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Global software development: Exploring socialization and face-to-face meetings in distributed strategic projects

Ilan Oshri [a], Julia Kotlarsky [b,*], Leslie P. Willcocks [c]

[a] *Rotterdam School of Management Erasmus, Burg. Oudlaan 50, P.O. Box 1738, Rotterdam 3000 DR, The Netherlands*
[b] *Warwick Business School, The University of Warwick, Coventry CV4 7AL, United Kingdom*
[c] *London School of Economics, Houghton Street, London WC2A 2AE, United Kingdom*

Abstract

Socialization is one means through which globally distributed teams (GDTs) can improve collaboration. However, harnessing socializing processes to support globally distributed collaboration is not easy. In particular, infrequent and limited face-to-face (F2F) contact between remote counterparts might result in difficulties in sharing norms, attitudes and behaviours. In this paper we seek to understand how dispersed teams create socialization in globally distributed settings. Based on data collected at SAP, LeCroy and Baan we conclude that, while F2F meetings are important in socializing remote counterparts, other activities and processes employed before and after F2F meetings are no less important. In particular, the paper highlights the importance of re-socializing remote counterparts throughout a project lifecycle. Re-socializing means supporting the re-acquisition of behaviours, norms and attitudes that are necessary for participation in an organization. We offer a framework in which three phases of creating, maintaining and renewing socialization in GDTs are discussed. The paper concludes by offering managers some guidelines concerning socialization in GDTs.
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Keywords: Strategic software development projects; Face-to-face meetings; Socialization; Globally distributed teams

* Corresponding author.
 E-mail addresses: ioshri@rsm.nl (I. Oshri), Julia.kotlarsky@wbs.ac.uk (J. Kotlarsky), l.p.willcocks@lse.ac.uk (L. P. Willcocks).

1. Introduction

Recent years have witnessed the globalization of many industries. Consequently, globally distributed collaborations and virtual teams have become increasingly common in many areas, but in particular in software development (e.g. Kotlarsky and Oshri, 2005; Krishna et al., 2004; Herbsleb and Mockus, 2003; Battin et al., 2001; Carmel, 1999). Ongoing innovations in Information and Communication Technologies (ICTs) have made it possible to cooperate in a distributed mode. From originally quite small projects, enabled by ICTs, companies now embark on major complex software development projects across multiple locations.

For example, more and more companies in developed nations are outsourcing parts of their IT services and business processes to developing nations (Carmel and Agarwal, 2002), which results in strategic projects on a large scale and with a longer lifespan. Specific examples include DuPont, the US-based global corporate, that in 2006 signed a sourcing contract with CSC and Accenture to develop and implement SAP Enterprise Resource Planning software and systems globally across more than 20 locations at a cost exceeding $1bn. Another example is a Tata Consulting Services (TCS) outsourcing project, in which globally distributed teams would provide support and application enhancement services to ABN AMRO Bank over five years. These teams provide support and application enhancement from centres in Mumbai, Bangalore, Sao Paolo, Luxemburg and Amsterdam.

Overall, a high degree of global collaboration has been evident since the 1990s. Friedman (2005, p. 176), in his book "*The World is Flat*", describes how a global, web-enabled playing field has been created as a result of the convergence of 10 flattening factors (e.g. the introduction of search engines such as Netscape and Google and of workflow applications, and the growing tendency to outsource and offshore work), which offer a real-time platform for collaboration and knowledge sharing to almost anyone on the globe.

Collaboration and team performance depends, to some extent, on the socialization of the dispersed team members (Andres, 2002; Govindarajan and Gupta, 2001; Maznevski and Chudoba, 2000). *Socialization* refers to the process by which individuals acquire the behaviours, attitudes and knowledge necessary for participation in an organization (Ahuja and Galvin, 2003; Goodman and Wilson, 2000). Through socialization, the norms, identity and cohesion between team members develop, enabling team members to effectively communicate and perform (Ahuja and Galvin, 2003; Hinds and Weisband, 2003).

By and large, the existing research on socialization is based on co-located teams. In the context of non-co-located teams, research has emphasized the unique conditions under which socialization can be supported. For example, electronic communications can enhance the socialization of a newcomer in a virtual team (Ahuja and Galvin, 2003). Nonetheless, non-co-located teams may vary in their degree of virtuality (Crowston et al., 2005), in the length of the project and in the number of remote counterparts involved. In this regard, in addition to creating and maintaining socialization, distributed teams, especially those with a long lifespan, may need to re-acquire norms and re-socialize as the project progresses. Therefore, the key objective of this paper is to understand how globally distributed teams support the re-acquisition of norms and attitudes over time.

Data were drawn from several globally distributed software development projects at SAP, LeCroy and Baan. The results of the case analyses suggest that indeed various activities were carried out before, during and after F2F meetings to support socialization between remote counterparts. Furthermore, these activities were at the individual, team

and organizational levels. As a conclusion, the lifecycle of socialization in GDTs is described and suggestions to managers and for further research are made.

Following this introduction, the next two sections provide reviews of the literature relating to socialization in teams in general and in globally distributed teams in particular. The next sections describe and analyze two cases of strategic GDTs from LeCroy and SAP, placing an emphasis on the mechanisms employed before, during and after F2F meetings. These cases are then compared with the Baan case, where a different approach to socialization was carried out. The following section discusses the findings of this study and offers a framework to consider the lifecycle of socialization in distributed teams. Lastly, practical implications and possible future research are discussed.

2. Socialization and teams

Socialization is the process through which one "learns the ropes" of a particular organizational role (Wooldbridge and Minsky, 2002). Most studies refer to organizational socialization as a process that is based on interactions between a newcomer and members of the organization (e.g. colleagues, superiors or subordinates). Through such interactions an employee is taught and learns what behaviours and views are customary and desirable at their workplace, and becomes aware of those that are not, as well as acquiring the knowledge and skills needed to perform his or her job (Taormina and Bauer, 2000). Research has consistently shown that organizational socialization has been positively associated with the organization's strategic effectiveness, inter-functional coordination capabilities (Wooldbridge and Minsky, 2002), team performance (Hinds and Weisband, 2003) and employee retention (Bigliardi et al., 2005). Activities that support socialization between members of a team have been widely described in the literature and include bonding exercises, training programs, and mentoring schemes. By and large, the literature on socialization is in the context of co-located teams. Only recently have some studies considered socialization in non-co-located teams (e.g. Crowston et al., 2005; Ahuja and Galvin, 2003; Goodman and Wilson, 2000). These studies have emphasized the unique contextual settings involved in non-co-located teams that result in a socialization process that is different from the process observed in co-located teams. For example, Ahuja and Galvin's (2003) study suggests that electronic communications can enhance the socialization of a newcomer in a virtual team, because of the comfort "provided by a lean and faceless electronic communication medium" (Ahuja and Galvin, 2003, p. 161). For exocentric groups such as incident response and flight crew teams, which are temporary and of short lifespan, Goodman and Wilson (2000) suggest replacing socialization within team boundaries with "substitutes for socialization" that take place beyond actual team boundaries. Such substitutes for socialization include structural substitutes such as the development of standard procedures and common sets of knowledge and skills, and learning substitutes based on shared databases and professional meetings through which members of a community can learn in advance how to work in a team.

Nonetheless, when examining non-co-located teams, it is evident that such teams may vary in terms of their degree of "virtuality" and lifespan. Indeed, as Crowston et al. (2005, p. 3) have observed, "teams fall along a continuum from traditional face-to-face to fully distributed, with many exhibiting a mixed mode of interaction". Furthermore, Ahuja and Galvin (2003, p. 170) have explained that some teams do not share a single, physical space since their members are spread throughout the world; however, these teams are not

completely virtual because some of the sub-team members are co-located. Such teams are also referred to as "hybrid" teams (Lu et al., 2006). Members of a "hybrid" team are dispersed, but they maintain F2F meetings from time to time. Therefore, members of a "hybrid" team may create socialization with their remote counterparts through F2F meetings as well as by relying on ICTs. Nonetheless, establishing socialization in "hybrid" teams is not problem-free. In particular, challenges to socializing within "hybrid" teams may arise when such projects continue over a long time and when interpersonal ties may thus fade away. The following section discusses in more detail such challenges.

3. Socialization in globally distributed contexts: the challenge

One specific case of a "hybrid" team is a globally distributed software development team. Globally distributed projects involve two or more teams working together from different geographical locations to accomplish common project goals. In addition to geographical dispersion, globally distributed teams face time-zone and cultural differences that may include different languages, national traditions, values and norms of behaviour (Carmel, 1999) that may greatly reduce the extent of socialization between remote counterparts.

Socialization in globally distributed teams may take place through two key mechanisms. One is the application of ICT and the second is through face-to-face interactions. In terms of the application of ICT, research on globally distributed teams has widely reported the various electronic media needed to support connectivity between remote sites and facilitate socialization. For example, Carmel (1999) has argued that a powerful ICT infrastructure is required to ensure connectivity and data transfer at high speed between remote sites. Additionally, generic collaborative technologies (e.g. Groupware) are needed to enable remote counterparts to connect and communicate. The most commonly suggested collaborative technologies are e-mail, chat (e.g. Instant Messaging), phone/teleconferencing, videoconferencing, intranet, group calendar, discussion lists and electronic meeting systems (Herbsleb and Mockus, 2003; Smith and Blanck, 2002). More recent studies have focused on integrating collaborative technologies into an Integrated Development Environment in order to offer solutions that deal with breakdowns in communication among developers in dispersed software development teams (Cheng et al., 2004).

The literature relating to face-to-face meetings in globally distributed teams is also wide. For example, past research has confirmed that face-to-face meetings are important for the development of distributed teams through the establishment of interpersonal relationships (Crowston et al., 2005). Furthermore, such meetings were found to positively affect team collaboration (Ahuja and Galvin, 2003; Kanawattanachai and Yoo, 2002; Kraut et al., 2002; Child, 2001) and team performance (Andres, 2002; Govindarajan and Gupta, 2001; Maznevski and Chudoba, 2000), mainly through the enhancement of interactions between team members (Crowston et al., 2005). While past research has demonstrated that face-to-face meetings are imperative for developing interpersonal ties and socialization between remote counterparts, the literature has, so far, not considered certain challenges associated with F2F meetings in GDTs. For example, for budget reasons, it is likely that only a minority of the GDT will participate in a F2F meeting. Furthermore, such F2F meetings tend to be short and often revolve around technical and project management matters, leaving little time for socialization. These shortcomings relating to face-to-face meetings are summarized in Table 1.

Table 1
Socialization in GDTs – the challenges

F2F meetings are *short* and tend to offer only limited social space that accommodates cultural differences
Most time spent in F2F meetings is dedicated to project procedures and technical issues (i.e. they are *formal* to a great extent)
F2F meetings are *selective* in the sense that not all counterparts are invited to F2F meetings
Short and infrequent F2F meetings offer *sporadic* interpersonal interactions between remote counterparts, which restrict the build-up of interpersonal relationships
ICT offers limited opportunities for personal contact and social space, as compared to F2F meetings (based on Robey et al., 2000; Andres, 2002; Nardi and Whittaker, 2002; Olson et al., 2002)

While F2F meetings assist in acquainting remote counterparts and addressing project and technical issues, such meetings, being *sporadic*, *short*, *selective*, and *formal* to a great extent (Andres, 2002; Nardi and Whittaker, 2002; Olson et al., 2002; Robey et al., 2000), barely provide support for long-term socialization (Kraut et al., 2002). Furthermore, unlike exocentric teams with a short lifespan, some globally distributed teams cooperate on a lengthier basis, often over several years, while maintaining a "hybrid" mode of work. Such project teams (e.g. research and development teams in multinational organizations and outsourcing projects teams) tend to be large in scale, involving hundreds of remote counterparts who collaborate almost on a daily basis. In this regard, socialization, as a multi-staged process that unfolds over time (Goodman and Wilson, 2000), starts when a team is formed or a newcomer joins and continues throughout a team's lifetime. Indeed, in such teams, face-to-face meetings may assist in familiarizing remote counterparts in the early stages of a project; however, the interpersonal ties created during the initial socialization through face-to-face meetings may eventually degrade over time (Nardi and Whittaker, 2002). Consequently, the development of a long-lasting globally distributed team could be inhibited, as members of the team might experience challenges in progressing from the 'forming to performing' through 'storming and norming' stages in the team development process (Furst et al., 2004). In this regard, lack of processes and organizational mechanisms that support the re-acquisition and re-norming of behaviours, attitudes and knowledge could result in breakdowns in communication, and might negatively affect the productive participation of team members in organizational activities.

While the literature is clear about the positive impact that socialization has on team performance (Hinds and Weisband, 2003), it provides little evidence as to the processes through which socialization can be re-created and renewed. In line with such observations, this study investigates how globally distributed teams support the re-acquisition of norms and attitudes over time.

4. Research design and methods

4.1. Design and case selection

An in-depth study of globally distributed software development projects is provided in this paper. A qualitative, interpretive approach is adopted. According to Yin (1994), case study research is appropriate to investigate a phenomenon in its real-life context, to answer *how* and *why* questions, when the investigator has little control over the events. Therefore, a case study method was chosen as the most appropriate approach for this research. The case study method is widely used in Information Systems (IS) research. For example,

Palvia et al. (2003) examined the usage of various research methodologies, based on an overview of leading management and IS journals, and observed a greater use of the case study method and other qualitative techniques over the years.

To correspond with the main interests of the research, only project teams that were globally distributed across at least two locations, large in scale and long-term, were considered for this study. A search for companies with such GDTs resulted in three companies, LeCroy, SAP and Baan, who agreed to participate in this study. Initial inquiries about the way these GDTs collaborated revealed that SAP and LeCroy pursued an approach that encouraged interpersonal ties between members of their global teams, while Baan downplayed this aspect but emphasized the utilization of electronic media in its collaborative work. An in-depth study of these aspects then followed to reveal the various aspects involved.

It is also important to mention that, while these GDTs were similar in terms of their size and geographical dispersion, there was one distinct difference between them. The SAP remote teams did not have a history of working together, while the LeCroy dispersed teams had been working together as a global team for a long time (since the mid-1980s). The Baan dispersed teams, on the other hand, had been working as a global team for about three years (since 1999). Such variation in team age was seen by the researchers as an opportunity to examine the process through which socialization was created and renewed over time.

4.2. Data collection

Evidence was collected from interviews and documentation. Interviews were conducted at two remote sites per company: in India and Germany for SAP, Switzerland and USA for LeCroy, and India and The Netherlands (NL) for Baan. Interviewees were chosen to include: (1) counterparts working closely from remote locations, and (2) diverse roles such as managers and developers. In total, 23 interviews (five at SAP, five at LeCroy and thirteen at Baan) were conducted (see interviewees' details in Appendix A). Interviews lasted one hour and 30 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.

4.3. Data analysis

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 with some degree of diversity (Strauss and Corbin, 1998; Miles and Huberman, 1994), and linking these to categories and concepts (see Appendix B). In the first round of analysis, three categories emerged from an initial screening of the data, namely: *F2F meetings activities*, *additional activities* (i.e. *beyond F2F meetings*), and *collaborative technologies*. Statements referring to socialization activities *during F2F meetings*, *beyond F2F meetings*, and *collaborative technologies* were selected, coded and analysed using Atlas.ti – Qualitative Data Analysis software (Miles and Huberman, 1994).

As data analysis progressed, statements (i.e. codes) referring to socialization were grouped around the three above-mentioned categories. A careful examination of the statements revealed that the category of "beyond F2F meetings" actually contained activities

that took place *before* and *after F2F meetings*. Following this, a second phase of data analysis was launched in which statements referring to socialization activities that took place *before* and *after* F2F meetings were selected, coded and analysed. Finally, we analyzed statements coded into *before*, *during* and *after F2F meeting* categories, to distinguish between socialization activities that took place on individual, team and organizational levels. Analysis of data collected at Baan followed a similar procedure. Nonetheless, as little evidence relating to socialization was evident, the researchers sought for statements that also referred to the drawbacks associated with the socialization approach taken by Baan.

5. Case studies of socialization: SAP, LeCroy and Baan

This section details the results of the three case studies carried out at SAP, LeCroy and Baan. Based on the empirical evidence presented below, we argue that, despite the challenges faced, the dispersed teams of LeCroy and SAP developed and sustained socialization through various activities that took place before, during and after F2F meetings, which ensured the renewal of socialization over time. Baan, on the other hand, had taken a different approach: socialization activities were encouraged mainly when development problems became critical, and mostly between certain individuals. We first present the findings from SAP and LeCroy, followed by the Baan case.

5.1. The SAP case

This dispersed team was involved in the SAP Collaboration tools project developed by the Knowledge Management (KM) Collaboration group, which is part of the Enterprise Portal Division. The goal of the SAP Collaboration tools project was to develop a comprehensive collaborative platform that would enable both individuals and teams in different locations to communicate in real-time and asynchronously, and to support the teamwork of any distributed project teams. The SAP Collaboration tools were developed to be part of the next generation application and integration platform (that is, SAP NetWeaver), and to allow integration with various tools of different providers.

The development of SAP Collaboration tools started in September 2001. By June 2002, the first version of SAP Collaboration tools was released and the group was working on the second release.

The GDT in which the case study was conducted was made up of software engineers, architects, a project manager and team leaders. From a geographical perspective, the software team was distributed between three locations and consisted of four teams: two teams in Walldorf, Germany (10 people in each team), one team in Bangalore, India (six people) and one team in Palo Alto, USA (five people). Each team worked on a different part of the Collaboration tools (see organizational structure in Appendix C).

5.1.1. Before face-to-face: The challenges and socialization activities

When the project was launched in September 2001, key players (managers and architects) and team members from remote locations did not know each other. This team did not have a history of working together and only some of the team members had been previously engaged in global development projects.

Therefore, during the initial stages of the project the key challenge was to create awareness of the composition of the remote teams and their members. For this reason, an

introduction of new team members was organized using videoconferencing (VC) sessions that involved managers and developers in all three locations. One member of the team, Akhilesh, describes this process:

> *Whenever a new colleague joins our team or any of the teams in the other locations, we make sure that in the next VC, we will introduce this person. We actually do a round like 'these are new colleagues that have joined'. So, though you have not met them personally, you start learning about this person from that point in time.*

Furthermore, interviewees indicated that teleconferences between managers and key members from the three locations were organized on a weekly basis in order to share the different perspectives about how the project should be run, and to create the dynamics for collaborative work between remote counterparts through exploring issues such as the vision of the project and its main objectives.

Another challenge that this team faced was to make sure that each remote counterpart knew who their contact person was. Indeed, once members of the team were introduced through the first VC session, information about the mini-teams and their contact persons was released. The reason for the formation of mini-teams was that team members did not know each other personally in the beginning and the process of getting acquainted took, in some cases, several weeks; therefore, the management established cross-continental mini-teams and a contact person per each remote team was appointed. For example, Christoph and Martin (development architects located in Walldorf) served as technical contact persons for the remote teams: Christoph was the contact person for the Bangalore team, and Martin was the contact person for the Palo Alto team. These contact persons were the main contact points within the team and they ensured the smooth flow of information between dispersed teams and, as a result, facilitated knowledge-sharing processes between the Head Office in Walldorf and remote sites. Christoph described how the communication between teams was managed:

> *What I did in the past was – this was in the very early phase of the project – I sent requests only to Sudhir [team leader of Bangalore team] and he would distribute the issues between people.*

This procedure, it was reported, reduced confusion and miscommunications with regard to who was supposed to deal with what. The contact persons made sure that communications between counterparts who did not know each other and were relatively unfamiliar with the roles within the teams would still take place despite these challenges.

5.1.2. During face-to-face: The challenges and socialization activities

There were numerous F2F meetings that took place during this project. For example, managers from Bangalore and Palo Alto flew to Walldorf to meet for a "kick-off" meeting in late 2001. While blocking time to discuss project- and product-related issues was not a problem, freeing time for one-on-one sessions between counterparts had always been a challenge. For this reason, remote team members were encouraged to make time for one-on-one interactions with their counterparts so that they could get to know each other and become familiar with personal communication styles. For example, Stefan, (Director of the GDT from Walldorf) described his experience with Sudhir in adjusting communication styles between them:

What I did with Sudhir in the very beginning, I told him: 'I am explicit; I am forgiving – but you have to tell me that something is going wrong in the very beginning. […] it is not just me having to deal with an Indian team and it is not just me who needs to adapt my style totally. I will try to adapt, but because of time constraints I am not going to adapt exactly to what you are expecting'. This is what we discussed during the F2F meeting when he [Sudhir] was here in Germany. Sudhir said that this is clear, and now we need to see that it works.

Additionally, to gain a better understanding of the local context of the Indian team, which is a common challenge in globally distributed contexts, in early spring 2002 key players from Germany and Palo Alto visited Bangalore to participate in a team-building exercise together with the local team. Some key outcomes from the team-building exercise were described by Sudhir:

It [the team-building exercise] is also about getting to know the infrastructure and the environment in which we work, because in a situation when there is a problem, then it's easy to visualise what is happening.

Also, during the team-building exercise, team members from the three sites met and spent time together, something that gave the entire team and each site a feeling of belonging, of being equally important and being part of the Collaborative Tools project team. Stefan, who participated in the team-building exercise, summarizes the experience:

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

One interesting outcome of this team-building exercise was that teams set up rules for communications and communication styles. Having discussed the direct personal style of communication exercised by the German team, the Indian team acknowledged this style and agreed to not take it personally. In return, German team members learned about Indian working communication habits.

5.1.3. After face-to-face: The challenges and socialization activities

It was noted by interviewees that following the initial F2F meeting, communications became more informal, as well as that in some cases it was not necessary to communicate through the contact person any more. However, as this was a lengthy project, several activities and mechanisms were offered to members of the team to avoid losing touch with their remote counterparts. In term of activities, regular and frequent communications, such as teleconferences and VCs between remote counterparts, were carried out, more frequently (e.g. on a daily basis) between managers, architects and team leaders as well as between individual developers working on a closely related issue, and less frequently between all teams.

Acknowledging that such communication means can be limited in terms of the richness of the media, short visits to remote locations were organized to ensure that remote counterparts shared information and to maintain a "one team" spirit. Sudhir explained that managers of remote teams (Bangalore and Palo Alto) typically travelled at least once every three months to remote sites, because:

Staying in Bangalore does not help. By staying here [in Bangalore] we may lose some information, mainly because people don't write every single piece of information in the email. The best is to go out, work with your colleagues for one week to 10 days, keep asking a lot of questions and make sure you get good answers and knowledge.

The idea of individual trips was supported by other interviewees, who claimed that indeed it was challenging to maintain a "one-team spirit" in the long term after a F2F meeting. For example, developers located in Bangalore were also encouraged to visit the Head Office:

The idea was that every developer travels across [to Walldorf] and meets everybody at least once for the sake of getting to know each other in person rather than just by name (Sudhir).

Through these activities, this GDT attempted to renew contacts between remote counterparts through individual trips, VCs and teleconferences. Attention, in particular, was paid to interpersonal contacts between developers and managers who carried out globally distributed collaborative work.

5.2. The LeCroy case

The project studied at LeCroy, called Maui, was distributed between two sites: Geneva (Switzerland) and New York (USA) (see organizational structure in Appendix C). There were about 10–15 people in Geneva and the same number in New York (NY). The project code "Maui" stands for Massively Advanced User Interface. The goal of the Maui project was to develop and implement a software platform for new generations of oscilloscopes and oscilloscope-like instruments based on the Windows operating system. This case study covers the development of the Maui platform, and the development of the first products based on the platform. The project started in July 1997; in December 2001, when the data collection took place, LeCroy was launching a first product based on the Maui platform.

5.2.1. Before face-to-face: The challenges and socialization activities

The software team had a long history of working together developing software for oscilloscopes (since the mid 1980s). At the time this study was carried out, the team had already gone through the initial stages of developing cohesion, learning the attitudes and behaviours of remote counterparts and developing strategies for working together across distance. However, the Maui project introduced new challenges to the GDT at LeCroy. The project involved switching to Microsoft COM technology, which was very different from the approaches LeCroy software engineers had used to develop embedded software for earlier products. Therefore, as with the introduction of the new technology, the norms, behaviours and attitudes common to the GDT were about to change, and one of the dilemmas LeCroy faced while developing the Windows-based Maui platform was how to collectively train embedded programmers located in different sites and yet ensure that this transition would not trigger disruptive communication problems or breakdowns.

Concurrently, another key challenge that this team faced was to integrate newcomers into the team. To overcome this challenge, newcomers joining the project were "introduced" to remote counterparts through transatlantic VCs. Such VCs became frequent during the time that the New York team joined the Geneva team in developing the Maui platform.

Another challenge that this team faced concerned language barriers between the Swiss and the rest of the team. To reduce language barriers, software engineers in Geneva, whose native language is French, were offered English language lessons. The language lessons were reported to improve significantly the communication between remote counterparts. It also positively affected the feeling of belonging to the entire project of the French-speaking team. Furthermore, interviewees indicated that overcoming language barriers, in addition to the introduction of remote counterparts through VCs, had been a key factor in creating direct and effective communication channels between dispersed teams.

5.2.2. During face-to-face: The challenges and socialization activities

Numerous F2F meetings took place during this project. One key challenge that this team faced was to introduce a new technology in a way that further strengthened the inter-personal ties that already existed within the team. The options were to train each team separately in different geographical locations, which may have been cheaper, as opposed to training the team in one geographical location and using this event for additional activities. Eventually, project managers from the Geneva and NY teams decided to organise an event in the Alps that took place in August 1997 and combined training sessions in Microsoft COM technology and some social activities. Larry (director of GDT and manager of NY team) described this:

> *We all got together in the mountains of France and it was a real fun week. It had two purposes: one was to teach us all this new technology [Microsoft COM]. The other, which was equally important, if not more important, was to try to build relationships between people.*

The social events organized during this F2F meeting had provided a space for participants to get to know each better. Anthony (manager of Geneva team) explained:

> *In fact, I would say that the most valuable time spent is probably in the local bar rather than in the meeting room. Because getting to know someone happens over a few beers. And that develops into the professional [area]. I think that's an important thing, very important thing. That was the idea behind the meeting in the Alps, to get people in an environment where there was plenty time for that. It was pretty important.*

This view was supported by other interviewees, who indeed argued that the meeting in the Alps was important from the professional viewpoint but was no less important from the social aspect. During this gathering, remote counterparts re-established existing work attitudes and negotiated the way work would be conducted using the new development tools. Interviewees claimed that without meeting their remote counterparts face-to-face, it would have been challenging for the entire global team to jointly develop a new platform, meet the project deadlines and achieve product success.

5.2.3. After face-to-face: The challenges and socialization activities

Similar to SAP, the LeCroy team was concerned with losing the momentum of socialization created during face-to-face meetings. For this reason, the team at LeCroy maintained frequent communications between the remote sites, utilizing various communication means. While teleconferences between engineers were a matter of daily communications, VCs were held every several weeks to ensure that a team atmosphere

was maintained. This means of communication was critical for the remote team in Geneva, as Anthony explained:

> *What happened in Geneva is that among the guys there was a natural feeling that they are kind of unplugged from the rest of the company. Because it is an outpost! In order to handle that we organised regular meetings to let people know what is going on in the company, what everyone else is working on. It was a big help. Every several weeks we would have a transatlantic VC between the software teams in NY and Geneva. It helps everyone, I think, to feel we are working as a team and that they are part of the LeCroy team.*

In addition, managers from Geneva and NY visited each other up to five times a year. Short visits and the temporary co-location of software engineers were offered by management so that counterparts could work and solve design problems together as well improve interpersonal contacts. The relocation of experts between remote sites served also as a mechanism that accelerated the sharing of knowledge and technical expertise of the Maui platform. Gilles (software engineer) was involved in the Maui project from the very beginning and was initially based in Geneva and during transition to the Maui platform was relocated to NY for one year. He explained:

> *Initially only a few engineers from NY worked on the platform so they had always a lot of questions regarding the new platform. The NY engineers were constantly in touch with Geneva. When more and more people in NY started to work on the new platform, it was decided for me to come over here [to NY] for one year to be the contact person for those who started working on the new platform. […] this is because I know all the basics, the background of the platform. So, that's why I am here [NY] for one year to kind of teach all the other co-workers how to develop using the same tools.*

Indeed, the relocation of experts has assisted in the sharing of knowledge as well as in tightening the links between the Geneva and the NY teams. Additional activities applied at LeCroy were the use of a wide range of collaboration technologies that allowed them to combine audio and visual cues, e.g. doing design reviews using Application Sharing and the telephone at the same time. These, it was reported, reduced miscommunications and breakdowns in the design process.

5.3. The Baan case

The Baan globally dispersed team was involved in the development of an E-Enterprise Suite that was designed to let users extend their Baan manufacturing, financial, and distribution software on the Web, to allow them to collaborate better with customers, suppliers, and partners. At the time of data collection the E-Enterprise Suite consisted of seven products that were all based on one platform called E-Enterprise Server. Products included in the E-Enterprise Suite were developed to be stand-alone as well as to be integrated with the ERP package developed by Baan.

Development of the E-Enterprise suite was organized by feature/product function (see organizational structure in Appendix C). From a geographical perspective, the E-Enterprise group was distributed between two locations: Hyderabad, India (about 60 people working on five products of the E-Enterprise Suite) and Barneveld, NL (about 35 people working on two products and the common platform of the E-Enterprise Suite).

5.3.1. Socialization challenges and activities at Baan

The E-Enterprise group was established in 1999. Some people in Hyderabad had been working in a globally distributed environment before joining the E-Enterprise group, developing the Baan ERP solution. However, because of a general Baan policy to reduce travel expenses, and because the E-Enterprise organizational structure had changed several times since the group was established, team members had gradually come to know each other less well in person. These changes gave rise to particular challenges. First, the majority of the global team did not know their remote counterparts, their norms and attitudes in the workplace. Second, differences relating to cultural backgrounds in terms of national culture (Dutch and Indian) and organizational culture (newcomers and people who had joined from Baan ERP group) were more difficult to bridge. The General Manager of E-Enterprise based in Hyderabad explained:

> *In E-Enterprise most of the people have not met face-to-face, except some key people. It is my perspective, I might be wrong, that E-Enterprise overall is not part of the Baan ERP culture. Especially in E-Enterprise Hyderabad, you find two sets of people[…]; People who worked for 3-4 years on ERP and moved into E-Enterprise […], they understand the issues because they have also gone through them in the past; they also understand how the Dutch culture is. Newcomers, who have come directly from outside and started working on E-Enterprise products, have not undergone the process of maturity; they have not understood the Baan culture very well. They are not exposed to the Dutch culture.*

Despite recognizing a lack of cohesion in terms of attitudes, norms and behaviours in the E-Enterprise group, Baan did not take actions to facilitate socialization between remote teams and within local teams. Furthermore, F2F interactions between remote counterparts in Baan were limited to high-level managers only, even though the value of interacting face-to-face was clear. The General Manager reflected on the socialization process achieved in these limited meetings:

> *After going through face-to-face discussions and starting to understand each other I could see a lot of change in the way we deal with things. Issues are still issues, but now the issues are tackled differently. […] There is a change. During face-to-face we shared with each other what are the issues and discussed each other's wishes. So some kind of empathizing is coming in, understanding each other.*

Nonetheless, Baan preferred to limit these face-to-face interactions for cost-saving reasons, as well as limiting the visits of certain individuals to remote locations only to those urgent occasions when it was not possible to deal with problems over distance.

Last but not least, remote locations (e.g. Hyderabad office) found it difficult to access information generated in other locations (e.g. Barneveld office), such as updates about changes in requirements and dependencies between the products, and product and technology roadmaps.

To cope with such changes in the way dispersed teams collaborated and related to each other, the E-Enterprise group equipped its teams well with the technologies required to enable collaboration in a globally distributed environment. Technologies were considered very important to support collaborations despite the cost-cutting approach that significantly reduced face-to-face meetings between remote counterparts. As one manager from Hyderabad explained:

[…] technology comes to our rescue in working in a distributed environment

Indeed, various technologies were used to save on travel costs between the Netherlands and India. For example, email would typically be used for brief queries and for describing a problem prior to a phone-call. The phone would be used in situations when an urgent response was required and to resolve potential conflicts. The Product Architect from Hyderabad described the use of these electronic means:

> *Telephone was usually involved when a lot of emails have exchanged and when certainly we feel that everyone is talking differently and it is taking too much time and no one is coming to any conclusions, then we start organising a telephone call.*

While the use of the phone was imperative for solving such problems, there was a general tendency, guided by management, to minimise the use of the phone because of the costs involved. This rule was applied to other communication means. For example, VC sessions took place between managers from dispersed locations, but in an infrequent manner, and application sharing tools (AST), in particular NetMeeting and Webex, were only occasionally in use, mainly for knowledge-sharing activities during meetings between sites and customers.

5.3.2. Socialization activities at Baan: the impact

The lack of face-to-face interactions and the limited use of electronic means generated discontent among members of the dispersed teams and exacerbated the lack of socialization across the remote sites. Interviewees claimed that there was a lack of team atmosphere between teams in Hyderabad and Barneveld, which was evident in the way norms and attitudes were not shared. For example, the General Manager of E-Enterprise in Hyderabad explained:

> *The major issue is that people don't perceive that on the other side, **they**'re not reciprocating **our** needs: what **we** want, during which time, what priority **we** have. **They** don't see the same priority as **our** people see, and vice versa. So there is always a gap.*

Another example of tensions as well as lack of cohesion (the problem of ownership) was given by a product manager of two products of the E-Enterprise suite:

> *When **we** [in Hyderabad] gained a lot of knowledge (for example myself: being consultant, I knew the product in and out), **we** realised that we in India could take the ownership of the entire product, one module at least, and create everything from scratch. So then **we** really had a huge problem with Holland to take ownership. **We** wanted to build a product in India without any influence from Holland, but **they** were not willing to give* (Vijaya).

There was also a gap in the common understanding of processes, and resistance to following them. As the General Manager of the E-Enterprise explained:

> *The processes are not really defined well, so still you find some gaps in having a common understanding on the processes. Slowly, slowly that is getting reduced, but still I can see an issue over that.*

Furthermore, there was internal resistance to following processes, in particular among newcomers:

> *Whenever we start on a project we will say that these are the processes which we need to follow. But still we find some people are not very keen, they think that 'what advantage do we get if we follow this process?'* (Jeevan).

The impact of the approach taken by Baan to create socialization between remote counterparts, which was mainly based on occasional F2F meetings between certain individuals and a restricted use of rich media tools, resulted in discontent among members of the global team concerning their belonging to "one team" as well as their ability to cooperate and jointly develop products.

5.4. Collaborative tools for socialization

Focusing on SAP and LeCroy, the evidence suggests that the tools and technologies employed by these GDTs were similar and included various means of media and collaborative technologies, such as phone, VC, and Groupware technologies. Nonetheless, within these dispersed teams different tools and technologies were employed before and after F2F meetings. Asynchronous media (e.g. email) were widely employed before the "kick-off" meeting. It has been claimed by interviewees that at the early stages of the project, remote counterparts did not always feel confident in contacting their remote colleagues by phone. The email was the main collaborative tool employed at this stage. One flaw in this practice is that during the early stages of a project, remote counterparts tended to engage in several rounds of sending emails, trying to clarify all the issues involved and resolve misunderstandings. Once remote counterparts had met, the use of synchronous media (e.g. phone, VC, on-line chat, Application Sharing) increased. It was

Table 2
Collaborative tools before, during, and after F2F meetings

	Before F2F	During F2F	After F2F
LeCroy	*Email* for clarifications/resolving misunderstandings *Phone* mainly between managers for updates *VC* for virtual meetings between managers and team members *Intranet* to post internal documents	Social spaces that enable F2F meetings and team building exercises	*On-line chat* to address short questions *Email* for clarifications *Phone* for resolving misunderstandings and conflicts and for helping in bug fixes (working around-the-clock) *VC* for virtual meetings between managers and team members *Application sharing* for helping in bug fixes *Intranet* to post internal documents
SAP	*Email* for clarifications/resolving misunderstandings *Phone* for urgent situations (mainly between managers) *VC* for virtual meetings between managers and team members	Social spaces that enable F2F meetings and team building exercises	*Email* for clarifications *Phone* for resolving misunderstandings and conflicts and for helping in bug fixes (working around-the-clock) *VC* for virtual meetings between managers and team members *Application sharing* for knowledge sharing (e.g. slide shows) *Intranet* to post internal documents

also reported by interviewees from both companies that VC was employed before and after F2F meetings to ease the lack of opportunities to meet in person.

In between F2F meetings, both companies utilized the telephone. LeCroy also relied on voice-chat as the main means of communication. SAP, for example, set up internal phone lines across the globe in which five digit numbers between Bangalore and Walldorf were offered to the remote teams. Interviewees reported that the telephone was mainly used for urgent matters, regular updates between managers and the resolution of misunderstandings.

The email, on the other hand, was employed to communicate low priority tasks and issues, and tasks that could not or did not have to be completed in real-time because of time-zone differences.

Moreover, some remote counterparts, mainly those who enjoyed long-term interpersonal ties, tended to communicate more informally, using, for example, on-line chat applications. The global team at LeCroy, for example, communicated through MSN Messenger. Using this application enabled the team to have a real-time remote contact without having to use the telephone. Furthermore, at LeCroy MSN Messenger was used to inform team members about the availability of their remote counterparts in real-time. Table 2 summarizes the collaborative tools employed by remote teams at LeCroy and SAP.

6. Discussion of key findings

The main objective of this study was to understand how globally distributed teams re-socialize through the re-acquisition of norms, attitudes and behaviours. We have suggested earlier that such teams may need to "re-acquire" norms, attitudes and knowledge because of the unique characteristics of these teams. Indeed, evidence from LeCroy and SAP suggests that their GDTs needed to re-socialize over time. For example, the introduction of a new technology at LeCroy created a need for the global team to re-acquire norms and work attitudes relating to new practices, tools and procedures. The first major F2F meeting at the SAP team only sharpened participants' awareness of the need for additional exposure to remote counterparts' attitudes and behaviours, and the need for innovative ways to update the team about evolving work attitudes and knowledge within the globally distributed team. On the other hand, the Baan team faced difficulties in developing socialization throughout the project lifecycle, not just in relation to mechanisms that could re-socialize its remote counterparts. This team mainly relied on occasional socialization activities that were supported by electronic means, which resulted in disagreements and tensions between remote counterparts and had a negative impact on the ability of the GDT to collaborate. In this regard, the Baan global team failed to normalize and socialize newcomers in the first place, but more importantly, failed to "re-socialize" the entire global team. Thus, as the entire GDT faced difficulties to develop shared norms, attitudes and behaviours, this created barriers to "re-acquiring" norms and "re-socializing" as the project progressed and as certain work practices changed.

Furthermore, our analysis suggests that the GDTs at SAP and LeCroy employed various mechanisms and implemented numerous processes to ensure that socialization would be created and maintained throughout the project lifecycle. For example, holding video-conferences to introduce team members to the global team was one element that interviewees indicated as important for collaboration prior to a F2F meeting. Making time during a F2F meeting for social activities as well as for one-on-one discussions were two

additional components that assisted remote counterparts to acquire norms, attitudes and behaviours. Re-acquiring (changing) norms and attitudes required additional mechanisms in the form of short visits, relocations and the use of rich media communication technologies. In this regard, SAP and LeCroy treated socialization as an organizational process that requires constant improvement and renewal, and which is part of the collaborative mode of work developed within these GDTs. Both LeCroy and SAP practised temporary relocation of experts and offered short visits to remote sites, not necessarily in sync with the degree of difficulty to collaborate that the team was facing. Opposed to the approach taken by LeCroy and SAP, Baan regarded socialization as a stand-alone process, separated from the daily mode of collaboration, which can be activated mainly when other mechanisms to support collaboration have failed. As described above, F2F meetings and videoconferencing at Baan were often organized in situations in which other communication means had failed to deliver a solution. Indeed, evidence from Baan suggests that this globally distributed team suffered from tensions, lack of cohesion, and gaps in understanding attitudes, norms and behaviours between remote counterparts.

In line with the existing literature (e.g. Crowston et al., 2005), the findings of this study suggest that face-to-face meetings are indeed important in creating interpersonal ties and facilitating a socialization process. However, evidence from the SAP and LeCroy cases also suggests that socialization in these GDTs was not supported by F2F meetings only. Rather, an array of activities that were offered and implemented by these companies before and after F2F meetings allowed these teams to socialize and, when necessary, to re-acquire norms and attitudes. Furthermore, we observed that the team development process in GDTs indeed faces distinctive challenges induced not least by geographical and cultural differences, thus requiring management's intervention in supporting the timely development of a team from "forming, through storming and norming to performing" (Furst et al., 2004). But in anything other than a relatively small globally distributed project, and probably not even then, this cannot be a straightforward linear process. As global projects become more strategic in importance and larger in size, from a socialization perspective, the GDTs involved in such projects have to regularly re-acquire norms and attitudes, mainly because, as we observed, newcomers join and affect the norms and attitudes within the teams; and disagreement and miscommunication may regularly arise even in late phases of projects. These soft factors can seriously delay projects, restrict productivity and have quality and cost consequences, as other studies of complex IT projects regularly note. Therefore, based on the observations made in this study, we argue that socialization in GDTs should be an ever-evolving organizational process enacted on individual, team and organizational levels and supported by an array of activities that go beyond F2F meetings.

7. Socialization in globally distributed teams: A proposed framework

It is important to note that our findings are based on three case studies and therefore, by definition, meet to only a limited extent the criteria of transferability (the extent to which the findings can be replicated across cases). Additional research across multiple case studies is needed in order to verify the insights reported in this paper. With this in mind we can explore the approach to creating, maintaining and renewing socialization in globally distributed teams.

In line with the data analysed above, we propose that the process of socialization in GDTs should be framed in three phases: *Introduction*, *Build-Up* and *Renewal* (as shown in Fig. 1).
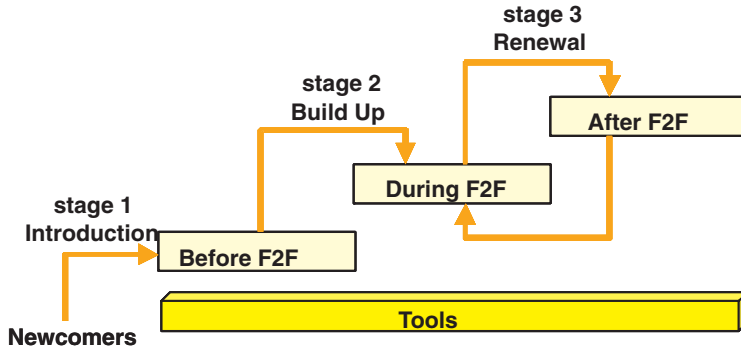
Fig. 1. The lifecycle of social ties development in GDTs.

Each phase is associated with an array of activities that a firm may apply in order to move from the Introduction phase to the Building Up of socialization, and finally to the Renewal phase. The first phase, *Introduction*, relates to the initial stage of a project or when a newcomer joins the GDT. During this phase, remote counterparts are being introduced to the norms, attitudes and behaviours that should govern the collaboration mode within the global team. While such procedures are a standardized approach to collaboration, these rules can still be understood differently by remote counterparts or newcomers. Negotiating the meaning of work and communication procedures can be done during the introduction phase, and yet requires remote counterparts to overcome distance, cultural differences and language barriers. Realizing the team composition and key rules, for example, can play a key role in the negotiation process, as team members refer to their remote counterparts with whom they will be corresponding when discussing aspects related to work and communication procedures. Reducing communication barriers is also critical in facilitating an initial negotiation of the meaning of work and communication attitudes. This can be achieved, for example, by overcoming language barriers and providing language lessons to local and remote sites. Yet, reducing possibilities for communication breakdowns and miscommunication is no less important, as remote counterparts, in particular newcomers, may not have diffused the norms and attitudes of collaboration. Therefore, the role of a contact person and mini-teams in ensuring the flow of information between remote counterparts is critical.

The second phase, *Build-Up*, offers a stage to advance the socialization process through F2F meetings. Such a stage offers remote counterparts the opportunity to negotiate the meaning of work and communication procedures, and to resolve pending collaboration issues in a person-to-person manner. Typically, a major F2F meeting would take place early in the project and would involve a significant number of participants from remote locations. Additional F2F meetings would take place throughout the project lifecycle and would involve fewer remote counterparts in different roles. The negotiation of the meaning of work and communication procedures should be facilitated at various levels and through different channels, such as between corresponding remote counterparts and through a one-on-one meeting. Through such negotiations, the global team is going through a "storming" and "norming" process (Furst et al., 2004), during which remote counterparts examine existing work and communication procedures and assess their meaning in the team's local and global context. "Norming" the team would mean that members of the team can relate to the

context within which their remote counterparts operate and agree on a shared under-
standing of norms, attitudes and behaviours that support their collaborative work.
Through such processes the global team facilitate (as in the SAP case) or refresh (as in
the LeCroy case) the acquisition of norms and attitudes at the individual and team
levels through intensive inter-personal interactions and social activities.

The third phase, *Renewal*, refers to a later stage of the project, in which "re-socializa-
tion" is needed. As the interpretation of work and communication procedures by remote
counterparts may change over time, a "re-norming" process of the team may need to
take place. Having collaborated with each other for some time, the "re-negotiation" of
the meaning of work and communication procedures can be done through media-rich
communication tools, but also through short visits and re-locations. "Re-socializing" the
team requires the participation of remote counterparts in reflection sessions and other
discussions. Through such participation, remote counterparts share their understanding
of the team's work and communication procedures, consequently embarking on a "re-
negotiation" of these meanings until an agreement is achieved. This process "re-social-
izes" the global team.

We observed that LeCroy, where dispersed teams had been working as a global
team for a long time, mainly invested in activities associated with the Renewal step, i.e.
in "re-socializing" this particular team. SAP, on the other hand, where remote teams
had simply merged into one global team, advanced socialization by introducing activi-
ties associated with the Build-Up phase. Most companies will engage in activities asso-
ciated with the Introduction phase either for the sake of introducing newcomers or
when a new project is assembled and the counterparts do not know each other from
the past.

8. Practical implications

From a practical viewpoint, we argue that in order to achieve successful collabora-
tion, firms should consider investing in the development of socialization despite the con-
straints imposed by global distribution. Socialization can be supported over time and at
various levels within an organization, as shown in Table 3. We argue that such activities
can be associated with the individual, team and organizational level. Yet, in practice,
each level contributes to the development of socialization across the entire organization
and through the different phases (i.e. Introduction, Build-Up and Renewal). For exam-
ple, language lessons offered before F2F meetings are likely to contribute to one-on-one
interactions during F2F meetings, and these in return will support direct communica-
tions after F2F meetings. Therefore, we argue that the array of activities in Table 3 is
imperative for understanding the multiple channels through which socialization is facili-
tated between remote teams.

Furthermore, we propose that firms should first assess the phase that the dispersed team
is at, prior to embarking on introducing activities, communication tools and procedures
that aim at the creation and renewal of socialization. Dispersed teams that are in the Intro-
duction phase (such as SAP and Baan in our research) require a different set of activities
and tools that support the creation of socialization from teams that are in the Renewal
phase (such as LeCroy). In assessing the phase that their team is at, managers should ask
the following question: is there a reason to believe that the set of norms, work attitudes and
knowledge has changed since the team was formed?

Table 3
Individual, team and organizational activities supporting social ties before, during and after F2F meetings

	Before F2F	During F2F	After F2F
Individual	• Offer language courses • Increase awareness of communication styles • Offer short visits of individuals to remote locations	• Create space for one-on-one interactions • Provide sense of importance of each member • Adjust communication styles	• Offer short visits to remote locations • Offer temporary co-location • Ensure real-time communication channels • Ensure mixed audio and visual cues
Team	• Introduction of new team members • Increase awareness of team composition • Offer virtual F2F meetings • Increase awareness of communication protocol • Setup mini-teams • Appoint contact person per remote team	• Conduct kick-off meeting • Offer space for multiple interactions between counterparts • Offer team-building exercises • Organise social events • Discuss differences in national cultures	• Facilitate reflection sessions • Facilitate around-the-table discussions • Facilitate progress meetings
Organizational	• Distribute newsletters • Create and offer shared cyberspaces	• Discuss organizational structure • Discuss differences in organisational culture	• Ensure direct communication channels

In answering this question, managers should mainly consider two aspects. The first aspect is the shared histories of team members. A newly formed team whose members have little or no shared history of working together is more likely to be at the Introduction phase. This means that such a team would need to employ a set of activities and processes that ensure the acquaintance of remote counterparts with each other (e.g. through videoconferencing) and that support the flow of information, especially in the early stages of the project, with as few communication breakdowns as possible (e.g. through contact persons and communication protocols). A team whose members have previously worked together is likely to be at the Renewal phase. This team would require the employment of processes that ensure the re-acquisition of norms (e.g. short visits and relocations) and offer a stage to negotiate the meaning of norms and work attitudes over time (e.g. through reflection sessions). The second aspect is technological change or innovation that a team may have experienced during the project, or in the beginning of a new project. In such a case, work attitudes and norms may have changed and their meaning might not be similarly perceived by remote counterparts. To overcome this, managers should provide a stage during which remote counterparts could discuss the meaning of the change in the context of their work and the implications for global collaboration. This can be achieved through reflection sessions via teleconferencing, videoconferencing or discussion boards on the Intranet. On occasions when the change is significant, such as the switch to Microsoft COM technology at LeCroy, a F2F meeting between the remote counterparts involved should be considered.

Last but not least, we propose that managers consider staffing dispersed teams based not only on their set of skills but also on their shared past experiences. By doing this, GDTs will mainly focus on re-acquiring norms and attitudes over time and on re-negotiating the meaning of these norms and attitudes when change takes place.

While the focus of this study has been F2F meetings, we acknowledge that not all GDTs have the opportunity to develop socialization throughout the project lifecycle. Financial and project planning constraints may impede F2F meetings, thus resulting in fewer opportunities to develop interpersonal ties that support the re-acquisition of norms and attitudes within the dispersed team. Despite these constraints, a GDT could still consider the activities described in Table 3 that will foster socialization without the support of F2F meetings.

Appendix A. Interviewees' details

A. SAP: Interviewees' details
Interviews were carried out between February and June 2002. Roles are correct for 2002

Name	Role	Location
Stefan	Director of KM Collaboration Group	Walldorf
Sudhir	Development Manager	Bangalore
Christoph	Development Architect, contact person for Bangalore team	Walldorf
Ahhilesh	Developer	Bangalore
Jyothi	Senior developer	Bangalore

B. LeCroy: Interviewees' details
Interviews were carried out between November 2001 and January 2003. Roles are correct for 2002

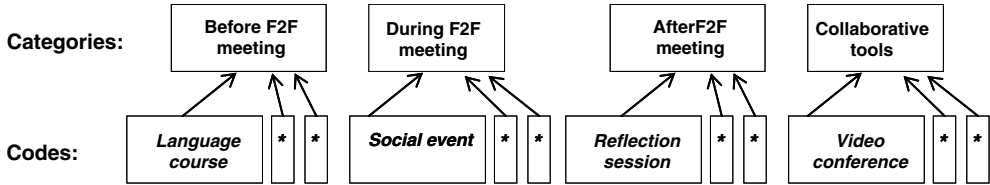| Name	Role	Location
Larry	Director of Software Engineering	NY
Anthony	Chief Software Architect	Geneva
Gilles	Software engineer	Geneva
Adrian	Web-master	NY
Corey	Vice President Information Systems	NY

C. Baan: Interviewees' details
Interviews were carried out in March 2002. Roles are correct for 2002

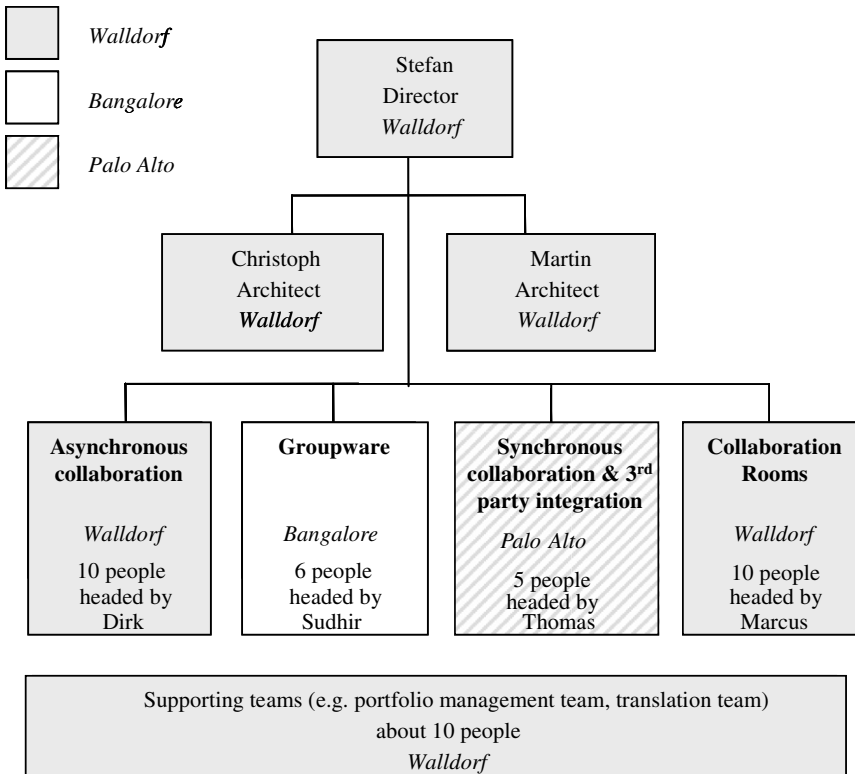| Name	Role	Location
Sjaak	Senior process engineer	Barneveld
Jeevan	General manager of E-Enterprise	Hyderabad
Sridhar	Development manager of Group 2 (Group 2)	Hyderabad
Phani	Product architect of E-Service (Group 2)	Hyderabad
Sujai	Development manager of Group 1 (Group 1)	Hyderabad
Srinivas	Product architect of E-Service Remote (Group 2)	Hyderabad
Venkat	Product manager of E-Service and E-Service Remote (Group 2)	Hyderabad
Ganesh	Process manager for Hyderabad group	Hyderabad
Vijaya	Product manager of E-Time and Expense (Group 2)	Hyderabad
Maruthi	Product architect of E-Procurement (Group 1)	Hyderabad
Johnson	Product architect of E-Time and Expense (Group 2)	Hyderabad

Appendix B. Data analysis approach

The figure below illustrates the process through which codes describing specific socialization activities were associated with categories, and includes examples of the codes used for each category. A bottom-up, interpretive approach was used to associate codes with particular categories. Interview transcripts were analysed using Atlas.ti software. During this process chunks of text that are partial or complete sentences or expressions describing socialization activities were assigned codes summarizing the activity.
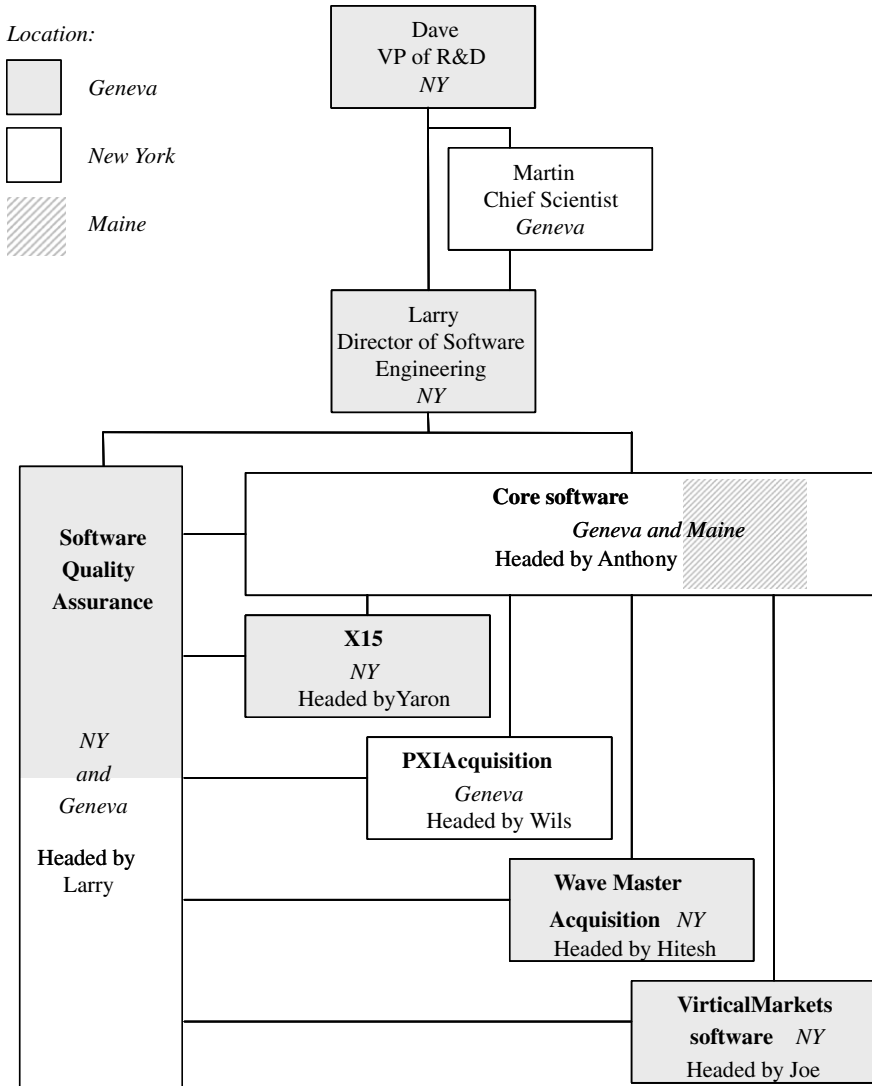
Categories:

Before F2F meeting	During F2F meeting	AfterF2F meeting	Collaborative tools

Codes:

Language course	*	*	*Social event*	*	*	*Reflection session*	*	*	*Video conference*	*	*

* more codes exist (not shown in the statement used as an example)

Appendix C. Organizational structure of GDTs

a   *SAP: Organizational structure of KM Collaboration group (as of June 2002)*

Location:

☐ *Walldorf*

☐ *Bangalore*

☐ *Palo Alto*

Stefan
Director
Walldorf

Christoph
Architect
Walldorf

Martin
Architect
Walldorf

Asynchronous collaboration

Walldorf

10 people headed by Dirk

Groupware

Bangalore

6 people headed by Sudhir

Synchronous collaboration & 3rd party integration

Palo Alto

5 people headed by Thomas

Collaboration Rooms

Walldorf

10 people headed by Marcus

Supporting teams (e.g. portfolio management team, translation team)
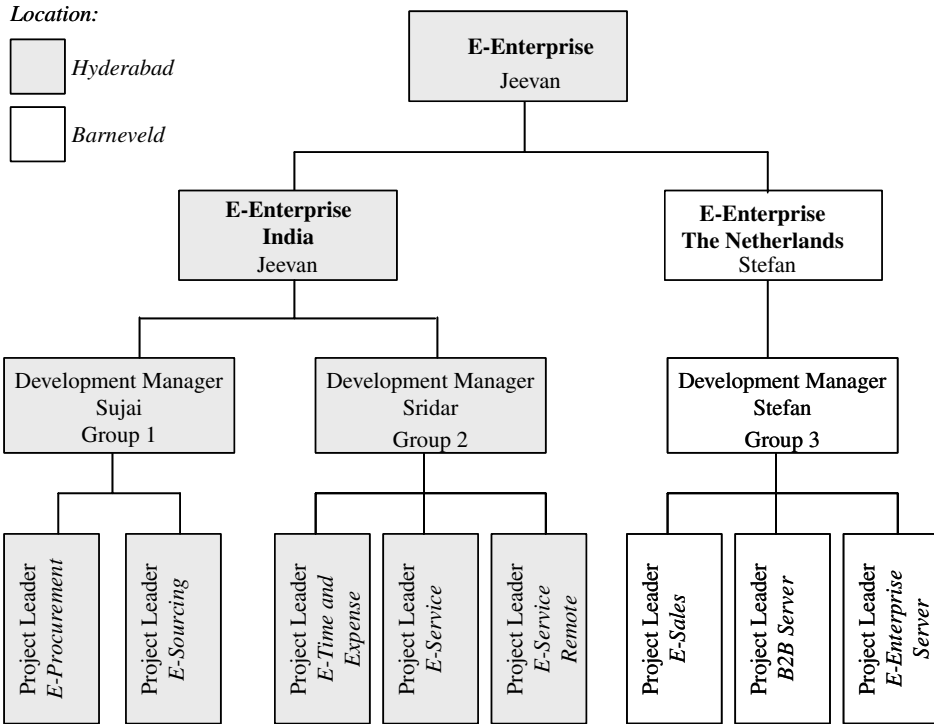about 10 people
Walldorf

b *LeCroy: Organizational structure of global software team (January 2002)*

C   *Baan: Organizational structure of E-Enterprise development group (as of March 2002)*

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