AN ANALYSIS OF MANAGING THE GLOBALLY DISPERSED TEAM
A CASE STUDY OF AN AUTO COMPONENT MANUFACTURER

by

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A case study of an Auto Component Manufacturer

by

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ABSTRACT

Globalization has become one of the most important strategic issues for almost every business organization. Along with globalization, managers and employees are being required to work with people in geographically dispersed locations as well as in local organizations.

For a new project, a global company typically creates a group with professionals located in multiple places. The basic principles for managing a co-located group are important and can be applied to managing a group of people in geographically dispersed locations, referred to as a "globally dispersed team". However, global dispersion involves additional complexities, such as cross-cultural and cross-organizational issues.

Managing globally dispersed teams is a new challenge for managers and employees, especially those who are appointed as leaders of such teams.

Through a review of the literature and existing management publications, as well as actual case studies of globally dispersed teams, this thesis explores the key issues and develops proposals for managers who must deal with managing these globally dispersed teams.

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Introduction

In recent years, many companies have entered the international market and are expanding their business operations globally in order to pursue increased market share and economies of scale or to reduce costs by acquiring inexpensive labor.

As the result of this expansion, most companies run new projects with so-called "globally dispersed teams", that is, teams comprised of members who are located in various parts of the world. Due to recent progress with information technology (IT) (i.e., e-mail, Internet, videoconferences, and extranet), team members can communicate easily and work closely despite the enormous geographical distances that may be involved. However, even though some companies have state-of-the-art IT networks, having such physical infrastructures does not in itself promise effective information sharing and productive teamwork. In order for globally dispersed teams to work effectively, companies and managers must be aware of the issues and key factors involved in managing such teams.

Unlike co-located work teams, members of a globally dispersed team often consist of multiple-site professionals, each of whom is attached to a different organization; thus, the team is virtually organized and human interactions within the global teams are often sacrificed.

The basic principles and concepts for managing teams can be applied to both co-located teams and global teams; however, diminished human reactions from global teams can generate other complexities for managing those teams. Some of the issues involved are:

- how to build trust with minimal face-to-face interaction,
- how to motivate team members to work together when all of the team rarely ever gets together,
- how to share a common goal and lead members toward that goal.

Other issues for the organization are:

- systems to fairly evaluate team performance and individual performance,
- reward systems to encourage the team, and
- authorization.
The thesis is organized as follows:

Chapter One reviews the literature on the topic of globally dispersed teams, with a brief discussion of some of the ideas and philosophies on the subject.

Chapter Two is a brief overview of the automotive company where I found case studies for evaluating two globally dispersed teams.

Chapters Three and Four discuss two case studies of globally dispersed teams, providing information about their unique characteristics, the factors each team needed to consider, and problems encountered.

After presenting these two cases, Chapter Five analyzes the facts of the two case studies, including a discussion of communication among the team members, trust building, cultural differences, and rewards.

In Chapter Six, I draw conclusions from the research and make recommendations about successful practices for developing and managing globally dispersed teams.
CHAPTER ONE

Literature Review

1.1 DEFINING THE GLOBALLY DISPERSED TEAM

In a recent study, Jarvenpaa et al. (1998) define a global team:

A global virtual team is an example of a new organization form, where a
temporary team is assembled on an as-needed basis for the duration of a task,
and staffed by members from the far corners of the world. . . . In such a team,
members (1) physically remain on different continents and in different
countries, (2) interact primarily through the use of computer-mediated
communication technologies (electronic mail, video-conferencing, etc.) and
(3) rarely or never see each other in person. (p. 29)

A globally dispersed team is a type of virtual organization, and thus the key issues
and principles for managing virtual teams can also be applied to managing globally dispersed
teams as well. According to Kostner (1994), there are several types of virtual organizations:

- alliances with customers, suppliers, and other vendors
- downsized staffs that must share resources across a distance
- sales or service organizations that span multiple locations
- cross-functional teams where team members don’t report to the leader
- remote manufacturing, internationally shared R&D, or other remote groups
- strategic partnership and other virtual organizations
- telecommuters, mobile work groups, and other anywhere/anytime groups.

1.2 SUCCESSFULLY MANAGING GLOBALLY DISPERSED TEAMS

There are a number of important principles involved in successfully managing
globally dispersed teams, and discussion of these principles can be found in various research
and publications regarding the management of virtual organizations. Some of these
principles are: trust, leadership, communication, and integrating cultural differences.
1.2.1 Building Trust

It is obvious that for both co-located and globally dispersed teams, building trust among the team members is one of the most important prerequisites for making the team function productively. According to Jarvenpaa et al. (1998), “Although trust is important in any type of team, trust is pivotal in preventing geographical distance from leading to psychological distance in a global team.” Handy (1995) claims that “if we are to enjoy the efficiencies and other benefits of the virtual organization, we will have to rediscover how to run organizations based more on trust than on control”.

Similarly many publications that discuss virtual organizations emphasize the importance of building trust; on the other hand, they also emphasize the importance of face-to-face interaction and indicate that it is one of the best practices for building trust. Handy also notes that “paradoxically, the more virtual an organization becomes, the more its people need to meet in person.” He continues, “…videoconferences are more task focused, but they are easier and more productive if the individuals know each other as people, not just as images on the screen.”

Kostner (1994) suggests that “companies should bring people together for a project launch meeting.” However, because of distance and associated cost, most companies are unable to provide those opportunities. In such cases, trust within the globally dispersed team has to be built in different ways.

So, to build trust we need to determine what is meant by trust and define the elements of the trust for teams.

Jarvenpaa et al. (1998) suggest, “Trust can be viewed from a rational or social perspective, and increases in trust decrease the transaction cost of relationships because individuals have to engage less in self-protective action in preparation for the possibility of others’ opportunistic behavior.” The authors explain that trust enables people to take risks; it is based on the expectation that others will behave as expected. If trust is defined this way, what are the important requirements for creating such a relationship within a globally dispersed team?
1.2.2 Attributes of Trust

Jarvenpaa et al. (1998) suggest:

The trustee attributes are his or her perceived (1) ability, (2) benevolence, and (3) integrity. Ability refers to the group of skills that enable a trustee to be perceived competent within some specific domain. Benevolence is the extent to which a trustee is believed to feel interpersonal care and concern, and the willingness to do good to the trustor beyond an egocentric profit motive. Integrity is adherence to a set of principles (such as study/work habits) thought to make the trustee dependable and reliable, according to the trustor. (p.31)

Since most virtual organizations are created to accomplish a common goal together with other team members, each member’s integrity and ability to execute his/her task are essential elements to building trust within the team. Cummings and Bromiley (1996) maintain that “collective trust has an affective, cognitive, and behavioral intent component.” In addition to ability, the precise outcomes from each member are important for strengthening trust.

Sharing information regarding reputation and credibility established on the last project may accelerate the process of building trust. Handy (1995) mentions that “Trust is tough, which means that when trust proves to be misplaced – not because peoples are deceitful or malicious but because they do not live up to expectations or cannot be relied on to do what is needed – then those people have to go.” Moreover, Hallowell (1999), indicates that “productive team members will begin to feel lousy and that, in turn, will lead them to underperform or to think of looking elsewhere for work.”

Because one of the characteristics of a globally dispersed team is that it should be constructed on an as-needed basis, each member is expected to work effectively under limited time constraints. This suggests that the ability of the member has to be carefully assessed when forming the team, and then the performance of each member has to be supervised regularly. Benevolence and integrity are strong elements for building trust in the team.
1.2.3 Swift Trust

Unlike ordinary organizations, dispersed teams are usually task-oriented and exist for shorter periods of time. Under such circumstances, Meyerson et al. (1996) advocate the concept of “swift trust”. According to Meyerson, “Swift trust may be a by-product of a highly active, proactive, enthusiastic, generative style of action and there is less emphasis on feeling, commitment, and exchange and more on action.” Jarvenpaa et al. (1998) claims:

Swift trust enables members to take action and this action will help the team maintain trust and deal with uncertainty, ambiguity, and vulnerability while working on complex interdependent tasks with strangers in a situation of high time pressure. (p. 56)

Therefore swift trust created by high-quality, active performance based on members’ capabilities will enable the dispersed team members to bond and work as a team. Meyerson claims that “Swift trust is less about relating than doing.”

1.3 LEADERSHIP

According to Pellecchia (1997), “a leader’s biggest responsibility is recruiting the best people for a group.” As mentioned above, members’ abilities are crucial to the performance of a dispersed team. Therefore the team leader has to devote enormous effort to recruiting the best members for the team.

Grove and Hallowell (1998) claim that “according to leaders of successful global teams, their responsibilities require many more hours of work than they’ve ever devoted to co-located teams.” The authors continue,

There’s a greater need for thorough, timely documentation of everything, supported graphs, charts and other visuals to aid communication across language and culture barriers. Perhaps most significant, there are the hours devoted to becoming personally acquainted with the team’s members, to learning about their national and organizational cultures, and to dealing proactively with their diverse and sometimes clashing expectations regarding accountability, conflict, authority, decision making, feedback, deadlines and more. (p. 26)

Even through we expect dispersed teams to include swift trust based on a choice of the best members who have been successfully recruited by the leader, the leader has to make strong efforts to communicate with members and share information with them. Unlike a co-
located team, the leader rarely has opportunities to present information to the members at the same time and place, so the leader has to refine the content so that it will be clear to all members at every location.

Grove and Hallowell (1998) also indicate that,

The leader’s informed skillfulness is rarely more critical than during the first weeks of the team’s formation. Before the first meeting, the leader must hammer out the team’s purpose with its executive sponsors, then gauge the member’s aggregate strengths and weaknesses (information to be shared with team members so that ways of compensating for weaknesses can be devised). Worthwhile, too, is trying to persuade each members’ local manager to introduce performance on global teams in determining that member’s evaluation. (p. 26)

Even though the leader tries to recruit the best members for the team, it is not likely that every perfect candidate will be recruited. So one of the most important roles of the leader is to find ways to compensate for capabilities that are lacking. Moreover, negotiation with each member’s local manager regarding the member’s evaluation is crucial, as it gives the leader a way to motivate his team members to work more productively -- although this process may be quite time-consuming. Benson and Hsieh (1997) suggest that “Before the team starts work, the team leader or coordinator will need to facilitate a discussion that nails down role, goals, and accountabilities. When there are no face-to-face meetings, such discussions can too often go by the board.” It is also important for the leader to clarify the purpose, goals, and accountability of the project at the initial stage.

Benson-Armer and Hsieh (1997) also claim,

Teams that perform well recognize that there are essential disciplines that must be established no matter where they work.[...] The first three basics can be attained whether or not team members work in the same place. To begin with, a team must have complementary skills that together will be equal to the task in hand. Second, it must establish goals and individual and collective accountability for achieving them. Third, it must agree on a common approach to getting work done. (p. 22)

Overall, the leader’s role with a dispersed team is more crucial than it is with a co-located team in many aspects such as recruiting members, communication with their local managers, building trust, coordinating members, and leading the team to the goal.
1.4 COMMUNICATION

Communication is the basis on which the dispersed team works together. Recent information technology such as e-mail, voice mail, videoconferencing, can be used by many dispersed teams and organizations. While many of us look at the convenience brought by these innovations, most of us have also experienced e-mail or faxes that can seem to be peremptory and hostile. Especially for globally dispersed teams, e-mail is becoming a primary means of communication. However, e-mail alone, without human interaction, can result in uneasiness in the receiver, which may in turn destroy trust within the team. Hallowell (1999) cautions, “...obviously we don’t want to turn back the clock and dispense with the tremendous efficiencies afforded by electronic communications, but we do need to learn how to deal with the hidden problems they can create.”

1.5 CULTURAL DIFFERENCES

As long as teams are dispersed globally, cultural differences associated with nationality and local organization will also be a factor. Shane (1997) mentions that “while adhering to cultural preferences will not guarantee a successful innovation effort, particularly if the preferred championing style is one that is not effective in encouraging innovation, working against these preference is likely to make effort fail.” Although a dispersed team only exists virtually, and members may have different cultures and nationalities, the team should create its own culture and norms through the team’s common performance. Therefore, creating a common innovative culture within a team is an important element for the team’s long-term success.

1.6 JAPANESE vs. WESTERN KNOWLEDGE CREATION PROCESSES

One of the approaches to creating a team’s unique culture or norm is to understand the different knowledge creation processes between Japanese and Western organizations and to integrate the advantages in each process. Nonaka and Takeuchi (1995) argue that there are three key differences.

First, the interaction between tacit and explicit knowledge in the West tends to take place mainly at the individual level. Concepts tend to be created through the externalization efforts of top leaders or product champions and are then combined organizationally into archetypes of new products, services, or management
systems. In Japan, on the other hand, the interaction of tacit and explicit knowledge tends to take place at the group level. Middle managers lead knowledge-creating project teams which plays a key role in sharing tacit knowledge among team members.

Second, Western business practices emphasize explicit knowledge that is created through analytical skills and through concrete forms of oral and visual presentation. On the other hand, Japanese business people tend to rely heavily on tacit knowledge and use intuition, figurative (i.e. ambiguous) language, and bodily experience in knowledge creation. They are relatively weak in analytical skills, for which they compensate by frequent interaction among people.

Third, Western-style knowledge creation is receptive to certain enabling conditions, such as clear organizational intention, low redundancy of information and tasks, less fluctuation from top management, high autonomy at the individual level, and high requisite variety through individual ‘natural’ differences. In contrast, Japanese-style knowledge creation is characterized by relatively ambiguous organizational intention, high redundancy of information and tasks, frequent fluctuation from top management, high autonomy at the group level, and high requisite variety through cross-functional project teams. (pp. 198-199)

A summary of the differences is shown in the following Figure 1-1.

<table>
<thead>
<tr>
<th>Japanese Organization</th>
<th>Western Organization</th>
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<tr>
<td>• Group-based</td>
<td>• Individual-based</td>
</tr>
<tr>
<td>• Tacit knowledge-oriented</td>
<td>• Explicit knowledge-oriented</td>
</tr>
<tr>
<td>• Strong on socialization and internalization</td>
<td>• Strong on externalization and combination</td>
</tr>
<tr>
<td>• Emphasis on experience</td>
<td>• Emphasis on analysis</td>
</tr>
<tr>
<td>• Danger of “group think” and “overadaptation to the past success”</td>
<td>• Danger of “paralysis by analysis”</td>
</tr>
<tr>
<td>• Ambiguous organizational intention</td>
<td>• Clear organizational intention</td>
</tr>
<tr>
<td>• Group autonomy</td>
<td>• Individual autonomy</td>
</tr>
<tr>
<td>• Creative chaos through overlapping tasks</td>
<td>• Creative chaos through individual differences</td>
</tr>
<tr>
<td>• Frequent fluctuation from top management</td>
<td>• Less fluctuation from top management</td>
</tr>
<tr>
<td>• Redundancy of information</td>
<td>• Less redundancy of information</td>
</tr>
<tr>
<td>• Requisite variety through cross-functional teams</td>
<td>• Requisite variety through individual differences</td>
</tr>
</tbody>
</table>

![Figure 1-1: Comparison of Japanese vs. Western-style organizational knowledge creation](image)

Source: adapted from Nonaka and Takeuchi, 1995, p.199.
As Figure 1-1 suggests, there are distinct differences between the Japanese and Western styles of knowledge creation. In the case of a globally dispersed team which includes both Japanese and Western members, these different process can be one of the major sources of difficulty in understanding each other. One focus of the case studies found in Chapters Three and Four is to understand different approaches to integrating these differences within a globally dispersed team.

1.7 SUMMARY

In summary, the basic principles for teamwork in co-located teams are also applicable for managing global dispersed teams. But, in addition to those basic principles, managers for globally dispersed teams must also deal with additional issues.

Unlike members in co-located teams, or teams in which members have interpersonal relationships and thus may accept some delays and tolerate some poor performances, members in a dispersed team are more sensitive to inferior outcomes. Even though each is understandably caught up in his/her own local issues, those circumstances may not be issues for all the members. The responses or outcomes are almost the only evidence to prove the existence of the virtual organization. Moreover the quality of the outcomes from members is crucial for the team's productivity, which implies that the capabilities and credibility of each team member is highly important.

Careful selection of the team members is one of the primary requirements for the dispersed team. The second is to establish clear common goals for the team which every member can share and find worthwhile to work on together. Regardless of members' nationalities, the manager should find ways to create team norms that bind the members together. The third issue is coordinating with the team members' local managers and maintaining an environment in which individual contributions to the dispersed team can be fairly evaluated for promotion within the local organization. The fourth issue is sensitivity to the fact that electronic communication between individuals who do not know each other can sometimes be hostile, and dispersed individuals hardly ever get opportunities to recover the relationship, which could result in a breakdown of the whole operation of the team.
CHAPTER TWO
Corporate Group and Company Profiles

This chapter provides a brief overview of the corporate group and the company within that group where the author evaluated cases of globally dispersed teams. In Chapters Three and Four, the author presents details of the cases as well as results from interviews conducted with team members. However, before getting into the case studies, this chapter provides background information to clarify the dynamics of the corporate group's global value chain.

2.1 CORPORATE GROUP OVERVIEW

The corporate group was founded in Japan in the late 1920s. The group's primary operation is to manufacture and market auto components to Japanese auto manufacturers. Since it began, the corporate group has expanded its operations vertically by acquiring the capability to manufacture parts needed for its final products. In parallel with the remarkable growth of the Japanese economy and the Japanese auto industry, the group has increased its product lines from relatively low value-added products to high value-added ones, such as from a plastic component to a display unit. While most of the corporate group's products are designed for automobile applications, their products are sufficiently diverse that they are found in other industries as well.

In addition to the group's diversified product lines and capabilities, the group has created a globally dispersed value chain. Beginning with the establishing of its first overseas factory in Asia in the early 1960s and sales branches in the U.S. and Europe in the mid-1960s, the group extended its operations in order to acquire overseas auto customers while transferring the manufacture of labor-intensive products to developing countries. By dividing the world into three areas--Asia, U.S., and Europe--the group has duplicated its sales, development, and manufacturing activities in each region to capture cross-geographic
arbitrage. Although the multi-regional networks are generally complete, Japanese operations are still involved in many aspects.

2.2 U.S. COMPANY OVERVIEW

The company in this case study is located in Detroit, Michigan, U.S.A. It was founded in the mid-1960s for the purpose of marketing auto parts to U.S. auto manufacturers. In addition to its sales and marketing activities, the company began to support the auto manufacturers' development activities by providing on-site resident engineers to gradually transfer development capability from Japan. By having development support from other companies in the corporate group in Japan, the Detroit company increased its developing and marketing capabilities while establishing several sales branches in the United States.

The company has become a core company within the U.S.-based operation. Most of the corporate group's products that are produced in the U.S., Mexico, and Latin America are sold to U.S. auto manufacturers through this company.

2.3 ORGANIZATION OF THE U.S. COMPANY

According to information given to the author regarding the corporate organization, most of the other companies within the corporate group have a conventional, functionally aligned organization. However, the U.S. company has created a customer-focused organization, which means that the company divides its organization customer by customer. Moreover, the executive vice president of each business unit has authority and autonomy to modify its organizational structure to better fit its customer. For instance, some business units have a program management department but some do not. Besides these customer-focused business units, the company has a business unit called the Core Business Unit which functions as a headquarters and creates business policy for the other units. Part of the company organization is shown in Figure 2-1.
2.4 ORGANIZATION OF MEXICAN MANUFACTURING COMPANY

The Mexican manufacturing company produces three different products. Therefore it is divided into three factories, each producing one product. Each factory has a dedicated plant manager who is usually Japanese, and a vice plant manager who is usually Mexican. Depending on the products, such as display devices, harnesses, and connectors, the system in each plant differs slightly; however, from an organizational prospective, they are quite similar. A typical organization for the Mexican plants is shown in the Fig. 2-2.
2.5 ORGANIZATION OF THE DEVELOPMENT CENTER IN JAPAN

Similar to the Mexican manufacturing organization, the development center in Japan is also functionally divided into three departments: Mechanical Design, Functional Design, and Reliability Testing. However, since the mechanical part for the display unit is specifically designed to each customer’s line of cars, there are several duplicate sections in the Mechanical Department for each customer. In contrast, the Functional Design Department is divided into software and hardware development sections. Although the mechanical dimensions can vary for each car line, the functions of a display unit are similar from, so the Function Design Department is not divided for each customer. A broad overview of the organization is shown in the Figure 2-3.
Fig.2-3. Outline of the Japanese development center organization
CHAPTER THREE
Case Study 1: The Display Unit Development Team

This chapter discusses the results of interviews with a product development team consisting of members from the U.S., Japan, and Mexico. The product designed and developed by the team was a display device for a U.S.-based auto manufacturer. The display device had to meet relatively complex specifications and restrictions, i.e., communication functions and electro-magnetic requirements in addition to its basic display function. Since the group’s Development Center for the display unit is located in Japan and its manufacturing facility is in Mexico, development of the product involved three major companies located in three countries.

Fig. 3-1. Outline of the development of the display device.
The initial development plan for this project called for the mechanical part to be developed by the Engineering Department in the U.S. company. The software and hardware development would be done in the Japanese development center and then gradually transferred to the U.S. company. The U.S. company did not have enough resources to develop the entire display, but the company wanted to assign this development work to engineers in their organization for on-the-job training. In addition to OJT, both the U.S. company and Mexican manufacturing wanted to develop the product to include local suppliers for components like semiconductors, plastic resin and tooling, so they would have more time to organize the supply chain.

As the project proceeded, this challenging development plan was perceived as unrealistic because of continual specification changes as well as some critical failures. While hardware development work was transferred after completion of the first prototype, software development was not transferred at all, and the mechanical part developed by the U.S. company did not meet requirements. Just two months before the official production drawing was scheduled for release, the Mechanical Department in Japan was asked to support the product development. While the engineers finalized the development work, manufacturing in Mexico began preparations for production.

3.1 STRUCTURE OF THE DEVELOPMENT TEAM

Due to the expected high volume of sales of the display unit and its relatively complex functional requirements, the progress of its development had a significant influence on the business relationship with the customer. Therefore, this product development was considered one of the most important programs. In addition, this program was an opportunity to learn the development process and demonstrate development capabilities for future business opportunities.

While team development work is dependent on the auto manufacturer’s development schedule, it usually takes two to three years. In this case, the time allotted for development was approximately thirty months. This is more or less the standard span for a development center in Japan. However, due to late actions to improve mechanical concerns, the timing schedule was critical because the refining that Japanese engineers needed to do represented a big change. According to them, it was unusual to implement such a big change just before pre-production.
Fig.3-2. The Product Development Team

The change affected the entire concept of the display unit and required modifications to hardware as well. In order to meet the development schedule, the number of the engineers was increased and the communication flow was redefined.

3.2 TEAM MEMBER SELECTION

When the U.S. company was selected by the auto manufacturer as the supplier for this product, the U.S. company sent out an official announcement to the corporate group’s headquarters in Japan as well as related companies.

In the business unit of the U.S. company, there is an engineering department; however, that department was established to design only moderately complex products. So this product development was assigned to engineers in the core business unit.

In response to the announcement, each company selected members who would participate on the development team. Theoretically, the director or managers in each company have authority to assign an associate to work on the project. In talking about the selection of team members for the product development, a manager in the U.S. company commented: “In our organization, the team member selection was more flexible than in the other two organizations. Because we got engineering help from the core business unit, we
had slightly more flexibility to recruit members for the project.”

Unlike the U.S. Company, the Development Center in Japan is divided by functional divisions. Therefore, selection of team members was actually done along organizational lines without regard to the complexity of the product. A Japanese resident in the U.S. company confirmed this:

*When the organization in the development center in Japan was slightly modified, an engineer who had worked for the U.S. customer was transferred to another team and he was no longer involved with the development for U.S. customers. In general, the organizational structure has higher priority than an individual’s experience or any understanding of the customer.*

Team member selection at the manufacturing company in Mexico was much the same as in the Development Center in Japan. Although the Mexican manufacturing company does not have small teams delegated to customers in functional divisions, it has small teams delegated to the types of components or facilities. Therefore, members for the product development team could be decided based on those components. Overall, the process of member selection here is controlled by the organizational structure.

Thus, for both the Mexican company and the Japanese Development Center, it is difficult to recruit associates and engineers for a specific project, and thus, even more difficult to request the Development Center and the Mexican manufacturing site to assign particular engineers to work on the development team. A Japanese manager in the U.S. company commented:

*Of course it’s possible to mention the name of a particular engineer and request that the engineer in the other organization be assigned to a product development team. But we have never done that because the selection of members for a project team at a remote site is basically out of our authority so that those requests have negative side effects at the remote site.*

### 3.3 Socialization Process

In my interviews, most team members could not mention any specific socialization process that occurred, even at the start of the project. A Japanese manager in the U.S. Company commented:

*In this corporate group, cross-functionally and globally dispersed teamwork is not something really new. Everybody already knows that product development can’t be done without cross-functional collaboration. We*
usually create a list of contact persons and submit it to the customer but not for internal purposes. This time the program manager created a list of team members, but this is not common.

According to the program manager in the U.S. company, although no specific activities had begun, he distributed a list of team members to each member by e-mail. Especially because of the sudden involvement of the Japanese mechanical engineers at the launch phase, it was important to have a list of members. The program manager commented

I knew that such a list of team members for internal purposes is not common; however, I needed to have the list to control the product development and to know who were the key people in the remote organization. Initially, it was not easy to obtain the names of people actually working on this program because standard procedure for the group was that the department name was used, not the name of the person.

Most team members at all three locations confirmed that the list was especially useful for finding a contact person to help with occasional problems or to figure out the background of the person if questions were asked.

3.4 COMMON OBJECTIVE

Regarding the goal of this product development team, the program manager stated three key elements and distributed them to the involved department managers. Those three elements were actually customer expectations, namely, targets for Technical, Quality, and Price.

According to the program manager, he felt that since this team consisted of cross-functional professionals, it was not possible to establish a single common objective that could be shared by all members. However, he did want a set of common objectives that were somehow applicable to all members, even though individual interests would differ depending on their responsibilities.

3.5 TRUST

According to US and Mexican employees' comments, cross-functional teamwork is spelled out in their job descriptions. This implies that as long as the person works in the company, he/she may be requested and should expect to work with persons he/she does not know. In addition, the corporate group has a global network, so the cross-functional work
can be extended to cross-cultural teamwork. An engineer in the U.S. company commented:

Cross-cultural and functional activities are part of my job description, so I
tend to trust people in other departments. I don't worry about whether the
other members are trustworthy or not. I just expect them to have proper
skills to do the job right and respond to me in a professional manner.

Other interviewees in the U.S. and Mexican offered similar comments. They said that after a
few responses from other team members, it is possible fairly easy to figure out who is
capable. What is most important for team members is professional skills in their area of
expertise.

I also asked interviewees whether they do anything special to encourage trust by their
fellow team members. The answers differed due to position and responsibility, but the
following comment by a U.S. hardware engineer is a typical answer.

I don't think I did anything special. What I did was to try to complete my
task properly and keep due dates. If I could not finish the task by the due
date, I informed the other members in advance.

Unlike co-located teams, team members in globally dispersed teams are not able to
observe how members on the other side are doing, so proper performance with expected
results and timely response are crucial elements for working as a member in a globally
dispersed team.

3.6 LANGUAGE

The official language for the team communication is English. For the manufacturing
company in Mexico, language was not a big problem when communicating with members in
the U.S. company. English is required for recruiting office workers and is the official
language for office work, so all the office workers in the manufacturing company in Mexico
speak fluent English. All of the documents submitted to outside companies are written in
English and are also expected for internal use. Spanish is used purely for internal purposes
such as manufacturing standards, internal claim sheets, and equipment manuals.

However, for most members in the Development Center in Japan, English was a big
problem. The language used in Japan is of course Japanese, so all documentation is written
in Japanese. In extreme cases, employees have to translate into Japanese for internal
circulation. In general, engineers are encouraged, but not required, to learn English.
In this case study, I found that few Japanese team members had problems reading or writing English, but most found it difficult to speak in English. A Japanese mechanical engineer in Japan commented:

_\textit{I do not want to send e-mail in English unless it is really necessary or the question is really simple. Mostly I send e-mail to a Japanese member in the U.S. company and ask him to translate and explain to the other members. I'm really not comfortable speaking English over the phone.}_

For most of the team members in Japan, language was one of the biggest problems of working on the globally dispersed team.

### 3.7 ROLE OF PROGRAM MANAGER

The primary responsibility of the program manager was to maintain the timing schedule as well as to manage overall product development activities. As shown in Figure 3.1, the development team contains many professionals from different departments, so the responsibilities of each professional are generally clear for each member. However, some areas or issues need collaboration between professionals. As those issues cannot be resolved within a single department, quite often no one works on those issues, so they are kept open and sometimes cause serious problems. The role of the program manager is to avoid such situations. During my interview with the program manager, he commented,

_The program manager is not a just coordinator or facilitator. The program manager should be the team leader, which means the program manager can assign tasks to the team members. When cross-functional collaboration is needed, the program manager sets up a sub-team and assigns the task to the sub-team. It is important to make sure that each member understands his/her role and to provide necessary arrangements for collaborative work. At the same time, the program manager should be the best contributor to the team, otherwise team members will not listen to requests from the program manager. In order to be the best contributor, the program manager has to have broad knowledge of the members and be willing to help every member._

According to him, he has less experience in this company than other team members, but he has had experience in most of the roles while working in other companies. His prior background is hardware engineering, but he has experience with strategic purchasing, software development, software testing, quality, production engineering, and sales. His broad job experience was crucial to managing and contributing to the team.
3.8 ROLE OF RESIDENT JAPANESE STAFF

Within the U.S. company, more than forty Japanese people were transferred as resident staff. The standard period for residents is five years. One in the team was a resident engineer. From an organizational prospective, he worked as an engineering manager in the core business unit, so he was required to work as a manager over the mechanical, hardware, and software engineers. In addition to those organizational tasks, he was also considered a contact person for the Development Center in Japan. Therefore, initially all communication with the Development Center was done through him. He commented:

*In the initial phase of product development, it was so stressful. All the engineering information from both customers and the development center in Japan were going through me, and I had to translate from Japanese to English. Besides that, I had to manage my engineering staff. Since the software part of this product development was huge, most of my efforts went into software development. Although there were some misunderstandings in other areas of the product development, I wasn’t able to investigate the details. After some business meetings in Japan, some of the engineers in Japan started sending e-mail in English.*

3.8.1 Temporary Resident Engineer from the Japan Development Center

After the prototype phase was completed, the work of developing hardware was transferred from Japan to the U.S. company. Since there were always design changes at each development step, prototype drawings completed by the Development Center were not exactly applicable to the next pre-production model. Moreover, considering the availability and local price of components in Mexico, the circuit drawings needed to be refined. For these reasons two mechanical engineers and a section leader came to the U.S. They stayed two months, working with the U.S. engineers to refine the drawings and implement the design changes.

Assignment of the two temporary resident engineers was very straightforward but stressful. Although the two engineers did not speak English fluently, they were able to communicate sufficiently with the U.S. engineers because of face-to-face communication and a willingness to collaborate. Also the opportunities for the temporary resident had a great impact on sharing knowledge and experience with the U.S. engineers, which ultimately built human relationship with the U.S. members and enabled future communication improvements.
3.8.2 Temporary Resident Section Leader

The assignment of the section leader was somewhat more complex. In order to implement the design changes, the section leader had to talk with other departments and convince them to change their parts in order to match to the new design. By collaborating with the program manager, the section leader had to coordinate the entire development as well as production preparation activities.

3.9 RESIDENT STAFF FROM MEXICAN MANUFACTURING

While the U.S. engineers and Japanese resident engineers were refining the development work, production and quality engineers from manufacturing in Mexico were also sent as temporary residents to the U.S.. Their assignment was to learn the function and structure of the display unit. But beyond that their purpose was also to draw up specifications for the inspection tester with help from the development engineers.

With support from the program manager, a sub-team for the inspection tester was created and the temporary residents worked with development engineers. Again, this was a great opportunity to share information and experience as well as to improve overall communication between the U.S. and Mexican engineers.

3.10 CONTROL DOCUMENTS

There were four types of documents that were shared with all departments as a way to confirm the progress of development activities:

(1) Customer required document (Mostly customer forms were used.)
(2) Overall outline of timing schedule for product development
(3) Detailed action plan for limited time periods
(4) List of Issues (actions that should have been completed.)

These documents were prepared by each department. For example, the Design Failure Mode Effect Analysis (FMEA) was prepared by the Development Center in Japan, and the Process FMEA was prepared by manufacturing in Mexico, etc.. Every department manager knew which department would prepare which document, and the documents would
be updated at each step until the whole product development was finished. However, in the U.S. company and Mexican manufacturing, associates actually prepared the documents, and they did not have sufficient knowledge or experience. Therefore, there were slight delays in preparing the documents during development.

There were other documents that were used only internally. One was the general timing schedule which was prepared by the Sales Department. This schedule included the auto manufacturer’s development schedule, all major internal events, and the delivery date for customer-required documentation. Another was the detailed action plan for each company’s activities. The last was the Issues list. The term “Issue” was generally understood by the team to mean actions that should have been completed already but were not actually finished yet. These three documents were used during the development phase and regularly updated by follow-up meetings.

All of the above control documents were generated by PC-based software, so they were easy to update and possible to distribute via e-mail. A set of paper copies, together with meeting protocols, were kept officially in the library in the U.S. company.

3.11 INFRASTRUCTURES WITHIN EACH ENTITY

The infrastructure of each company is a direct reflection of that company’s strategy. Because one of the most important tasks for the U.S. company is to be the window to the auto manufacturers, the U.S. company set up a modest infrastructure to communicate with auto manufacturers.

In contrast, manufacturing in Mexico installed the minimum infrastructure for communicating with the U.S. company. So investment in the manufacturing system had higher priority over the infrastructure for communicating to the outside.

In the case of the Development Center in Japan, the infrastructure is in transition to the latest new infrastructure. However due to Japan’s long economic recession, the Development Center has not yet upgraded its infrastructure, so the Development Center is using a legacy infrastructure. A comparison of the infrastructures in each company is shown in the following Table 3.1.
Table 3.1: Comparison of Infrastructures

<table>
<thead>
<tr>
<th></th>
<th>US Company</th>
<th>Manufacturing in Mexico</th>
<th>Development Center in Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail address</td>
<td>for Individuals</td>
<td>Managers</td>
<td>For Individuals</td>
</tr>
<tr>
<td>PC availability</td>
<td>for Individuals</td>
<td>2 to 4 for the</td>
<td>3 to 5 for the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>organizational team</td>
<td>organizational team</td>
</tr>
<tr>
<td>Telephone Number</td>
<td>for Individuals</td>
<td>One representative</td>
<td>Each Department</td>
</tr>
<tr>
<td>Fax Number</td>
<td>for Individuals</td>
<td>One representative</td>
<td>Each Department</td>
</tr>
<tr>
<td>Telephone conference</td>
<td>Available</td>
<td>Available</td>
<td>Available</td>
</tr>
<tr>
<td>Video conference</td>
<td>Available</td>
<td>NOT Available</td>
<td>Available</td>
</tr>
</tbody>
</table>

3.11.1 E-mail

Although each company’s infrastructure is different, e-mail was widely used by all the members. As shown in the table, all employees in the U.S. company had PCs, and their own e-mail address. In the Development Center in Japan, all employees had e-mail addresses; however, PCs were not distributed to all employees. In the Mechanical Design Department, a team engineer had to share one PC with other members in the organization; the software and hardware engineers had their own PCs. In manufacturing in Mexico, only upper managers have e-mail addresses and PCs are limited.

So, although the infrastructure differed depending on the company and department, most team members that I interviewed confirmed the convenience and extensive use of e-mail. And while e-mail is not perfect, it is considered to be the best tool for distributing documents, exchanging information, and communicating with other members.

3.11.2 Telephone

Like the e-mail infrastructure, the availability of telephones and fax machines varied by company. Among the three, the U.S. company has a modest infrastructure, as shown in the table, so all employees were able to receive faxes and phone calls at their work spaces.

It is interesting to note that in spite of the clear differences of infrastructure and the high use of e-mail, telephone communication is reported to be the preferable tool, particularly for clarifying the context of e-mail sent in advance, notification of urgent situations, and reminders of overdue issues. However, all the engineers mentioned time difference as the biggest problem when using telephone communication.
3.11.3 Fax

Fax communication was the least-used communication method. The members reported that the modest fax system in the U.S. company was troublesome. As U.S. members each had individual fax numbers, the members in the other companies had to dial many numbers in order to send a fax and they simply avoided doing that. This inconvenience actually resulted in increased e-mail to team members in Mexico and Japan.

3.11.4 Telephone Conferences

Because manufacturing in Mexico does not have the capability for videoconferences, telephone conference was the only method for conducting a "virtual" meeting between the three sites. The telephone conferences were carried out, on average, about three times a month and most English-speaking members reported that this method was a useful way to conduct a meeting.

However, in contrast, several Japanese managers in manufacturing had comments like: "I knew that telephone meetings were often carried out. Initially I participated, but due to my insufficient English ability and bad telephone lines, I found it was a waste of time." Thus, the effectiveness of the telephone conferences clearly depends on the language ability of the participants.

3.12 WORKING MEETINGS

During product development, many joint meetings were arranged to assess the progress of product development and production preparation. The meetings were initially held either in the U.S. or Japan. But after pre-production began, most meetings were held in Mexico.

Table 3.2 shows the number of business trips made during the thirty months of the program. For each meeting, participants were requested to prepare thoroughly prior to the meeting. The joint meeting was reported by all the members as the best opportunity to calibrate their understanding of the situation as well as to clarify the real interests of each department.
Table 3.2: Number of business trips made during the program

<table>
<thead>
<tr>
<th>Home</th>
<th>Member</th>
<th>Trip to USA</th>
<th>Trip to Japan</th>
<th>Trip to Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Program Manager</td>
<td>N/A</td>
<td>5 times</td>
<td>8 times</td>
</tr>
<tr>
<td></td>
<td>Sales Manager</td>
<td>N/A</td>
<td>None</td>
<td>8 times</td>
</tr>
<tr>
<td></td>
<td>Engineering Manager (*1)</td>
<td>N/A</td>
<td>5 times</td>
<td>4 times</td>
</tr>
<tr>
<td></td>
<td>H/W Engineer</td>
<td>N/A</td>
<td>Once</td>
<td>2 times</td>
</tr>
<tr>
<td></td>
<td>Mech. Engineer</td>
<td>N/A</td>
<td>Once</td>
<td>None</td>
</tr>
<tr>
<td>Japan</td>
<td>S/W Section Leader (*1)</td>
<td>6 times</td>
<td>N/A</td>
<td>2 times</td>
</tr>
<tr>
<td></td>
<td>H/W Section leader (*1)</td>
<td>3 times</td>
<td>N/A</td>
<td>3 times</td>
</tr>
<tr>
<td></td>
<td>H/W Engineer(*1)</td>
<td>(1 month resident)</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Mech. Section Leader(*1)</td>
<td>2 times</td>
<td>N/A</td>
<td>2 times</td>
</tr>
<tr>
<td></td>
<td>2 Mech. Engineers (*1)</td>
<td>(2 months resident)</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Mexico</td>
<td>Vice Plant Manager</td>
<td>3 times</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Costing Manager (*1)</td>
<td>2 times</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Quality Engineer</td>
<td>(2 months resident)</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Prod. Engineer</td>
<td>(2 months resident)</td>
<td>None</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* = Japanese staff

Most of the meetings in Mexico were held during the launch phase. One of the biggest joint meetings was held after the mechanical department in Japan became involved. Due to major design changes just before the production launch, as well as the participation of Japanese engineers, most members from the U.S. and Mexico attended the meeting. A Japanese manager resident in Mexico made the following comments:

"It seemed to me that the meeting was actually a kick-off meeting. During the meeting, I met almost all the members and had detailed discussions with them. The meeting was a real opportunity to clarify concerns, the timing schedule and further action plans, and to contact various other people."

From the perspective of the initial development plan, the purpose of the meeting was to recalibrate project objectives and clarify the situation; however, due to the sudden involvement of the Japanese mechanical department, the meeting also worked as a socialization process and externalized all the concerns before the production launch.

In general, when the Japanese engineering leaders visited the U.S., they also visited Mexico in order to learn about the manufacturing facility. For Japanese engineers in particular, the business trips to the U.S. and Mexico were long, sometimes more than two weeks. So willingness to travel is one characteristic needed to work as a member of a dispersed team.
3.13 REWARDS AND RECOGNITION

None of the companies has a system that gives rewards and recognition for dispersed cross-functional activities. While the U.S. engineers expressed frustration that there were no rewards for achievement, Japanese manager offered the following reply during the interviews:

Regardless of the team members' location, cross-functional work is an underlying concept of product development. All the tasks I assigned to engineers were initially accepted by the organization, which means that the organization is responsible for the tasks. Therefore the outcome of the work is the achievement of the organization, not any one individual's achievements.

He concluded that it would be different if the task was assigned to another engineer. In any case, all the individuals' achievements were reflected in their performance evaluation, so from the Japanese perspective it is reasonable that the company does not have a reward and recognition system.

3.14 CULTURAL DIFFERENCES

Throughout the interviews, none of the team members expressed real concern about problems that may have been caused by cultural differences. According to the Japanese manager working in Mexico, the Mexican office workers had higher education and they worked as hard as the Japanese. Occasionally they put a higher priority on major family events, but otherwise they worked overtime if it was really needed. These comments were confirmed by other members in the U.S. and Japan.

In terms of cultural difference between American and Japanese, one of the team members commented that Americans seem to focus on reasons why the task is important, while Japanese tend to focus on its due date. Some members mentioned those small issues, but most reported that cultural differences were not an issue in the overall product development activities.
CHAPTER FOUR

Case Study 2: The New Connector Development Team

This chapter presents the result of interviews with a product development team consisting of 18 members in six departments from the U.S. and Japan. Their objective was to develop a new connector to be manufactured by the supplier, then shipped to the assembly plant and delivered to auto manufacturers as part of an assembled product called a “harness”. Development of the connector requires that engineers have specific knowledge about this piece of the component. However, from a functional standpoint, the component is relatively simple, so auto manufacturers tend to use the connector for as many car lines as possible to realize further cost reductions.

In this case, development of the connector was originally initiated by a Japanese transplant auto manufacturer in the U.S., so the plan was to use the connector for both the U.S. and the Japanese operation for the auto manufacturer. Despite the fact that both the supplier and the auto manufacturer have duplicated operations in each country, the connector will be used as a global standard component for both manufacturers and the supplier. Therefore, from a sales volume as well as quality perspective, this product development is a key activity, especially for the supplier. Nevertheless, development of the connector is a secondary program prior to the harness development, which added some complexities in terms of obtaining and sharing information among contact persons in the dispersed locations.

This team is structured somewhat differently in that there is no third country manufacturing component as there was in Case Study 1. As can be seen in Figure 4.1, all components of the team came from the U.S. company and the Japanese manufacturer.
4.1 STRUCTURE OF THE DEVELOPMENT TEAM

The members of the development team were two connector engineers, three harness engineers, two customer engineers, and three salespeople in each country, a total of twenty professionals involved in this product development.

The three harness engineers devoted only part of their effort to this connector development, but they were expected to gather technical information and share it with the connector engineers so as to be an engineering window. The two connector engineers in Japan were expected to contribute with technical advice and design review. From their perspective, as far as the connector development was concerned they believed they had superior knowledge, experience, and testing equipment. The three sales associates in Japan
actually contributed the least; however, as contact people to the customer's headquarters, their input had great impact to the connector engineers.

Due to the nature of the connector, actual development activities, such as making drawings, testing, and review, could be done by a relatively small number of experts; however, the two sources of customer information, the two harness development activities, and the needed technical advice added other complexities to obtaining the necessary information.

4.2 TEAM MEMBER SELECTION

The process of selecting team members was almost the same as in Case One. After receiving an official kick-off announcement from the U.S. company, each company selected members for the team. Theoretically, the director or managers in each company had authority to assign associates to work on the project; in reality, the members were selected according to the organizational structure. Again, it was not realistic to recruit members who were not aligned with the proper organization.

4.3 SOCIALIZATION PROCESS

The socialization process for this development was also the same as the previous case, even though no specific person was delegated as program manager. Instead of a program manager, the sales manager in the U.S. company created a list of team members and distributed it to the customers as well as to each member. This type of socialization activity is not usually considered as standard procedure but it is widely used in the company.

4.4 COMMON OBJECTIVE

The common objective shared by all team members was dedicated commitment. One manager had the following comment: "This is the first connector development initiated by the U.S. transplant. As the representative of the supplier, all of us have to work hard to fulfill all customer expectations." All the team members confirmed this feeling during the interview; however, most of them also believed that the U.S. connector engineers should have ultimate responsibility.
Typically, harness engineers (excluding the manager) saw the connector as only one component of the harness. Thus, they put a higher priority on their own tasks, namely development of the harness itself, rather than their expected role as an information window on the development of the connector piece.

4.5 TRUST

Similar to the first case study, the U.S. connector engineer commented that he never seriously considered whether he could trust other people in the team because cross-functional work was required by his job description. Although his responsibility was to connector design and his contact was limited to his manager, the U.S. harness engineers, and connector engineer in Japan, he expected those members to have the same understanding he did, that cross-functional work was the underlying concept for the product development and he expected that they would perform each task accordingly.

4.6 LANGUAGE

The official language for team communication is English; however, informally Japanese is generally used. This is not officially acknowledged, but it is unofficially considered to be part of the service to provide a contact person who speaks the customer’s native language. In fact, more than one Japanese in each department were involved in this project. Even though it was primarily for customer service that there were Japanese in each department, the members in Japan did not properly understand this concept. They saw the Japanese residents as the contact persons to Japan so that all the inputs from Japan were written in Japanese. Even the agenda of a meeting held in Japan was sent in Japanese.

4.7 ROLE OF TEAM LEADER

Unlike Case One, this development team did not have an explicit team leader. In fact, during the interviews different names were given as the team leader. In further discussions with interviewees, they offered definitions of “team leader” which explained why different names came up.

*The person who provides necessary information.*

*The person who has the most knowledge and skills*

*The person who has the most information for the customer and the project.*
4.8 ROLE OF RESIDENT JAPANESE STAFF

The Japanese resident staff at the transplant auto manufacturer are in a delicate position. They are expected to be contact people to customers and to speak easily and knowledgeably, which implies that they are expected to have deeper information than many local employees would have. At the same time, they must also have a broad knowledge of activities happening in Japan and thus calibrate their understanding of the situation between both parties. On the other hand, one of the ultimate goals for the transplant company is localization, so that as organizational managers or supervisors they are expected to develop their staff to become their successors so the transplant staff can return to Japan. During the interviews, most of the Japanese residents referred to the difficulties of accomplishing these two almost conflicting tasks.

In addition to those comments from Japanese residents, I was also given the following strong comments from one of the U.S. employees: "I know some people in Japan are involved in this development activity but I don't know what they are doing. I don't consider them as team members." Apparently, while he was required to work as a contact person to the customer, he himself felt isolated. This comment implied frustration with his organizational supervisor and indicated the difficulties of the role of resident. Unfortunately, he left the company one month after I interviewed him.

4.9 TEMPORARY RESIDENTS TO JAPAN

The U.S. company expects that a new employee will learn his/her responsibilities through on-the-job training (OJT). In addition, the company sometimes sends engineers to Japan as a way for them to acquire further development know-how and ongoing improvement. One U.S. engineer who had been in Japan three months made the following comments:

It was a really nice opportunity. I learned more about company and development procedures. Besides, it was nice because I was able to see a real facility and finally meet people I had contacted before.

The purpose of the program was to increase knowledge and skills for development, however, people who had this opportunity emphasized the value of the complementary activities.
4.10 CONTROL DOCUMENTS

Unlike Case One, there were no common control documents that could be shared with team members. Although the members acknowledged the importance of developing this connector, most were focused on the progress of the overall harness development because the connector was only one part of the finished product.

Nevertheless the connector development team in the U.S. company created a timing schedule based on the overall harness development schedule; however, the connector timing schedule was shared only with connector engineers in the U.S. and Japan.

4.11 INFRASTRUCTURES WITHIN EACH ENTITY

As mentioned in Chapter Three, people in the U.S. company enjoyed the most advanced infrastructure.

Table 4.1. Comparison of infrastructure

<table>
<thead>
<tr>
<th></th>
<th>Sales/ Harness development/ Connector development in the USA</th>
<th>Sales/ Harness development/ Connector development in Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail address</td>
<td>For Individuals</td>
<td>for Individuals</td>
</tr>
<tr>
<td>PC availability</td>
<td>For Individuals</td>
<td>3-5 for the organizational team</td>
</tr>
<tr>
<td>Telephone Number</td>
<td>For Individuals</td>
<td>Each Department</td>
</tr>
<tr>
<td>Fax Number</td>
<td>For Individuals</td>
<td>Each Department</td>
</tr>
<tr>
<td>Telephone conference</td>
<td>Available</td>
<td>Available</td>
</tr>
<tr>
<td>Video conference</td>
<td>Available</td>
<td>Available</td>
</tr>
</tbody>
</table>

For team members in Japan, as in the previous case, each had a moderate level of infrastructure.

4.11.1 E-mail

As a result of autonomous IT strategies in the individual organizations, infrastructure varied from company to company. Although the team members generally used e-mail, one team member reported the following negative comment:

*E-mail is a very useful way to access team members in Japan and it’s easy to distribute information. However I don’t think e-mail is the way to communicate all the members. In my experience, I’d send e-mail to three people in Japan and no one replied.*
Most team members people confirmed that e-mail is useful for accessing members but e-mail alone does not promise efficient communication within the dispersed team.

4.11.2 Telephone

Although most of the team members maintained e-mail as the most frequently used tool for communicating with each other, in this Case too, the telephone remained the most useful tool because of its instant accessibility and interactive communication -- despite the limitations due to time differences. One engineer suggested that the telephone is the best tool for direct interaction with members in dispersed locations. For the most part, the telephone is used for clarifying distributed information and communication urgent needs; however, it is also recognized as a good tool for establishing relationships.

4.11.3 Fax

Just as in Case One, fax communication was considered the least preferable tool due to differences of infrastructure. The following problem encountered by a U.S. harness engineer was reported:

One person in Japan dialed the U.S. company's number to send a fax. Since the number of fax machines in Japanese companies is limited and the sender's department has an internal fax distribution system, he assumed that the U.S. company would have a similar system. As there were no such system setup in the U.S. company, the fax was never delivered to the intended receivers.

A person working at one site tended to assume that another site would have a similar infrastructure as his own, which suggests differences of infrastructure should be covered as a part of the socialization process.

4.11.4 Telephone Conferences

Telephone conferences were not arranged as part of the connector development. All the telephone conferences were primarily for the purpose of discussing harness development. As connector development was only one of the discussion items, the connector development engineers participated only occasionally.
4.12 WORKING MEETINGS

In the U.S. company, regular meetings were arranged bi-weekly. At least one person from each department was expected to participate in this meeting. After the meeting, a meeting protocol was distributed to all six departments except the customer. Information was distributed to most team members; however, of a team member wanted to clarify some aspect of the content, he was expected to contact the expert in the same professional area. This meant that sales in the U.S. would contact sales in Japan, and the connector engineer would contact connector engineers in the opposite site. Joint meetings across the country were held only a few times. Every six months, a representative of this project went to the other country. As far as this project was concerned, there were few business trips required of members in either country.

4.13 REWARDS AND RECOGNITION

As reported in the interviews for Case One, some engineers also felt the need for a reward and recognition system which the U.S. company did not have, while most of the Japanese managers in this team felt there was no need.

4.14 CULTURAL DIFFERENCES

None of the members reported any troubles caused by cultural differences. However, one Japanese team member reported that he felt as if he was working in Japan while living in the U.S. and An American engineer said that he felt isolated.

Even though team members thought that those issues were trivial, they could bring a harmful impact to the employees’ long-term performance.
CHAPTER FIVE
Analysis

The previous two chapters presented several issues identified through the case studies of two product development teams. In this chapter, I selected some of the issues that are crucial for managing a globally dispersed team and I analyze each issue as it relates to the literature review in Chapter One.

5.1 TEAM DYNAMICS

5.1.1 Communication Patterns in Case One

Due to his personal efforts, the team manager was able to identify team members in the U.S. company as well as in the other organizations. He actively communicated with members in the U.S. and the program manager in Mexico so he could manage the overall product development. Because of his leadership efforts and broad knowledge, he was able to communicate with members in every department and check project progress in each department.

Fig. 5-1. Initial team communication network
As shown in Figure 5.1, the initial communication pattern within the team was the so-called "hub-and-spoke" style which was efficient for the program manager as he was the center of team communications and thus was able to provide information to the team members. However, that type of communication pattern also had the unfortunate effect of reducing cross-functional communication as well as collaboration.

After the involvement of the Mechanical Department in the Development Center in Japan, communication pattern began to change and cross-functional communication increased. In order to implement the changes, the Mechanical section leader had discussions with other departments and then collaborated with the Hardware Department. Since the Japanese engineering manager who had overall responsibility for the development work was too busy to take care of software development as well, the Mechanical section leader started discussions with a senior hardware engineer. The Mechanical section leader had long experience with both hardware and mechanical development for this type of product development, he gradually started supervising both the mechanical and hardware parts of the development.

He also began to communicate with manufacturing managers in Mexico. Since all five Japanese managers resident in Mexico formerly worked in manufacturing in Japan -- in the same location as the Development Center, the section leader had previously worked with three of the resident managers in the past. Although he did not know the other two managers, all five of them knew the principles for product development in Japan.

This common knowledge among the Japanese managers helped the Mechanical section leader to establish a communication network with both the development and manufacturing departments even though he had been forced to jump into the middle of this project.

The characteristics of this type of network are the basic principles and common knowledge of product development which were already familiar to each member. In addition, as mentioned in Table 1.1, this network has characteristics that are typical of Japanese organizations. The ultimate communication pattern was shown in the Figure 5.2.
One point I would like to make is the redundancy of information. Before the Mechanical section leader began participating in this project, information regarding mechanical concerns was not widely shared by the dispersed cross-functional team because mechanical engineers understood that those concerns would be taken care of by their department and other departments were not responsible. However, after the Mechanical section leader created his network, information was more widely shared by the members. The Mechanical Department was of course responsible for resolving concerns; however, by sharing these concerns, the Mechanical Department also received feedback from the Production Departments, which in turn were able to prepare for upcoming design changes in advance. This redundancy of information was ultimately beneficial for the entire product development.

With support from program manager for a joint meeting in Mexico, the Mechanical section leader tried to expand this network to other departments, such as sales, finance, and software development. Through the joint meeting as well as the information network, each department began to share their concerns, and the resident Japanese managers in Mexico started working on this project.
One advantage of this network was the members' position. Most members of the network were middle managers who had the authority to manage their staff and implement the objectives of each local organization (See Fig. 5-3).

By sharing the project goal with those key people in each department, the Mechanical section leader was able to manage the entire product development. He relied on program managers to help him do this, but his approach was to create a middle management network among the involved departments. This approach ultimately deprived the program manager of the leadership (see Fig. 5-2).

In terms of communication within each department, there were some conflicts between the resident Japanese manager and the local staff. One problem was a lack of communication because of language differences. However, a different knowledge creation process was a more critical factor. As mentioned in Table 1.1, Western organizations tend to have individual autonomy and less redundancy of information. Typically, in the U.S. Mechanical Department, each engineer has a specific job description and there is little overlapping work. By contrast, the Japanese Mechanical section leader used his customary Japanese approach, including a middle management network and overlapping knowledge creation through cross-functional interaction. An example of the cross-functional communication flow is shown in Fig. 5-4.

In this case, because two resident Japanese engineers were able to work together with local engineers and share knowledge and experience, these approaches were reinforced. Otherwise it would have been difficult to implement these approaches in a short time.

In summary, this product development team required two types of management skills: one to manage and communicate with different departments in dispersed locations, and the other skill to utilize local objectives, project goals, and the reality of the work environment.
5.1.2 Communication Patterns in Case Two

For Case Two, the involved departments in the U.S. and Japan were almost identical, although tasks and responsibilities were different. Therefore communication between the U.S. and Japan was very function-oriented. This meant that development staff in the U.S. talked with development staff in Japan; sales personnel in the U.S. communicated with sales personnel in Japan, and so on.

As far as communications between the U.S. and Japan, there was no communication cross-functionally. Because of language differences and different technical terms, people in both organizations tended not to communicate with people in different functions in the other company because the communication was very inefficient.

In terms of communication across departments, the U.S. Company set up bi-weekly meetings. In these meetings, issues, task progress, and the timing schedule were discussed. Because of these face-to-face meetings with co-located members, the discussions were usually very productive and, although some issues were very technical, members generally understood the situation and could confirm the status of the project.
This communication style was probably possible due to fewer complexities of the product as well as duplicated departments in both the U.S. and Japan. Nevertheless, this communication style provided a great advantage of simplicity. The concept of the communication pattern is shown in figure Fig.5-5.

![Diagram showing communication flow of the new connector development team](image)

---Middle management network
---Task-oriented Communication flow at engineer level
---Function-oriented communication flow

Fig. 5-5. Communication flow of the new connector development team

Although the team had a simple and clear communication flow, there were some problems. One was information sharing. Because connector engineers received customer information from the harness engineers, the connector engineers sometimes encountered delays and lack of information— even though the team had a joint meeting every two weeks.

5.1.3 Summary of Team Dynamics

In summary, by analyzing both case studies, four different communication flows were observed in the globally dispersed teams.

1. Middle management network: Communication with representatives from each local organization. Middle management was usually a department manager or section leader and
they understood the project objectives, the local organization’s objectives, and the reality of the actual tasks to be accomplished. They were core members of the globally dispersed team.

2. **Task-oriented communication**: Although several departments were working on the same project, at the engineer or associate level communications were limited and task-oriented. Typically, there was intense communication between the Mechanical Department and Hardware Department, while there was almost no communication between Software and Finance at the associate level.

3. **Function-oriented communication**: If there was an identical functional organization at the remote site, communication with the remote site was dominated by the functional department.

4. **Communication within the local team**: Such communication is not unique to a globally dispersed team, but in these two case studies communication between the Japanese residents and the local staff was an important element for the success of the team’s performance so local objectives, project goals, and the realities of the work environment can be shared through this communication.

5.2 **SOCIALIZATION**

In both cases, there were no special socialization processes for the team members. The only way the members knew who was working on the team was through an e-mail distribution list; however, the list was not regularly updated. Ultimately, there were no materials to show all the team members.

When Japanese Mechanical section leader began to work in the team, there was no socialization process for the team, and he had to establish the relationship himself. Eventually
his network with middle management was effective for initiating collaborative cross-
functional work as well as utilizing Japanese and Western knowledge creation processes. The
same was true for new engineers and associates. Two temporary mechanical engineers from
Japan had to determine the appropriate contact person themselves with some support from
their supervisor.

It is apparent that while the program manager in Case One argued for the importance of
the socialization and a clear understanding of the contact persons, Japanese managers did not
see the importance. As mentioned in Chapter One, Western companies tend to focus on
individual autonomy while Japanese companies focus on group autonomy. Thus, Japanese
managers considered that the project tasks were given to a local team: not to a specific member,
so as long as the local team was working on the project tasks, it was not necessary for the other
side of the organization to be informed of individual names.

In summary, the socialization process depended largely on personal effort, and the
Japan-based organizations did not feel the need for a specific socialization process for the
cross-functional projects.

5.3 TRUST WITHIN THE TEAMS

As mentioned in Chapter 1.5, Benson and Hsieh (1997) suggest that there are three
disciplines essential to attaining high team performance. Those elements were seen in both
case studies.

1. **Complementary skills**: In both cases, the teams consisted of cross-functional
team members with local organizational backup.

2. **Goals and accountability**: The goals were shared by the team members and
each member had properly defined responsibilities.

3. **Common approaches**: Procedures and guidelines for product development
were widely understood by middle management in each department.
These three elements encouraged trust building within the team members and reinforced communication among the members.

By analyzing actual cases, I observed four different communication flows. In any one of the four communication flows, these three issues were essential to building trust and binding the members to work together toward a common project objective.

5.4 PROGRAM MANAGER AND LEADERSHIP

As mentioned in Chapter 1.5, Grove and Hallowell (1998) claimed that the role of team leader is to recruit the best members for the team and to find ways to compensate for lacking capabilities. In these two case studies, team member selection was done by each local organization, and the selection based on the local organizational structure.

In Case One, the Program Manager was responsible for the entire project. Although he was not able to recruit team members, he made an effort to clarify the purpose, goals, and accountability of the project in the initial phase of the project. As Grove and Hallowell (1998) suggest, before the team starts work, the team leader or coordinator needs to facilitate a discussion that nails down goals and accountabilities. In this case, the Program Manager’s approach was essential as leader of the team.

However, when the Mechanical section leader from Japan joined the team, the leadership gradually moved to him. As Clark and Fujimoto (1991) maintain,

... leadership in product development is not only a matter of position; it involves the practices and behaviors that exert influence over designers, engineers and marketers. (p.247) Effective product managers must be “multilingual”; they must be fluent in the language of customers, marketers, and designers. (p. 259)

When the section leader joined the project, implementation of a big design change was the most important task, and he needed to collaborate with the other departments. Since he understood the work of the other departments because of his long experience in Japan, and he
had the authority to implement the mechanical design changes, he gradually took over management of the project.

In addition to the section leader’s capabilities, he created middle management network within the involved departments. This network eventually changed team’s communication flow from hub-and-spokes to federal style therefore project information that previously controlled by the program manager was shared by middle management and the program manager was eventually considered facilitator.

5.5 THE ROLES OF RESIDENT AND LOCAL STAFF

5.5.1 Criteria for Residents

Through interviews with Japanese residents in the U.S. company, it was determined that residents are nominated based on their abilities in the following areas:

(1) Credibility and experience in a particular work area
(2) People skills and ability to adapt to a different environment
(3) Language ability

Actually, language ability is considered the lowest priority when final decisions for residents are taken. This is partly because headquarters in Japan provides language training courses for residents before they are transferred. Most residents appreciated the language education program and found it useful. However, they pointed out the program was not enough to prepare them for day-to-day work. Due to time differences between the U.S. and Japan, residents found they had to remain late at work in case they needed to contact Japan. This meant they had little time to arrange for language lessons after they transferred to the U.S.

As long as the residents are required to work as line managers or supervisors, the first criteria is considered the most important, however, the third is also crucial in terms of information sharing. Especially for residents in Mexico, they have to acquire English skills in a Spanish environment, so OJT alone will not help them increase their English ability.
Additional language education is essential for residents who do not have superior language skills because language is obviously a barrier to accomplishing their assigned role.

5.5.2 Role of Residents

The role of residents was not clearly specified in their job description, while every engineer and other associates have a well-documented job description. Since all Japanese residents are placed as either line managers or supervisors, they are responsible for their organizational position. However, in addition to that fundamental task, they are also required to accomplish the following tasks.

- Communicate with the organization in Japan
- Transfer knowledge and implementation to the local organization
- Educate local members and train a successor
- Customer contact in cases where the customer is a Japanese transplant

These additional tasks are equally important. However, the second item has the highest priority because the third item can be accomplished while doing the second one. In fact, most residents tend to focus on communication with the Japan organization and put a lower priority on the other items because that is easiest for those who do not speak English fluently.

5.5.3 Different Knowledge Creation Processes

In addition to the language barrier, as mentioned in Chapter One residents face problems caused by different knowledge creation processes. The residents have sufficient ability to proceed with project tasks such as prioritizing issues, identifying important issues, taking immediate action, sharing selected information, and so on. However, they are not able to transfer that knowledge to the local staff because their tacit knowledge is based on past experience in a Japanese organization. The best way to transfer tacit knowledge is to work together and share experiences. By working together on a decision-making process with the
local staff, residents can transfer knowledge that way. This may sound like the traditional “learning by doing” method of knowledge transfer, but it also seems to be the most efficient way for residents to transfer tacit knowledge to their local staff.

Nonaka and Takeuchi (1995) claim that, with some modifications, the Japanese style of knowledge creation can be applied to Western organizations to create an integrated knowledge creation style by utilizing both advantages. The ultimate challenge for resident managers is to refrain from imitating the Japanese system in the local site, but at the same time to understand the differences and utilize advantages of the both systems.

5.6 TEMPORARY RESIDENT PROFESSIONALS

In the case studies, the role of the temporary resident was basically as a solution provider. In Case One, mechanical engineers began working with U.S. engineers for two months. Initially there was great reluctance among the U.S. engineers, as the two Japanese engineers were considered to be “outsiders”. Although neither Japanese engineer could speak fluent English, by working together, the four began to communicate with each other.

In working with the U.S. engineers, the two Japanese engineers transferred technical knowledge, know-how, and procedures. The approaches for this knowledge transfer were sharing information about concerns, identifying the cause of concerns, and implementing solutions using explanations taken from past experience. By going through these steps with the U.S. engineers, the two Japanese engineers transferred their knowledge and created solutions. Their technical knowledge were tacit knowledge-oriented therefore, by sharing experience with the U.S. engineers, they were able to transfer their knowledge. The temporary resident engineer is a typical example of “learning by doing”.

In the case of a globally dispersed team, it can become an important issue to transfer knowledge and create a common knowledge platform, so temporary residents are considered one of the best approaches for solve this problem.
5.7 INFRASTRUCTURE

Regarding infrastructure, there were obvious differences between companies; however, all members of the global teams had IT capability to communicate with members in the remote site. Although the U.S. company had the most modest infrastructure, that did not mean any communication advantages for the other members. It is important to have the ability to communicate with members via e-mail, telephone, fax, voice conference and videoconference if possible. However, IT capabilities alone will not provide effective team communication within a globally dispersed team.

5.8 REWARDS AND RECOGNITION

Since the Japanese style of management dominated both globally dispersed teams, there were no rewards or special recognition for working on a globally dispersed team. Although there were no obvious conflicts or problems caused by this different management style, most U.S. employees and the Mexican workers expressed frustration at not having any type of reward or recognition, and over the long term, this frustration could have a negative impact on employee morale. As long as the corporate group aims for localized operations, it will be important to pay attention to this issue.
CHAPTER SIX

Conclusions and Recommendations

After studying publications on the topic of globally dispersed teams, as well as product development projects at auto parts manufacturing company, I conclude with a summary of the key issues found in the case studies and some recommendations for future study.

6.1 GLOBALLY DISPERSED TEAMS

The two cases studied in this thesis involved product development teams that had to work on cross-functional activities. The teams existed only for a limited time period and so could be considered temporary teams. However, for this particular corporate group, this type of cross-functional product development is quite common, and most departments had two or three product development teams running simultaneously. Certainly more will be used in the future.

Depending on the complexity of the product to be developed, the number of involved departments and the number of members can vary significantly. In Case Study One, which concerned product development for a relatively complex product, there were thirteen departments in three locations involved in the product development, and project tasks were completed on a departmental basis with collaboration among related departments.

In Case Two there were six departments from two locations involved and the project tasks were completed almost on an individual level. Nevertheless, in this particular corporate group, the globally dispersed teams worked on department-oriented activities.
In summary, I observed that there was a strong notion, especially among Japanese managers, that globally dispersed teams consist of many departments, not individuals, in multiple locations. Therefore, even though each product development project was a temporary team-based activity, for members in each department who worked as part of a globally dispersed team for a time, it was not a temporary task but a continuous routine task within their local department.

6.2 COMMUNICATION

In the case studies, I observed four different communication dynamics in the globally dispersed teams and key elements behind each communication flow.

1. **Middle management network**: Sharing project goals and integrating with local objectives.

2. **Task-oriented communication**: Leveraging and integrating different knowledge.

3. **Function-oriented communication**: Acquiring deeper knowledge, know-how, and procedures.

4. **Communication within the local team**: Sharing tacit knowledge and externalizing concerns.

The intensity of communication varied depending on the size of the team. However, these four communication flows remained crucial elements for the success of the project and the teams’ overall outcomes. Of course, the four were equally important for the teams’ success.

From the viewpoint of managing a globally dispersed team, the middle management network was the most crucial element for binding diversified functional departments so that the network provided opportunities for each department representative to share information, exchange knowledge, measure project progress, and build common experiences from the project. Information gained from this network might be useful for some departments and
redundant for others, but this redundancy of information eventually created common understanding and reduced the transaction cost of information sharing.

Task-oriented communication and function-oriented communication flows were important interactions for engineers and associates to help them complete specific project tasks and acquire knowledge and know-how in specific working areas.

Communication within the local team was an essential dynamic to managing co-located members. In the specific Japanese-based corporate group, in order to establish foreign operations, Japanese staffs were transferred as residents, which strengthened the middle management network but at the sacrifice of communication from local staff.

6.3 CULTURAL DIFFERENCES

Although no particular issues caused by cultural differences were reported during the interviews, different approaches to such things as rewards, recognition, and management styles arose out of cultural differences.

One requirement for understanding cultural differences is the need to understand the differences in knowledge creation processes between Japanese and Western organizations. As reviewed in Chapter One, several characteristics were highlighted in Table 1.1, and they are crucial for preparing to work with people in a different culture.

In both case studies, the Japanese style of knowledge creation became dominant for managing the teams. However, it is important that managers working in globally dispersed teams harmonize the advantages in both styles and create a unique management style. Along with their company’s globalization, this issue could be the ultimate challenge for the entire corporate group.
6.4 RESIDENTS

Japanese resident personnel were usually appointed to positions as manager or higher, and they worked for five years in the local organization. In particular, Japanese residents who were appointed as functional managers played important roles in the product development teams, and their performances were crucial for connecting and synchronizing the four communication flows within the globally dispersed team.

In Japanese organizations, those four communication flows were already established and embedded in the team members’ tacit knowledge. Therefore when Japanese residents were at work in Japan, they did not think about the importance of such communication since the members naturally shared tacit knowledge.

However, after being transferred abroad, the residents needed to work with local team members who had different knowledge. The initial challenge for the residents was to generate communication flows within the local team and transfer the residents’ tacit knowledge. Language was an important skill but even more important was figuring out effective ways for exchanging and transferring knowledge to the local employees. Traditional approaches, such as face-to-face conversation, learning by doing, working together, and sharing experiences, worked well. While Japanese residents needed to transfer their knowledge, they also had to respect the local knowledge and create communication flows that took advantages of both types of knowledge creation.

In summary, besides capabilities in a specific functional area, residents are required to have a high degree of management skills in order to generate and coordinate the four requisite types of communication flows.
6.5 TEMPORARY RESIDENT

Installing temporary residents was a preferable approach to accelerating task-focused communication, function-oriented communication, and communication within the local team. The main role of temporary residents was as solution provider, and they were under strong pressure due to time constraints. Therefore, to find solutions in a limited timeframe, they grabbed members from related department and worked closely with them. In addition, they communicated intensely with their original departments to have concrete back-ups.

Through their limited stay, the temporary residents exchanged knowledge, shared experiences, built personal relationships, and gained a better understanding of the realities of the remote site. All these elements were crucial to maintaining communication across departments and sustaining effective communication within the globally dispersed team.

6.6 LEADERSHIP

The objective of both globally dispersed teams in the two cases was product development. Product development is generally categorized by sales, development, pre-production, and production phases.

In Case Study One, in the sales phase, the program manager in the U.S. company was seen as the team leader. When the Japanese Mechanical section leader began to participate in the product development, he took over leadership by creating a network among responsible team members in each department. However, eventually there were no particular leaders in the team due to the middle management network. It is interesting to note that the timing of this migration matched the team’s move from a Western individual-oriented style to a Japanese group-oriented style.

In Case Study Two, there were no specific leaders right from the outset. Part of the reason for this could be due to the simplicity of the product being developed, but I would argue
that it was due to a simple management network. The entire Case could be considered one of task-oriented communication flows as outlined in Case Study One.

The Program Manager in Case Study One put great effort into binding the team members but, along with progress of the product development, he could also be seen as a facilitator or coordinator. Even though he had broad knowledge as well as technical and production knowledge, the authority to complete the project tasks were located in each responsible department. Because the Japanese notion of product development was department-oriented, it was natural that the Program Manager became a facilitator for the product development and there were no leaders in the team.

This may sound negative, but as long as each department is able to show strong leadership if problems develop in its own area, that is the most flexible leadership style.

6.7 FURTHER IMPROVEMENTS

As a result of what has been learned in these two case studies, it is clear that in order to have productive global teamworking, it is important to develop the four different but necessary communications flows. One of the communication flows, the middle management network that the author argues is the most important, was created in part by past work experience, common knowledge about the procedures or systems, and challenging project goals; however, face-to-face meetings supported by many business trips were the most effective means of building the network. In particular, information shared via this network is somewhat redundant for middle managers; therefore such information sharing without human interaction tends to be thought of as less important. Thus, traditional face-to-face meetings with middle managers are still important for a globally dispersed team.

Unlike the middle management network, task and function-oriented communications focused more on a specific topic than middle management communication. Therefore I could
see some possibilities for accelerating effective communication by using modern information technology. Shared databases can be an efficient approach for sharing technical information, such as mechanical, hardware drawings and design standard with members in multiple locations.

In addition, by combining the shared technical information with video or telephone conferencing, engineers in different locations will able to do virtual design reviews in each home location. Rather than occasional business trips, frequent virtual design reviews can accelerate the two communication flows and eventually support efficient communication within the local team by providing timely knowledge exchanges.

6.8 FUTURE RESEARCH

I would strongly urge that additional research be done on globally dispersed product development teams in non-Japanese companies as well as other Japanese companies as a way to compare the results shown in this thesis.
References


