

DECENTRALIZED WORK IN ONSITE-OFFSITE COLLABORATIVE TEAMS:
ISSUES AND INSIGHTS

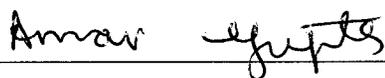
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Decentralized Work in Onsite-Offsite Collaborative Teams: Issues and Insights

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Abstract

Global collaboration and the use of virtual teams, or globally distributed teams, have become more and more popular in today's business world due to the widespread access to the internet and other collaborative technologies. We conducted thirteen qualitative interviews of managers and developers involved in a globally distributed team (GDT). The purpose of this study is to see what challenges the managers and developers face on a daily basis, especially regarding personal challenges, hand off problems, and technology limitations. The focus of this paper is on the managerial perspective while the developer perspective is supplementary. Our evidence shows that the interviewed managers are troubled by the challenges their GDT faces. This study can serve potential managers of GDTs by showing them the real issues regarding GDTs so that they can better prepare to manage a GDT. Both organizations and team members need to focus on technical issues, such as hand off protocol, preferred technologies, and intellectual property issues. However, these organizations and team members also need to be aware of challenges related to team dynamics, like the issue trust, building a sense of team, sacrificing personal time, cultural, and geographical issues.

I. Introduction*Offshoring leading to Global Collaboration*

The way the world does business today has changed dramatically from the days of limited access to the Internet and collaborative technologies. Now organizations must realize that the world is becoming much smaller and the ways of doing business are changing. In the 1980s and 1990s, businesses were driven to cut costs because of

the declining economy (Embleton and Wright, 1998). When the world needed help with the Euro conversion and Y2K crisis, countries and organizations turned to outsourcing and onsite-offshore collaboration (Arora and Gambardella, 2004).

Organizations are no longer located in one geographical city; many organizations have locations in multiple cities around the world (Ashkenas, Ulrich, Jick, and Kerr (1996). Now organizations are seeing the benefits of outsourcing specific functions to areas with more expertise or cheaper labor (Loh and Venkatraman, 1991). With the advent of the Internet, organizations are now able to outsource tasks or entire departments to other locations, including offshore locations. Given the technology and expertise found in organizations today, it is possible to outsource virtually any aspect of business (Embleton and Wright, 1998).

Outsourcing occurs when firms choose not to accomplish tasks in-house and instead decide to purchase them from suppliers (Laabs, 1997). Offshoring occurs when organizations move work to another country. This work could be in-house or outsourced. Offshoring can be divided into two categories: offshore outsourcing and captive offshoring (Sako, 2007). Offshore outsourcing is typically used when outsourcing tasks, functions, and/or activities to developing countries. The idea of offshore outsourcing equates to foreign suppliers and international trade. The latter category of offshoring (captive offshoring) is the focus of this paper. Captive offshoring is foreign direct investment in a captive center located in a developed country. These captive centers increase foreign direct investment and foreign trade, but differ from offshore outsourcing because the work remains internal within the organization (Sako, 2007).

While offshoring work has become a common cost-saving strategy, organizations are now beginning to recognize the impact of global collaboration on their bottom line. To remain competitive, organizations are leaving behind the vertically integrative structure of business and are turning toward a smaller network of firms that operate as a collaborative unit (MacCormack, Forbath, Brooks, and Kalaher, 2007). This change in organizational strategy is an interesting shift in the way organizations are doing business. By restructuring the organization to be more viable in a global economy, the level of competition has increased.

Strategy of Offshoring and Global Collaboration

Organizations in the US have been moving manufacturing activities to lower-wage countries for decades. By moving to lower-wage countries, organizations can reduce wage costs, although that is not always the outcome (Infosys Understanding Global Sourcing Brochure, n.d.). Another benefit of transferring work to another country is that the organization can gain greater access to emerging markets (Lewin and Furlong, 2005). While manufacturing is still popular to offshore, data has shown in the last 10 years businesses have been offshoring other business processes like software development and consulting services. Benefits for offshoring information technology and services include cost savings, but also access to qualified personnel and improvement of operating service levels (Duke, 2006).

A survey of 100 major companies was conducted by Duke University and Archstone Consulting. Over 90% of respondents strongly agree that reducing costs is the number one reason for US firms to offshore. Other significant drivers for offshoring

are competitive pressure (69%), service quality (55%), and qualified personnel (54%). This survey also showed that IT is the number one function that is offshored. Closely following IT offshoring (66%) is the offshoring of finance and accounting services at 60% of the business processes offshored (Duke, 2006). As countries are investing in large infrastructures of education, technology, and professional skills, organizations that had originally outsourced only routine tasks are now beginning to see that there are competitive benefits to outsource more complex, innovative tasks as well. According to a study by Stern and Wharton Business Schools, as of August 2008, "as many as 8% of IT workers have been displaced by offshore outsourcing" (Thibodeau, 2008). The study had a sample of 10,000 people and researchers found that IT workers have been displaced by offshore outsourcing twice as much as workers in other occupations. Outsourcing in the professional services industry is growing and organizations that are outsourcing more complex tasks are seeing that while there is usually a cost advantage, this type of outsourcing also provides an organization with a competitive advantage (Weston, 1996).

Structure of Organizations and Global Collaboration

The structure of an organization is the main reason why an organization chooses to implement outsourcing or offshoring. Organizations typically to create departments in order to integrate specialized work. These departments are structured according to function, process, product, or market structure. However, as the use of technology helps bridge communication gaps, more organizations are opting for a geographical structure (Galbraith, 2002). These organizations can take advantage of different time

zones, specialties, cultures, and labor costs. All of these factors make implementing a geographical structure more enticing.

Some industries are better suited to have a geographical structure. For example, sales forces and knowledge-based services, such as consulting, are gradually moving from being based in local offices to dispersed offices located around the world. Another example of a well-suited industry for offsite work is professional service organizations which process knowledge or data and provide information to their customers. This paper will specifically focus on the professional services industry (such as consulting, software development, and financial services). These organizations can gain competitive advantage by transferring some or all of the work to other employees in different countries. This could possibly provide a faster response time, a lower labor cost, and/or relief from excess workload (Richman, Noble, and Johnson, 2002). With new advances in distance learning and remote medicine, both healthcare and education will also become less traditionally based and follow the trend of being completed by offsite employees (Galbraith, 2002).

Organizations need to adapt to significant changes in the way business is conducted. Re-engineering and just-in-time manufacturing are examples of how business processes have changed (Bridges, 1994). The introduction of information technology has transferred dependency onto computer technology, thereby increasing the need for a more technology-savvy workforce. Communication technology has changed the structure of work by increasing the information influx and accelerating the pace of change (Embleton and Wright, 1998). Organizations are choosing to restructure by condensing teams and outsourcing. However, these organizations do not

want to lose core competencies that may be crucial to future effectiveness (Spee, 1995). To avoid a loss of core competencies, organizations are choosing to have employees work in a globally distributed team in order to maximize knowledge transfer while at the same time cutting costs on labor and gaining new expertise in new markets.

To benefit from global collaboration, organizations must approach collaboration differently than outsourcing. When firms focus only on lowering costs, they fail to see the potential strategic benefit of collaboration. An organization also needs to invest in building collaborative capabilities. When a firm develops a strategy and shifts its original structure, global collaboration in teams allows the business to explore new opportunities and maintain a competitive edge (MacCormack, Forbath, Brooks, and Kalaher, 2007).

Research Interest

To accomplish global collaboration the organization must focus on teamwork. The issues involving the onsite-offshore teams that collaborate are critical to the success or failure of the idea of global collaboration. The aim of this paper is to interview managers and developers that deal with collaborating onsite-offshore teams to learn what challenges the teams' face regarding collaboration, technology, and handing off work. Through learning about the teams, the goal is to understand the challenges the teams face on a regular basis. So far, this paper has covered the general issue of global collaboration including the transition from offshoring to global collaboration, organizational strategy, and organizational structure that leads to global collaboration. Now this paper will turn its focus to the collaborative onsite-offshore team (called the

globally distributed team or GDT). It will explore the known challenges of the GDT and the issue of adding a third team. The discussion will then turn to the methodology of this study and the results found.

II. Onsite-Offsite Collaborative Teams

Globally Distributed Teams (GDT)

As globalization is occurring, onsite teams are either being replaced or are working in virtual teams or offsite teams, or the work is being distributed to another location and possibly another time zone. The process of adding offsite teams has been gradual over the last 15-20 years as the necessary technology developed. With the advent of new technologies regarding communication and information transfer, organizations are now being divided into “globally distributed teams”. For the purpose of this paper, globally distributed teams (GDTs) are defined as a group of individuals: (i) identified by one or more organizations; (ii) interdependent and guided by a common purpose; (iii) characterized by the use of technology-supported communication substantially more than face-to-face communications; and (iv) whose members are based in different countries (Lipnack and Stamps, 1997). The teams referenced in this paper are all one single team that is participating in intra-team collaboration. Group members collaborate in order to make or implement decisions related to the organization’s strategy (Cohen and Mankin, 1999). The transition between onsite teams and offsite teams is difficult for many organizations and employees, but in order to keep up with competition, organizations are being forced to increase productivity by working in offsite teams and sharing the workload between two or more sites. These

teams consist of internal and/or external members working together to finish a project or goal. By shifting from manufacturing to knowledge-intensive work, organizations now require teams with large flexibility in order to bring together knowledge from disparate sources (Bell and Kozlowski, 2002). However, when combining employees from across the globe, team members are sure to face intricate issues.

GDT Known Issues

Both internal and external team members face many issues regarding geographic, temporal, and cultural conflicts. An internal team works within an organization while an external team interacts with other entities such as suppliers or the government. Geographic challenges that GDTs face are the lack of face to face contact, travel time is expensive and tedious, and depending on the industry, teams may need to double the amount of resources in order for both teams to be simultaneously working on the same project. Teams may be separated by thousands of miles which could lead to a possible communication breakdown. Studies have shown that as distance between teams increases, the teams communicate both less frequently and less effectively (Allen, 1977; Van den Bulte and Moenaert, 1998). Issues regarding time differences include difficulties finding a meeting time, sacrificing personal time (usually either late in the evening or early morning) in order to communicate with geographically dispersed team members, and productivity hindrance if one team member has an immediate question and another dispersed team member is not available to give the answer until hours later. Cultural issues are by far the most widespread and diverse. Examples of cultural issues that GDTs can face are differentials

regarding the quality of a project, language barriers, lack of understanding, hierarchical cultures interacting with non-hierarchical cultures, roles of the different genders in each culture, and nationalism. Each of these three conflicts (geographic, temporal, and cultural) plays a large part in determining the success or failure of a GDT. If a team can learn to adapt to another team regarding these three areas, the probability for success is much higher.

While the three above-mentioned issue areas are most likely the largest determinants of success, there are other factors that GDTs must overcome in order to fully collaborate and accomplish their goals. Roles of subgroups, power imbalances, trust, intellectual property transfer, and knowledge transfer all contribute to the difficulties that globally distributed teams (GDT) share. Previous literature has addressed the roles of subgroups by finding that when the GDT is composed of team members with similar expertise, position, organizational affiliation and ethnicity, the teams tend to incur subgroup and status differentials (Gupta and Mattarelli, n.d.; O'Leary and Mortensen, 2008). On the issue of trust there are many papers and specific research of organizational psychology regarding trust in distributed teams is not difficult to find (Dalton, in press). By finding ways to generate and sustain trust within teams, organizations can look forward to successful teamwork and joint knowledge creation among different groups (Child, 2001). Along with the issue of trust, intellectual property transfer issues are becoming more common. Within the professional services industry, knowledge transfer also allows intellectual property to be transferred (Infosys Understanding Global Sourcing Brochure, n.d.). Because intellectual property is evaluated according to its future usefulness, it is difficult to know how large of an issue

this is. However, to remain competitive, organizations must be aware and address this issue, especially when transferring information to different countries with different regulations (Smith, Wiederhold, and Gupta, 2007). The issue of knowledge transfer can be divided into four facets: knowledge acquisition, knowledge discovery, knowledge management, and knowledge dissemination. Each of these aspects of knowledge directly relates to how the globally distributed teams deal with knowledge. By following these four facets, GDTs can gain knowledge in two specific ways, manage that knowledge and disseminate the knowledge in order to spread specific knowledge based on the individual needs (Gupta and Seshasai, n.d.). The issue of knowledge transfer is directly related to technology. The success of these teams regarding knowledge transfer is partially driven by the types of technologies used to collaborate.

Technology and the GDT

Through the use of different technologies, teams in the professional service industry are able to collaborate; this is increasingly enriching the project outcome. These technologies (such as email, VOIP, networks, teleconferencing, video conferencing, and collaborative software) are allowing teams to communicate in real time with their teammates across the globe. Previous literature has weighed different types of technology regarding collaborating teams (Baba, Gluesing, Ratner, and Wagner, 2004; Maznevski and Chudoba, 2000). In order for technology to be an enabler of creativity and productivity, it must be “user friendly, reliable across network irregularities, and provide a framework for the user to structure the information in the most useful manner possible” (Gupta and Seshasai, n.d.). While the technologies that

are used have limitations, new ways are being invented to ensure that global collaboration via technology will continue to push the limits of innovation.

III. Adding a Third Team

24-Hour Knowledge Factory

Technologies are allowing onsite teams to communicate with offsite teams as well as hand off information and previous work. By viewing different locations and time zones as a positive tool instead of a harmful setback, organizations are able to improve their productivity through using a variation of the theory of the 24-Hour Knowledge Factory¹.

The 24-Hour Knowledge Factory is a collaborative theory where the workload is continually being traded off between three teams positioned in strategic locations around the world. The first team works an 8 hour day and then passes the work off to the second team, who is just arriving at work in another part of the world. The process continues when the second team works their 8 hour day and then passes the work in progress to a third team located in a separate time zone. When the third team has worked their 8 hour day, the work returns to the first team, who are just arriving to start their new workday. This process allows all team members to get a full night's sleep, which is crucial to productivity. When an employee is saved from working overtime or overnight, their health is benefited. However, the productivity of the organization is not hindered by the employee's need for sleep through the 24-Hour Knowledge Factory's notion of handing off of information and tasks from one set of employees to another (Gupta, Seshasai, n.d.)

¹ Term and definition provided by Amar Gupta through his extensive research in globally distributed teams.

Third Team Theory

The persons interviewed only worked with teams in one other location. There were more than one location utilized at a time, but this was not done in succession. The third location was included when specific problems or needs occurred. Because of a lack of case studies of three globally dispersed teams, the research regarding the 24-Hour Knowledge Factory is limited. It is important to keep in mind that while productivity is increased, the cost will also be increasing. By increasing the numbers of distributed teams from two to three, organizations face the same difficulties mentioned above that face only two teams, however, the challenges may increase exponentially.

When organizations have mastered having two globally distributed teams to the best of their ability, some may attempt adding more teams to the mixture. However, these organizations will have to deal with the same difficulties present in two teams, only magnified. If an organization adds a second team and experiences higher productivity and lower cost, it may be assumed that adding a third team will continue to provide higher productivity and even lower costs. This causes the issue of diminishing returns to come into play. The cost (both explicit and implicit) of adding an extra team will need to be lower than the expected benefit for organizations to make the venture of adding an additional team. By continuing to research the subject of globally distributed teams and the 24-Hour Knowledge Factory, researchers and experimental organizations will decide whether there is a limit to efficiency by expanding teams and if the law of diminishing returns will come into play when organizations use time differences in order to increase productivity.

IV. Methodology

Open Issues and Research Questions

The purpose of this paper is to conduct qualitative analysis in order to see what issues members of globally distributed teams were facing. The reason why qualitative analysis was used is that the researchers did not want to bias the interviewees by giving set answers. The purpose was to find interesting issues the GDT encountered in order to shed light on the complex relationships involved in GDTs. This work is part of a larger study (Gupta and Mattarelli, n.d.).

Study Participants

In order to investigate both the opportunities and challenges onsite and offsite teams face, thirteen interviews were conducted with managers, developers, and engineers of organizations that carry out globally distributed work in teams. This qualitative analysis uncovered how the GDTs function and what the main issues the US-based teams face. Because the focus was on qualitative data only, the interviewer was very careful not to bias the interviewee in any way. Each interview was approximately 1 hour long and was standardized using an interviewing template provided by Dr. Elisa Mattarelli (see Appendices A and B). Interviewees were asked about their work, what types of challenges they faced working in a GDT, how they shared information with others in the GDT, and what kinds of technologies they used to accomplish their work. These in-depth interviews were recorded and then transcribed in order to be analyzed and coded. All of the interviewees were located in the United

States and collaborated with teams across the world. By interviewing employees from different types and sizes of organizations, the researchers hoped to gain different perspectives. The employees who were interviewed were all either managers or members of global teams. However, all sequential collaboration involved only the passing off of work from one country to another and back again. An example of an organization using the full 24 hours was not found in time for this paper to be written.

Data Collection

Thirteen in-depth, semi-structured interviews were conducted with eleven managers and two developers from January 2008 to May 2008. This paper will focus on the manager perspective, but will supplement that with the developer perspective. The two developers are coded as “D”. The manager sample size consisted of five employees of technology development organizations, four from consulting firms, and two from manufacturing organizations. Two interviewees were in executive management (defined as only being informed at the top-level – coded as “E”), three were in senior management (defined as overseeing the GDT at a high level – coded as “S”), and six were in middle management (defined as overseeing the GDT directly day to day – coded as “M”).

Code	Type of Firm	Position	Team Size
S1	Technology Development	Senior Management	Varies
M1	Consulting	Middle Management	Middle
M2	Technology Development	Middle Management	Large
M3	Manufacturing	Middle Management	Unsure
S2	Manufacturing	Senior Management	Small
M4	Technology Development	Middle Management	Large
D1	Technology Development	Developer	Middle
D2	Technology Development	Developer	Middle
M5	Consulting	Middle Management	Small

M6	Technology Development	Middle Management	Unsure
E1	Consulting	Executive Management	Large
E2	Technology Development	Executive Management	Large
S3	Consulting	Senior Management	Middle

Team size was classified as small if the team had fewer than 19 members, middle if the team had between 20 and 40 team members, and large if it had over 40 members.

Data Analysis

The thirteen interviews were transcribed and coded using SPSS software and Microsoft Excel. First the raw data was taken and transcribed from a recording into text. A spreadsheet in Microsoft Excel was created to see which questions provided the most varied answers. By choosing to focus on a few categories, it was easier to see the diversity of answers and then delve back into the text to see what each participant said for each category. After creating a broad spreadsheet of approximately thirty categories, the data was looked over again and reduced to sixteen categories. Again, the criterion used to focus on each category was the assortment of responses and the depth behind these responses. When the sixteen categories were determined, the analysis moved to coding with SPSS software. Each category was coded by the participant's response and then put into SPSS for correlation analysis. Through transcribing and analyzing the data, seven categories of interest emerged:

- Taking advantage of time differences
- Challenges regarding handing off work
- Technologies used and their limitations
- Routine versus innovative tasks
- Challenges within the GDT
- Temporal, geographical, and cultural challenges
- Overall contribution of GDT

V. Evidence from the Field

Time Differences

Although an exact example of a 24-Hour Knowledge Factory was not found, the interviews gave examples of how the passing of information was accomplished in a collaborative setting. One developer (D1) working for a large technology development firm in the United States explained his day-to-day relations with his team in Japan. At 5pm in the US, it is 9am in Japan; so when he arrives at work his day begins with reading over what the Japanese team accomplished while he slept. Then D1 builds on that work during his eight hour shift and then at the end of his day, updates the storage architecture so the Japanese team is able to see what he has done and is able to build upon his work for their eight hour shift. This process of sharing information allows D1 to accomplish almost double what he would have normally accomplished. He did this by simply passing off the work when leaving the office. Instead of working 8 hours, going home, and coming back to start the same work he finished with, now he can add to the work already accomplished by his coworkers in Japan.

Through conducting interviews, the researchers found that a third of participants did not take advantage of time differences. These organizations passed off work to other members of the GDT, but did not hand off work daily in order to increase productivity. Over 25% of interviewees only took advantage of time differences occasionally. The teams did not pass off work daily, but did take advantage of the time differences when a project deadline was tight.

Take Advantage of Time Differences

No	36.4%
Yes	36.4%
Sometimes	27.3%

The interviewees that did take advantage of time differences were confident that it increased the team's productivity. M1, a middle manager from a large consulting firm, explains:

M1: "When you use the remote execution model you can cut down on the timing it takes a client to deliver a deliverable by up to 40%. I would say that's true. We use it when there are very tight client deadlines."

The two main challenges regarding time differences that the managers mentioned were that they were unable to communicate when they had immediate questions or concerns (18.2%) and had difficulty finding compatible meeting times (54.5%).

When distributed teams cannot talk to each other on an immediate basis, progress may be hindered. M4, a middle manager of a large technology development organization, explains:

M4: "If in the middle of the day I need a question answered, I'm not going to know until tonight or tomorrow morning and I can't do anything about it until tomorrow. So there is a day lag, which could be a problem with a hard deadline."

The most important thing is to keep the lines of communication open between the teams in different locations, but the time difference does prevent some instant communication from happening. However, this causes teams to plan ahead and prepare questions for the following day in advance. Through working in onsite and offsite teams, employees can learn to better manage their time because they must meet deadlines in order to pass off work to the next team to complete overnight.

Challenges Regarding Handing Off Work

All developers and managers interviewed acknowledged the difficulty of handing off work, but all interviewees recognized that the benefits of having another team to share the work overcame the sometimes tedious work of passing off information.

While handing off information can be a tiresome exercise, it can also be a large benefit to both employees and the organization. D2, who works at a large technology development firm, speaks on this subject:

D2: "I spend the last hour of my day communicating stuff that could take me 5 minutes in person. I write a specific email with drawings, but that does help with record keeping."

If an employee comes in the middle of a project or needs to reference something completed in the past, he or she can simply look at the trail of messages sent by the individual employees. This provides an enormous increase in knowledge management and knowledge sharing. The tracking of changes and steps in specific tasks can also help the organization for auditing purposes or legacy work.

The difficulties related to handing off work are well rewarded if the employees can clearly communicate their progress.

D2: "I'll spend a half an hour working on describing my progress on the task, but then I'll come in the morning and 8 hours of work has been done."

Most organizations simply look at the cost savings associated with offsite teams. The organizations see that the work can be completed cheaper in another part of the world and decide to transfer pieces of the work to the other locations with lower labor costs. As this practice increases, some organizations are enjoying the cost savings, but are also concerned with productivity. By viewing time zones as a positive tool that can create a competitive advantage, organizations are implementing the collaboration of teams instead of just dividing tasks. The benefit of the increase in productivity from

using collaborative offsite teams is becoming equally important, or even more important than simply saving money by reducing costs.

Handing off work can also provide many challenges and at times can hinder productivity. A table of challenges regarding handing off work is below:

Hand Off Challenges

Understanding	45.45%
Time Difference	27.27%
Language Barrier	18.18%
Expectation Differences	18.18%
Redundancy	9.09%

Almost half of the managers interviewed mentioned struggling with understanding when transferring work. While handing off tends to provide better documentation, GDTs are still struggling with the transfer of knowledge and getting the recipient to really understand what is being passed. M6, a middle manager of a large technology development organization explains:

M6: "The knowledge transfer is the one that is difficult because knowledge is 50% towards on the information and the other 50% is in the individual's brain. And unless that part is completely captured, you won't get it."

Time difference and the language barrier are usual issues that the GDT faces. Team members have a limited time to hand off work and the recipient must have complete understanding, because the first team member will be unavailable throughout the recipients eight hour shift. Members of the GDTs are learning how to bypass the language barrier by being cautious with their use of language. S1, a senior manager of a small technology development firm, says:

S1: "We are commonly getting in text using English but something I say may be taken the wrong way, so I have to be very clear about how I am phrasing myself and not using complex words. I make sure that it cannot be misunderstood."

Even though the language standards in English seem to be uniform, members of the GDT do not necessarily have equal understanding and interpretation of these standards. At times, members of the GDT must take it upon themselves to make sure the recipient can fully understand the message being sent. S1 also explains the expectation differences he faces when looking for coders to contract work:

S1: "So, what a coder in China considers to be well designed and well documented may not be something that I would consider to be well documented code."

Handing off work can be both a strategy to increase productivity and a challenge for members of the GDT. By improving communication and ensuring understanding, members of the GDT can prevent many problems associated with handing off work.

Technologies Used and Their Limitations

Advances in technology have helped the GDTs to be able to communicate clearly and quickly over large distances. The introduction of VOIP "*helped us improve communication in areas where phone lines aren't spectacular,*" says M1 (a middle manager of a large consulting firm). When interviewees were asked which technologies they used to communicate with teammates, their responses were varied. The interviewees were only asked what technologies they used to collaborate, not which technologies they were required to use according to company mandate. The technologies mentioned are listed below:

Technologies Mentioned	
E-mail	100%
Shared Database	82%
Collaborative Technologies	73%
Teleconference	64%
Instant Messaging	55%

VOIP	45%
Video Conference	27%
Telephone	18%

The research shows that 100% of the respondents said that they use email and 82% said that their organization uses some sort of shared database. These shared databases and collaborative technologies, like wikis, are making the task of handing off work much easier. All respondents listed more than one technology that they use to communicate with their teammates and pass off work.

S1: "We're always on Skype. We use Go-To meetings so people can go to conferencing. Because I already have my Blackberry people usually e-mail me and I usually get a response faster and wikis of course"

Using a combination of technologies allows team members to elect which technology suits each task.

Although new technologies are making communication more efficient, there are limitations to these technologies. The top five mentioned limitations of technology were: a lack of resources to move to newer technologies, lost information during transfer, a steep learning curve, better results from interacting face to face, and a lack of personal connection. M1 explains the dilemma regarding using technology versus meeting face to face:

M1: There is a premium on being able to have face to face contact with the person you are dealing with. You just sense more things when you talk to them directly rather than going through e-mail or going through a phone call or things like that. If you are face to face in front of the client you can actually figure out what their needs are and tailor a solution accordingly. It kind of gets lost when you do it remotely.

Many times using technology instead of meeting face to face provides a cost savings.

However, most of the interviewees reported meeting regularly (times varied from once a

month to once a year) in order to establish familiarity and camaraderie between coworkers.

Routine vs. Innovative Tasks

As organizations began moving tasks offsite, the trend was to give tasks to the offsite teams that were more remedial and required less skill. An example of this was found in Galbraith's 2002 book titled Designing Organizations. To design an oil company's Asian refinery, the initial high-skilled work was performed in North America where the leading design skills were located. Once the high-level design was complete, the work was transferred to a group of 300 Filipino engineers. The Filipino engineers generated 15,000 drawings needed to complete the project. By transferring the lower-skilled work to the Philippines, the company saved drastically on labor costs (Galbraith, 2002). This example not only demonstrates the cost benefit to the initial organization, but also mentions that the work required lower-skilled workers. This type of offsite work causes disparities within the virtual teams. Issues of trust and superiority arise when the tasks are divided up according to skill level. Offsite teams may also face issues of status differentials, even across team members with similar positions within the organization (Gupta and Mattarelli, n.d.). The benefits of including offsite teams in the workforce may be overshadowed by the critical disparities between the teams.

While conducting interviews it was found that many organizations had originally began the offsite project with simply outsourcing lower-skilled tasks.

M4: "It [the use of the GDT]] started out with application maintenance initially. Just going and fixing the bugs and maintaining older versions, but by now they [the offsite team] are actually doing new product development."

Organizations are beginning to see the value of having offsite teams and are assigning the offsite teams more challenging tasks. A different middle manager with a different organization gives a similar account.

M2: "The work that was put out there was at first only programming and then it grew into logical design as well. The project management and architecture was done here. Over time that has evolved. Our team has integrated more. We now share the responsibility between the different sites."

As offsite teams become just as prevalent as onsite teams, the work must be distributed in a manner that feels equitable to all members of the team.

Challenges within the GDT

The main benefit of conducting qualitative interviews is the variety of responses. Regarding the broad question about what challenges the GDT members faced there were many opinions about what challenges affected the GDT. These figures do not include temporal, cultural, or geographical problems which were asked about separately.

Challenges Mentioned	
Trust	36.4%
Building a Sense of Team	36.4%
Sacrificing Personal Time	18.2%
Lost Time	18.2%
Status Differentials	9.1%
Difference in Knowledge Levels	9.1%
Language Differences	9.1%
Distribution of Resources	9.1%
Lack of Physical Proximity	9.1%
Lack of Clarity	9.1%

The issue that arose repeatedly throughout interviews was the idea of trust. When one team does not trust another team, the work progresses very slowly or at times may stop

all together. M1 describes a situation where collaborating teams failed because of cultural differences.

M1: "A US manager was not communicating enough information, so the Indian guys couldn't get good estimates. He started second guessing what the Indian guys' numbers truly meant. So you ended up with a project with so little trust between the two groups. In a span of three months, that team went from being one of the most productive teams to being one of the least productive teams."

Another middle manager described the issue of trust by explaining that a larger amount of time spent working with the group alleviates the mistrust which was felt when the group was formed. By working together and building up trust, teams can work faster because they do not have to continually check up on what the other team is doing. Trusting offsite coworkers also saves time because each team member does not have to sit and review each detail of the coworker's work. They simply trust that the coworker will perform to the standards determined by the group or by the organization.

Another repeatedly mentioned challenge was the issue of building a team. Managers reported struggling to get team members to feel they were part of the GDT and the organization, even though they offsite team members worked remotely.

M2: "I think just the one challenge is truly building the sense of team and that sense of commodity and that sense of being one organization."

If a team member feels isolated, he or she will be less likely to make the extra effort to support the GDT. Although building a sense of team is difficult even with the entire team working in one building, managers of GDTs face the extra challenge of getting team members to collaborate across temporal, geographical, and cultural boundaries.

Temporal, Geographical, and Cultural Challenges

There were only two problems mentioned by the respondents regarding time difference challenges. One challenge was the difficulty of finding meeting times for the entire group. Time zones are very beneficial when work needs to be passed off and done more quickly, but for longer term projects the teams need to meet occasionally and this is where time differences provide a challenge. The second time difference problem is the limitation on the interaction between team members.

M5: "Very often times we will schedule conference calls in the late evening so we can pick up Europe in the morning. So we'll either go very very early or very very late to pick up people in Asia and/or Europe. What is frequently done is you will actually have two meetings and come to whichever one depending on where you are at in the world."

Managers and developers stated that they only have a certain amount of time to interact with their counterparts when handing off work. The time differences cause problems when there is an immediate question or concern that cannot be addressed because of the time difference.

When asked about any geographical problems the GDT faced, managers and developers did not have as much to comment on. Respondents spoke about the difficulty and expense of traveling to different sites (9%), the cost of doubling equipment and resources at more than one site (9%), and the lack of personal connection between dispersed team members (18%), but others did not see geographical distance as a hindrance.

S1: "You'll find this funny. Even when two of us are in Foster City, CA and Palo Alto, CA, we almost never meet."

Employees are growing used to the idea of using technology to communicate and collaborate with their team members which lessens the effect of the actual geographical distance between them.

Cultural differences also provide challenges to globally distributed teams. By facing a cultural barrier or a language barrier, teams learn to adapt to other coworkers. The cultural challenges mentioned by the interviewees are listed in the table below.

Cultural Challenges Mentioned	
Language	63.6%
Learning Preferences	27.3%
Presence of Assertiveness	27.3%
Misinterpretation	18.2%
Personality Conflicts	18.2%
Quality Differential	9.1%
Gender Differences	9.1%
Nationalism	9.1%
Hierarchical Cultures	9.1%

Some interviewees felt that cultural differences played a small role in conducting business, while others felt that the distinctions were more pronounced and valid.

Regarding the language barrier, one manager (M5) says, “*Surprisingly language isn’t a big deal because English is the language of technology. Everything is done in English.*” Although some felt the language barrier was not an issue, most managers (63.6%) mentioned language as one of the cultural challenges they faced. Another major challenge teams faced when working with certain countries was the presence of assertiveness in direct cultures.

D1: “One of the main things is that they [the Japanese] are very averse to risk. We have to be careful how to approach different things. A lot of times they write, ‘We’ll wait for your decisions...’. They want to be told what schedule to follow; they don’t want to make decisions. They get kind of freaked out if we say, ‘We want to wrap this project up by this deadline,’ and something happens that disturbs that deadline. They are funny like that. I have adjusted to how they are and now I know how to not rattle them.”

A few managers spoke about culture differences between direct and indirect cultures (M1, S2, and E2). With direct cultures (like the United States) communication is explicit,

action-oriented, and solution-minded. In indirect cultures (like Japan), people try to avoid direct confrontation. Messages are transmitted indirectly and implicitly (Ting-Toomey, 1985).

M1: "Here in the U.S we are more open so if there are issues we bring it up to senior management versus some of the other countries it's just more you tend not to be open about issues. Asia and South America people will say yes, everything is fine, if they are running with challenges they won't be as forth coming. You might ask if you understand something and they'll say yes where they really don't and you will have to ask them to explain what I asked. It's a major difference versus here if I don't get it I would be like "Bob, I'm not really sure what your talking about please explain it again" versus some other countries, some other cultures it's like oh he'll think I am stupid so I won't say it."

Direct cultures and indirect cultures have an opposite approach when approaching communication. The way problems or conflicts are addressed between these different cultures can cause many problems between collaborating members of the GDT if not addressed and adjusted for. Cultural differences can contribute to slower progress as well as unnecessary disagreements between coworkers. By providing cultural training, language classes, and face-to-face meetings, organizations can lessen the effect of cultural barriers, which will impact the cross-cultural communication and increase overall productivity.

Overall Contribution of the GDT

When asked about the overall contribution of the GDT, respondents quickly identified numerous benefits to implementing the GDT within their organization. The managers interviewed realized that the creative contribution of the GDT had a large impact on the overall success of the project. Having a team in another, unfamiliar

location provides the organization with access to local knowledge and pull advantages from both sites.

M1: "We need team members from that area who are more in tuned with the local culture. People like to deal with people from their own country rather than the American coming down. Also with the same token people are going to be more open dealing with people from their own country."

Another key creative contribution that GDTs are able to capture is the diversity in opinions which allow for better decision making. By having people come together from different backgrounds and cultures to collaborate on a task, the onsite-offsite team can frequently generate a wider selection of solutions than an onsite team.

Regarding the overall performance of the GDTs, attitudes were mixed. Some managers said that the GDTs performed much better than an onsite team.

S1: "A live team just wastes so much time. If you are working with a team of people, I would say two hours out of eight hours is productive. If I am working from home, coordinating with people, I would say seven hours out of eight hours is productive."

Other managers said it would take time for the GDT to perform at the level of a traditional onsite team.

M1: "So I think that no they [the GDT] aren't really performing at the level I would expect an American team to perform at right now but I don't think that's going to be a long term trend. When you hire somebody right out of school they don't perform at the level you expect them to perform at for awhile so it's the same type of thing; the experience."

Although managers disagreed on the productivity level of the GDT, all agreed that under a time constraint, the GDT could provide the necessary time savings. Another factor that some managers brought up was how the use of resources changed when using a GDT. M1 says, "We don't have to put a prime resource on something routine, which is

intimately going to be more beneficial to us.” By focusing on specialization, teams can increase productivity by distributing resources more efficiently.

There have been many studies on the cost reduction factor of using a GDT (Agerfalk, Fitzgerald, Olsson, and Conchuir, 2008; Rao, 2001). Many managers mentioned the cost benefit of using the GDT, but also focused on the quality of work and the efficiency in which the work was completed.

M3: “I think we definitely have been more successful as far as cost reduction and even just in speed to be able to source these new products and launch these products more quickly with the global teams.”

Along with mentioning cost, quality, and efficiency, a few managers and both developers mentioned the impact using a GDT had on their quality of life. M4 explains, *“It [the GDT] is more efficient and people have better lives that way.”* By working in a GDT, team members can learn to depend on each other in order to save time and quality without having to sacrifice a lot of personal time.

D2: “I like it a lot [working in a GDT]. The reason I don’t have to work around the clock is because of them. At crunch time I would have had to work the second and third shift, but now I don’t.”

Overall, managers and developers all agree GDTs present a new wave of problems that the teams must learn to deal with. They also acknowledge that working in these teams generally increases productivity and reduces costs. Organizations need to decide whether the effort of putting together and training the GDTs will be worth the benefits.

VI. Discussion

This qualitative study investigated eleven managers (executive, senior, and middle managers) and two developers by conducting structured interviews. The

interviewees all worked or managed a GDT in either a consulting, technology development, or manufacturing firm. The study did not observe the teams working or perform a case study on any particular team or organization. The aim of the study was to understand how managers and developers think about working in or managing a GDT. They spoke of general challenges, challenges handing off work, technologies used and their limitations, and the overall contribution of the GDT among other things. By allowing the managers and developers to share their thoughts freely, we were able to gain insights into their daily challenges and successes. Studies using qualitative interviews over a variety of industries, organizations, team sizes, and organizational positions are more difficult to find. Many studies focus on observing a team and measuring the success or failure of that team as well as any challenges the GDT faces (Baba, Gluesing, Ratner, and Wagner, 2004; Maznevski and Chudoba, 2000). Other studies chose to use an interpretive case study approach (Levina and Vaast, 2008).

By comparing the empirical issues observed in this study with the theoretical issues brought up in other papers, it is easier to see where this study fits amid the numerous other studies regarding GDTs.

Empirical Issues	Theoretical Issues	Source
Time Differences	Limit spontaneous conversation, collaborative social environments, mutual learning, shared understanding	Hinds and Kiesler, 2002; Cummings, 2004
Hand Off Challenges	Process of coordination and knowledge sharing across time and distance is not widespread because it causes many problems	Espinosa and Carmel, 2003; Treinen and Miller-Frost, 2006
Technologies and their Limitations	Technology limits GDTs if there is misalignmnet between technology and context	Baba, Gluesing, Ratner, Wagner, 2004; Maznevski and Chudoba, 2000

Routine vs. Innovative	Innovative tasks are usually reserved for highly developed countries	Galbraith, 2002
Issue of Trust	Trust is a critical component to have between the onsite and offsite team	Child, 2001
Status Differentials	Knowledge sharing during hand offs hampered by status differentials	Mattarelli and Gupta, n.d.; Levina and Vaast, 2008
Cultural Challenges	Direct cultures interacting with indirect cultures could hinder productivity	Ting-Toomey, 1985

This study partly supported the theoretical work involving time differences. We found that the main challenges regarding time differences were the inability to communicate when problems arose and the difficulty in finding compatible meeting times. Time differences do affect spontaneous conversations and collaboration regarding meeting times, but we found no mention of it hindering mutual learning or shared understanding. Previous literature has mentioned hand off challenges, but our study has added to the literature. We have shown that the interviewees were concerned with the difficulty of handing off work and faced specific challenges such as general understanding, time differences, the language barrier and differences in expectations. However, the interviewees also acknowledged the benefits, such as an increase in knowledge management and documentation. Theories about technology limitations were more abstract. We did find that if the context does not match the technology used, the interaction will be hindered. However, this study delved into which specific technology was used.

The types of tasks given to offsite locations are beginning to change, according to our findings. Many organizations had originally began the offsite project with simply outsourcing lower-skilled tasks, but are now beginning to see the value of assigning the offsite teams more challenging and innovative tasks. It was expected that the

interviewees would mention the issue of trust (36.4% did mention the issue of trust) and our findings are similar to what previous literature has found. However, in addition to the issue of trust, we also found a high percentage of respondents mentioned the issue of building a sense of team (36.4%) and the difficulty of sacrificing personal time (18.2%). These issues were found to be very large challenges as well, but are not mentioned extensively in previous literature. On the other hand, status differentials are mentioned quite extensively in GDT literature, but in our study there was not a significant percentage of respondents who mentioned the idea of status differentials (only 9% mentioned it was an issue). This could be because each of the interviewees is based in the United States which is also where many of the clients are based. Because our interviewees were the ones interacting with the clients, they quite possibly did not notice any status differentials present. A large part of our research was focused on determining any cultural challenges that the GDT faced. Previous literature does mention cultural challenges, but it is usually in passing and is not one of the focuses of the paper. This study found a large portion of the interviewees were concerned about cultural challenges and the top three cultural challenges were language (63.6%), learning preferences (27.3%), and the presence of assertiveness (27.3%). These three issues have a stark effect on the productivity of the GDT and the day to day activities of the members of the GDT.

VII. Conclusion

The goal of this qualitative research study was to find challenges that the GDTs face during day to day interactions. We were especially referring to personal challenges, hand off problems, and technology limitations. Our evidence shows that the

interviewed managers are very concerned with the challenges their GDT faces. The interviews have provided an in-depth look into the challenges of the GDT. The practical implications of this study include showing potential managers of GDTs what the real issues are so that they can better prepare to manage a GDT. Both organizations and team members need to focus on technical issues, such as hand off protocol, preferred technologies, and intellectual property issues. However, these organizations and team members also need to be aware of challenges related to team dynamics, like the issue of trust, building a sense of team, sacrificing personal time, cultural, and geographical issues.

This study has several limitations. The first limitation is the disparity between the number of managers (11) and developers (2) interviewed. By choosing to focus on managers, the paper is skewed towards the manager perspective. A solution to this would be to interview more developers in the future in order to gain the developer perspective as well. The second limitation of this study is the sample size is fairly small (13). At this time, work is being done to create a quantitative survey based on this study's qualitative analysis. By combining both the quantitative and qualitative analysis, we should have a better view of the overall impacts of the challenges mentioned in this study.

By asking specific questions to the interviewees and analyzing their responses, more questions arose. It would be an interesting addition to this study if follow up questions were asked. Examples of these follow up questions could be:

- How much do the managers and developers trust the expertise of their GDT colleagues?
- How much time on average does it take to properly document the hand off task for a GDT versus the task for a local team?

- Does the lack of team-spirit lead to opportunism and free riding?
- Which technologies does your organization require you to use? Do they specify which technologies should be used for each task?

The quantitative analysis will also be an excellent addition to this study. The quantitative survey will be sent out via email to approximately 2,500 contacts and will be a link to an online survey website. This quantitative analysis is being completed under the guidance of Dr. Amar Gupta at the University of Arizona.

The topic of onsite-offsite team collaboration is complex and interesting. Globalization has ensured the use of GDTs will continue into the future. These GDTs are bringing a new perspective to organizational structure and the way professionals across the globe are working. We hope this study will stimulate more research in this area in order to help organizations remain competitive in this global economy by decreasing costs and increasing productivity through the use of globally distributed teams.

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Appendix A.**Interview protocol for developers/operators**

Duration: ~ 1 hour

Preliminary data to be collected

- Name
- Organizational position
- Professional tenure
- Organizational tenure
- Education
- Previous experiences with globally distributed teams

Questions will be drawn from the following list, depending on the background and expertise of the concerned person

Globally distributed team work

How would you describe the activities you perform on a typical work day?

- What are your primary tasks?
- On how many projects are you working on now? Do you belong to one team only?
- Where do you typically perform your work activities (in the office, at the client site, at home...)? Do you have discretionary power to decide on where to work?

Which subset of the abovementioned activities are performed at distance in globally distributed teams working around the clock?

- How is your global distributed team composed?
- What are the activities you do for and with distant members? What do distant members take care of?
- Do you know your clients' product (or service) and customers?
- With whom and how often do you interact with?
 - o Internal - Distant members of the team
 - o External – Clients, Suppliers, Public entities
- What is the type of interactions (sequential, reciprocal, pooled, integrated, see figure 1)?
- Are they one-to-one interactions or group interactions?
- Are they formal or informal?
- What is their frequency?
- What is the content of the interactions and during which phase of the project do they take place?

How do you hand-off work to your distant members?

- What are the main challenges you face?
- How do you take advantage of (or you solve the problems caused by) time differences?

How do you define your priorities?

- Do you have criteria to define the importance of an activity? Do all activities have the same importance?
- How do you share your time between projects? Do you have autonomy in doing so? Do you share time between fully localized and distributed projects?

Would you describe me a specific project “around the clock” you were involved in?

Did the work performed in globally distributed teams changed over time? How?

Technology use and face to face interactions

Which ICTs (e.g.: telephone, video-conference, email, instant messaging, collaborative technologies, KM repositories, ecc.) does the globally distributed team use? Are they different from those used with co-localized members?

- Do you differentiate the type of technology according to the content of interaction?

- What are the advantages of the use of the different technologies?
- How do technologies support the hand off of completed or partially completed work across locations?
- Did the use of technologies change over time? Or across projects?

What are the limitations of the abovementioned technologies for distant interaction, collaboration, and handing off work?

- Examples of limitations:
 - o Technical: characteristics of technology, lack of experience in the use of the technology, communication difficulties...
 - o Social: norms, organizational limitations, lack of familiarity....
- Are difficulties associated to particular activities or interactions?

When do you (or your organization or the client organization) decide not to interact virtually, but to schedule a face to face meeting?

- Do you remember a particular occasion when the virtual team decided not to interact virtually, but to define a face to face meeting?

Does the organization support you in the use of ICTs for collaboration? Do you feel at ease in their use?

- Were you trained in the use of technologies?
- Are there formal or informal incentives for the use of ICTs (for example, for those teams contributing to the knowledge repositories)

Activity and perspective awareness

When you work in a globally distributed team, do you know, in every stage of the project, what activities are performed by individuals at distant locations?

- Do you know what distant members are working on? Do they know what you are doing?
- Are you able to tell what's the best time to contact them? Are they?
- Are there situations when the impossibility of a synchronous interaction is a serious problem for the team?

When you work in a globally distributed team do you know the specific competences of distant members?

- Do you know the background of distant members?
- Does the composition of the virtual team change across projects?

Distant collaboration and knowledge sharing

What is your creative contribution to the GDT?

What did you learn from distant members? What did they learn from you?

- did distant collaboration change your work practice?
- Did information and knowledge exchanges change over time? How?

- Did distant collaboration change organizational work practice?
- What is your role in knowledge sharing?
- Would you provide me with an example of acquisition/transfer of work practice and their impact on your work and your organization?

Is distant collaboration an incentive for higher codification of work and knowledge? Which mechanisms do you use?

What are, in your experience, the main barriers to distant collaboration and knowledge sharing?

- How do you hand off work?
- what are the problems generated by distance (time, physical contact,...)?
- What are the problems generated by cultural differences?
- Are there organizational/professional differences between virtual team members?
- Did barriers change over time (increased, reduced, modified)?

Trust

How do you evaluate the overall experience of working in a virtual team?

- What were your initial expectations? Did you have any concern?
- Are the competences of the virtual team distant members in line with yours?
- Are distant team members courteous? Professional?
- Do you sometimes argue with distant members? If yes, why? Are discussions similar to those with localized co-workers?
- Do you feel threatened by distant team members? Do they?
- Have you developed personal relationships with distant members? And with co-localized members?
- Do you feel to have established a relationship based on trust with members of the globally distributed team?
- What are the most positive and most negative experience you had working in a globally distributed team?

Perception of performance

What is, in your experience, the performance of globally distributed teams when compared to traditional (collocated) ones?

- Did you have other experiences of distant collaboration in other organizations or units?
- How would you compare your previous experiences with the current one?
- Is there difference between globally distributed teams working around the clock and other distributed teams (for example, with members located in different cities in India)

Professional and organizational identity

What is the professional community you feel to belong to?

How would you describe what being a is all about?

- If someone were to ask, what is your professional “mission statement” what would you say?
- What do you like about your profession? What do you wish were different and how?
- Do you think that for the distant members of your team, being a ... means the same thing?

What are, in your opinion, the attributes that characterize your organization? And the organization of the distant members of the globally distributed team? And your clients?**Does your organization formally or informally incentive disperse collaboration?**

- what are the principal mechanisms?
- In what part are these mechanisms explicit? In what part are they embedded in organizational practice?
- In your opinion, does the organization invest in cultural integration? How?

What is, in your opinion, the difference between your organization and its main competitors?

- What are the incentives to remain in your unit?
- What are the alternative work occupation opportunities for professionals working with you (both in competing and not-correlated organizations)?
- Have you ever thought of founding your own organization?

Concluding questions

Is there anything you would like to add?

Figure 1 located in Appendix B

Appendix B.**Interview protocol for project managers
and senior managers**

Duration: ~ 1 hour

Preliminary data to be collected

- Name
- Organizational position
- Professional tenure
- Organizational tenure
- Scholarization
- Previous experiences with virtual teams

*Questions will be drawn from the following list, depending on
the background and expertise of the concerned person*

Overview questions: characteristics of the organizational unit and work content

What are the services that this organizational unit offers to clients (internal or external)? *

- How many clients does this organizational unit have?
- Where are they mainly located?
- Why do clients ask services to your organization?
- Do you need to know your clients' products, suppliers, and customers?
- Do you interact with your clients' customers and suppliers? Do you interact with other entities?

How many teams and resources do you manage and what are the characteristics of their specific activities?

- Is/Are the team/s collocated or dispersed? How are they composed of? Are they ad-hoc or permanent?
- Would you define activities as:
 - o Standard or highly customized/specialized?
 - o Innovative or routine?
 - o Based on codified or tacit knowledge?
- Are these activities related to the core business of the clients' organization?
- Did the type and content of activities change over time (for example: clients asked for more work, entailing increasing knowledge-intensive activities or you proposed new work)? How does offshoring of knowledge intensive work differ from offshoring of routine operational work?
- How many projects does/do your team/s have now?
- Is each individual assigned to only one project? Is each individual assigned to only one team?

From now on the focus is on geographically distributed teams (GDTs), in particular those that work "around the clock"

Organization of virtual work in geographically distributed teams

What is the composition of the globally distributed team? What is its history?

Can you describe to me how a typical project within a geographically distributed team takes place?

- How does it start?
- How long does it typically take?
- How many phases is it composed of?
- How do you plan and control the work of your team?
- Are there specific mechanisms your organization and the client organization use to address intellectual property issues?

In the organization of work, does your team take advantage of time differences? How?

* Question to be asked only to the first manager

Can you describe the interactions you and the local team members you supervise have?

- With whom do you and the local team members interact with?
 - o Internal - Distant members of the team
 - o External – Clients, Suppliers, Public entities
- What is the type of interactions (sequential, reciprocal, pooled, integrated, see figure 1)?
- Are they one-to-one interactions or group interactions?
- Are they formal or informal?
- What is their frequency?
- What is the content of the interactions and during which phase of the project do they take place?

How do distributed members hand-off work? What are the main challenges you face?

Can you give me an example of successful project and an example of unsuccessful project? What are the factors differentiating the two outcomes?

Technology use and face to face interactions

Which ICTs (e.g.: telephone, video-conference, email, instant messaging, collaborative technologies, KM repositories, ecc.) does the globally distributed team use?

- Does everybody in the team have access to the same technologies?
- Do individuals differentiate the type of technology according to the content of interaction?
- What are the advantages of the use of the different technologies?
- How do technologies support the hand off of completed or partially completed work across locations?

Did the use of technologies change over time?

What are the limitations of the abovementioned technologies for distant interaction and collaboration?

- Examples of limitations:
 - o Technical: characteristics of technology, lack of experience in the use of the technology, communication difficulties...
 - o Social: norms, organizational limitations, lack of familiarity....
- Are difficulties associated to particular activities or interaction?

When do you (or your organization or the client organization) decide not to interact virtually, but to schedule a face to face meeting?

- Do you remember a particular occasion when the virtual team decided not to interact virtually, but to define a face to face meeting?

Does the organization have a formal knowledge management system?*

* Question to be asked only to the first manager

- What are the characteristics of this system?
- Does the organization establish an individual or group level evaluation on the use of this technology? For example: team level incentives for the use of repositories of documents.

Knowledge sharing and knowledge management

What is the creative contribution of the GDT?

- What is the creative contribution of the local members? Is it different from the contribution of the distant members?

Where does your team acquire knowledge from?

Do you think the members of your team share knowledge when working in virtual teams?

- What do you learn? What do you transfer?
- Did knowledge and information exchange change over time?
- Is there an evolution of competences due to repeated interactions?
- Are the new competences integrated within the organization? How?

What are the main difficulties in knowledge and information sharing?

- What are the main challenges when handing off work?
- What are the problems related to geographical distance? Is time difference an issue?
- What are the difficulties generated by cultural differences? Does your organization invest in cultural integration?
- Are there organizational/functional/professional differences between the dispersed members?
- Do barriers to knowledge and information transfer change over time during a project? And across projects?
- Are there other difficulties in the interaction within virtual teams?
- Do different individuals perceive these barriers differently? Why?

The organization and its local context*

What are the relevant, unique, and enduring characteristics of your organization/unit?

- How do you differentiate from your main competitors?
- How do you adapt to your customers and how do they adapt to you?

Is there a high turnover in your organizational unit?

- What are the incentives to remain in your unit?
- What are the alternative work occupation opportunities for professionals working with you (both in competing and not-correlated organizations)?

Do individuals or groups who leave your organization found new firms?

- Do you perceive risks of knowledge spillover for your organization and for your clients?
-

- Following offshoring collaborations, did new clusters develop?

Performance of the virtual team

How do you measure the performance of (virtual) teams?

- What is, on average, the performance of virtual teams when compared to traditional ones?
- Did you have other experiences of distant collaboration in other organizations or units? How would you compare your previous experiences with the current one?

Concluding questions

Is there anything you would like to add?

Are there public documents about international projects that I can access to?

Can you suggest me any report that describes the local context, jobs opportunities,... in this area?

Figure 1: Interdependences with the client (rectangles represent work-sites or locations, and circles, the actors within the location)

