

2009

Distributed Communication as Collective Socio-material Sensemaking in Global Software Work

Simeon Vidolov

University College Dublin, simeon.vidolov@ucd.ie

Seamas Kelly

University College Dublin, seamas.kelly@ucd.ie

Follow this and additional works at: <http://aisel.aisnet.org/icis2009>

Recommended Citation

Vidolov, Simeon and Kelly, Seamas, "Distributed Communication as Collective Socio-material Sensemaking in Global Software Work" (2009). *ICIS 2009 Proceedings*. 34.

<http://aisel.aisnet.org/icis2009/34>

This material is brought to you by the International Conference on Information Systems (ICIS) at AIS Electronic Library (AISEL). It has been accepted for inclusion in ICIS 2009 Proceedings by an authorized administrator of AIS Electronic Library (AISEL). For more information, please contact elibrary@aisnet.org.

Distributed Communication as Collective Socio-material Sensemaking in Global Software Work

Completed Research Paper

Simeon Vidolov
University College Dublin
Dublin, Ireland
simeon.vidolov@ucd.ie

Séamas Kelly
University College Dublin
Dublin, Ireland
seamas.kelly@ucd.ie

Abstract

In this paper, we address the issue of communication difficulties on globally distributed offshoring projects. We argue that although communication issues feature prominently in the extant literature on offshoring, and in that pertaining to project management more generally, they are not dealt with in a very satisfactory way. In particular, much of the literature either treats communication as an unproblematic process of information exchange, thus implicitly embracing a naïve conduit model (Kelly 2005; Lakoff et al. 1980; Reddy 1979), or adopts a detached, factor based approach that neglects the actual practices sustaining the process of communication (for notable exceptions see Boland 1995; Kelly 2005). We draw on in-depth, longitudinal, processual case study of an offshore relationship comprised of two software development projects with varying degrees of success. By contrasting and comparing these two projects we develop a richer understanding of communication practices and the specific challenges posed by the globally distributed nature of the project teams. Based on the rich empirical evidence from these two detailed projects, we build upon and develop previous work (i.e. Kelly et al. 2008) in order to synthesize a distinctive theoretical perspective on communication practices in distributed projects based on the notion of collective socio-material sensemaking. On basis of this perspective, we, furthermore, suggest a more holistic role of project managers that is crucially concerned with senseshaping.

Keywords: global software work, offshore, distributed collaboration, collective socio-material sensemaking, and communication

Introduction

Global Software Work (GSW) is an organizational phenomenon that has become widespread in the last decade as a result of outsourcing and offshoring (Carmel et al. 2005) . It is carried out by geographically distributed individuals/teams, interacting mainly through Information Communication Technology (ICT) in order to achieve financial and/or strategic advantages. The important role of GSW in the global economic processes and specifically in the recovery of national economies and whole geographical regions (Carmel 2003) accounts for its growing popularity.

Despite its proliferation and claimed maturity, the burgeoning literature on GSW reports many failures and problems (Cramton 2001; Grinter et al. 1999; Herbsleb et al. 2002; Jarvenpaa et al. 1999; Sarker et al. 2004). Specifically, temporal, spatial and cultural separations, along with the intensive mediation of ICT, appear to be the key aspects that shape the complexity of GSW and distinguish it from traditional (co-located) software work (Sahay et al. 2003; Sarker et al. 2004). The process of communication has been widely recognized as problematic in such global distributed projects (Curtis et al. 1988; Sahay et al. 2003; Sarker et al. 2004). Earlier attempts to theorize the process of communication have been focused on the technical characteristics of the communication media (Daft et al. 1986), later this techno-centric, conduit model of communication has attracted a critique that pointed to the importance of the social and interactional aspects of communication (Carlson et al. 1999; Lee 1994; Ngwenyama et al. 1997). In the more recent years the concepts of mutual knowledge /shared understanding have been widely drawn upon to account for communication problems (Cramton 2001; Espinosa et al. 2001; Kobitzsch et al. 2001).

Whereas, these studies have offered interesting insights into the process of distributed communication and have overcome some of the more problematic conceptions of communication, most authors have failed to describe and theorize the actual process of communication and how this mutual understanding is produced in distributed settings. Instead, most of these authors have concentrated on reporting the communication problems and highlighting the factors that alleviate or exacerbate the process of communication and the actual micro practices that constitute this process have been neglected. Therefore, in this paper, by building on few studies that theorize the process of communication in insightful ways (e.g. Boland 1996; Kelly 2005; Kelly et al. 2008), we attempt to open the black box of communication processes in distributed settings.

More specifically, by contrasting and comparing two exclusively ICT-mediated offshoring projects that had varying degrees of success, we explore the micro practices that underlie the interactions between distributed teams with a view to develop a richer understanding of the process of communication. Based on the rich empirical evidence from these two projects, and drawing upon the perspective of sensemaking (Weick 1995; Weick et al. 2005), we attempt to synthesize a novel perspective on communication in distributed settings that extends and complements extant communication studies in important ways: firstly, we illuminate the material mediation of communication by viewing it as a process of socio-material collective sensemaking, comprised of two interlocking processes of participation and reification (Kelly 2005; Wenger 1998); secondly, we highlight how the social and power relations as a context of such distributed processes bear relevance to how these socio-material practices are carried out and sustained over time; thirdly, we point to the importance of intensity and temporality of interactions for sustaining collective sensemaking processes and keeping momentum going; fourthly, we extend the conventional understanding of project management by arguing that the process of collective sensemaking has to be established and sustained by a skilled 'senseshaper' that facilitates the process of co-creation of shared and actionable understanding.

The paper is structured as follows. In the following section the contribution of this paper is positioned in the context of extant studies on distributed work. Next, the conceptual perspective of collective socio-material sensemaking is described, followed by an introduction of the research context and method of the study. The findings section offers a chronological description of the relationship and some of the key problems and difficulties are highlighted, in the analysis section, then, the conceptual perspective outlined earlier is drawn upon to make sense of the divergent project outcomes. In the discussion section, the conceptual perspective is synthesized in relation to the empirical data presented. The paper concludes by outlining some implications for research and practice.

GSW Research

Communication has emerged as a central theme in both research on GSW and the broader distributed work area (Cramton 2001; Dickey et al. 2006; Maznevski et al. 2000; Sarker et al. 2003; Sarker et al. 2004). It is a widespread belief that the temporal, spatial and cultural separations are key antecedents of the communication difficulties and problems in GSW projects (Carmel et al. 2005; Cramton 2001; Curtis et al. 1988; Sarker et al. 2003; Sarker et al. 2004).

Although there have been many attempts to understand and theorize the process of communication, many studies still fail to go beyond the positivist “message transmitting model” of the conduit conception of communication (Boland 1995:352; Ngwenyama et al. 1997). This perspective assumes that communication is a unproblematic exchange of well-packaged items among communicating parties through a conduit. Media richness theory (MRT) (Daft et al. 1986), being one of the most pervasive perspectives on communication, has followed the underlying logic of the conduit model in order to account for the problems of miscommunication. MRT suggests that communication media can be arrayed along a continuum of media "richness" based on differing objective characteristics of the communication channel. In particular, Daft and Lengel (1986) argue that managers could improve communication by matching the communication media to the complexity (based on either uncertainty or equivocality) of the organizational information-processing task.

Another stream of authors however opposed this narrow, techno-centric view on communication and suggested that there are other ‘social’ factors i.e. familiarity with technology and organizational context that can facilitate the process of communication. Walther's (1992) social information processing theory suggests that computer-mediated communication can be used to coordinate complicated tasks, it just takes longer to do so. Channel expansion research, for instance, suggests that when individuals have relationships with one another and experience with the underlying technology, they change their perceptions about the richness of text-based communications, leading to the observation that under certain conditions, media channels may expand in terms of perceptions of richness (Carlson et al. 1999). In addition, in contrast with MRT that argues that computer mediated communication is a lean communication channel that hinders the accomplishment of equivocal work tasks, other authors argue that people are “intelligent being(s) in a shared social context who can transform whatever ‘lean’ words and cues he or she receives into an understanding of what the speaker or writer meant,” (Ngwenyama et al. 1997: 150) either through critical reflection (Ngwenyama et al. 1997), or hermeneutic circle (Lee 1994).

The conception of mutual knowledge/ shared understanding has been also utilized to account for the problematic process of communication (Cramton 2001; Espinosa et al. 2001; Kobitzsch et al. 2001). It has been argued that not technology causes miscommunication but rather the lack of shared understandings among individuals (Hinds et al. 2003). Cramton (2001), for instance, argues that more diverse and dispersed distributed teams can posit mutual knowledge problems. She shows that a failure to exchange information about the context or to evenly distribute information to all team members, together with the inability to properly interpret information and its salience, can ultimately lead to disintegration of the relationship. Cramton, furthermore, contends that distributed team members should be in a continuous dialogue i.e. exchanging and verifying contextual information in order to develop mutual knowledge and succeed in their collaboration. Although such studies depart from the conduit model of communication by assuming interpretive flexibility of the media and illuminate the importance of mutual knowledge, they fail to explore and describe the actual micro practices that underlie the development of mutual knowledge.

Few other studies, however, look more closely at the process of communication and offer rich insights that illuminate these communicative micro practices (Boland 1995; Kavanagh et al. 2002; Kelly 2005; Kelly et al. 2008; Malhotra et al. 2001). Boland and Tenkasi (1995), for instance, conceptualize the communication process within and between knowledge communities as a social practice of perspective making and perspective taking and points to the socio-material aspects of collaborative interactions. Their work can be distinguished from other more traditional studies for drawing upon the perspective of sensemaking to illuminate the underlying interpretive practices and draw attention to the use of boundary objects. Kelly (2005) also goes beyond popular intellectualist and cognitivist interpretations of communicative processes and illuminates the material mediation of communication by presenting communication as a dual process of participation and reification. In addition, Malhotra et al. (2001) offer thick descriptions of how different reifications promote more complex forms of collective participation. Drawing on, and developing, previous work on communication in distributed settings (specifically Kelly et al. 2008), we attempt to develop a more holistic perspective on communication that attends to the material nature and temporal aspects of communication practices, and also points out the importance of social and power relations.

Socio-material Sense-making and Leadership

A sensemaking lens (Weick 1995; Weick et al. 2005) offers the prospect of an enlarged and richer perspective on organizational life than provided by the 'conduit' models of communication (Kelly 2005). Moreover, we complement this perspective in important ways with a view to developing prominent themes that emerged from our reading of the case. In particular, we analytically attend to leadership and artefactually mediated sense-making.

A key feature of a sensemaking perspective is the assumption that the world is not unproblematically given, but needs to be actively made sense of on an ongoing basis. Events are equivocal, being open to multiple (and often competing) interpretations. Consequently, effective communication should not be conceived as the unproblematic transfer of objective information/ meanings from alter to ego but, rather, as a complex collaborative process that involves the development of a (partially) shared perspective that frames a specific situation or event, with a view to facilitating action/ intervention in the world. Thus, the sense we make of the world shapes how we act in it and sensemaking becomes especially important and problematic in the context of unfamiliar or uncertain circumstances.

The sensemaking perspective, based as it is on an enactive model of social reality (Weick 1969), allows us to connect the levels of social structure/ institution and action in a structural manner (Giddens 1984). From such a perspective, social structure is conceived as institutionalized practices, both discursive and non discursive, which shape sensemaking along conventional lines. These practices, however, do not determine action; there is also room for individual agency. In the context of sensemaking, then, the role of key strategic sense-giver is of central importance in providing leadership and shaping the process in deliberate ways. The role of the skilful and influential agent, then, in the capacity of a sense-giver, is crucial in the successful mobilisation of collective action. By framing situations or issues in particular ways, leaders can try to ensure that there is enough commonality in the manner in which different individuals/ groups make sense of circumstances to facilitate concerted forms of collective action.

With regard to the shaping of collective sensemaking processes, the physical positioning of actors and the manner in which their interaction is mediated can play a vital role. One way of conceiving of the process of collective sensemaking, following Wenger (1998), is as an ongoing duality of reification and participation (see Kelly 2005). Wenger (1998: 52) argues that the act of knowing is located within a social process of meaning negotiation, that involves the interaction of two constituent processes – processes of *reification* and processes of *participation*. By participation he means that knowing inevitably involves "the social experience of living in the world in terms of membership in social communities and active involvement in social enterprises" (p. 55). Thus, a prerequisite of knowing is participation in communal social practices. Reification, on the other hand, is used to refer to "the processes of giving form to our experience by producing objects that congeal our experience into 'thingness'" (p. 58). Wenger sees participation and reification as complementary processes that can "make up for their respective limitations" (p. 63) and points out that the "communicative ability of artifacts depends on how the work of negotiating meaning is distributed between reification and participation.

Methods

The objective of the study is to explore the mundane practices and relations that maintain the process of collective sensemaking in distributed context. The exploratory nature of the study leads to adoption of a qualitative case study approach that aims to generate novel insights from the data in an inductive, grounded manner (Strauss et al. 1990).

Research Site

The fieldwork of this research is a result of an ongoing in-depth, longitudinal, interpretive study of two offshoring projects that constitute the relationship between JaipurSoft and E-TAGSEC. JaipurSoft specializes in providing software development services to small Irish start up companies and SMEs with annual revenues of up to 200K. Its organizational structure is comprised of onshore (Dublin), offshore (Jaipur, India) and nearshore (Poland) canter. E-TAGSEC is a Cork based innovative start up company, which offers technological solutions for retrieval of lost or stolen belongings. These technological solutions, both software and hardware, provide security to owners of small electronic devices such as PDAs, mobile phones and laptops and enable lost & retrieve service.

Data Collection & Analysis

The authors followed the relationship from the middle of the first project and their engagement with the two companies continued well after the end of their relationship. The initial contact was established with Sean (CMO of JaipurSoft) and Balram (CEO of JaipurSoft). After two initial face-to-face meetings with them further access was negotiated and the authors were able to explore the development of the relationship in an ongoing, longitudinal fashion. The main participants from the three locations were interviewed in two rounds of interviews. Most of the interviews were conducted through Skype and were recorded. Informal chats and telephone conversations with project participants further provided additional information. Having the Skype IDs of all project participants made easier maintaining frequent interactions with a view of developing better relationships. The engagement of the authors with the project participants continued well after the end of the relationship. Follow up conversations and chats complemented some of the issues that needed further clarification. In addition, after the end of the projects all project documentation was also provided for analysis. As part of the ongoing interaction with the companies, the researchers produced a report that contained analysis of the collected data and suggested practical recommendations for improving project management and communication practices. This document was then discussed with both companies and its content encouraged a collective sensemaking process between researchers and participants. The overall objective of the researchers was to trigger a learning process and facilitate the development of practical knowledge among practitioners (Reason et al. 2001)

Besides the formal and informal conversations, all email correspondence and archival data were thoroughly analyzed. This documentary evidence consisted of all the email correspondence (more than 500 emails) during the two projects and all project documentation including project plans, consultant reports, financial information, weekly status reports, and etc. The examination of these textual and conceptual artefacts offered a more granular perspective on the mundane interactions and practices sustaining the client-vendor relationship and compensated some of the challenges associated with the digital divide and depth of the investigation (Marcus 1995).

The collection and analysis of data was exploratory, expecting to generate insights into the practices that sustain the process of collective sensemaking. During the first project the interviewees were asked to comment on their mundane collaborative practices and relations, in the second project when the problems and failures started to emerge, project participants were more willing to reflect on their practices in order to explain why these problems emerged. These interpretations were more reflexive and offered richer insights into process of collective sensemaking and the practices and relations that surrounded and sustained it. Our analytical strategy borrowed heavily from a grounded theory research perspective (Strauss et al. 1990; Strauss et al. 1997). Although we decided against explicitly coding the data, our concern was to identify key themes therein and develop them with reference to extant theoretical literatures (Walsham 1995). The process of data collection and analysis was iterative allowing new themes to emerge. The analysis consisted of multiple readings of the interview transcripts, field notes and project documentation. The raw data was further analyzed in different smaller documents with regard to other similar in-depth accounts and conceptual perspectives that ultimately facilitated the identification of important practices and relations that facilitated and sustained the process of collective sensemaking. The researchers have been continuously engaged in many interactions and sensemaking sessions in order to extract the key analytical themes presented in this paper. Although, the analysis followed a less structured approach (e.g. Law 2004; Mol 2002) than what traditional methodologies would recommend, the authors not only adhered to the prescriptions of good research practice (e.g. Klein et al. 1999) but also tested the analytical interpretations against the reflections of key project participants following the tradition of participatory inquiry (Reason et al. 2001).

Findings

This client-vendor relationship between E-TAGSEC and JaipurSoft continued over an 8 month period during which two projects were conducted. The relationship was unique for its exclusive reliance on technology for establishing and sustaining the project interactions. Only two co-located meetings were conducted over the whole period and they were intended to discuss commercial issues. The first project was perceived as a success by both companies, while the second project was fraught with conflicts, communication breakdowns and ended in a commercial dispute. In both cases the development of the software applications were developed by the offshore centre in India in collaboration with the team of developers at E-TAGSEC. On the E-TAGSEC site, the key actor and project manager was Paul and other two in-house developers were involved. The project manager in India was Madhuri and he was key contact person at JaipurSoft. Balram (CEO) and Sean (CMO) were running the JaipurSoft's onshore centre in Dublin. They, primarily, had a mediating role and were looking after the commercial and relational aspects of the collaboration. In this section, I present empirical evidence from the in-depth, interpretive study that offers a description of how the two projects unfolded over time.

First Project

The relationship between JaipurSoft and E-TAGSEC kicked off with a meeting between all interested parties. A short term plan was developed which specified some of the basic responsibilities and practices. These included: clearly defined roles and responsibilities, frequent daily project interactions between Paul and Madhuri and frequent review meetings and continuous monitoring of the team performance. These issues were captured in a minute meeting and re-distributed to all project participants. In addition, Balram set the good tone of the relationship by stating:

“I hope we will be able to define our expectations, targets etc in well defined manner and with clear distinctions of responsibilities between different teams to keep a regular performance monitoring going forward.”(Balram, September 2007, emails correspondence to key project participants)

The project started following the prescriptions from the first meeting i.e. by exchanging as many requirement documents as possible and having daily conference calls between Paul and Madhuri in order for the Indian team to get into the ‘nitty gritty’ of the project.

During the first week of the project the interactions between the team members were extremely intense. Madhuri was sent a range of documents that were related to the project and were providing information about the application. In addition, he was closely interacting with E-TAGSEC’s IT specialists Kevin and Cormack who helped him develop a better understanding of their system, hierarchy and technology:

“we had a discussion with them and they walked me through the whole set of questions and what needs to be done, then we had to agree upon how it should be done... now I am much more comfortable because I know the whole structure, what exactly know what has to be done and I am a lot more relaxed (referring here to instances during the second project)” (MADHURI, December 2007).

Paul’s memories as to how their mundane interactions evolved were: *“once they were given the specs, Madhuri was coming back to me, I was trying to give the right specs and to talk with him as much as possible and then I would try to talk to Madhuri about other side issues and may be higher level design or architecture level discussions.”* (PAUL, January 2008)

The representatives from both companies thought that over time they had refined their interactions and developed trust:

“I think we came to a routine in Skype chats and calls with Madhuri and the actual development. And what happened to me once the project is running, I am looking at the next project so the amount of attention I am able to give is less, so in the second project I put one of our senior developers here Anthony as the contact between us and India. So they have the chats with Madhuri because I have effectively been no longer involved in the technical aspects of the project.” (PAUL, January 2008)

The office in Dublin became actively involved in the project. They were mediating the relationship between Madhuri and Paul and alleviating some anxieties or handling problems that might arise. Discussing commercial issues, including invoice delays or increases of scope, was another central role of the Dublin office. These interactions created a private channel through which JaipurSoft were able to get a feeling of E-TAGSEC’s satisfaction with the Indian team performance.

According to Sean, the onshore centre in Dublin was touch basing on a regular basis with both the client and the team in India. In addition, Balram and Sean were copied on most emails between Jaipur and Cork. He further described the role of the on-shore centre and emphasized its mediating role:

“Madhuri would have a meeting with Paul and then I would do separately, I would know that this meeting is taking place, I would contact Paul afterwards to ensure that everything is ok, that he was happy with the outcome, I would get minutes of the meeting. Then I would contact Madhuri to make sure that he is happy, to make sure that the client is happy and cooperating in order to meet our deadlines, because obviously sometimes we would have clients that do not provide the required information on time. So cooperation needs to be working on all levels. I and Balram would have a helicopter view to make sure that everything is running smoothly on the project” (Sean, November 2007).

The project interactions were carried out through different communication media. Besides the frequent interactions with E-TAGSEC's technical staff through Skype, they were also having frequent conference calls (4 during the first week). Through email correspondence many issues were clarified but also issues were raised. Most of these issues were then discussed during the conference call meetings among all participants. In addition, these conference calls were crucial for structuring the project and setting short term priorities and tasks. These meetings were then reified in MoMs that were sent to all project participants. This cycle was repetitive through 2 days during the first week of the interaction.

When the project passed this initial phase and project plan was put together the interactions continued in a structured way, with less conference calls but frequent email and Skype chats. According to Madhuri throughout the relationships he and Paul had regular Skype meetings at least once a week to discuss *“what tasks, what modules we have to develop, are we having any issues in terms of functionality or logical issues if the modules make a logical sense to us; the kind of day-to-day activities .Sometimes I touch base with Paul more than once per week”*. (MADHURI, December 2007)

A common email list was created through which developers were openly interacting. Key project participants and stakeholders were copied on all emails so that everyone was kept updated and no one felt excluded. For instance, although the main interaction was between Paul and Madhuri their team members had each others Skype IDs and were sometimes having discussions. The developers at JaipurSoft were encouraged to pursue direct contact with their Irish colleagues in certain cases:

“so generally my team here if they have some issues they first come down to me ‘here is what happens we got stuck with it, it doesn’t make a logical sense, or something is not happening for me’ etc. so I try to help them out if I am not able to help them out, I ask them to contact the client developers. It is a pretty technical, hard core technical stuff, so they need to know what changes need to be done. Whenever we start on a new module I and Paul have a meeting and discuss the requirements”. (MADHURI, December 2007)

The project continued smoothly for 3-4 months and after its end both sides were satisfied and assumed that it was successful. The success of the relationship was confirmed by the start of the second project right after the end of the first one.

Second Project

Although the second project kicked off with enthusiasm and an established level of social capital, it did not unfold as per expectations. Although the Indian team included the same developers who were familiar with the system, there were some significant changes. On the E-TAGSEC side, for instance, Paul was substituted by Anthony, as a key contact person, and the other developers from the office in Cork were relocated to other projects. In addition, Paul and Balram were involved in other projects and were not able to participate on a day-to-day basis in the project.

These staff changes lead to the project communication being almost exclusively restricted to Madhuri and Anthony. They established a new way of interacting that was different from the one during the first project. More specifically, they failed to sustain the pattern of having frequent real time online meetings. Instead, they were engaged in asynchronous interactions and were relying on exchange of lengthy emails.

Although during the initial stages of the project there were less interaction, later the dialogue intensified and certain problems started to transpire. The communication process was unproductive and both companies failed to recover their relationship. As a result, the second project ended in a commercial dispute that brought disappointment and emotional reactions to project participants:

“Loosing a client is always disappointing, we just have to work hard and probably improve what we did wrong” ...“It’s one of those things, we are being paid and if we lost a client, it doesn’t matter whose fault it is, in the end of the day it is us who are going to suffer the most” (BALRAM, July 2008)

All problems and difficulties were associated with the fundamental process of communication:

“...the concerns, to me they are relatively constant; communication is key and is always the biggest issue” (PAUL, December 2007).

“...a single point is communication everything else can be categorized as problem due to insufficient communication” (BALRAM, December 2007)

These communication problems surfaced as delays, misinterpretations and misunderstandings, failure to escalate and generate collective action, and unclear project roles.

Misinterpretations & Misunderstandings

Misunderstandings as to what and how needs to be done surfaced in the project and lead to the problematic output of the project:

“As I said early on, they make some assumptions about the functionality and about the scope, some of them they got them right but other wrong. So those were the things. The main problem is communication” (PAUL, June 2008)

“let’s say there were ten actions to be done and four of them were absolutely ok and the rest there were issues to them and there were backwards and forwards between Anthony and Madhuri or whoever else was on the project and you know I got involved, trying not to be involved and then may be another 2-3 actions failed and 5-6 still open - misunderstood, or didn’t implement correctly or just didn’t where they are...”(PAUL, June 2008)

Project participants hinted that the lack of continuous dialogue in order to develop common understanding lead to such misunderstandings:

“it is an absolute disaster, because you a) didn’t specify what you want or at least not exhaustively b) I delivered it according to your specifications , it is very functional think has nothing to do with technology, and once I delivered it you didn’t tell me ‘I didn’t want it so’ and then you just say ‘it is all wrong.’” (BALRAM, June 2008)

Ultimately, most project participants thought that the insufficient and exacerbated communication process was the reason for these misinterpretations to emerge:

“There was not enough communication ‘this is what we are trying to get together to do’... they all asked very similar questions and even with the system in front of them and working (?)... it does amount to communication, probably there was a little bit...(PAUL, June 2008)

Delays & Low Intensity

These misinterpretations and communication problems generated delays that made project participants to abandon the project plan:

“Problems arose from mismatch i.e. there needs to be a match...E-TAGSEC’s feedback on different deliverables was negative and this was obviously a mismatch in the specification i.e. what they wanted and what was done. These problems led to delays or skipping the deadlines and in this rendered project plan meaningless.” (BALRAM, June 2008)

Throughout the project, team members were blaming each other for delaying responses or being unavailable to each other:

“I had to send a couple of reminders to Anthony - I haven’t heard from you can you get back to me with answers regarding the issues raised’ ... ‘we will arrange Skype meetings for instance for 11 but Anthony won’t switch his Skype for quite some time” (Madhuri, June 2008)

Furthermore, the response cycle was slow and made the communication process less intense and also enhanced the frictions between project participants:

“So the reason they went completely silent is perhaps because they thought that the amount of time and effort I would spend in writing emails with these guys - I told you they would write emails to us on the other day when the Indian office is closed, so the day after the next will write them asking questions and then on the next after the next this new project manager would response the next afternoon. So with every communication we did we were losing one day and we were waiting. We did a lot of follow ups ‘Could you please respond’ but the way he was doing- it was to look at the emails in the end of the day and then lets do the rest of the project” (BALRAM, June 2008)

Failure to escalate & generate collective action

Escalation of problems to senior management did not improve the project processes. After some of the problems with deliverables and delays transpired, both companies escalated issues to the other side. Escalation, however, did not elicit the expected response and reaction. On some occasions, escalation was delayed, but in most cases the escalating side failed to create a feeling of urgency around their request for intervention. The lack of sensitivity to

the emergent problems and the inadequate and delayed escalation efforts to the other side further deteriorated the trust between the two companies.

“Due to these difficulties, Sean and Balram got involved, these problems were brought to Paul’s attention and they asked him to interfere. He, however, probably was busy with other obligations and was not in a position to attend to these issues. He responded to their request quite late when ‘damage was done already’” (Madhuri, April 2008).

Although, Balram believes that escalation is crucial for repairing emergent communicative problems and difficulties, he points out that due to lack of commitment and delays it did not work well:

“What happened, instead, is, because project worked great in the past it was assumed from both ends that it was working and we lost the communication somewhere between and then I got involved where I started seeing the flag where Madhuri was frustrated for not getting enough response, I got a few emails from Paul saying ‘you know things are not great’ then I started raising the flag to Paul saying ‘Paul we need your time and we need your feedback (with an emphasis) and we need to talk’ but at that stage Paul had a lot of responsibilities in terms of his overall corporate responsibilities, and he couldn’t find the time and then to make an executive call - ‘ would he spend enough time to clean up these communication issues go back to us trying to get help or would he do the job himself” (Balram, May 2008).

Unclear Project Roles

During the commercial dispute the issue about who the project manager was emerged. On one hand, JaipurSoft were inclined to blame Anthony for the delays and inability to engage in practices that facilitate the dialogue between the companies; on the other hand Paul argued that *“Anthony was not the project manager, he was effectively a technical leader... He was doing what I was expecting him to be doing...” (Paul May 2008)*

The heated discussion about Anthony’s project status shows that there were assumptions and misunderstandings that were not handled properly from the start of the project: *“This is another key thing that we didn’t characterize the roles”.* (Paul, May 2008).

Paul furthermore admits: *“When I spoke with Sean and he said that there was no project manger on the project, and I agree with him and I think there was not really a project manager.” (Paul, June 2008).*

In addition, Paul acknowledges the benefit of having a project manager: *“I can say if we had a project manager we would have done better or at least could have known earlier” (Paul, June 2008)*

Making sense of the problematic relationship

The case description offered above raises important questions as to why the two projects had varying degrees of success. The exploration and comparison of micro practices during the two projects promises to illuminate important aspects of communication process in distributed settings. In the subsections below, we present our interpretations with a view of illuminating the communication practices that work well in distributed settings, and suggest insightful explanations that can account for the divergent outcomes of these two projects. We structure the analysis around few key themes (i.e. understanding communication, social context and power relations) in order to develop conceptual and practical conclusions in the next two sections.

Understanding Communication

Communication was perceived as a fundamental process in offshoring projects:

“The key to offshore model is communication and all three of us understand this. And we will fail as business if we don’t communicate with our customers. Their requirement for communication is multiplied by 10 when they are dealing with outsourcing companies. You have to communicate even if you don’t have anything to say. You don’t wait to deliver something you just communicate with them.” (SEAN, November 2007)

In addition, the failure to establish and sustain a working communication process was seen as a root cause to other problems. The failure to continue the practices that sustained the process of productive communication during the first project, can, therefore, account for the problems during the second project. The way communication was understood and practised during the first project goes against the simplistic conduit model of communication according to which communication is unproblematic, straightforward process of information exchange. Instead,

communication was viewed as a complex dialogic process of meaning negotiation which requires a lot of productive 'back and forth' in order to guarantee mutual understanding and can generate collective action e.g.:

"But again it is up to the process of communication, because if the communication was good enough, we should have or probably did ask a lot of clarifications about the project, which wasn't either responded on time or with quality or we didn't hear it properly. It is one of those either." (BALRAM, June 2008)

"we could have been more proactive in terms of the communication and be more explicit regarding their understanding of the specifications... and might have started the coding too early before making sure that they have properly understood the specifications". (MADHURI, June 2008)

Below, I attempt to unravel the practices, and their performance, that constitute the complexity of communication as a successful dialogic, ongoing process of developing actionable shared understandings.

Intensity and timeliness of communication practices

The dialogic, iterative process of collective sensemaking is intrinsically interrelated with the temporal flow of interactions among participants. The intensity and timeliness of these interactions generate predictability and visibility and guarantee unproblematic temporal flow of meaning negotiation. Temporal aspects of communication practices were frequently discussed by project participants and it was claimed that the failure to sustain the intensity and timeliness of communication lead to serious frictions during the second project:

"Due to these difficulties, Sean and Balram got involved, these problems were brought to Paul's attention and they asked him to interfere. He, however, probably was busy with other obligations and was not in a position to attend to these issues. He responded to their request quite late when 'damage was done already'" (MH, July 2008)

"Therefore even though there were communication problems and we could have been more pro-active and start shouting to E-TAGSEC management - 'we are not getting through much, we are not getting timely feedback for example', we should have started flagging the 'red flag' a lot earlier" (BALRAM, June 2008)

Moreover, the slow email response cycle diminished the visibility and predictability between the two parties. This slow response rate, furthermore, created confusion and dubious interpretations of the other party's actions and reactions

"(regarding Balram's comment that they didn't get feedback so they couldn't fix and improve) we were providing feedback but the fix didn't take place or was taking too long and then we said for me there was a communication break down on both sides" (PAUL, June 2008)

Disruptions in the temporal flow of the second project lead to serious delays and deterioration of the relationship. For instance, in a comment by Paul Bermingham becomes clear that the unproductive and slow communication cycle between Anthony and Madhuri towards the end of the second project is a key factor for Paul to decide to ultimately stop working with JaipurSoft:

"by the time Balram got involved to kind of raise the flag that there weren't getting a response from Anthony and they weren't getting a response because I told 'look forget about it'... "We did not wait; I actually didn't have the time to wait JaipurSoft". (PAUL, June 2008)

In contrast, the first project had a quick email response cycle. Email exchanges regarding specific issues rarely extended to the next day. Prompt email response and reaction were appreciated and encouraged: e.g. *"Thanks for sending this so quickly"* (Paul to Madhuri). In cases when response or action had to be delayed to the next day the other side was explicitly informed in an apologetic manner. This created transparency and predictability in the actions of the other side and maintained the momentum of key conversations.

The analysis of the correspondence instances supports the argument that the intensity and timeliness of interactions are crucial for sustaining the process of collective sensemaking. More specifically, the aggregate number of communication instances i.e. conference calls and exchange of documents was higher during the first project. Although the first project was slightly longer in duration, there was a higher frequency of communication exchanges than during the second project (Table 1).

Table 1 Comparison of the level of communication during the two projects (from email archive)

Communication Project	Document Exchange	Conference Calls	Exchange of MoMs
Project 1	38	9	9
Project 2	13	2	3

Communication as a process constituted of socio-material practices

Whereas, the temporal aspects (i.e. intensity and timeliness) of communicative practices are crucial for sustaining the process of collective sensemaking, a closer look at the communication patterns also point to the importance of artefactual mediation. The process of communication has been carried out through diverse communication media, interweaving synchronous and asynchronous, oral and written interactions through a mixture of emails, documents, real time chats and conference calls. The socio-material characteristic of communication practices stood out during the first project where cycles of asynchronous email communication were followed by quick synchronous interactions carried out through Skype. The first project started with E-TAGSEC sending documents to JaipurSoft in order to get acquainted with the project. These documents then triggered further discussions of issues that had to be clarified and, thus, rendered the iterative cycle of meaning negotiation going. On basis of these documents, JaipurSoft produced other project documents such as project plan and schedule that further reproduced the ongoing process of interactions.

Besides the frequent interactions with E-TAGSEC’s technical staff through Skype, they were also having frequent conference calls (4 during the first week). Through email correspondence many issues were clarified but also issues were raised. Most of these issues were then discussed during the conference call meetings among all participants. In addition, these conference calls were crucial for structuring the project and setting short term priorities and tasks and were reified into Minutes of Meetings (MoMs). These MoMs had a temporary nature and were stabilizing the shared understanding about priorities and responsibilities until the next meeting takes place and their content gets updated. Therefore, they were used, on one hand to explicitly capture commitments and facilitate the monitoring of project progress in order to assure that participants had congruent understanding of project processes and priorities; and on the other hand, they were used to foster discussions and clarify issues.

A closer look at the patterns of interactions shows that the process of communication resembles an iterative process through which meanings are negotiated and then stabilized in written documents. During the first project documents and artefacts were not considered as ultimate carrier of meaning, but were rather used to sustain the ongoing process of meaning negotiation. In contrast, during the second project Madhuri assumed that the documents sent to him were exhaustive and did not require additional discussions and cycles of sense making, and this understanding hindered the process of communication:

“Regarding Madhuri’s idea that they probably started coding too early and the specifications were not that clear - I wouldn’t disagree with this, but would see those as being; I guess I would see the documentation as a starting point, rather and end point. What you said what he had said about the assumptions (i.e. Madhuri) is another way to say what I am saying it is expected some assumptions to go against but it seemed to many to go against it the second time, it seemed as it is almost, I don’t want to use the word, not careless, but just assuming something and eventually too many assumptions went against it, but they really picked the easy choice rather than the most likely one, you know what I mean.”(Paul, July 2008).

This quote highlights the role of documents in the process of meaning negotiation i.e. fostering and stabilizing congruent understandings about different issues and therefore diminishing diverse interpretations and assumptions. Two major documents were central to the first project i.e. use case document and project plan. The use case

document was the one that triggered the most discussions and interactions and made the process of meaning negotiation richer and more intense:

“let’s talk about the project plan because that’s what structured our relationship. It came back from JaipurSoft, and the specs that went you get it back from JaipurSoft. One particular was the use documents. This was a critical document”. (PAUL, January 2008)

During the second project the process of meaning negotiation suffered from the diminished overall level of communication. In particular, the level of all kinds of correspondence instances was significantly diminished during the second project (see table 1) and documents were not perceived as a means for stimulating and sustaining the ongoing nature of the discussion, but instead were seen as an end point of communication. Figures 1&2 show the number of emails and documents exchanged each day throughout the projects. It is evident that the intensity of email exchanges was higher during the first project but also it transpires that the intensity was diminishing with a faster pace during the first project as compared with the second one. The number of document exchanges was also much higher during the first project and, apparently, more evenly distributed throughout the project lifecycle. Documents were used in few important ways i.e. as a means of accountability and exercising control and therefore mobilizing collective action, stabilizing meaning and stimulating further discussions.

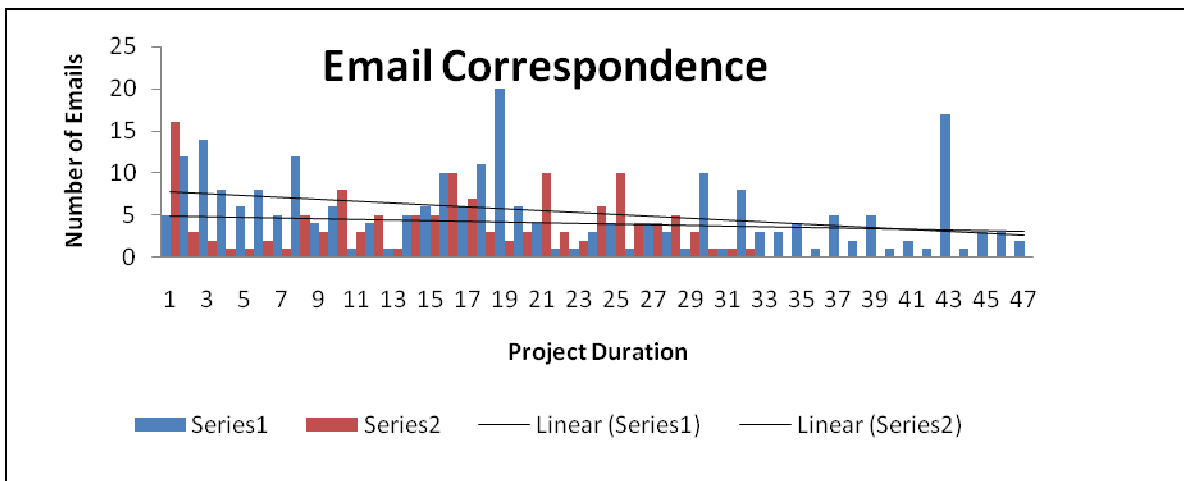


Figure 1 Email Correspondence: Series 1 refers to Project 1 and Series 2 refers to Project 2

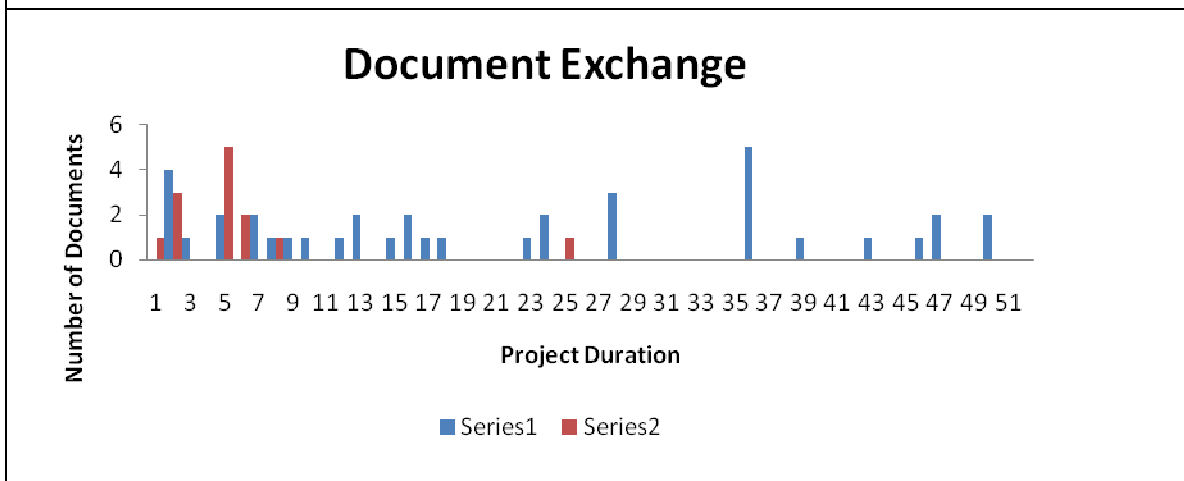


Figure 2 Document Exchange: Series 1 refers to Project 1 and Series 2 refers to Project 2

Figures 1&2 illuminate the socio-material nature of communication practices in which the artefactual mediation through emails and documents is intrinsic part of project interactions. The high intensity and even distribution of

email and document exchanges facilitate and sustain the continuous and productive dialogue among project members.

Later, all project participants came to recognize the importance of viewing communication as inseparable socio-material process which intertwines both documents and discussions in order to de

“There were some difficulties there. It was part of the documentation but because we did not specifically talk about it didn’t get done initially.” (PAUL, July 2008)

“the documentation wasn’t sufficient in this project - the functionalities of the specifications were not exhaustive - we should have come to them or they to us on this...we assumed things that we should have not assumed”(MADHURI, June 2008)

Social Context

The spirit with which the communication practices are performed also has a vital role for the success of communication. During the first project, the positive attitude of team members was cultivated by top management and created a social context that sustained the productive interactions. In particular, care, mutual respect and enthusiasm to work together transpired in the interactions between team members. While the intense ongoing communication was stimulating the emergence of positive social relations, these relations were also sustaining the ongoing interactions among team members. For instance, in cases when some of the contact people were away from their desks, senior managers were quick to respond to inquiries or at least inform them about the absence of their subordinates. On some occasions when response or action had to be delayed to the next day the other side was explicitly informed in an apologetic manner e.g.:

“Paul, If I send this document tomorrow, will it be ok?” (Madhuri to Paul)

Such practices expressed care and commitment to the other side and developed predictable social context in which confusions or disappointments can be overcome if they emerge. Performed with enthusiasm, ongoing interactions facilitated the emergence of transparent project space which compensated for the lack of visibility and proximity. In contrast with the second project, the first project was marked by efforts to cultivate a positive social context in which participants felt comfortable and open to share information and flag important issues early in the process. Such a collegial and friendly atmosphere was created and sustained by including everyone in the communication process. Some of the developers were looking for advice on topics that did not concern the other side, but people were taking time to respond to them and even trace additional information in order to be helpful:

“Looking for any ideas / suggestions WRT encryption on the database. A few things come to mind so any feedback would be appreciated... Fire suggestions this way :o)” (excerpt of an email sent by Kevin to the email list)

In addition, the feeling of inclusion was enhanced by the development of common email list and the practice to copy almost everyone to all email correspondence. The positive attitude towards the other side was cultivated during the first project. For instance, Madhuri was contributing to the project beyond the call of duty. He was involved in different conversations about the project, ones that not necessary concerned his team. This open and friendly project environment gave him confidence to actively participate in the project and successfully shape his team understanding about the project.

During the second project, on the contrary, occasions of dishonesty, exaggerations and undisclosed important information were frequent. Namely, Madhuri has been exaggerating about their progress or was offline to avoid contact with E-TAGSEC. This behaviour has created wrong expectations and ultimately resulted in complacency and serious misunderstandings. The lack of openness and honesty about the progress and problems can account for the failure of the second project:

“It would have been difficult for them, but, as Madhuri said, they knew themselves they didn’t have thorough understanding, they knew it, ... put their finger on it and say ‘I am going to delay this project’ but that’s the difficult part, that needed to be done, that would have started the alarm bells in my head we would have sat down with Madhuri on the phone for a day or put him on the plane get him over her. As I said we had other elements much harder than the website, I wasn’t really in the mood going to India or even sending Anthony there for a couple of days, because it was too much to do to keep the other elements together” (Paul, June 2008)

Balram also appreciates the importance of honesty and openness as intrinsic part of a productive offshoring relationship:

“This is where many companies in the off-shoring industry make mistakes, in my opinion, the project manager always tries to be nice with the client, but instead he has to be very, very honest and frank, when the client is not responding and doing the things, just trying to be nice is not nice enough, you just have to be strong some time and rude, rude doesn’t have to be using the bad words or anything” (BALRAM, July 2008)

Power Relations

While the benefit of having honest, open and engaged social relations among team members is unquestionable for supporting the process of developing congruent understandings and commitment to collective action, there are other issues around power and reciprocity of the relationship that can also interfere with the success of a project. The comments of project participants reveal that they have divergent expectations as to how such types of client – vendor offshoring relationships have to unfold:

“Why would they pay us, they hired us to do the job, and its there response to respond, review and provide us with feedback and let us do the job for them rather do it themselves” (BALRAM, June 2008)

Over the period of the two projects the two companies were involved in balancing the reciprocity of the relationship through continuous negotiation of power positions i.e. scope increases, financial negotiations and etc. The ending of the second project in a commercial dispute also shows that the companies failed to preserve the mutually beneficial power balance.

In some of Paul’s comments this lack of reciprocity is acutely apparent:

“I can understand that and understand why they think that (i.e. according to Balram’s and Madhuri’s arguments that the root of the problems lies in the change of Paul with Anthony), but from my perspective, they probably have forgotten it but they didn’t feel any financial pain on it”

“You need to have a relationship, and if prices start going up that relationship comes under strike.”

“When I was starting going back to them to re-negotiate ‘look I am not getting what I expected and I don’t think you shouldn’t be getting what you expect ‘and the only thing I have control over is money” (PAUL, June 2008)

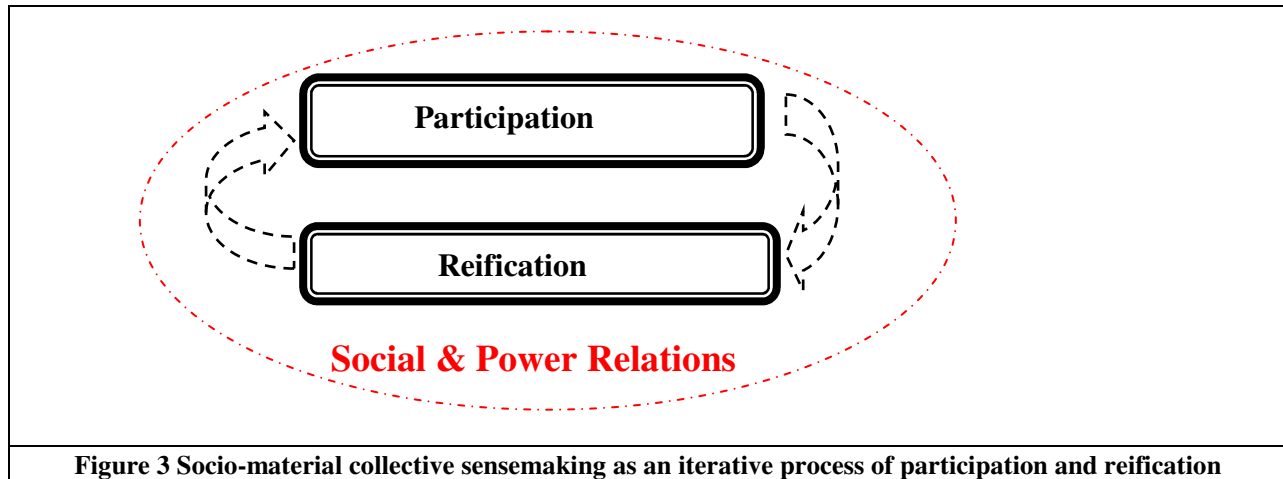
The deterioration of power reciprocity is directly related with the failure of the communication process, as both a consequence and cause. On one hand, it exacerbated the process of communication and this, on the other hand, prevented both sides to re-negotiate their power balance:

“I would request you to please let us know, when and how would you like to discuss it on conf call and what process you would like to follow between us so that we can resolve this issue in win-win way, we always rate you as a valuable and important client, and committed to support you as much as you can. At the same time, we are a small start up business and cash flow is very important for us to survive. We have done every thing possible from our side in timely manner I hope you would do the same.” (BALRAM, June 2008)

Discussion

By contrasting and comparing the two projects between JaipurSoft and E-TAGSEC, this study attempted to open the black box of the process of communication by illuminating the socio-material practices that shape its complexity.

The data shows that project communication is a complex socio-material collaborative process i.e. collective socio-material sensemaking the failure of which can result in project failure and deteriorated client-vendor relationship. Weick’s (1995, 2005) conception is modified to recognize the socio-material nature of collective sensemaking and the role of artefacts as illustrated in Figure 3 i.e. collective sense making is a continuous process of participation (meaning negotiation) and reification (stabilization in documents or other artefacts) (Kelly 2005; Kelly et al. 2008; Wenger 1998). Intense communicative interactions have to be supported and complemented by meaning stabilization through documents and artefacts in order to sustain the ongoing reproduction of shared meanings. Drawing upon different documents and artefacts makes the process of meaning negotiation richer and more intense by introducing different forms of participation (e.g. Malhotra et al. 2001). Documents, therefore, should be perceived as means for fostering discussions and collaboration rather than simply as means of accountability. This cyclical flow between oral and written or synchronous and asynchronous communication should be considered as a crucial part of project collaboration in distributed settings.



The findings, furthermore, reveal the importance of social and power relations that shape the characteristic of the sensemaking practices. By establishing and cultivating positive social and power relations, project managers can develop a social context that guarantees the emergence of productive collective sensemaking. As it was evident from the description of the case study, these relations to a large extent hinge on the active role of the project manager (Kelly et al. 2008).

From such a perspective, managers must not only take responsibility for planning and monitoring progress but also for actively facilitating these repetitive cycles of establishing project understandings by shaping expectations, priorities and meanings among project members (Kavanagh et al. 2002). The manager as an active sense-shaper has to continuously relate to project members and mediate their interactions. The orchestrated negotiation of meanings and understandings is means for dealing with complexity and mobilizing collective action. In addition, the continuous and skilful facilitation of shared understanding reduces the possibility for unexpected events or serious interruptions to arise. The collective sensemaking processes show that a key problem was the absence of skilled 'sense-shapers' who could take a leadership role in the projects at hand by ensuring that a sound, and mutually satisfactory, communal understanding was synthesized as a basis for the mobilisation of productive collective action.

Another central management responsibility is concerned with cultivating the relations that are crucial for facilitating productive co-development of shared understanding. Successful distributed projects require a skilful and reflexive approach to fostering social relations and facilitating collective sense making. For instance, creating a friendly social environment that encourages project participants to openly raise issues and share ideas is crucial condition for avoiding misunderstandings and misinterpretations. A failure to foster and nurture appropriate social relations can lead to interpersonal frictions, withholding information, lack of commitment and complacency that can significantly deteriorate the process of distributed collaboration. The case study shows that senior management must play a significant role in fostering and sustaining productive social relations among project participants such as mutual respect and concern, reciprocity and openness. By doing this on an ongoing basis, project managers develop a project atmosphere that encourages team members to be open and honest about current or potential issues and thereby can easily identify and repair emergent problems.

Conclusions

By building on previous work, in this paper we attempt to reveal the underlying dynamics of communication practices. We offer rich insights from an in-depth field study of two software development offshoring projects in order to synthesize a distinctive theoretical perspective on communication practices based on the notion of collective socio-material sensemaking. This perspective offers a novel way for thinking and speaking about communication i.e. as a continuous dialogic process of socio-material collective sensemaking, aimed at reconciling divergent perspectives in order to mobilize collective action. While popular studies on distributed work and communication

speak about the importance of mutual/shared understanding, this paper goes further by opening the black box of this process and pointing to important aspects of the underlying micro practices. The empirical evidence presented in this paper shows that congruent understandings among distributed project participants is crucial especially in projects with high level of interdependence with exclusively ICT-mediated nature of the relationship and high degree of task complexity. The perspective of socio-material collective sensemaking has a number of important implications.

For instance, we develop the perspective of socio-material collective sensemaking in relation with the empirical data by modifying the notion of collective sensemaking (Weick 1995) as constituent of two interlocking processes of participation and reification (Kelly 2005; Wenger 1998) in order to attend to the often neglected artefactually mediated characteristic of communication. This emphasizes in important ways the intrinsic role of documents and artefacts as reifications that not only sustain the ongoing nature of communicative interactions but also instigate richer forms of participation. The findings also illuminate the temporal aspects of the communication practices and, more specifically, the importance of timeliness and intensity in order to maintain the momentum and flow of interactions.

In addition, the data points to the importance of social and power relations as being relevant to the way the process of collective sensemaking is performed. The presence of care, willingness, enthusiasm and mutual respect among project participants creates a context of openness and learning, in which project participants will be less inclined to hold back questions and information that can escalate into serious problems. In addition clearly demonstrating ongoing concern and care about the project improves collaboration between project members and elicits reciprocity of commitment and contribution.

We also present an enriched conception of project management that goes beyond the popular views of project managers as being only responsible for technical tasks such as planning and scheduling (Hodgson et al. 2006). Instead, we argue that the failure of collective sensemaking can be ultimately attributed to the failure or inability of project management to engage in her/his sensemaking function in order to ensure that problems are framed in helpful and mutually acceptable ways and that there is a shared understanding of ongoing priorities. In addition, we believe that project managers should not only be leaders/sensemakers actively involved in the day-to-day activities of shaping sound, congruent and actionable understandings among project participants, but also continuously cultivate good friendly professional relationships that sustain a proper level of social capital.

References

- Boland, R. "Perspective Making and Perspective Taking in Communities of Knowing," *Organisation Science* (6:4) 1995, pp 350-372.
- Boland, R. "Why shared meanings have no place in structuration theory: A reply to Scapens and Macintosh," *Accounting, Organizations and Society* (21:7/8) 1996, pp 691-698.
- Carlson, J.R., and Zmud, R.W. "Channel expansion theory and the experiential nature of media richness perceptions," *Academy of Management Journal* (42:2) 1999, pp 153-170.
- Carmel, E. "Taxonomy of New Software Exporting Nations," *The Electronic Journal on Information Systems in Developing Countries* (May) 2003.
- Carmel, E., and Tija, P. *Offshoring Information Technology: Sourcing and Outsourcing to a Global Workforce* Cambridge University Press, Cambridge, 2005.
- Cramton, C. "The Mutual Knowledge Problem and its Consequences for Dispersed Collaboration," *Organization Science, Vol. 12, No.3, pp. 346-371* (12:3) 2001, pp 346-371.
- Curtis, B., Krasner, H., and Iscoe, N. "A field study of the software design process for large systems," *Communication ACM* (31:11) 1988, pp 1268-1287.
- Daft, R.L., and Lengel, R.H. "Organizational information requirements, Media Richness theory and Structural Design," *Management Science* (32:5) 1986, pp 554-571.
- Dickey, M.H., Wasko, M.M., Chudoba, K.M., and Thatcher, J.B. "Do you know what I know?: A shared understandings perspective on text-based communication," *Journal of Computer-Mediated Communication* (12:1) 2006.
- Espinosa, A., Kraut, R., S., I., J., e., and A., e.J.a.M. "Shared Mental Models and Coordination," 2001.
- Giddens, A. *The Constitution of Society: An outline of the theory of structuration* Polity, Cambridge, 1984.
- Grinter, R.E., Herbsleb, J.D., and Perry, D.E. "The Geography of Coordination: Dealing with Distance in R & D Work," 1999, pp. 306-315.

- Herbsleb, J., Atkins, D.L., Boyer, D.G., Handel, M., and Finholt, T.A. "Introducing instant messaging and chat into the workplace," *Proceedings of the Conference on Computer-Human Interaction, Minneapolis, Minnesota* 2002, pp 171-178.
- Hinds, P., and Weisband, S. "Knowledge sharing and shared understanding in virtual teams," in: *Creating conditions for effective virtual teams*, C. Gibson and S. Cohen (eds.), San Francisco, CA: Jossey-Bass, 2003, pp. 21-36.
- Hodgson, D., and Cicmil, S. (eds.) *Making Projects Critical (Management, Work and Organisations)*. Palgrave Macmillan, 2006.
- Jarvenpaa, S., and Leidner, D. "Communication and Trust in Global Virtual Teams," *Organization Science* (10:6) 1999, pp 791-815.
- Kavanagh, D., and Kelly, S. "Sensemaking, safety, and situated communities in (con)temporary networks," *Journal of Business Research* 55) 2002, pp 583-594.
- Kelly, S. "New frontiers in the theorisation of ICT-mediated interaction? Exploring the implications of a situated learning epistemology," *Proceedings of the International Conference on Information Systems (ICIS)*, Las Vegas, USA, 2005.
- Kelly, S., Noonan, C., and Sé, M.Ó. "Collective sensemaking, power and relationship development in global software work: the anatomy of a crisis in an Ireland-India offshoring project," in: *The Second Information Systems Workshop on Global Sourcing: Services, Knowledge and Innovation*, ed. by Kotlarsky, Julia and Oshri, Ilan and Rottman, Joseph W. and Willcocks, Leslie P., Val d'Isere, France., 2008.
- Klein, H.K., and Myers, M.D. "A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems," *MIS Quarterly* (23) 1999, pp 67-94.
- Kobitzsch, W., Rombach, D., and Feldmann, R.L. "Outsourcing to India," *IEEE Software*:2) 2001, pp 78-86.
- Lakoff, G., and Johnson, M. *Metaphors We Live By* University of Chicago Press, Chicago, 1980.
- Law, J. *After Method: Mess in Social Science Research* Routledge, New York, 2004.
- Lee, A. "Electronic mail as a medium for rich communication: An empirical investigation," *MIS Quarterly* (June:18) 1994.
- Malhotra, A., Majchrzak, A., Carman, R., and Lott, V. "Radical Innovation Without Collocation: A Case Study at Boeing- Rocketdyne," *MIS Quarterly* (25:2) 2001, pp 229-249.
- Marcus, G. "Ethnography In/Of the World System: the Emergence of Multi-Sited Ethnography," *Annual Review of Anthropology* (24) 1995.
- Maznevski, M.L., and Chudoba, K.M. "Bridging Space Over Time: Global Virtual Team Dynamics and Effectiveness," *ORGANIZATION SCIENCE* (11:5) 2000, pp 473-492.
- Mol, A. *The Body Multiple: Ontology in Medical Practice* Duke University Press 2002, p. 196.
- Ngwenyama, O.K., and Lee, A.S. "Communication Richness in Electronic Mail: Critical Social Theory and the Contextuality of Meaning," *MIS Quarterly* (21:2) 1997, pp 145-167.
- Reason, P., and Torbert, W.R. "Toward a Transformational Science: a further look at the scientific merits of action research," *Concepts and Transformations* (6:1) 2001, pp 1-37.
- Reddy, M.J. "The conduit metaphor: a case of frame conflict in our language about language," in: *Metaphor and Thought*, A. Ortony (ed.), Cambridge University Press, Cambridge, 1979, pp. 284-324.
- Sahay, S., Nicholson, B., and al., e. *Global IT Outsourcing: Software development across borders* Cambridge University Press, Cambridge, 2003.
- Sarker, S., and Sahay, S. "Understanding Virtual Team Development: An Interpretive Study," *Journal of the Association for Information Systems* (4) 2003, pp 1-38.
- Sarker, S., and Sahay, S. "Implications of space and time for distributed work: an interpretive study of US Norwegian systems development teams," *European Journal of Information Systems* (13) 2004, pp 3-20.
- Strauss, A.L., and Corbin, J. *Basics of Qualitative Research* Sage Publications, 1990.
- Strauss, A.L., and Corbin, J. *Grounded Theory in Practice* Sage Publications, 1997.
- Walsham, G. "Interpretive studies in IS research: nature and method," *European Journal of Information Systems* (4) 1995, pp 74-81.
- Walther, J.B. "Interpersonal Effects in Computer-Mediated Interaction: A Relational Perspective," *communication Research* (19:1) 1992, pp 52-90.
- Weick, K. *Sensemaking in organizations* Sage, London 1995.
- Weick, K.E. *The Social Psychology of Organising* Addison-Wesley, Reading, Mass, 1969.
- Weick, K.E., Sutcliffe, K.M., and Obstfeld, D. "Organizing and the Process of Sensemaking," *Organization Studies* (16:4) 2005.
- Wenger, E. *Communities of Practice: Learning, meaning and identity* Cambridge University Press, 1998.