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Aligning Knowledge Sharing Strategy With Organizational and Cultural Contexts: An Information System Perspective

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Abstract: This paper highlights the importance of organizational and cultural contexts in the efficiency of knowledge sharing strategies and particularly strategies based on the use of Information Systems to support knowledge sharing activities. Relying not only on our theoretical investigations, but also on industrial fieldworks, we propose a framework which helps identify, given dominant characteristics of the organizational and cultural contexts, information system functionalities to develop or to promote in order to support knowledge sharing. A case study illustrates the use of our framework and the implications of this work are finally discussed at the end of this paper.

Keywords: knowledge sharing, knowledge management, information system, organizational learning, organizational culture, strategic alignment

1. Introduction

The growing importance of knowledge as a critical resource has encouraged knowledge based organizations to pay greater attention to their knowledge sharing strategies. Information systems play an important role in the implementation of such strategies. They act as knowledge flow facilitators and can be used to encourage knowledge sharing which is an important challenge for organizations (Liebowitz 2008). From an Information System perspective, knowledge sharing strategy can be seen as the choice of a set of specific information system functionalities (and associated organizational rules) in order to support knowledge sharing activities.

Prior research has shown that successful use of information system functionalities to support knowledge sharing is not only influenced by technical factors, but also by “less rational but highly influential” factors as cultural and organizational contexts (Dulipovici and Robey 2013, Wiewiora and al. 2013, Leonardi and Treem 2012, Alavi and al. 2006). Various studies suggest that cultural and organizational contexts shape employees’ knowledge sharing behaviors and the way they consider information systems to support knowledge sharing (Alavi and al. 2006, Gray and Densten 2005, De Long and Fahey 2000). However, few studies have attempted to investigate how cultural and organizational contexts might be associated with the technological choices to support knowledge sharing.

Therefore, the objective of our research is to explore the choice of appropriate information system functionalities in order to support knowledge sharing and how this choice may be influenced by cultural and organizational contexts. More specifically, we propose a framework which helps to identify, given dominant characteristics of the cultural and organizational contexts, information system functionalities to develop or to promote in order to support knowledge sharing. To sum up, this framework helps elaborate knowledge sharing strategies (based on the use of information systems) fitting strongly with cultural and organizational characteristics of the firm.

The content of the paper is organized as follows: first, in section 2, we introduce the concept of knowledge in the organization, as we consider it in this research. Then, we present our vision of knowledge sharing and different visions of information systems to support knowledge sharing. In section 3, the concept of “cultural and organizational contexts” is defined and then, we introduce the framework we propose as a guideline to identify appropriate information system functionalities to support knowledge sharing. Last, we present in this section a case study which illustrates the use of the proposed framework. Discussions and lessons learned from the application of our framework are then described. Finally, our conclusions are presented in section 4

2. Literature review

The way we consider knowledge in the organization in this work is introduced in the first part of this section. Knowledge sharing and different visions of information systems to support knowledge sharing are then highlighted in the second and in the third part of this section.

2.1 Knowledge in the organization

As the authors of this article, we have got tacit knowledge, i.e. an individual cognitive construction that we have structured in information during a process of *sense-giving*. As the reader of this paper, you have interpreted this information perceiving forms and colors, you have absorbed words, data, during a process of *sense-reading*, possibly creating new tacit knowledge for you (see 0). Sense-giving and sense-reading processes are defined by Polanyi (1967) as follows: “Both the way we endow our own utterance with meaning and our attribution of meaning to the utterances of others are acts of tacit knowing. They represent sense-giving and sense-reading within the structure of tacit knowing” ((Polanyi 1967), p. 301).

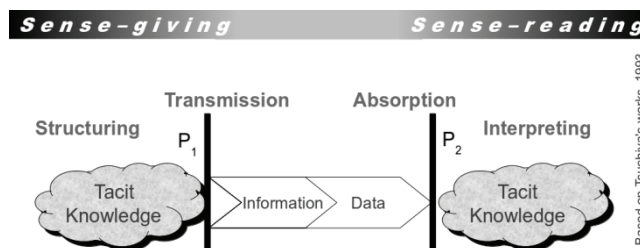


Figure 1: Tacit knowledge transfer

Information is continuously interpreted during sense-reading processes. Within an organization, information can be transmitted by speaking, writing or acting, and more generally, by information systems. However knowledge can be:

- *explicited*, it can be made explicit, it is socially constructed, and it can be supported by information technologies. Individuals, as well as computers are “information processing systems” as said by Hornung (2009) (p. 9). Knowledge sharing strategies focusing on explicited knowledge attempt to increase organizational efficiencies by codifying and reusing knowledge mainly through advanced Information Technologies (Choi and al.2008).
- *tacit*, it is not always articulated and cannot always be articulated, relying on Polanyi (1958) notably: “we can know more than we can tell”. Tacit-oriented knowledge sharing strategies focus on the personalization approach where knowledge is communicated through direct person-to-person contact and through socialization processes (Choi and al.2008).

The term “explicit knowledge” is often used (by Nonaka and Konno (1998) and Nonaka and Takeuchi (1995) notably), whereas it does not reflect the existence of a codification process of tacit knowledge. That is the reason why we talk of “explicited knowledge” instead of “explicit knowledge”.

2.2 Knowledge sharing in the organization

As highlighted by Davenport and Prusak (1998), knowledge is shared when (1) information is transmitted, (2) information is absorbed, i.e. interpreted into tacit knowledge through an individual cognitive process, and (3) when this piece of tacit knowledge is used, knowledge being linked to the action. For Davenport and Prusak (1998): “Transfer = Transmission + Absorption (and Use)” (p. 101). Knowledge sharing can then be defined as a process of knowledge transfer, through which an organization maintain complex and ambiguous knowledge and the associated routines (Szulanski 1998).

Many models to support knowledge sharing activities have been proposed (Nonaka and Takeuchi 1995, Szulanski 1998, Wiig 1993, Zack 1999, McElroy 1999, Dalkir 2011, Harrison and Hu 2012). Rodriguez-Elias and al. (2008) have made a relevant synthesis of knowledge management (KM) main activities involved in knowledge sharing with the two perspectives of tacit and explicited knowledge:

- *Identification* refers to the location of internal and/or external (from the environment) crucial knowledge and knowledge sources. Here, technologies can be useful to identify formal sources but also informal sources as experts and communities for example.
- *Codification* deals with formalization of knowledge identified as crucial, when it can be made explicit and then articulated into words, text, drawings or other symbolic forms. Codification stage is often critical in organizations, since individuals frequently do not use existing IS functionalities to perform it because they spend too much time attempting to make their knowledge explicit (Rodriguez-Elias and al. 2008). Moreover, it can be difficult for some employees to know how to express their ideas. That is why it is convenient to identify information system functionalities that may facilitate codification of knowledge when possible.
- *Storage activity* allows storing and updating explicated knowledge in knowledge repositories. Here, specific attention must be paid about the updating mechanisms depending on the type of explicated knowledge: there is knowledge that does not change over a long period of time, but there is also knowledge that is constantly changing. Storing and updating explicated knowledge often requires much work from users to input their explicated knowledge and this can lead to the situation where information system (IS) storage functionalities are unused. Providing automatic support at certain stages could reduce users' work.
- *Diffusion* refers to the dissemination, deployment of information source of knowledge (in the sense of Grundstein and Rosenthal-Sabroux (2009)). Diffusion of explicated knowledge may be enabled with mechanisms which allow providing information about explicated knowledge that have been stored (search engines, information retrieval systems, etc.). On the other hand, tacit knowledge diffusion can take place in socialization processes, and can be therefore supported by communication and collaboration technologies.
- *Acquisition activity* facilitates for individuals contextualization and interpretation of knowledge (tacit or explicated) to perform an activity, make a decision, etc. However, providing technologies to assist users in this activity can be a challenging job (Marwick 2001). If the user has too much information or too many available knowledge sources, identifying which is the most useful for a particular purpose can be a complex task. This can be performed by, for example, pushing to the user personalized information, based on his interests, profile, etc.

2.3 Different visions of information system to support knowledge sharing in the organization

Besides the definition made by Reix (2002) of an information system, i.e. a set of digital and human resources organized in order to process, to disseminate, and to store information, we have now to position what is understood in this paper by "information system to support knowledge sharing".

For Stockdale and Standing (2009), information system (IS) and knowledge system (KS) may interact within an enterprise information and knowledge system (EIKS) in order to support knowledge creating and knowledge sharing. Within a knowledge system, individuals are holding tacit and explicated knowledge. Explicated knowledge may be shared, processed, stored, and disseminated by these individuals or by a digital information system, artifact designed from information and communication technology. The tacit dimension of knowledge is then considered through the individuals who hold it, whereas the explicated dimension may be considered through digital artifacts.

Stockdale and Standing (2009) consider that overlooking the social activity leads to "meaningless conclusions" ((Stockdale and Standing 2009), p. 1091). A study from IBM, conducted by Cross and al. (2002), considers interpersonal relations as an important component for knowledge sharing.

Relying on the literature review (Alavi and al. 2006, Rodriguez-Elias 2008, Von Krogh 2012, Shadbolt 2012), we have identified and categorized some functionalities which could be integrated in an information system to support knowledge sharing (Table 1).

Table 1: IS functions to support knowledge sharing

Knowledge sharing activities	IS functions to support knowledge sharing
Identification	<ul style="list-style-type: none"> - Analysis of social networks of the firm - Experts and Communities location - Environment scanning (formal and informal sources)
Codification	<ul style="list-style-type: none"> - Knowledge elicitation assistance (formalization of concepts, tasks, best practices, experiences, etc.)
Storage	<ul style="list-style-type: none"> - Knowledge repositories storing (electronic documents, forum discussions, etc.) - Updating (domains with rapid changing of knowledge, distributed contexts of knowledge sources, etc.) - Information retrieval - Indexation of explicated knowledge - Classification/categorization of explicated knowledge - other content management functions
Diffusion and Acquisition	<ul style="list-style-type: none"> - Information retrieval - contacts and profiles management - Users' profiles analysis - Experts location - Information Push - Communication - Collaboration - Networking

From an Information System perspective, knowledge sharing strategy can be defined as the choice of a set of specific information system functionalities (and associated organizational rules) in order to support knowledge sharing activities.

Implementing information system functionalities in order to support knowledge sharing is important but not enough to stimulate their use by individuals in the firm (Dulipovici and Robey 2013). Our literature review as much as our industrial fieldworks highlight the fact that cultural and organizational contexts can be successful factors (or barriers) in the use of functionalities designed in order to support knowledge sharing.

3. Propositions

Prior research has shown that a sophisticated information system to support knowledge sharing does not ensure more successful use of proposed functionalities (Alavi and al. 2006, Dulipovici and Robey 2013). For example, if a company wishes to encourage informal knowledge sharing among its workers, it might strategically design chat features in the company's intranet so that people could interact informally. However, people could also engage in other interactions types (conversations during coffee breaks for example) or they may avoid any informal communication (Fayard and Weeks 2007).

Successful use of information system functionalities to support knowledge sharing is not only influenced by technical factors, but also by "less rational but highly influential" factors such as cultural and organizational contexts (Alavi and al. 2006, Leonardi and Treem 2012, Dulipovici and Robey 2013, Wiewiora and al. 2013).

In this paper, we propose an analysis framework which can be used to:

- Identify given dominant characteristics of the cultural and organizational contexts, information system functionalities to develop or to promote in order to support knowledge sharing.
- Identify cultural and organizational contexts which can be barriers to a successful use of information system functionalities designed in order to support knowledge sharing.

3.1 Knowledge sharing and cultural and organizational contexts

Formal organizational context (structure and systems, sources of coordination and expertise) and cultural attributes of the organization affect efficiency of knowledge sharing (Burgelman 1983, Ghoshal and Barlett 1994, Wiewiora and al. 2013).

Gibson and Birkinshaw (2004) referred cultural and organizational context to the systems, processes, values and beliefs which collectively shape individual-level behaviors in any organization.

For Maier (2010) (p. 159-160), organizational structure has an impact on knowledge management approaches. He discussed different organizational forms which aim at accelerating organizational learning and knowledge sharing and thus the development, combination and use of organizational knowledge.

Various studies provide evidence to suggest that they are factors influencing knowledge sharing behaviors supported by information systems by shaping patterns and qualities of interactions needed to leverage knowledge among individuals. It seems that cultural and organizational contexts can influence social interaction and the way individuals consider information systems to support knowledge sharing (De long and Fahey 2000, Alavi and al. 2006, Gray and Densten 2005). The way in which information systems are considered by individuals within a certain context shapes the acceptance and the use of such systems within this particular context.

In this article, we explore the choice of appropriate information system functionalities in order to support knowledge sharing (these functionalities are an expression of the knowledge sharing strategy of the firm). We also study how this choice may be influenced by cultural and organizational contexts, introducing then alignment of knowledge sharing strategy with cultural and organizational contexts.

3.2 A framework to identify appropriate IS functionalities to support knowledge sharing given a dominant context

There are many theoretical and methodological frameworks which have been proposed to analyze cultural and organizational contexts (Hofstede 1990, Schein 1990, Denison and Spreitzer 1991, Cameron and Quinn 2005).

In our research, we make the choice to use the “Competing Value Framework” (CVF) developed by Cameron and Quinn (2005). The CVF has been validated in both international and Australian contexts (Lamond 2003). With this framework, Cultural and organizational contexts are assessed relying on two dimensions: *internal versus external* and *stability versus flexibility*. These dimensions lead to four cultural and organizational contexts types: Hierarchy, Clan, Adhocracy and Market. In the following, we assimilate “context” to “cultural and organizational context”.

It is important to underline that organizations are seldom characterized by a single context type but they tend to develop a dominant context over time in order to adapt themselves to environment changes (Cameron and Quinn 2005).

Hierarchy contexts are characterized by an internal orientation (inside the firm) and predictability. Here, the focus is on information management, documentation, expertise, formalization, stability, routines, centralization, continuity and control. Individuals are bounded through internal controls and they are governed by procedures. Principles of stability, formal rules are perceived as the cement of the organization.

In these contexts, there is a strong motivation for individuals to use functionalities for explicit knowledge storage because codification initiatives are encouraged and recognized. Formal communication and expert location functionalities are prioritized because recognition of expertise incites individuals to connect themselves with others and share their knowledge in order to increase their own social capital and then be attractive for assignments in need of their expertise. (Alavi and al. 2006, Rodriguez-Elias 2008) point out two barriers which can limit the use of storing functionalities and incite individuals to prefer local initiatives:

- the heaviness of formal rules for the storage in knowledge bases which can result in significant delays in posting submitted knowledge contributions,
- the centralization of knowledge repositories when the organization is, in fact, in a distributed context (contributions to knowledge repositories come from diverse sources that may be distributed throughout the entire organization). The management of knowledge repositories in a centralized form can lead to less reactivity in the updating of knowledge contributions thereby leading to relatively outdated content of some central repositories. As a result, these repositories are not used as widely as they could be.

Clan contexts give importance to the development of a shared understanding and human relationships unless of relying exclusively on formal communication processes. These contexts are characterized by a flexible structure and an internal orientation. Individuals are tied by core values as participation, loyalty and engagement.

Individuals give more importance to communication and collaboration functionalities delivered by the information system to support knowledge sharing: messaging, calendaring, online chat, online meetings, discussion forums, application sharing, team rooms for project teams and other types of communities, etc.

However, as shown by (Alavi and al. 2006), when there are many informal communities in the organization, formal communication/collaboration systems and procedures (as intranets or portals) can be less used because informal communities operate independently and in accordance with their own social norms.

Adhocracy contexts share the same human values than clan contexts. They emphasize flexibility and external competitive position. Adhocracy contexts give importance to values as innovation, creativity, adaptability and acquisition of external resources. There are values which encourage local initiatives and make possible the emergence of formal and informal communities in the organization.

In adhocracy contexts, the IS is viewed as a vehicle which accelerates innovation via cross-pollination of ideas across communities (Alavi and al. 2006) and exploitation of knowledge from the external environment (De Long and Fahey 2000). Here, it seems relevant to give more importance to environment scanning (from formal and informal sources), storage (of information scanned from sources), communication and collaboration functionalities in the IS supporting knowledge sharing.

In adhocracy contexts, due to important number of local initiatives and the value placed upon creativity and innovation, organizations should:

- avoid to impose specific communication and collaboration tools in the IS, but should rather propose a panel of tools that communities could adapt to their local sharing practices.
- choose a management of knowledge repositories in a distributed form to increase the use of IS storage functionalities.

Market contexts are characterized by an external orientation (towards the market) and predictability. They emphasize on values such as competitiveness, productivity, goals clarity and efficiency. Individuals are bounded together through goal orientation and competition. Here, there is a tension between values: some of them incite to stability and predictability (controls, clear objectives) and others orient individuals towards an innovation attitude with a market orientation.

It is a state which can lead to divergent use of IS functionalities to support knowledge sharing. Some groups can focus on functionalities supporting knowledge accumulation (codification and storage functionalities) because they are guided by productivity and competition goals. Other groups can give more importance to socialization functionalities (communication, collaboration, and networking) in order to increase their innovation capacity.

The framework we propose can help design information systems to support knowledge sharing with features and functionalities fitting to the cultural and organization contexts they are to be embedded in.

3.3 Case study

This case study took place in an important French insurance company in 2010. It illustrates the use of the framework we propose and highlights the importance of aligning cultural and organizational contexts with information system for the design of appropriate functionalities to support knowledge sharing.

3.3.1 Context of the study

The French Insurance company was looking for an efficient knowledge sharing strategy to anticipate the massive retirements planned in the coming years.

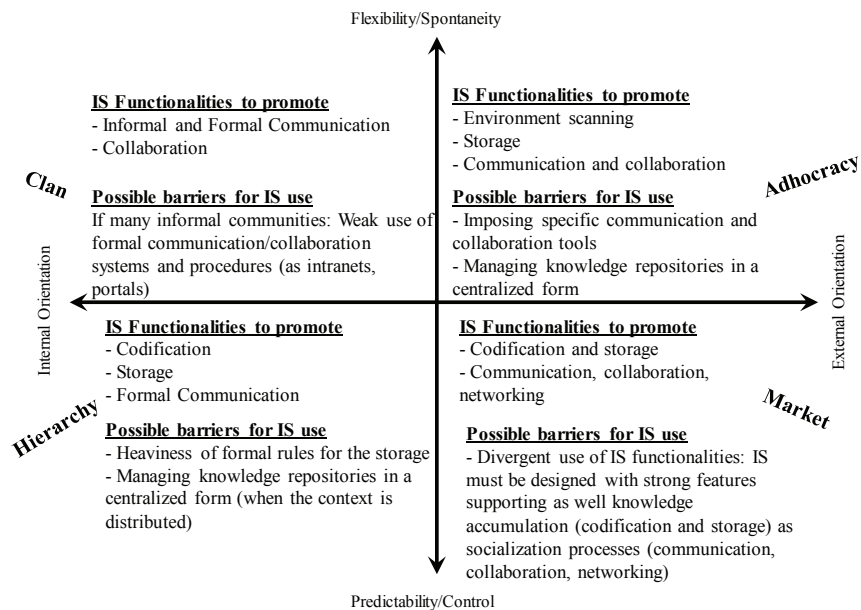


Figure 2: Aligning cultural and organizational contexts with information system to support knowledge sharing

A pilot project involving a team of four persons was then initiated with one main goal: identify cultural and organizational factors to promote in order to make efficient knowledge transfer between experts (two members of the team) and new employees (the two others). The general activity of this team was dealing with incidents resolution during mainframe software development: detection of errors during compilation and management of the impacts on production. A full version of this case study is available in (Arduin and al. 2013).

3.3.2 Understanding the context in which the implemented information system to support knowledge sharing evolved

We observed a “Hierarchy” context with a focus on information management, documentation, expertise, formalization and centralization of document repositories.

The French insurance company made a strong investment in Information and Communication Technologies, considering it as an efficient strategy to ensure knowledge sharing between employees. From the intranet, employees could easily access to documentary bases and F.A.Q. (see Figure 3). A “knowledge center” was also implemented and it provided codification functionalities to help team members formalize and structure their experiences about incidents resolution (problem met, solutions proposed and actions).

A records manager was also hired to manage documentary bases and deliver training sessions in order to encourage the use of implemented tools by the team.

3.3.3 Identifying barriers for the use of IS to support knowledge sharing

We noticed that the members of the team preferred develop a shared understanding through human interactions than use codification and storage functionalities of the IS (documentary repositories, F.A.Q, knowledge center tool). Moreover, training sessions delivered by the records manager did not increase the use of the IS for knowledge sharing. We found two principal barriers: expertise and language.

Experts were not really convinced by the codification strategy. Indeed, many efforts of knowledge elicitation have been asked to them these last ten years to support knowledge sharing. Despite of these efforts, the contribution of codification was very low when considering its impacts on knowledge acquisition activities (performing tasks, making decisions). So, experts had made important efforts to make visible explicit knowledge (via a shared system) without an important gain of recognition. This can be explained by the fact that only experts’ explicit knowledge, i.e. knowledge that has been made explicit, was considered. There was no focus on social mechanisms needed to interpret and understand this explicit knowledge. All efforts

were centralized on codification and storage functionalities in the digital information system when communication and collaboration functionalities were neglected in the sharing and appropriation process.

The knowledge center tool was proposed in English and it was a problem for the team members who did not speak and read it well. So, using the knowledge center tool required much more effort, discouraging them.



Figure 3: A digital information system to support knowledge sharing, what about the context of its use?

3.3.4 Aligning context and information system to support knowledge sharing

We suggested the planning of meetings where non-solved incidents were discussed. As a result, we noticed that they were an active participation of experts. Moreover, a few weeks later, there was an increase of the use of the existing information system to support knowledge sharing. So, the context evolved from “Hierarchy”, where formalization and centralization were favored, to a mixed context “Hierarchy-Clan”, where individuals could elaborate shared understandings through human interactions.

In this new context, experts gained recognition because they were not only source for knowledge codification but also advisors and trainers for other members of the team.

3.3.5 Discussing the results and implications

This case study highlights not only the importance of the existence of an information system to support knowledge sharing, but also the importance of cultural and organizational contexts which can strengthen or thwart the use of an information system to support knowledge sharing.

Before the beginning of our knowledge management initiative, the members of the team were working in a Hierarchy context. They focused on documentation, formalization and control in order to establish formal rules and procedures. It was difficult for new employees to appropriate easily such formal rules and procedures without human interactions.

Our initiative gave the opportunity to the members of the team to meet weekly in order to elaborate a shared understanding of the realized processes. Each one could express his/her misunderstandings and obtain explanations from the experts. Experts became central in the knowledge sharing process with an active participation in meetings and in the codification process. The evolution from a “Hierarchy” context to a “Hierarchy-Clan” context (where human interactions and communication/collaboration functionalities were central) was a key factor of success for knowledge sharing. Figure 4 illustrates this evolution.

The limits of this work must now be discussed. Relying on background literature and on observations that we made in the field, one limit of this work is that our framework is not totally operational for an easy implementation in companies. We need to build from the proposed framework a tool with (1) more detailed criteria for each type of context and (2) questionnaires to evaluate in depth cultural and organizational contexts in companies. Moreover it would be useful to experiment the framework in other contexts. We have initiated studies within several organizations. The goal is to provide a validated and robust approach which helps design information systems to support knowledge sharing with features and functionalities fitting to the cultural and organization contexts they are to be embedded in.

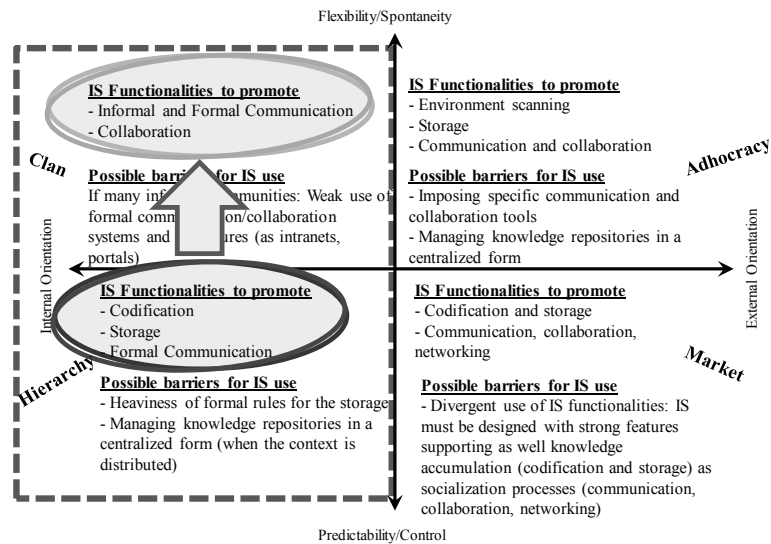


Figure 4: From hierarchy to “hierarchy-clan”, aligning the context with information system to support knowledge sharing

4. Conclusions and perspectives

This article presents a work-in-progress addressing two questions: (1) how do cultural and organizational contexts affect the efficiency of knowledge sharing strategies and particularly strategies based on the use of IS for knowledge sharing support? and (2) can we identify groups of IS functionalities to promote or develop in order to support knowledge sharing given dominant characteristics of the cultural and organizational contexts?

In addressing these two questions, the paper makes two contributions for the understanding of the importance of *alignment between cultural and organizational contexts and knowledge sharing strategy (through the choice of appropriate IS functionalities to support knowledge sharing)*.

First, relying on the “Competing Values Framework” introduced by Cameron and Quinn (2005), we examine cultural and organizational contexts in term of dominant values influencing employees’ behaviors in the use of information system supporting knowledge sharing. Our literature review and field observations have confirmed that these contexts are factors influencing social interaction and the way employees consider information systems to support knowledge sharing. Consequently, cultural and organizational contexts shape the acceptance and the use of information systems supporting knowledge sharing.

Second, we propose an analysis framework which can help to design information systems to support knowledge sharing with features and functionalities fitting to the cultural and organization contexts they are to be embedded in. This framework can also be used to analyze barriers to a successful use of information system functionalities designed in order to support knowledge sharing. In our case study, using the proposed framework, we have highlighted the misalignment between the designed information system to support knowledge sharing and the relevant context in order to enhance its use by team members.

The aim of this work is not to propose a general framework to identify all favorable contexts to the use of an information system to support knowledge sharing. We ambitioned to highlight how complex it could be to design an appropriate information system in order to support knowledge sharing, which is a social and cognitive process strongly tied to cultural and organizational contexts in the firm.

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