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CHAPTER 1

Knowledge sharing, social ties and successful collaboration in globally distributed system development projects

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> The biggest problem is a people problem: if people from different sites don't have the respect and trust for each other, they don't work well together. (Anthony, Chief Software Architect, LeCroy)

Introduction

Recent years have witnessed the globalization of many industries. Consequently, globally distributed collaborations and virtual teams have become increasingly common in many areas, for example in new product development (Malhotra *et al*., 2001) and in Information Systems (IS) development (Sarker and Sahay, 2004; Herbsleb and Mockus, 2003; Carmel and Agarwal, 2002).

Managing dispersed development projects is far more challenging than co-located projects. However, ongoing innovations in Information and Communication Technology (ICT) make it possible to cooperate in a distributed mode. Indeed, recent research in the IS field has focused on ICT in the context of globally distributed IS development teams (Herbsleb *et al*., 2002; Mockus and Herbsleb, 2002; Carmel, 1999). However, little is known about the social aspects associated with the management of globally distributed IS development projects and, in some studies, social aspects are perceived to be constraints on globally

distributed collaboration (Sarker and Sahay, 2004; Evaristo, 2003; Jarvenpaa and Leidner, 1999). While other disciplines, such as organizational behaviour, have acknowledged the importance of social aspects, such as trust (Child, 2001; Storck, 2000), in global collaborations, evidence about the role that human and social aspects play in global collaborative work is still missing. To fill this gap, this chapter attempts to address the following question: *Do knowledge sharing and social ties contribute to successful collaboration in globally distributed IS development teams?*

The chapter begins with a discussion of the literature on globally distributed IS development projects. A review of past studies related to social ties, knowledge sharing, and successful collaboration in various contexts, such as co-located sites and global alliances, will be provided. Following this, the motivation for this research, and an identification of the gap in the literature, will be outlined. After an outline of the research methods applied, data drawn from SAP and LeCroy, two companies that have engaged in globally distributed IS development projects, will be set out. A qualitative presentation of these findings will be followed by a quantification of the research data, providing evidence for the importance of social ties and knowledge sharing to collaborative work in globally distributed IS development teams. Evidence regarding the mechanisms supporting the build-up of social ties observed in the companies studied will also be outlined. Finally, the implications for theory and practice are discussed.

Background

Globally distributed IS development projects consist of two or more teams working together to accomplish project goals from different geographical locations. In addition to geographical dispersion, globally distributed teams face time zone and cultural differences that may include, but are not limited to, different languages, national traditions, values, and norms of behaviour (Carmel, 1999).

Traditionally, the main focus of IS literature on globally distributed teams has been on technical aspects related to system development projects. Past research in the IS field suggests that the proper application of technical and operational mechanisms such as collaborative technologies, IS development tools and coordination mechanisms, is the key to successful system development projects (Herbsleb *et al*., 2002;

Majchrzak *et al*., 2000; Carmel, 1999). It has been claimed, for example, that a powerful ICT infrastructure is required to ensure connectivity and data transfer at high speed between remote sites (Carmel, 1999). Additionally, generic collaborative technologies (e.g. Groupware) are needed to enable remote colleagues to connect and communicate. The most commonly suggested collaborative technologies are email, chat (Instant Messaging), phone/teleconferencing, video-conferencing, intranet, group calendar, discussion lists, and electronic meeting systems (Herbsleb and Mockus, 2003; Smith and Blanck, 2002). Finally, in addition to generic collaborative technologies, a number of specific tools for software development have been suggested to support globally distributed teams. These include configuration and version management tools, document management systems, replicated databases, and CASE tools (Smith and Blanck, 2002; Carmel and Agarwal, 2002; Ebert and De Neve, 2001). Recent studies have focused on integrating development (e.g. Integrated Development Environment) with collaborative tools (e.g. email, Instant Messaging) in order to offer solutions that deal with breakdowns in communication and coordination among developers in dispersed development teams (Cheng *et al*., 2004).

A related stream of studies has focused on issues pertaining to the geographical dispersion of work. Naturally, because of several constraints associated with globally distributed work, such as distance and time zone and cultural differences, traditional coordination and control mechanisms tend to be less effective in global development projects (Herbsleb and Mockus, 2003). Distance, for example, reduces the intensity of communications, in particular when people experience problems with media that cannot substitute face-to-face communications (Smith and Blanck, 2002). Cultural differences, expressed in different languages, values, working and communication habits, and implicit assumptions, are believed to be embedded in the collective knowledge of a specific culture (Baumard, 1999) and thus may cause misunderstanding and conflicts. Time zone differences reduce opportunities for real time collaboration, as response time increases considerably when working hours at remote locations do not overlap (Sarker and Sahay, 2004). Such challenges raise the question whether globally distributed work can benefit from other factors, human in nature, involved in dispersed projects. The following sections provide a review of the literature on the human and social aspects involved in collaborative work. We draw on studies from several disciplines in order to assess the extent to which human and social aspects have been considered as enablers for collaborative work in globally distributed projects.

Social aspects in globally distributed teams

A large number of factors that may contribute to collaborative work have been given consideration in earlier studies. Among the many socially related factors contributing to collaboration, past studies have considered formal and informal communications (Child, 2001; Dyer, 2001; Storck, 2000), trust (Arino *et al*., 2001; Child, 2001), motivation (Child, 2001), and social ties (Oshri *et al*., 2007; Storck, 2000; Child, 2001; Granovetter, 1973). The literature on IS development projects is far more limited in addressing the impact that human-related factors may have on IS projects in general, and successful collaboration in particular. It has been argued, for example, that informal communications play a critical role in coordination activities leading to successful collaboration in co-located IS development (Kraut and Streeler, 1995). As the size and complexity of IS development increases, the need to support informal communications also increases (Herbsleb and Moitra, 2001). Consequently, one of the central problems in distributed development projects is induced by time, cultural, and geographical distances that greatly reduce the amount of such communication. Nonetheless, past studies related to IS in the context of globally distributed teams have mainly raised concerns about managers' abilities to overcome geographical, time zone, and cultural differences. According to Smith and Blanck (2002: 294), for example, ''an effective team depends on open, effective communication, which in turn depends on trust among members. Thus, trust is the foundation, but it is also the very quality that is most difficult to build at a distance.''

Trust was defined by Child (2001: 275) as ''the willingness of one person or group to relate to another in the belief that the other's action will be beneficial rather than detrimental, even though this cannot be guaranteed.'' Trust is more likely to be built if personal contact, frequent interactions, and socializing between teams and individuals are facilitated (Arino *et al*., 2001; Child, 2001).

Additional challenges to globally distributed work have been raised by Herbsleb and Mockus (2003). They claim that (i) distributed social networks are much smaller than same-site social networks; (ii) there is far less frequent communication in distributed social networks compared to same-site social networks; (iii) people find it much more difficult to identify distant colleagues with necessary expertise and to communicate effectively with them; and (iv) people at different sites are less likely to perceive themselves as part of the same team than people who are at the same site. Studies that have sought solutions to overcome the above challenges, often induced by the lack of personal interactions between

remote teams, have suggested a division of labour and task between remote sites (e.g. Battin *et al*., 2001; Grinter *et al*., 1999). While it seems that the main challenge is to create rapport between members of the dispersed teams, the solutions proposed have been mainly in the field of technical and project procedures. *Rapport* is defined as "the quality of the relation or connection between interactants, marked by harmony, conformity, accord, and affinity" (Bernieri *et al*., 1994: 113). Past research has indeed confirmed that rapport is the key to collaboration between project teams and individuals, though only in the context of co-located project sites (Gremler and Gwinner, 2000). Little is known about creating rapport between globally distributed teams.

To summarize, while past studies in the various disciplines have acknowledged the importance of social aspects in collaborative work, the studies that have focused on the IS field have tended to see such social aspects (e.g. trust and rapport) as very difficult to encourage or foster in the context of globally distributed projects.

Knowledge sharing in globally distributed teams

The importance of knowledge sharing for collaborative work has already been established in past studies (e.g. Hendriks, 1999; Goodman and Darr, 1998). Storck (2000), for example, claims that sharing knowledge is important to building trust and improving the effectiveness of group work. Herbsleb and Moitra (2001) reiterated such an observation, claiming that without an effective sharing of information, projects might suffer from coordination problems leading to unsuccessful collaborations.

Nonetheless, achieving an effective knowledge sharing process may encounter certain challenges, in particular when teams are faced with cultural, geographical, and time zone differences (Herbsleb and Mockus 2003; Kobitzsch *et al*., 2001). Herbsleb *et al*. (2000: 3) described how one global IS development project was facing major challenges in identifying who knows what: "The difficulties of knowing who to contact about what, of initiating contact, and of communicating effectively across sites, led to a number of serious coordination problems."

There seemed to be a need to know whom to contact about what in this particular organization, something that is far more challenging in globally distributed teams. This organizational aspect, knowing who knows what, has been acknowledged as the key to knowledge sharing activities by several studies (Herbsleb and Mockus, 2003; Orlikowski, 2002). Faraj and Sproull (2000), for example, suggested that instead of sharing specialized

knowledge, individuals should focus on knowing where expertise is located and needed. Such an approach towards knowledge sharing is also known as transactive memory. *Transactive memory* is defined as the set of knowledge possessed by group members coupled with an awareness of who knows what (Wegner, 1987). It has been claimed that the transactive memory may positively affect group performance and collaboration by quickly bringing the needed expertise to knowledge seekers (Faraj and Sproull, 2000; Storck, 2000). We will elaborate on the concept of transactive memory in distributed teams in Chapters 2 and 5.

Another socially constructed concept that was proposed as a connecting mechanism between individuals and teams is collective knowledge. Grant (1996) claims that collective knowledge comprises elements of knowledge that are common to all members of an organization. In the case of globally distributed system development projects, the ''organization'' involves all people participating in the project in remote locations. *Collective knowledge* is defined as ''a knowledge of the unspoken, of the invisible structure of a situation, a certain wisdom'' (Baumard, 1999: 66). Such a concept may entail the profound knowledge of an environment, of established rules, laws and, regulations. It may include language, other forms of symbolic communication and shared meaning (Grant, 1996). Building a sense of collective knowledge in co-located organizations would mean the development of a collective mind (Weick *et al*., 1999; Weick and Roberts, 1993) through participation in tasks and social rituals (Orlikowski, 2002; Baumard, 1999; Orr, 1990).

To conclude, while globally distributed teams have employed a range of communication tools (e.g. Groupware applications comprising chat, email, discussion lists, and application sharing capabilities) which support the sharing of knowledge across remote sites, evidence from recent research suggests that the challenges involved in sharing knowledge across globally distributed teams are still widespread, and that breakdowns in sharing knowledge do occur. Indeed, technical solutions are important but are, however, not sufficient. This calls for further investigation of socially constructive elements involved in developing collective knowledge and transactive memory as complementary mechanisms to existing technical solutions.

Successful collaboration in information system projects

The word collaboration comes from the Latin words *com* (prefix ''together'') and *laborare* (verb ''to work''). It means that two or more

individuals work jointly on an intellectual endeavour (Webster, 1992). *Collaboration* is a complex, multidimensional process characterized by constructs such as coordination (Faraj and Sproull, 2000), communication (Weick and Roberts, 1993), meaning (Bechky, 2003), relationships (Gabarro, 1990), trust (Meyerson *et al*., 1996), and structure (Adler and Borys, 1996; Scott, 1992).

The IS literature covers at length some factors that support successful collaboration. *Successful collaboration* is the process through which a specific outcome, such as a product or desired performance, is achieved through group effort. In this sense, successful collaboration is represented in this chapter as either product success or a desired performance of a distributed team (Hoegl and Gemuenden, 2001). Product success can be represented by various indicators, such as growth in sales, product delivery on time and within budget (Andres, 2002; Nellore and Balachandra, 2001), or short time-to-market (Datar *et al*., 1997). In line with these indicators, *product success* is thus defined as the achievement of project objectives (Gallivan, 2001). This criterion for product success can either be objective, i.e. based on market or company data, or subjective, i.e. based on project participants' perception of product success.

A desired result of a distributed team can also be a people-related outcome (Hoegl and Gemuenden, 2001) which entails meeting the psychological needs of the members (Gallivan, 2001). Hoegl and Gemuenden, and Gallivan, for example, suggest that, in addition to performance objectives, teams must also work in a way that increases members' motivation to engage in future teamwork. There should be some level of personal satisfaction that motivates individuals and teams to continue their engagement in collaborative work despite geographical, time, and cultural differences. We perceive *personal satisfaction* as the outcome of a positive social experience. Such experience can, for example, be in the form of stress-free communication rituals between remote counterparts and collegial relationships between remote teams. Some factors that may foster people-related outcomes and thus may improve personal satisfaction are open and multiple informal communication channels (Hoegl and Gemuenden, 2001), the encouragement of interactions between parties involved in the development process (Nelson and Cooprider, 1996), and the cohesion of a team (Gallivan, 2001; Hoegl and Gemuenden, 2001). Naturally, geographical, cultural, and time-zone differences pose additional challenges to globally distributed teams to achieve successful collaboration, whether seen as a people-related outcome or as a product outcome.

The motivation for the research: The gap

By far, the solutions proposed to support globally distributed teams were technical in nature involving little attention to the human and social aspects involved in globally distributed work (Al-Mushayt *et al*., 2001). Furthermore, in the few studies that focused on social aspects in globally distributed projects, these aspects were presented as concepts that added challenges to the coordinating of collaborative work because of cultural, geographical, and time-zone differences. Jarvenpaa and Leidner (1999), for example, indicated that lack of trust is likely to develop between globally distributed teams, while Carmel (1999) raised a concern about possible breakdowns in communications that may cause coordination problems because of language barriers, cultural differences, asymmetry in distribution of information among sites, and lack of team spirit.

While we accept the observation that insufficient trust and poor social relationships may act as barriers to successful collaboration in globally distributed teams, and sufficient trust and well-established social relationships may act as enablers to collaborative work, we also argue that there is a need to understand whether, and how, social aspects actually contribute to successful collaboration teams. The importance, and the contribution, of social aspects to collaborative work in globally distributed projects is neglected in the IS literature, and the little that is known about this area is mainly based on co-located project teams. To fill this gap, three concepts – social ties, knowledge sharing, and successful collaboration – will be studied in an attempt to address the following question: *Do knowledge sharing and social ties contribute to successful collaboration*

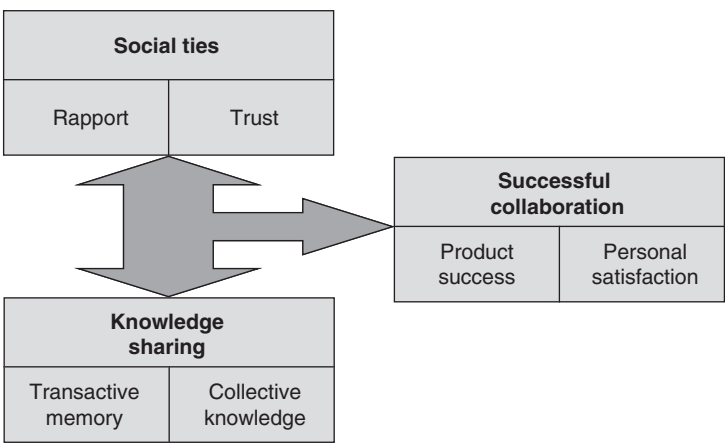

Figure 1.1 Main concepts and their categories in this study

in globally distributed IS development teams and, if so, through what mechanisms are social ties established and facilitated?

Figure 1.1 illustrates the three main concepts, social ties, knowledge sharing, and successful collaboration; and their categories, trust and rapport, transactive memory and collective knowledge, and product success and personal satisfaction, respectively. In addition, the importance of collaborative tools will be studied in order to assess their impact on successful collaboration in comparison to the contribution that social ties and knowledge sharing have made to successful collaborative work. Lastly, the mechanisms that support social ties will be explored in an attempt to explain how companies may create social ties between globally distributed team members.

About this research

An in-depth study of globally distributed software development projects is provided in this chapter. A qualitative, interpretive approach is adopted. In line with much past IS research (e.g. Palvia *et al*., 2003), a case-study method was selected for this research. In this study, evidence was gathered from a variety of sources such as documentation, archival records, and interviews (Yin, 1994; Eisenhardt, 1989). Data were also triangulated through interviews with team counterparts in different locations and in cases where the interpretation of subjective evidence was questionable, such as in the case of successful collaboration. In addition, data analysis methods involved both the presentation of qualitative data in the form of statements made by interviewees as well as a quantification of data in the form of statement frequencies.

To correspond with the main interests of the research, only project teams at SAP and LeCroy that were globally distributed across at least two locations were considered for this study (see Company Background in the Appendix). Interviews were conducted at two remote sites per company: in India and Germany for SAP, and in Switzerland and the USA for LeCroy. Interviewees were chosen to include (i) counterparts working closely at remote locations; and (ii) diverse roles such as managers and developers. In total, ten interviews (five at each company) were conducted. Interviews lasted one hour and thirty minutes on average; they were recorded and fully transcribed. A semi-structured interview protocol was

applied, to allow the researchers to clarify specific issues and follow up with questions.

Data analysis followed several steps. It relied on iterative reading of the data using the open-coding technique (Strauss and Corbin, 1998), sorting and refining themes emerging from the data based on the definitions of the categories with some level of diversity (Strauss and Corbin, 1998; Miles and Huberman, 1994), and linking these to categories and concepts.

Coding was done in Atlas.ti – packaged Qualitative Data Analysis (QDA) software. The QDA software facilitated the analysis process. In particular, it was used for coding, linking codes and text segments, documenting diversity in codes, creating memos, searching, editing and reorganizing, and visual representation of data and findings (Weitzman, 2000; Miles and Huberman, 1994).

Data were analyzed by the researchers independently. The interpretation of selective codes (those that seemed to have dual meaning), the consolidation of codes into categories, and the examination of empirical findings against the literature were done by both researchers together. In addition, feedback sessions with key informants in the case companies were organized and their comments were incorporated into the research findings. Such a data analysis approach is believed to enhance confidence in the findings (Eisenhardt, 1989).

Empirical results and analysis

In this section the results of two case studies carried out at SAP and LeCroy will be presented. Based on the empirical evidence presented below, we will argue that social ties and knowledge sharing contribute to successful collaboration in the companies studied. In principle, we claim, based on the data analyzed, that in globally distributed IS development teams, social ties and knowledge sharing improves collaboration. Furthermore, several organizational mechanisms supporting the build-up of social ties between remote sites are reported. In order to support the above claim, three levels of evidence will be outlined in the following section. The first level is an outline of statements made by interviewees associated with the concepts under investigation (i.e. social ties, knowledge sharing, and successful collaboration). The second level is

the frequency of these statements. The third level will present the number of instances in which social ties, knowledge sharing, and collaborative tools are linked to successful collaboration.

Social ties in globally distributed teams: Evidence

Statements made by interviewees about rapport and trust are presented below. These statements were analyzed and associated with rapport and trust based on the definitions provided above.

Rapport:

LeCroy "Most of the guys know each other very well – we try to make sure they interact, we increase the possibility that they really get to know each other." (Anthony)

SAP "I need to have good relationships with the people I am working with . . . the better you know the people the easier it gets. I know Sudhir and Thomas, both of them I think by now quite well." (Christoph)

Trust:

LeCroy "It makes a big difference, when the guys know each other but more importantly when the guys trust each other." (Anthony)

SAP "The team-building exercise was a way to show that we care about remote locations. The end result of that exercise was that the entire team [globally distributed] feels more comfortable to work together. Now they know each other and trust each other better." (Stefan)

Knowledge sharing in globally distributed teams: Evidence

Statements made by interviewees about transactive memory and collective knowledge are presented below. These statements were analyzed and associated with rapport and trust based on the definitions provided above.

Transactive memory:

LeCroy "When a problem occurs it is important for the team, instead of finding the bug, to find quickly who knows best about the failing component." (Gilles)

SAP "What I did in the past was – this was in the very early phase of the project, I sent requests only to Sudhir and he would distribute the issues between people. But by now, after six months, I know quite well what everybody is doing. So after a time, you just know who's doing what." (Christoph)

Collective knowledge:

LeCroy "How do you pick all the guys that we had – pure embedded programmers – and teach them all about Windows at the same time. Well, we all got together in the mountains of France. It was a real fun week with two purposes: one was to teach us all about this new technology. The other which was fairly equally important if not more important in some way – was to really try to build relationships between people." (Larry)

SAP "It [team building] was a pretty good experience for myself: learning the culture and also how the team internally works. So my understanding of what you can expect from the team, and what you cannot expect, is very important for the project." (Stefan)

Successful collaboration in globally distributed teams: Evidence

Successful collaboration can be defined by various indicators. The very perception of interviewees that a project team was collaborative is one indication of such success. However, there may also be external indicators of successful collaboration, such as project and product success. These indicators can be either subjective or objective. Subjective evidence may include statements made by interviewees about their perception of product success, while objective evidence presents evidence in the form of sales, growth, and industry recognition associated with the product. While objective evidence should not be biased, one has to acknowledge that some indicators may have been manipulated prior to presentation by the company (e.g. sales figures). The perception of interviewees with regard to product success and personal satisfaction, representing successful collaboration, is presented below. These statements were analyzed and associated with product success and personal satisfaction based on the definitions provided above.

Product success:

LeCroy Engineers described the Maui project as a component-based architecture, claiming that this new approach serves as a basis for future products because "we can take the bunch of different components and create different instruments . . . within a few months rather than in a few years." (Larry)

SAP "We just went through a merger, so setting up a global project was not an easy task. Despite all the difficulties we managed to have a successful second software release in eight months." (Stefan)

Personal satisfaction:

LeCroy "The job here is very demanding and challenging. I think that those who stay onboard are the engineers who share the same goal: to work on complex problems in cutting edge technologies. I think that the fact that we share this goal helps us to communicate well." (Gilles)

SAP "The team building exercise from our side [Bangalore team] was more of a building of awareness about the whole team of Stefan, because he heads now all our team, so he needed to have a good picture of how the team composition is, what each individual is like or what different people are like." (Sudhir)

In addition, objective evidence, presented below, supports the perception of product success that was reported by interviewees.

Product and project success (objective evidence):

LeCroy

- LeCroy's WaveMaster 8600, the first release of the Maui Project, was announced as the Best Product of Year 2002 by *EDN*, a leading magazine for design engineers.
- While revenues in 2003 were down to $107.8m from $111.5m in 2002 because of the difficult economic environment, the WaveMaster had a positive impact on the financial results of year 2003: "Our high-end oscilloscope product orders grew by 7 per cent in the first quarter of fiscal 2003 over a comparable period in fiscal 2002. This success is due to the new WaveMaster

product line, including the introduction of the world's highest performance oscilloscope during the quarter, the WaveMaster 8600A.'' (Tom Reslewic, CEO, LeCroy, news release, October 16, 2002)

SAP

- According to JupiterResearch, a leading research and consulting company in emerging technologies, SAP Enterprise Portal is the third largest software solution, with 17 per cent of the US market in 2002. The studied collaboration project developed collaborative tools as one of the three main features of the SAP Enterprise Portal.
- The 2003 revenues for SAP Enterprise Portal were up by 5 per cent representing 13 per cent of SAP software sales (SAP's 2003 annual report).

Concept frequencies for social ties, knowledge sharing, collaborative tools, and successful collaboration

The above section presents a sample of statements made by interviewees from SAP and LeCroy with regard to social ties, knowledge sharing, and successful collaboration. This section presents a calculation of all statements made by interviewees at SAP and LeCroy in the context of social ties, knowledge sharing, collaborative tools, and successful collaboration. We refer to this calculation as concept frequencies. Fifty-one statements were made by interviewees from SAP, for example, with regard to knowledge sharing in globally distributed teams (see Table 1.1). In addition, ''diversity in codes'' was calculated. This represents the number of different codes grouped within one category. Under the category ''trust'', for example, three different codes were identified. In other words, ''diversity in codes'' represents the number of instances that a statement was found to be somehow different from another statement in the context of a particular category.

Our calculations show that 81 statements were made with regard to social ties, 72 statements concerning knowledge sharing, and 102 statements about collaborative tools. Within the concepts, a large number of statements were associated with rapport (71). These findings may suggest that interviewees have considered developing rapport with counterparts from remote sites to be an important element in collaborative work. The importance of social ties and knowledge sharing in successful collaboration will be further discussed in the following section.

Table 1.1 Concept frequencies for SAP and LeCroy based on number of statements

Concept	Categories in concept	Diversity in codes	Concept frequencies (number of statements per concept)		
			SAP	LeCroy	SUM
Social ties	Rapport	17	50	21	**81**
	Trust	3	3	7	
Knowledge sharing	Transactive memory	15	28	14	**72**
	Collective knowledge	15	23	7	
Collaborative tools	None	8	54	48	**102**
Successful collaboration	Product success	14	23	24	**120**
	Personal satisfaction	19	45	28	

The relationships between social ties, knowledge sharing, collaborative tools, and successful collaboration

To assess the importance of social ties and knowledge sharing for successful collaboration, a calculation was made of statements that represented explicit relationships between social ties, knowledge sharing, collaborative tools, and successful collaboration. These calculations are presented in Table 1.2 under the column "relationships with successful collaboration".

We can see from Table 1.2 that social ties (30 per cent) and knowledge sharing (43 per cent) were associated with successful collaboration, almost to the same extent or even further than collaborative tools (37 per cent). The significance of these findings can be further underlined by the observation that interviewees were asked a similar number of questions about human-related issues and for collaborative tools. Based on this evidence, we argue that our findings suggest that, in addition to technical solutions, human-related issues in the form of social ties and knowledge sharing were considered as the key to successful collaboration.

Table 1.2 Calculated values of relationships between concepts based on number of associated codes

Concepts	Concept Frequencies (count from Table 1.1)	Relationships with successful collaboration (statements %)
Social ties	**81**	**24** (30)
Knowledge Sharing	**72**	**31** (43)
Collaborative tools	**102**	**38** (37)

Organizational mechanisms supporting social ties in globally distributed teams

The analysis of the evidence collected at SAP and LeCroy suggests that there were two phases of activities that supported the build-up of social ties: (i) before Face to Face (F2F); and (ii) after F2F. In addition, the analysis of the empirical evidence suggests that there were some particular tools that the projects studied have applied. Table 1.3 outlines these activities and tools, and a calculation of the number of statements made with regard to a particular activity or tool is provided for each company. The highest frequency calculated is in bold letters.

Table 1.3 suggests that interviewees from SAP considered activities prior to a F2F meeting important for building social ties, i.e. rapport and trust, between members of the globally distributed team. In particular, a short visit to a remote location was mentioned as an important mechanism prior to a formal introduction of the team. Interviewees from LeCroy considered activities before F2F and after F2F as equally important for the build-up of social ties. Nonetheless, managers from LeCroy also considered an initial introduction activity before F2F as important for instituting social relationships. In terms of post-F2F activities, interviewees from both companies indicated the importance of open communication channels. A non-hierarchical communication approach was another mechanism contributing to social relationships. Lastly, the tools through which social relationships were created across different sites were mainly phone, email, and groupware applications. Nonetheless, interviewees also indicated that the quality of messages, meaning, the assurance that messages communicate the issue successfully and are understood and interpreted properly, is important for establishing social relationships between team members.

Table 1.3 Organizational mechanisms and activities supporting social ties in globally distributed teams

Mechanisms	Mechanism frequencies	
	SAP	LeCroy
Before Face to Face (F2F)	**88**	**30**
Promote initial (non-F2F) introduction (e.g. virtual F2F, *short visit to location,* set up virtual mini teams, advocate shared cyber spaces)	61	26
Reduce communication barriers (e.g. English courses, *set up contact person,* distribute newsletters and communication protocol)	27	4
After F2F	**35**	**34**
Routinize communications (e.g. regular reflection sessions, around the table discussions, project meetings, *visits to remote locations*)	14	9
Open communication channels (e.g. *direct communication channel,* centralized source of shared information)	18	15
Ensure message quality (e.g. detailed email, use phone, ensure understanding of message received, *use graphical representation*)	3	10
Tools	**62**	**58**
Various collaborative tools (e.g. *phone, email, Groupware tools,* knowledge repositories, teleconference, videoconference, online chat)	54	48
Practices (flexible working hours, standardized software packages)	8	10

So far, we have presented evidence about the importance of social aspects in globally distributed teams and the means through which social ties can be established. The following section will discuss the implications of this for research and practice.

Implications

Human and organizational aspects involved in system development projects are at the centre of this study. The cases of SAP and LeCroy have demonstrated the importance of some human aspects (e.g. social ties and knowledge sharing activities) and organizational aspects (e.g. tools and project procedures) in globally dispersed collaborative work. The implications for human and organizational aspects are both theoretical and practical.

Theoretical implications

From a theoretical perspective, this study suggests that more attention is needed to understand the relationships between social ties, knowledge sharing, and successful collaboration in globally distributed teams. As it stands, the IS literature tends to overemphasize the contribution of technical solutions and collaborative tools to the flow and sharing of information (e.g. Battin *et al*., 2001; Ebert and De Neve, 2001), and in some cases to downplay the role of social aspects, such as rapport, in globally distributed collaborative work. We claim that collaborative work can also be understood from a social construction viewpoint in which the quality of the relation or connection between interactants in globally distributed teams can be enhanced through story telling (Orr, 1990) and participation in social rituals (Lave and Wenger, 1991). In this respect, the social practice is the primary activity, and collaboration is one of its characteristics. The learning involved in the manner in which people successfully collaborate is located within the social world. As part of the participation involved in a collaborative practice, members of a globally distributed project change locations and perspectives to create and sustain learning trajectories (Lave and Wenger, 1991: 36). We argue that collaboration is actually about renewing the set of relations between globally distributed project members through continuous participation and engagement. In this sense, collaborative tools are one mediator through which collaboration as a learned social practice is developed. The role that social interactions between remote counterparts play in reducing the perception of distance in remote communications and in establishing social capital will be elaborated in Chapters 3 and 4.

Practical implications

From a practical viewpoint, we argue that in order to achieve successful collaboration in globally distributed teams, companies need to introduce organizational mechanisms that create social spaces between team members. There is substantial support in research and practice, as for example in this study, for face-to-face meetings, suggesting that such meetings are important for teamwork and performance (Govindarajan and Gupta, 2001; Jarvenpaa *et al.*, 1998).

We argue that some activities should be planned both before and after face-to-face meetings, to ensure the participation and engagement of project members in collaborative work. We suggest, for example, that managers should facilitate social interaction prior to a F2F meeting, such

as short visits to a remote location of key project-members, the introduction of a contact person to the virtual team, support for language courses, and the dissemination of clear communication procedures. These activities, often ignored prior to a F2F meeting in globally distributed teams, have been reported as the key to establishing social and human contact and supporting the build-up of rapport between counterparts from remote sites. Regular meetings, either virtual or in terms of short visits, after F2F meetings, will ensure participation of project members over time. We also suggest that a variety of communication tools be utilized to assist the maintenance of a high level of participation of project members and to enrich the quality of messaging involved in collaborative work, such as phone, videoconference media, and email.

Lastly, from a strategic viewpoint, management should demonstrate strong commitment to addressing human-related issues in IS globally distributed projects and should dedicate resources that ensure the renewal of social relationships, as was done at SAP and LeCroy.

Concluding remarks

In this chapter, the contribution of social ties and knowledge sharing to successful collaboration in distributed IS development teams has been explored. We conclude that, in addition to technical solutions, human-related issues in the form of social ties and knowledge sharing were reported as keys to successful collaboration. In particular, the importance of rapport and transactive memory was evident in the studied projects. Furthermore, organizational mechanisms that create and maintain social ties between dispersed team members were reported in detail.

The conclusions offered in this chapter are based on an in-depth study of two companies, by applying a qualitative, interpretive methodological lens. Additional methodological approaches may contribute to further understand the relationships between social ties, knowledge sharing, and successful collaboration in globally distributed teams. We propose that future studies should conduct a survey across the IS industry in which the causal relationships between these three main concepts will be further investigated.

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