulting service. The findings concerning the codification strategy's impact on the time-related value and cognitive value of the service will now be reported.

### II.3.1 Codification and the time-related value of the service

To illustrate this discussion, a role matrix on the theme of use was constructed to summarize the interviewees' accounts on the themes of frequency of use, IT aspects, indexation-related aspects and the organization of the bases. A second matrix covers the consultants' opinions on the theme of capitalization, particularly the bases for capitalization and shared workspaces. This presentation refers to two main lines of business, auditing and consulting, and two grades, Senior Manager and Junior Manager.

It emerges that the IT (a network of knowledge bases on Lotus Notes) is central to the KM system and is well-liked by the staff. The existence of the bases themselves is an important driver in the search for knowledge. The bases are consulted intensively, particularly by the auditors, who use them daily (Senior Manager Audit, Junior Manager Audit), whereas management consulting professionals mainly consult the knowledge bases at the start of an engagement (Senior Manager, Consulting, Junior Manager, Consulting). Use of codified knowledge is apparently inevitable, and some interviewees declared they could not go back to their old ways or do without knowledge bases. As indicated in the proposed model, the time-related value is effectively improved when there is a reduction in access costs and faster consultation of the knowledge bases. Regarding the reduction of access costs, it is clear that the group's strategy, focused on development of the knowledge management system, is engendering significant investments each year. Due to the group's size and its growth through mergers and acquisitions, economies of scale are one of the aims of codification and international dissemination of knowledge.

Several opinions concerning the reduction of access time were collected. The system is perceived as efficient, and technical weaknesses would be totally unacceptable. Speed of access to

codified knowledge and response times are generally considered satisfactory. However, the speed of access is under more serious threat from the excessive number of available bases. Overabundance of knowledge is detrimental and the necessity of sorting through sources results in a non-negligible increase in the time needed to access knowledge, which can lead to discouragement. The group's knowledge management has therefore responded to this crucial problem by simplifying and standardizing bases (reducing the number of bases, having only one search engine) and by creating tools for organization and presentation (maps and portals presenting the bases). Thanks largely to the new strategic knowledge-related orientations, the priority is no longer identification, but organization and simplification of sources. In order to speed up access to codified knowledge, the KM department has also set up an alert system<sup>5</sup> for targeted supply of electronic documents. The ongoing efforts by the KM department to organize and update the bases have been noticed and appreciated by all the actors. The time-related value is thus improved in general by knowledge codification, with no differences depending on line of business or grade. This is reflected in the intensive use and central role of the system.

Interactive technologies also have a role to play in enhancing the time-related value of the service, providing possibilities of individual capitalization of client knowledge, and the level of electronic sharing of knowledge between staff. At individual level, zones of capitalization are also used, particularly by auditors (senior and junior) with a view to achieving capitalization of client knowledge from one year to the next, but also in order to exchange some knowledge with the client through secure exchange zones. In this case ITs make it possible to structure, organize and memorize individual knowledge for each client, and also to replace traditional methods of exchanging information by secure electronic methods, in order to reduce the total time taken to process an engagement. The quality of the client relationship (trust, loyalty) is vitally important in creating a favorable environment for such exchanges. At collective level, the electronic group workspaces are used and consulted by the interviewees to work on important files, mainly due to the easy, rapid access they offer. Complex engagements involving several different types of expertise can be managed

---

<sup>5</sup> In the group studied, an automatic new document display, based on a series of keywords selected by the consultant, presents updates by theme without requiring any additional personal search.

through the use of electronic workspaces. Within the group, interactive technologies provide a facility for management of the electronic file shared by several colleagues, both in audit (Junior and Senior Manager, Audit) through establishment of a shared software platform, and in consulting through multi-site collaborative exchanges (Junior Manager, Consulting). Each team member thus participates in development of the solution for the client. ITs can also structure and memorize collective knowledge, with a view to reducing the cost and time needed for coordination.

These findings show a reduction in access time for electronic documents, and frequent use of interactive technologies both at individual and collective level. On the whole the interviewees appear satisfied with the systems, which they find very effective. Integrative and interactive ITs thus make an effective contribution to the time-related value of the service. However, although they facilitate access to knowledge, the central problem of any KM strategy, particularly a codification strategy, remains the enhancement of the quality of engagements and relationships with clients, and therefore the cognitive value of the service.

### II.3.2 Codification and the cognitive value of the service

The major problem with knowledge codification remains the creation of cognitive value at the level of both electronic documents and groupware. Since much of the knowledge used is tacit, interpersonal, and constructed in the client relationship, it is theoretically difficult to argue that such knowledge can be codified. And yet codified knowledge is used, the bases are consulted frequently, and large files are partly processed via interactive technologies that enable several expert advisors to participate. This proven use of codified knowledge is not without an impact on the cognitive value of the service, but one of the central problems of codification is the trust necessary for use of sources of knowledge to be disseminated throughout the whole organization.

Regarding interactive technologies, interviews with the consultants revealed that the most widely used knowledge bases are the technical bases, the sector-specific bases and the external bases. As the information collected indicates, these bases are used by both types of consultant (in audit and consulting), in the preparatory phases of engagements, suggesting that there is a certain trust in use of these sources. As some of the consultants' knowledge is technical in nature, the bases used are a

channel for updating and disseminating consulting techniques for both auditors and management consultants. Use of the methodology and best practice bases is more problematic. For the moment, these bases simply contain descriptions of engagements. The consultants do not seem to be in favor of using and interiorizing working methods and methodologies created by other colleagues. They are more interested in seeking new ideas for form (such as Powerpoint presentations) than for content (Senior Manager, Consulting). Trust at the level of codification of methodological knowledge is therefore very low in certain business lines, particularly consulting. In the audit sector, the knowledge mobilized appears to be more suitable for codification and transfer, as it often concerns application of professional principles and codes of conduct that are shared by the entire auditing profession. Use of capitalization bases is common in audit, and even more so by Junior Managers. The interviews with the Junior Managers, Audit showed that the best practice bases and audit softwares<sup>6</sup> were highly useful and made significant contributions. These softwares can capitalize on all the stages of an engagement and make them accessible to certain auditors, and also supply methodologies, to create documents or general reports on a particular type of firm, for instance. Such software offers a normative framework that is highly-rated by auditors, particularly the Junior Managers. The primary objective of this type of capitalization is to avoid loss of information and data by collecting them centrally, but also to reinforce the reliability of audit approaches used with clients. A single "in-house" audit methodology is distributed, and used by all group auditors. It also appears that there is real trust in the audit-related methodological sources, leading to intensive use. The foundations of this trust relate to data security through encryption and selective access (Junior Manager, Audit). Nonetheless, it should be emphasized that the main objective of capitalization bases in audit is to save and store information from previous engagements and make that information available to a restricted number of auditors. The aim is not actually to describe specific innovative methodologies for the audit sector.

In the consulting sector, on the other hand, the actors are more skeptical and less inclined to use codified methodological sources. From the point of view of the Junior Manager, Consulting, use is made of a quality base defining the various stages to follow in order to "sell" an engagement properly.

---

<sup>6</sup> The group's KM department has set up an audit software called GAMX (Global Audit Methodology Exchange) which contains all documents related to an audit for a given client by stages of the procedure.

Despite the normative nature of this approach it is in fact considered a waste of time and is not often used as no incentives or sanctions apply. In cognitive terms, the capitalization base for consulting is only rarely used, and the codified knowledge is perceived as having low relevance. However, the actors would be interested in a marketing base containing the client list and contact details from past engagements (Junior Manager, Consulting). These results for consulting may be partly explained by the insufficient number of methodological documents added to the bases.

But there is also another problem affecting the KM system: the low level of knowledge capitalization. The group is marked by a strong culture of use and a weak culture of capitalization. This result is explained by strategic orientations focusing on the IT systems and development of a centralized knowledge base (centralized KM function, organizational measures such as creating knowledge manager posts), which paradoxically are not backed up with human resources measures such as incentives or promotions that would encourage greater capitalization. Also, autonomy is highly valued in the group, primarily to foster a more effective response to clients' expectations, and the persistence of a competition culture between consultants in the same sector (e.g. consulting) is not conducive to knowledge sharing. These are powerful obstacles to knowledge capitalization, and other researchers have also observed this problem. Based on a study of consultants in an audit and consulting firm, Monnier-Senicourt (2008) shows that the high frequency and duration of business travel, the specific nature of the cases handled, the lack of a single methodology used to adapt to client demands, and the autonomy of actors working in a team (consisting of experts with different specializations) contribute to low capitalization in KM systems, and mean that there is more emphasis on informal exchanges of knowledge. The quality of codified knowledge is directly threatened by the capitalization problem. Few actors actually take part in making methodologies or best practices available, mainly as a result of lack of time and self-esteem, but also because they fear being the judgment of others.

Whereas technical and sector-specific sources appear to benefit from high trust, codification of methodologies and best practices is hindered by a lack of trust in sources and the insufficient volume of documents in the capitalization bases. The consultants are well aware that in such an organization it is not desirable to "reinvent the wheel" for every engagement, and that someone must have come

across the same question in the past. Codification of experience would be one means of improving the firm's overall performance. Interactive technologies and electronic documents thus appear to cause a very partial improvement in the cognitive value of the service, particularly in consulting. However, this result must be qualified for audit, since the auditors acknowledge the usefulness and relevance of capitalization bases. Junior Managers, in particular, believe that the audit quality base provides a reassuring normative rule framework, and often use it.

Two levels of "electronic socialization" are observed in the interactive technologies: at individual level between the consultant and the client, and at collective level between colleagues. The consultants told us about personalized, secure exchanges with clients, but we have no detailed information as to whether there was any improvement attributable to interactive ITs in the quality of the client relationship or the service. This question requires more in-depth examination and could be a subject for further research. Whatever the result, personal relationships with clients remain central to the quality of engagements, and are not highly suitable for anything other than interpersonal exchanges. At the collective level, electronic shared workspaces seem to provide useful solutions for joint production of engagements considered important. It is clear from the interviews that interactive ITs are used in both audit (by Senior and Junior Managers) and consulting (mainly by Junior Consultants). These technologies make it possible to exchange files and viewpoints, notably through forums. It would also be interesting to examine this question in more depth by directly collecting the actors' opinions on this mode of socialization and its role in the way engagements are conducted. From the results as they stand, is not possible to reach a conclusive opinion on the potential enhancement of cognitive value. There is certainly potential for improvement, particularly at collective level through discussion forums, which can memorize the structure of exchanges from brainstorming sessions.

In terms of cognitive value, past research (Hansen et al, 2007) has shown that knowledge codification does not improve the quality of work or signal competence to clients. Our results qualify this conclusion somewhat. The accounts we collected in the case study provide glimpses of non-negligible virtues of knowledge codification, which can improve the quality of work and relationships with clients. For example, setting up personal capitalization spaces makes it possible to organize client

knowledge from one year to the next. The knowledge stored in this way can lead to better understanding of client characteristics and changes in client needs. Also, intensive use of the bases, as observed in this firm, and individual selection of sources (consultants often work with a few bases of particular relevance to their line of business) result in an accumulation of targeted knowledge. This individual learning has an effect on the quality of work. From our results, we deduce that a codification strategy results in overall improvement of the time-related value of the service, and partial but promising improvement of the cognitive value of the service.

A summary of results is proposed below.

Figure 4: Summary of validation of the codification model

		TIME-RELATED VALUE	Effect <sup>7</sup>	COGNITIVE VALUE	Effect
INTEGRATIVE TECHNOLOGIES	Electronic documents, bases	Reducing access cost Reducing access time - Indexation - Organization	++  + +	Trust in use and relevance of sources: - technical and sector-specific bases - methodology and best practice bases	+  -- <sup>8</sup> + <sup>9</sup>
INTERACTIVE TECHNOLOGIES	Personal workspaces	Secure exchange of client information Capitalization of client knowledge	+  +	Trust in “electronic” socialization of communication with clients	<b>UD</b>
	Collective workspaces	Structuring of exchanges Memorization of exchanges	+  +	Taking into account the range of different expertises “Electronic” socialization of communication	+  <b>UD</b>
<b>RESULTS</b>		<b>Overall improvement of the time-related value of the service</b>		<b>Partial improvement of the cognitive value of the service</b>	

### III CONCLUSION

Knowledge codification is considered a very important area for development of KMS in professional service firms. Codification can extract the knowledge, formalize it and separate it from its personalization. Broader dissemination of the knowledge can spread practices and thereby increase individual knowledge. As observed in our case study, although the use of codified technical or sector-specific knowledge is generally accepted and a source of satisfaction, especially as it improves the

<sup>7</sup> ++ very positive, + positive, -- very negative, UD undetermined

<sup>8</sup> For the consulting sector

<sup>9</sup> For the audit sector

time-related value of the service, use of methodological or best practice knowledge is differentiated between the sectors. Although this use is relatively widespread in audit (with the dominant aim of storing and centralizing information), it is largely underused in consulting due to a lack of confidence in sources but also to the low capitalization of methodological documents. Yet the interviewees are in favor of having methodology or best practice bases both in audit (where engagements may be reproducible) and in consulting (to draw attention to existing solutions that can be adapted to a specific problem). Why is the rate of capitalization on knowledge so low? How can methodological knowledge be codified? Are the traditional forms of codification based on written formalization appropriate for this kind of knowledge? These as yet underexplored research questions are at the heart of the debate over knowledge codification. The results of this study suggest, in line with previous research (Cohendet 2000), that the forms of codification supported by interactive technologies are more promising. Forum participation generates exchanges that are similar in nature to the electronic codification (trace and structure of exchanges) and electronic socialization (interpersonal exchanges of opinions, discussions) possible with ITs. The question is whether this form of socialization can be a substitute for a direct conversation. Other studies also concerning the audit and consulting sector have demonstrated the usefulness of interactive technologies in top-level knowledge codification<sup>10</sup>.

There are a certain number of limitations to the findings of our study. The number of semi-directive interviews conducted was small. It would be interesting to collect the opinions of other actors from the group's other sites, and to interview certain persons belonging to the head office's KM department. To complete this qualitative, exploratory study, a large-scale quantitative study on codification involving a directive questionnaire-based survey would be useful with a view to validating the proposed model. Finally, a study covering a rival firm would broaden the validation of the model.

---

<sup>10</sup> Morris and Empson (2001) report the case of the company Sun, which set up a dual KM system, one for existing knowledge bases and another for future knowledge bases. Observing that the actors were reluctant to share their knowledge (internal competition, independence), the company set up a capitalization base called a "think tank", accessible to a small number (approximately five) of persons selected by management based on competence. This experiment was a success, and led to codification by brainstorming, and sharing of innovative practices by experts who felt proud to belong to this hand-picked community.

Although reflections on the forms of codification are decisive, trust in the sources of knowledge is an important factor, and a natural obstacle to use of codified knowledge. Codifying, disseminating and raising the visibility of sector-specific knowledge remains problematic in a highly competitive field operating under competitive differentiation rules, such as audit and consulting. Firms are thus facing contradictory problems. The main difficulty is how to strike a balance between highly effective codification tools appropriate to the actors' needs, and management methods that are more informal but nonetheless provide more incentive for knowledge exchange and sharing.

## **BIBLIOGRAPHIE**

- Alavi M., Leidner D. (2001), « Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues », *MIS Quarterly*, Vol. 25 n° 1, pp 107-137.
- Alvesson M, Kärreman D., Swan J.,(2002), “Departures From Knowledge And/Or Management In Knowledge”, *Management Communication Quarterly*, Vol.16 n°2, pp. 282-291.
- Alvesson M, Kärreman D., (2001), “Odd Couple: Making Sense of the Curious Concept of Knowledge Management”, *Journal of Management Studies*, Vol.38 n°7, pp. 995-1018.
- Amit, R. Schoemaker, P.J.H., (1993), “Strategic Assets and Organizational Rent”, *Strategic Management Journal*, Vol.14 n° 1, pp 33-46.
- Argote L., Ingram P. (2000),”Knowledge Transfer: A Basis for Competitive Advantage in Firms”, *Organizational Behavior and Human Decision Processes*, Vol. 82 n°1, pp 150-169.
- Argote L., Darr ED., Epple D., (1995), “The Acquisition, Transfer, and Depreciation of Knowledge in a Service Organizations: Productivity in Franchises”, *Management Science*, Vol. 41 n°11, pp 1750-1763.
- Argote L, Sara L., Epple D., (1990), « The Persistence and Transfer of Learning in Industrial Settings », *Management Science*, Vol.36 n°2, pp. 140-154
- Awazu Y., Dezouza K.C. (2004),” The Knowledge Chief: CKOs, CLOs and CPOs”, *European Management Journal*, Vol. 22 n°3, pp 339-344.
- Barney, J.B., (1991), “Firm resources and Sustained Competitive Advantage”, *Journal of Management*, Vol.17 n°1, pp 99-120.
- Brown, J.S., Duguid, P., (2001), “Knowledge and Organization: A Social-Practice Perspective”, *Organization Science*, Vol.12 n°2, pp 198-213.
- Cohendet P., Steinmueller W.E., (2000), “The Codification of Knowledge: a Conceptual and Empirical Exploration”, *Industrial and Corporate Change*, Vol.9 n°2, pp 195-208.
- Connoly T., Thorn B.K., (1990), *Discretionary Databases: theory, Data, and Implications: in Organizations and Communication Technology*, Fulk J. Steinfeld C (eds). Sage, Newbury Park, CA, pp 219-233.
- Davenport, T.H., Pruzack, L.,(1998), *Working Knowledge: How Organization Manage What They know*, Boston, MA: Harvard Business School Press.
- Davenport, T.H., De Long, D.W., Beers, M.C., (1998), “Successful Knowledge Management Projects”, *Sloan Management Review*, Vol.39 n°2, pp 43-57.
- Empson, L., (2001 a), “Introduction: Knowledge management in professional service firms”, *Human Relations*, Vol.54 n°7, pp 811-817.
- Empson, L., (2001 b), “Fear of Exploitation and Fear of Contamination: Impediments to Knowledge Transfer in Mergers between Professional Service Firms”, *Human Relations*, Vol.54 n°7, pp 839-862.

- Grant, R.M., (1996), "Toward a Knowledge-Based Theory of the Firm", *Strategic Management Journal*, Vol.17, N° special issue winter, pp 109-123.
- Hansen, M.T.et Haas, MR., (2007), "Different Knowledge, Different Benefits: Toward a Productivity Perspective on Knowledge Sharing in Organizations", *Strategic Management Journal*, Vol.28 n°11, p. 1133-1153.
- Hansen, M.T.et Haas, MR., (2005), "When Using Knowledge Can Hurt Performance: The Value of Organizational Capabilities in a Management Consulting Company", *Strategic Management Journal*, Vol.26 n°1, p. 1-24.
- Hansen, M.T., Haas, MR., (2001), "Competing for Attention in Knowledge Markets: Electronic Document Dissemination in a Management Consulting Company", *Administrative Science Quarterly*, Vol.46 n°1, pp 1-28.
- Hansen, M.T., Nohria, N., Tierney, T., (1999), "What's Your Strategy for Managing Knowledge?" , *Havard Business Review*, Vol.77 n°2, p. 106-116.
- Huber, G., (1991), "Organizational Learning: the Contributing Processes and Literature", *Organization Science*, Vol.2 n°1, pp 88-115.
- Lowendahl, B, Revang, O, Fosstenlokken, SM, (2001), "Knowledge and Value Creation in Professional Service Firms: A framework for analysis", *Human Relations*, New York, Vol.54 n° 7; p. 911-931.
- Markus L (2001), « Toward a Theory of Knowledge Reuse: Types of Knowledge Reuse Situations and Factors in Reuse Success », *Journal of Management Information Systems*, Vol.18 n°1, pp 57-93.
- Miles M.B., Huberman A.M., (1994), *Qualitative Data Analysis*, 2<sup>nd</sup> edition, Thousand Oaks: Sage.
- Monnier-Senicourt Laetitia (2008), "l'Influence des Caractéristiques Professionnelles sur la Consultation d'un SGC et la Capitalisation : Le Cas des Métiers d'Auditeur, d'Avocat et de Consultant », *Systèmes d'Information et Management*, Vol.13 n°1, p.31-61.
- Morris T., Anand N., Gardner H.K., (2007), "Knowledge-Based Innovation: Emergence and Embedding of New Practice Areas in Management Consulting Firms", *Academy of Management Journal* Vol.50 n°2, pp 406-428.
- Morris T., (2001), "Asserting Property rights: Knowledge Codification in the Professional Service Firm", *Human Relations*, Vol.54 n°7, p. 819-838.
- Morris T., Empson L., (1998), "Organization and Expertise: a Exploration of Knowledge Bases and the Management of Accounting and Consulting Firms", *Accounting, Organization and Society*, Vol.23, n° 5/6, p. 609-624.
- Nightingale P., (2000), "Economies of Scale in Experimentation: Knowledge and Technology in Pharmaceutical R & D", *Industrial and Corporate Change*, Vol.9 n°2, pp 315-359.
- Nonaka I. (1994), « A Dynamic Theory of Organizational Knowledge Creation », *Organization Science*, Vol.5 n°1, pp 14-37.
- Penrose E.T., (1959), *"The Theory of the Growth"*, Oxford: Blackwell.
- Prahalad, C.K., Hamel G., (1990), "The Core Competence of the Corporation", *Harvard Business Review*, Vol.68 n°3, pp 79-91.
- Reagans R., McEvily B., (2003), "Network Structure and Knowledge Transfer: the Effect of Cohesion and Range", *Administrative Science Quarterly*, Vol.48 n°2, pp 240-267.
- Sarvary, M., (1999), "Knowledge Management and Competition in the Consulting Industry", *California Management Review*, Vol.41 n°2, pp 95-107
- Starbuck, W., (1992), "Learning by Knowledge-Intensive Firms", *Journal of Management Studies*, Vol.29 n°6, p. 713-740.
- Szulanski, G., (1996), "Exploring Internal Stickiness: Impediments to the Transfer of Best Practice Within the Firm", *Strategic Management Journal*, Vol.17 n° special issue winter, pp 27-43.
- Teece D., (1998), « Capturing Value from Knowledge Assets: The New Economy, Markets For Know How, and Intangible Assets", *California Management Review*, Vol.40 n°3, pp 55-79.
- Tsoukas, H., (2001), Vladimirov E., "What is Organizational Knowledge?" , *Journal of Management Studies*, Vol.38 n°7, pp. 973-993.

Tsoukas, H., (1996), "The Firm as a Distributed Knowledge System: A Constructionist Approach", *Strategic Management Journal*, Vol.17 n° special issue winter, pp 11-25.

Watson, S., Hewett, K., (2006), "A Multi-Theoretical Model of Knowledge Transfer in Organisations: Determinants of Knowledge Contribution and Knowledge Reuse", *Journal of Management Studies*, Vol.43 n°3, pp 141-173.

Zack M.H. (1999), "Managing Codified Knowledge", *Sloan Management Review*, Vol.40 n°4, pp 45-58.