National Cultural Differences – Benefit or Threat for New Product Development (NPD) Teams

Author: Nina Jakubeit
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

ABSTRACT

When involving supplier in a companies' NPD team, it might occur that the suppliers' national culture is not comparable to the buyers' national culture. Those cultural differences can influence the team performance due to communication issues. One of the threats is that the adherence to product quality specifications cannot be guaranteed in the specific project. A qualitative method is applied in the study. Six project managers from different manufacturing companies are asked for previous experiences concerning one specific project. The analysis results reveal that there is a pattern regarding a better adherence to quality specs when the national culture of all team members is comparable. However, in some projects flexibility within those quality specifications was a necessary condition to complete the project. Moreover, all interviewees indicated that in case the project manager is aware of cultural differences in the NPD team beforehand, it has no influence on the performance.

Supervisors: Dr. Matthias de Visser and Dr. Michel Ehrenhard

Keywords

National cultural differences; NPD team performance; supplier involvement; adherence to quality specifications

5th IBA Bachelor Thesis Conference, July 2nd, 2015, Enschede, The Netherlands.

1. INTRODUCTION

Nowadays, the business world becomes more and more globalized. Many manufacturing companies started to expand and operate on a global basis in order to stay competitive (Handfield et al. 1999). Within this area there are two widely discussed topics, which will be investigated further in this paper.

First, that is supplier integration in NPD teams. By integrating supplier in the firm's internal NPD teams, organizations can make use of the supplier's knowledge and expertise (McGinnis & Vallopra, 1999), and by developing products together both companies can share the risks (Wagner & Hoegl, 2006). Furthermore, there is a mutual dependency of buyer and supplier in new product development. On the one hand, the buying company is dependent from the resources of the supplier, i.e. innovative technologies, manufacturing capabilities, engineering talents and financial support, for the sake of successfully develop and produce new products (Azadegan et al. 2008; Handfield et al. 1999). On the other hand, the supplier is dependent from the buyer by market knowledge, product information and project management capability (Hong & Hartley, 2011; Hong et al. 2009). The interdependence can be turned into profit by integrating the supplier in the NPD teams of the buying organization (Pfeffer & Salancik, 1978). So, with respect to create a competitive advantage, in the manufacturing industry it is crucial to effectively integrate supplier into the product supply chain (Handfield et al. 1999).

A second widely discussed topic concerning globalization is the team construction and performance within international performing corporations. More and more companies operate globally and are thereby able to construct cross-functional and cross-cultural teams (Randel and Jaussi, 2003; Zhang et al., 2007). It has various advantages and disadvantages to work in a multicultural team. To name a few, it enables creativity and operational effectiveness (Randel and Jaussi, 2003), but also creates challenges within intercultural communication; communication issues can arise due to physically dispersed team members and cultural acceptance of power distance and individualism (Hoegl and Proserpio, 2004; Hofstede, 1984).

In this article a connection between both topics will be constructed; that is to investigate the influence of national cultural background on team performance when introducing suppliers from other countries to a firm's NPD team. The independent variable here is the national cultural background of NPD team composition (Buyer – Supplier), and the dependent variable is adherence to product quality specifications. It is important to research the relationship between the national cultural background of people and their influence on quality specifications, because earlier studies about culture have shown that multicultural team performance often leaks on good teamwork due to communication issues (Ongwatana and Chordia, 2008). Those communication issues within the team can ultimately lead to not meeting quality specifications of products, because it is not completely clear to every member of the team what the goals of the project are (Muller et al. 2008).

In general, to elaborate the team performance one can choose to examine adherence to quality specifications, adherence to budget or adherence to cycle time. The dependent variable adherence to quality specifications was chosen, because it best describes the relationship shown in the section above. Moreover, good adherence to quality specifications can help a team constructing a successful product. Combining both variables the overall research question was designed:

> *How do differences in national culture among team members of NPD teams in which suppliers are involved affect adherence to quality specs?*

So far there is no literature regarding this topic. However, there is separate literature on NPD team performance with supplier integration, on cross-cultural team construction, and on team performance measures. It is important to examine the topic of the national cultural background of buyer-supplier team collaboration within NPD teams on adherence to product quality specifications further, because it can give a certain impact for the buying organization about which supplying organization they should work close together with. That means, in case a buyer has more than one supplier for a specific product and those suppliers come from different countries, it might be advisable to integrate in the NPD team a supplier, which has a similar cultural background to the buying organizational culture. Moreover, in the end, good adherence to quality specifications benefits the products' success. So the outcome of the cross-case study can aid organizations in two ways; first to compose good buyer-supplier team collaboration, and second, to provide guidance for the products' market success. All those reasons named above are indicators why it is important to research this gap in the literature.

The article is organized as follows. The next section reviews the literature on multicultural team performance and adherence to quality specifications and discusses its theoretical connection and premises. Afterwards, the research design with a short firm and project description will be presented. The subsequent sections review the outcome of the six case studies, and its results in the context of the studies' conceptual framework. The article concludes by discussing limits and implications of the cross-case study and giving future research directions.

2. LITERATURE REVIEW

So far the topic of buyer-supplier collaboration with different national cultural background and its effect on team performance has not been studied. There is also rarely any literature on challenges of NPD teams regarding cultural differences. That is why the literature review is hold rather broad, and in the

end aims to connect the studied variables. To be able to connect the variables a few assumption have to be postulated. However, one can expect a relationship between those two variables, because research on other multinational team construction, without supplier integration, shows that the cultural background influences the team performance and ultimately the quality (Chang et al. 2011). Consequently, there is a need to further investigate this topic with supplier integration.

The paper will start by reviewing literature on cultural differences and its effect on team performance, investigating further why adherence to quality specifications is chosen as a measurement for NPD team performance, and last the connection to supplier involvement in NPD teams will be examined.

2.1 Cultural Differences

In the literature, there exist over 5,000 definitions of culture. For example, Trenholm and Jensen (2000) define culture as 'a set of beliefs and values, norms and customs, and rules and codes that socially defines a group of people, binds them to one another and gives a sense of commonality.' According to Schein (1985) culture is an approach how people solve their problems and evaluate challenges. It is about how people make their decisions. Therefore, it is obvious that a multicultural team construction can have influence on the performance (Schein, 1985). On the other hand, Hofstede (1984) describes culture as "the collective programming of the mind which distinguishes the members of one group or society from those of another." What he means is that culture shows what people associate with distinctive aspects of life, their way of looking at the world and their place in the world. In his work Hofstede discovered differences in the national culture of people. Muethel and Hoegl (2010) agree with Hofstede on the definition of national culture. They add that cultural norms are not the only factor, which shapes the national environment. Also other social knowledge, and rules and regulations, covered by the regulative institutions, play a role in the national environment (Muethel and Hoegl, 2010).

For simplicity reasons, in this article the national culture definition of Hofstede is used as the main definition. Hofstede points out that every country can be placed to a various degree within four value dimensions. Those value dimensions are namely Individualism, Power distance, Uncertainty avoidance and Masculinity. The four dimensions represent fundamental issues in the society, and every society deals different with those issues. Depending on how a country evaluates the importance of those issues they are positioned in a framework stating the four dimensions (Hofstede, 1984). This is happening by appointing each country a certain index score, assessed due to the collected data from all subsidiaries. The index score always varies from zero (score of the lowest country) to around 100 (score of the highest country). Which exact dimensions are considered as more important in multicultural NPD teams will be discussed in the next sections in detail.

2.2 Multicultural Teams

Multicultural teams are teams with members from different cultures, or out of simplicity reasons, with members from different countries. There is an increasing use of multicultural teams, because cross-cultural and cross-functional teams are more easily able to overcome the dual challenge of creativity and operational efficiency (Randel and Jaussi, 2003; Zhang et al., 2007). Nevertheless, cross-cultural teams often face another challenge of communication. Due to globalization there is a need of communication across borders, which necessarily involves intercultural communication (Ongwatana and Chordia, 2008). The difference in intercultural communication is that the communication happens between people of different cultures (Wells and Spinks, 1994). According to Knapp (1987) 'Intercultural communication, can be defined as the interpersonal interaction between members of different groups, which differ from each other in respect of the knowledge shared by their members and in respect of their linguistic forms of symbolic behavior.' Intercultural communication in multicultural teams can create issues due to increasing miscommunication. That is mostly the case when team members are not aware of the fact that cultural differences can create communication issues (Ongwatana and Chordia, 2008).

Another problem of multicultural teams is not only intercultural communication, but also a countries position within the four-dimension framework of Hofstede (1984). In this article we focus on two of the four dimensions, called Individualism and Power distance. That has certain reasons; the dimension of Individualism highlights the significance of social relations in the society (Kubátová and Kukelková, 2014). Especially when it comes to teamwork, so how well team members are able to work together in order to achieve the best outcome, the degree of Individualism of the countries culture is very important. The other dimension focused on in the article is Power distance. Power distance shows the degree to which members of a country accept hierarchical power (Kubátová and Kukelková, 2014), which is also considered to be important for team performance. For instance, in a country with high power distance, members of the society more easily accept hierarchy and their role as followers (Hiller et al. 2006). Contrastingly, countries with low power distance have an active learning and knowledge-driven environment and to complete the project status differences are mostly ignored (House et al., 2004). Countries with members who highly strive for individualism have a high performance orientation. People are better in completing their own tasks than working together with other team members; the main focus is on individual responsibility (Hofstede and Bond, 1988). On the opposite side are countries with a high extent of institutional collectivism. Members of these countries regard one another as interdependent from each other. An important part within teamwork is to build up relationships with other team member (Fu et al., 2004). It includes communicating open and sharing knowledge with each other in order to generate the information flow

in the team, and realize the best possible solution together (Fu et al., 2004).

Hofstede (1984) found a pattern in his work, which identified that more economical developed countries tend to be more individualized and have less power distance, whereas less economical developed countries rather score low in individualism and are having a greater power distance.

In general, it is recognized that teams with a great diversity are not always able to achieve mutual adjustment, but when possible use different leadership styles for different team members (Muethel and Hoegl, 2010). For example, in German-Chinese collaborations, German team members will be approached directly and in a way that uses a shared-leadership style (Frese et al., 1996). Communication with Chinese team members is more indirect and a more authorized leadership style is used (Westwood, 1997).

Even though there is no specific literature on multicultural NPD teams, for the continuation of this article we assume that what is found to be true for multicultural teams can also be accounted to multicultural NPD teams. Nevertheless, there is still no literature on multicultural buyer-supplier NPD teams, which cannot be easily generalized. In a buyer-supplier collaboration one also has to consider the influence of the corporate culture, not only the culture of the country. That is why no assumptions concerning intercultural buyer-supplier collaboration can be made. Even though, it cannot be generalized it is still interesting to further investigate the topic of buyer-supplier collaboration. Especially, for the buying organization it can aid in selecting certain suppliers for their NPD team collaboration.

2.3 NPD Team Performance Measurement

A broad definition of team performance is the degree to which the team is able to achieve predetermined goals (Hoegl and Wagner, 2005). Hoegl and Wagner (2005) differentiate between effectiveness and efficiency. Effectiveness refers to the team performance concerning the adherence to predefined product quality and costs. Efficiency points out the adherence regarding the development of budget and time. Also Yan and Dooley (2014) differentiate between effectiveness and efficiency within team performance, whereas the first one is often referred to as design quality. Furthermore, Smith and Reinertsen (1998) find that a NPD team performance can be measured by emphasizing four different components (project timeliness, product performance, development expense, and product cost). In this article it is decided to focus on product performance measurements, instead of time or budget measurements. Product quality can be seen as the desired properties a product should have and which are developed by the team (Hoegl, 2005). Those properties of the product can be the functionality, manufacturability, durability and robustness, as well as optical attractiveness of the product (Hoegl, 2005). The team has the task to design those properties in the designing stage and make sure they develop the product with the designed properties so that in the final phase the product is exactly created as in the beginning designed. If there is no differentiation between the two phases the team was able to achieve a good adherence to the product quality specifications. This stands for a good design quality of the product and ultimately for a well performing team (Swink & Calantone, 2004).

2.4 Supplier Involvement in (multicultural) NPD Teams

Supplier involvement in NPD teams is a widely discussed topic in recent literature. Recognized advantages of supplier integration are, for example, exploitation of resource interdependency as well as aligning goals to complementary capabilities (Pfeffer & Salancik, 1978; Rothaermel & Deeds, 2004), but also sharing information, accomplishing joint tasks and co-creating knowledge (Cao & Zhang, 2011; Hartley et al., 1997; Hoegl & Wagner, 2005). Moreover, it is proven that supplier involvement in NPD teams improves the manufacturability of a new developed product (Swink, 1999). The better manufacturability of products, hence also improves the production unit costs, and reliability and overall product quality (McGinnis and Vallopra, 1998). Additionally, already existing knowledge of the supplier about the buyers' internal practices and processes helps the supplier to prepare the capabilities needed for the product development (Dyer and Ouchi, 1993). Moreover, difficulties can arise here due to an international supplier with a different cultural background, since the processes and practices within another organization cannot be understood so easily.

However, especially in communication there are challenges, which need to be faced in supplier integration in NPD teams (Hoegl & Wagner, 2005; Hoegl et al. 2004). It is believed that it needs a mutual supportive atmosphere and nature of decision-making in order to overcome obstacles within communication (Marks, Mathieu, & Zaccaro, 2001; Wagner & Hoegl, 2006). Yet, in collaboration with a supplier from another country this is even harder to achieve due to already existing general intercultural communication issues (Ongwatana and Chordia, 2008). Another challenging factor of supplier involvement described by Susman and Rey (1999), is "the greater the differentiation among NPD participants, the greater the challenge of integrating those different functions toward achievement of common goals". Thus, it can be argued that cultural differences are one important factor where members of the NPD team differ from each other. Additionally, Paul and McDaniel (2004) mentioned, teams spread across organizational culture and national cultures, so with raised group heterogeneity, can happen to have increased conflicts among team members and consequently less effective performance. Part of less effective team performance, as mentioned before, is the adherence to quality specifications (Hoegl and Wagner, 2005). Consequently, an assumption can be made that highly differentiating culture in a team

can lead to less effective team performance, so ultimately a low adherence to quality specifications.

All in all, it can be concluded that supplier involvement in NPD teams can enable product success when there is a favorable buyer-supplier relationship (Birou and Fawcett, 1994). Though, it is perceived to accomplish harder when the integrated supplier has a diverse cultural background.

The aim of the following interviews is, to find out whether the assumption constructed in the literature review – a similar national cultural background of buyer and supplier enables the teamwork of the NPD team and ultimately the quality of the product – can be accounted more in general. This would give managerial implications for integrating a certain supplier (with a similar national cultural background) in the NPD team, and not just the one, which delivers fast or for the cheapest price. Furthermore, the study would give suggestion to further elaborate on this topic on a bigger scale, maybe by conducting a longitude or quantitative study.

3. RESEARCH DESIGN AND METHOD

The qualitative research is based on an in depth interview with five manufacturing firms. The manufacturing firms vary from medium-sized to Multi-National Corporation (MNC) size enterprises, operating in highly competitive industries with offices located in Germany and the Netherlands and have supplier involvement within their NPD projects. The companies, which are researched, are namely: AkzoNobel, Apollo Vredestein B.V., Bronkhorst High-Tech B.V., Sensata Technologies and Siemens AG.

AkzoNobel is a global manufacturer of paints, coatings and other special chemicals. Their head office is located in Great Britain, but the company operates in approximately 80 countries with more than 47,000 employees. Their main competitive advantages in the industry are leading innovative products and working with sustainable technologies.

Apollo Vredestein has been part of Apollo Tyres Ltd India since an acquisition in 2009 and is a multinational company with offices and production locations in several countries such as India, South Africa and the Netherlands. Apollo Tyres Ltd has its head office in India, whereas Apollo Vredestein head office is located in Enschede, the Netherlands. The core business of the organization is to develop, manufacture and sell car tyres, tyres for agricultural and industrial applications, and bicycle tyres. In total Apollo Vredestein have about 1,800 employees.

Bronkhorst High-Tech B.V. is located in Ruurlo, in the Netherlands. The company, Bronkhorst, is a leading manufacturer of advanced mass flow and pressure measurement and control solutions across various industries. The company has approximately 400 employees working for customers in more than 70 countries on all continents.

Sensata Technologies is a leading supplier of sensors and controls. These manufactured sensors and controls are used in various industries as for instance the automotive, the aircraft or the telecommunications industry. The company has 17,000 employees worldwide and is manufacturing and operating in 15 different countries. The Dutch head office is located in Almelo.

The Siemens AG, founded in 1847, is a global organization operating in the areas of electrification, automation and digitalization. Siemens is one of the world's leading suppliers in manufacturing energy-efficient, resource-saving technologies for power generation and transmission, and medical diagnosis,. The company is globally active in more than 200 countries and has around 343,000 employees. The head office is located in Germany.

All manufacturing companies invest huge amounts of money in their R&D departments in order to survive in such a competitive environment they are operating in. Hence, they rely on global supplier involvement in their NPD teams to stay highly innovative. Therefore, all firms have fitting company profiles for contributing to this research.

3.1 Overall Design

The research is designed as a cross-case study with conducting in depth interviews with project managers of each company concerning supplier involvement.

A cross-case study helps to gather more in depth knowledge about the topic. This also offers more capabilities for explanations, and can help answering follow-up questions (Gable, 1994).

It was agreed on interviewing project managers, because they are intensively involved in individual projects regarding NPD. Furthermore, they are responsible for achieving the objectives of the project, and work together with the supplier team on a daily basis. Project managers thereby have access to the most valuable information for this research. The interview consists out of four broad open questions concerning the topic of this paper. Open questions leave room for personal assessment and gathering of additional useful information.

The first question considers the independent variable and asks for the country of origin of the supplier. That is easily answerable and will be assessed with the help of Hofstede's framework concerning power distance and individualism in the national culture (Hofstede, 1984).

For the second question the dependent variable will be determined. It is asked for product specifications concerning functionality, manufacturability, durability and robustness and optical attractiveness and in how far the adherence to those specifications was kept in the project. Additionally, it is demanded to estimate, on a scale, the difference between the specifications achieved in the designing phase of the product compared to those realized later in the final phase. This helps to assess the excellence of the adherence to quality specifications. In the interview the following question is asked to assess the adherence to quality specifications: '*On a scale from 1 to 5 (1= no difference; 5= huge difference)*

how huge is the difference of the product specifications between the two previously named phases?' Also here it leaves space for personal assessment of the project manager, in order to also gain insights in his evaluation of the team performance concerning adherence to quality specifications.

The third question considers the relationship of both variables and basically asks the research question which will be investigated in this paper. However, here rather the personal experience of the project manager is considered and no technical data can be gathered. The question is: '*do you think the cultural background of the supplier had any effect on the NPD team performance? And if so, in what way? (E.g. through communication issues, language issues, different beliefs and values concerning teamwork and leadership)'*

At last, a more general question is asked which assesses whether the general team collaboration works better with supplier from the same country or with a supplier from a country different than the firms' country of origin. That will help by analyzing the general opinion on multinational supplier involvement in NPD teams.

To analyze whether the national cultural differences lead to a certain level of quality specifications, the index scores of Hofstede's framework regarding individualism and power distance will be compared. It will be assessed if the scores of both countries are rather similar or different from each other and thereby it will be decided if the national culture is comparable or not. If that step is fulfilled, one can determine whether it fits to the indication of quality specs on the scale, which was handed to the project managers. For example, when both countries score high in individualism and low in power distance, and the project manager indicates a one on the scale (so no differences within the quality specifications) the assumption made in this paper will be confirmed. The open questions will help to understand the "Why is that the case?" and "Do other factors influence the outcome?"

To guarantee consistency within the interviews, all interviews will be conducted in the same procedure: face-to-face, asking the same questions, and within a time period of 30-60 minutes. To sum it up, the interview with the project manager is helping to answer the research question aiming to be solved in this qualitative research design. The appendix shows the interview template.

3.2 Case-Study Selection, Sample, and Unit of Analysis

Since it is a cross-case study, in each company one case is selected that will further be investigated. Only in Apollo it was possible to conduct interviews about two different projects. The interview with the project manager addresses one specific project. It includes every step from the idea generation, to the forming of the project and team until the final product is launched to the market. The project in total is therefore the unit of analysis within this case study. In total, six interviews, with six different project managers in five different companies were conducted, asking the questions previously explained. In the next section insights into each project will be given.

The **project A**, at Sensata, was about creating a sample of a component in only 20 weeks, in order to get a certain job from the customer. Normal projects at Sensata from the same size require usually 35 weeks, so it was demanded to work fast and be flexible in order to get the job. Therefore, Sensata directly decided to integrate a well-known supplier from China in the project. Sensata only invested 1,5 working days on finding the right trade-offs between supplier possibilities and customer needs, and were able to heavily integrate the supplier in the whole NPD process. Important to notice here is that the team had to start directly and therefore wasn't able to stick completely to all product specifications, but had to be flexible and be able to quickly adopt to changes. It is also a reason why Sensata had to choose for a well-known and well-trusted supplier to integrate in the project. The personal relationship to the supplier is very good and they are both eager to share as much information as possible with each other.

Further, with Apollo two interviews were conducted. The first project, **project B**, was about improving wet-breaking of car tyres, with a project duration of two years and a supplier involved from India. There were more suppliers involved in the project, but since the Indian supplier was the biggest and most important one delivering the special rubber, his integration was of highest importance. Most of the NPD teamwork was done in the Netherlands. Sometimes, some Indian colleagues came to the Netherlands to work on the project and also some Dutch employees visited the suppliers manufacturing plant in India, but mostly all communication was not personal but via Email or phone.

Whereas, the second interview, concerning **project C**, was conducted with the manager of the testing department. He developed a new tyre test, together with a supplier from Germany. The supplier was involved directly from the beginning on, since it was required by the customer to develop a new test with this specific supplier. The duration of the project was only 10 months, due to customer requirements. The project manager himself was often able to visit the suppliers' location in Germany, because it is not very far from the Dutch office. That helped a lot due to frequent personal communication with the supplier.

The next interview was conducted at AkzoNobel, regarding **project D**, with the manager from the business unit of technology sourcing & innovation. The duration of the NPD project was seven years, which is a normal time span in this industry. In the beginning around five years of research are necessary to have another two years of intensive product development. The developed product is a new kind of paint. The integrated supplier is a European based supplier, which supplied the ingredients for the paint. The specific supplier was in this case viewed as important due to its good

expertise and its appropriate research facilities to manufacture the molecule itself.

Project E was an interview at the Siemens AG, regarding the creation of a Printed Circuit Board (PCB) instrument for industrial use. The interviewee was the project manager and also senior procurement president responsible for electronic components. An Austrian supplier was chosen to be integrated in the German-based NPD team. In total the project had a duration of three to four months. Siemens has a strict policy on supplier selection, due to high performance goals and customer satisfaction, which was relevant for this project as well.

The **project F**, with the project manager from Bronkhorst, was about a development about a new instrument for industrial use. Due to discretion agreements he could not give us more detail on the product. The duration of the project was around four years, even though a normal project about developing such an instrument would have taken only around three years. Further, the interviewee at Bronkhorst admits that the project was not completed as foreseen, because of errors in the supplier integration and no previous communication between the customer request and R&D department from Bronkhorst with the supplier. The supplier integrated in this project is also Dutch and located in the same cluster as Bronkhorst.

In the analysis part all named projects will be analyzed more in detail. Each project individually will be assessed concerning the interview questions. Further, the results will be compared to the literature found on the topic. In case there is some pattern between the various projects, those will be named as well. At the end, a conclusion will be drawn based on the findings of the interviews.

4. CASE ANALYSIS AND FINDINGS

The studies' analysis first reviews the overall results of all cases, excluding the last one from Bronkhorst

Table 1: Summary of all projects

	Companies' national culture (Hofstede)	Suppliers' national culture (Hofstede)	Degree of product quality specifications (1= no difference; 5= huge difference)	Evaluation of teamwork	General opinion of project manager on cultural influence
Sensata (project A)	The Netherlands IN: 80 PD: 38	Malaysia IN: 26 PD: 104	**4** (also, because flexibility is required)	Always communication issues; first supplier says yes, but then is missing the capabilities. Due to long and intense work with this supplier integrating him early on and facing expected problems in advance could prevent misunderstandings.	Not easy to say, both have pros and cons: supplier from… - Germany = better quality, - China= more price conscious; Sensata has no problem with working together with Chinese supplier, however smaller companies might face issues.
Apollo 1 (project B)	The Netherlands IN: 80 PD: 38	India IN: 48 PD: 77	**2** (also, because it is about improvement)	Due to personal relationship to India, the supplier was well known and expected cultural issues were faced from the beginning on.	There are communication issues with suppliers (especially from Asian countries). That is why when culture is comparable to ours the performance of the product is better.
Apollo 2 (project C)	The Netherlands IN: 80 PD: 38	Germany IN: 67 PD: 35	**1**	Due to a lot of personal contact very good and intense teamwork, a lot of information sharing, open communication	Teamwork is better with local supplier; more familiar with each other, will give his own advice/opinion, will support you more during developing the product.
Akzo Nobel (project D)	United Kingdom IN: 89 PD: 35	Europe – but different from UK (No index score)	**4** (when working with chemicals, no real assumptions about the ingredients can be made in the beginning)	AkzoNobel already works in a cultural diverse team, so the influence of the suppliers' culture did not make a difference and ultimately did not influence the product quality.	There is no difference in team performance due to cultural differences. In fact, more cultural differences enable other knowledge and resources.
Siemens AG (project E)	Germany IN: 67 PD: 35	Austria IN: 55 PD: 11	**1**	In this case the performance of the team was good. One enabling factor was, that there were no language barriers.	For the Siemens AG culture does not play a role, because the supplier selection is so strict that only good performing suppliers can be chosen.

(Table 1). Afterwards, each case is elaborated on in more detail, so that at the end some cross-case comparison can be presented. Here, some outstanding similarities and differences are highlighted, however those findings cannot be generalized yet, but lead to implications for future research.

4.1 Findings

4.1.1 Project A: Paul Pluter from Sensata

The first interview, conducted at Sensata, with the project manager Paul Pluter, was about a new product development, the VDA connector. The supplier heavily involved in this specific project is located in China, but many employees, especially the ones involved in the project are coming from Malaysia. The people involved from Sensatas' side are all located in the department in Almelo. Therefore, the two countries, which are considered in this context, are Malaysia and the Netherlands. Concerning Hofstede's model (Hofstede, 1984) their national culture differs a lot from each other. The national culture of Malaysia in Hofstede's framework is marked by an index score of 26 in Individualism and 104 in Power distance. That means that Malaysian employees are considered to be rather collective and have a very high power distance when it comes to the relationship between superiors and subordinates. On the other hand, the Netherlands has an index score in Individualism of 80 and in Power distance of 38. Therefore, in both parts the Netherlands basically scores the other way around compared to Malaysia. That is, they are considered to have are rather individualistic society and the power distance between the manager and his staff is rather low. From those index scores one can conclude, that the national culture concerning both, the degree of Individualism and the degree of Power distance, is very different from each other.

The second question asked for adherence to product specifications. The manager indicated that in this particular case the adherence to product quality specifications was rather low. On a scale from one to five, where one stands for no differences in specifications during the product development stages and five indicates huge differences in quality specifications within all stages, the quality specifications in this product have been set to be a four. The reason for such a low adherence to quality specifications in project A is also, that flexibility was one of the main requirement to win the business case of the customer. Moreover, all the preconditions of the customer were met; just the initial requirements set in the idea generation stage did not match the specifications when finally launching the product. It is said, that due to the fact that adherence to those quality specifications was not important, but trying to even improve them, the supplier was a great help of doing so by giving a lot of suggestions and enhancing a healthy discussion.

Answering the third question: *'Do you think the cultural background of the supplier had any effect on the NPD team performance?',* the interviewee mentioned some previous issues with this supplier due to communication problems. One of the cultural characteristics of this supplier are that people always say "yes", even though they do not have the capabilities to actually achieve the goal. Another important factor in the suppliers' culture is teamwork. They like to learn from their customer (Sensata) and therefore value trust and respect for each other very much. Due to previous experiences with the supplier, Sensata knew how to deal with the suppliers' culture. Furthermore, by integrating them early in the idea generation stage and helping them out in situations where former communication issues occurred the quality in this case was not affected by cultural differences.

In the fourth question the interviewee was asked to give a personal opinion on how to deal with cultural differences in NPD teams. The project manager indicated that indeed cultural differences in NPD teams could affect the quality of the product. Previous experiences have shown him that suppliers from various countries have different pros and cons, depending on what is important for achieving the goal of the project one can choose which supplier to rather build up a close relationship to. The interviewee mentioned that i.e. a German supplier has advantages due to proximity and quality, however the disadvantage is that their insight is so engrained that they could even start taking advantage of you. On the other hand, a Chinese supplier is more eager and cost conscious, but problems can occur due to cultural differences (one has to know how to value their "yes" and how to approach them when acting as superior or working in a team). He further indicates, that it might become an issue for a smaller company to work with a supplier from China, because they would try to cut corners to achieve the goal.

For project A it can be summarized that there are huge national cultural differences between those countries and also the product quality specifications were not kept. However, this was more due to required flexibility in the project and the supplier showed good teamwork capabilities in order to achieve the quality goals. The cooperation went well, mainly, because of previous experiences and complications with the supplier. Therefore, Sensata knew how to handle the communication and interaction with the supplier while working in a NPD team.

4.1.2 Project B: Nico Gevers from Apollo

The second interview was conducted at Apollo with Nico Gevers, the head of the material development department. In this specific case the Dutch Apollo team was working together with a supplier from India, in order to improve the wet breaking of a car tyres. According to Hofstede (1984) the suppliers' cultural index score in Individualism is 48 and the score in Power distance amounts up to 77. As mentioned earlier, the Dutch national culture is indicated by an index score of 80 in Individualism and of 38 in Power distance. Therefore, it can be concluded, that there certainly are cultural differences between those national cultures, however not as huge differences as in project A. Furthermore, it can be stated, that the less developed country, which in this case is represented by India, is rather collective and has a huge power distance.

Whereas, the more developed countries' culture, namely the Dutch culture, indicates higher individualism and a lower power distance. Due to the differences, communication issues may occur.

Concerning the second question, the interviewee stated that most of the product quality specifications are most important to match in functionality. In this specific project it was asked to improve the wet-breaking performance of the tyre. As a focus was set on improvements and not on developing a total new product, quality specifications are normally set higher than actually being achieved. This means that in project B the adherence to quality specification was indicated as two. On a scale from one to five, where one means no difference in quality specifications and five means huge differences in quality specifications, two reveals that most of the product quality specifications which were agreed on in the initial stage of the NPD project were kept. Especially, with regards to improvements of the product performance, a two on the score represents a good adherence to quality specs.

In the third question, related to the relationship between both variables it was asked for problems with the supplier concerning cultural differences. The interviewee, Nico Gevers, stated that in this case the quality specifications were not influenced due to cultural differences. However, he admits that working in a multicultural team can be challenging. Two reasons have been addressed for why there was no influence on quality specifications due to multicultural teamwork; at first, that the Indian supplier has a close relationship to the Indian department of Apollo, which indicated a high amount of face-to-face meetings. Also, the culture was already better understood by employees, as well as, in the Dutch NPD team there are Indian colleagues working and the other way around. The second reason is, that the supplier is a long trusted and good known supplier. The previous experience showed where difficulties could occur, i.e. Indian co-workers need better-specified job descriptions, which might require more planning in advance.

For the fourth question again, a personal assessment of the project manager was asked. Indeed, Nico Gevers indicated that when the culture of both companies' nations is comparable he found the performance of the NPD team to be better. This has certain reasons. For example, when there is a comparable culture, normally the countries are located closer to each other, which give opportunities to more face-to-face meetings. Additionally, the communication is easier due to common values and norms. Moreover, he thinks language barriers could be an issue, especially when working together with Japanese and Chinese suppliers. In general, the project manager agreed on feeling more comfortable when working together with European suppliers, because there is usually a great trust and personal relationship which is shaped by similar national culture.

Consequently, the interview concerning project B also indicates a huge cultural difference between both countries. Therefore, the quality specifications were more or less met, without a lot of variance. One argument, why that is the case, is certainly the close relationship to India due to the joint venture of Apollo and Vredestein.

4.1.3 Project C: Maarten van der Poll from Apollo

The third interviewee was Maarten van der Poll, the manager of the testing department from Apollo. The project under his direction was to develop a new test, customized for Apollo's customer, together with a German supplier. It required close co-operation with the German supplier from the beginning on. In this case, the two countries interesting to research are the Netherlands and Germany. In Hofstede's framework (1984) the Netherlands have an index score of 80 in Individualism and of 38 in Power distance. Germany achieved an index score of 67 in Individualism and of 35 in Power distance. Comparing both countries, one can say that their culture concerning degree of individualism and power distance is quite similar. Both cultures are considered to have a rather individualistic culture and their power distance is relatively low.

The second question, regarding quality specifications, revealed that all quality specifications were met. On the scale from one to five, the adherence to product quality specifications in this project was one, which stands for no differences. An explanation therefore was also the involvement of the customer. Apollo's customer demanded very specific what objectives the test has to perform. Further, the customer personally chose the supplier, with whom Apollo has to cooperate to develop the test, and gave this supplier also specific implications on what has to be reached at the end of the project.

Regarding the relationship of the two variables, cultural differences and adherence to quality specifications, the interviewee admitted that culture indeed played a role in the good project performance. A German supplier has similar working practices; there are hardly any language issues, the definition of quality is the same, knowledge exchange is more frequent and the level of trust is higher, as well as planning is more reliable so that mistakes can be found earlier. All those factors lead to a better overall performance.

The last question, respecting the project managers' own opinion, showed that he thinks culture does play a role in the teamwork of NPD teams. He emphasizes, that one cannot say which culture is better, but which cultures work better together than others. For example, while working together with a supplier from Asia he faced difficulties due to different priorities. Often, when he did not call the supplier twice a day they would not think it is an urgent project. Moreover, their power distance is much higher than the European one, which shows more integrated hierarchical practices. Maarten van der Poll argued, "An Indian co-worker would directly leave a NPD team meeting in case his boss would call him. That was something me and my colleagues had to get used to in the beginning."

Summarizing, in project C the national culture of both countries was quite similar. Also the product specifications were met completely. Even though, the customer of Apollo had a huge part in that, the interviewee also stated that the comparable culture was an advantage in the NPD team collaboration.

4.1.4 Project D: John Sinclair-Day from AkzoNobel

The fourth interview was conducted with John Sinclair-Day from AkzoNobel. The supplier involved in this specific project was European based, but not from the UK. The interviewee did not want to be more specific here. However, he stated that the corporate culture in both cases has low power distance and a rather collective view. Only the structure of AkzoNobel was much more formalized due to the size of the company. Nevertheless, it is not possible to use Hofstede's framework in this specific case. It is known that the NPD team from AkzoNobel was located in the UK, but one cannot compare it with the suppliers' side. The culture in Europe can vary quite a lot, for instance the Portuguese' culture is relatively collective and has in Europe one of the highest power distances. Compared to the UK, the Portuguese' culture is very different and a cooperation might be challenging. That is why the interviewee has to be trusted when he acknowledges that there are not a lot of cultural differences when comparing both cultures.

For the product specifications AkzoNobel first had an idea in the research proposal about which molecules they wanted to use. Nevertheless, in the product development stage other specifications became important such as compatibility with the rest of the ingredients. That is why, the specifications had to change and on the scale the project achieved a four, which stands for a quite huge deviation from the initial quality specifications.

Concerning the relation between the cultural background of the supplier and the performance of the team the interviewee indicated that culture did not play any role. Due to the fact that AkzoNobel is already culturally diverse in its team, the only issue, which might have still influenced the performance of the supplier-involved team, are language barriers. English is not the suppliers' first language, but what helped was that one team member spoke the suppliers' language. Furthermore, AkzoNobels' employees consciously acknowledged the different working practices of the supplier due to culture, which helped the teamwork. So the cultural differences (when existing) did not affect the product quality in the end.

Last, the project manager from AkzoNobel stated his own opinion on the influence on cultural diverse teams. In his view, there are no significant differences in the teamwork when working together with suppliers from other countries' cultures, as compared to integrating suppliers with a similar cultural background. In fact, the interviewee even stressed that sometimes it is better to collaborate with a supplier, which has a totally different cultural background. For example, teamwork with a Japanese supplier is considered to be very challenging, however the reward is high, because of access to the latest technologies. It thereby advances your company by not only operating locally in NPD teams.

In general, it can be assumed that in between the NPD team and the suppliers' team there have not been huge cultural differences. Nevertheless, the adherence to quality specifications was rather low. This was also to be expected, because there is always a certain degree of uncertainty when operating with chemicals. Moreover, it is stated that the cultural diversity rather comforted than lowered the performance of the team.

4.1.5 Project E: Frank Schoepke from Siemens AG

The fifth interviewee was Frank Schoepke from the Siemens AG responsible for electronic components, who provided information for project E. This project was about PCB for industrial use. The NPD team from Siemens AG involved in the project was located in Germany and their supplier, which was integrated in the buyer-supplier team, was from Austria. According to Hofstede's culture index Germany achieved a score of 67 in Individualism and of 35 in Power distance. To the contrary, Austria earned an index score of 55 in Individualism and of 11 in Power distance. Even though the countries show some differences, in both cases Individualism scores high and Power distance relatively low. That is, they are considered to be rather Individualistic and have a low power distance. Therefore, the cultural differences are supposed to only vary to a little extent.

Respecting the second question, the interviewee firstly indicated that they did not make direct use of product specifications, but rather had a product idea. That is because they need a solution to the customers' requirements. Once this idea was presented to the supplier, a product prototype was developed and all the specifications necessary for that were presented. At the end of the project all those previously discussed quality specifications of the supplier were met in the final product, so there were no differences as such. This example implies a one on the previously presented scale.

The third question: *'Do you think the cultural background of the supplier had any effect on the NPD team performance?',* was answered by the project manager with mentioning that the quality was not affected by culture in any way. Despite this, he acknowledged that Siemens' engineers do prefer to speak German, which makes it easier to integrate a German-speaking supplier into the NPD team. Apart of that he did not recognize any major problems based on culture.

Also regarding the last question, Frank Schoepke indicates that culture does not play a role in the performance of the NPD team. It has various reasons why that is the case, but mainly, because all suppliers from the Siemens AG have to adhere to certain procedures before being selected as a supplier. This is such a hard competition that after fulfilling all requirements the collaboration of a

shared team is not influenced by factors such as culture. Usually, when being chosen by the Siemens AG for a co-operation, normally the supplier knows how the Siemens AG works and how to please them in order to keep the buyer-supplier relationship.

Consequently, in project E the cultural differences are not very huge. Also, the adherence to quality specifications is regarded as high. Yet, according to the project managers' personal opinion this is believed to have nothing to do with culture but with the strict supplier selecting process of the Siemens AG.

4.1.6 Project F: Marcel Booiman from Bronkhorst

The last interview was conducted with Marcel Booiman, the project manager for project F, which was about creating a new instrument for industrial use. The interviewee himself is actually working for the purchasing department and was leading the project mainly for communication reasons with the supplier. Bronkhorst's NPD team was located in the Netherlands and the supplier, which was involved in the project, came from the same cluster (also located in the Netherlands), which makes personal contact easier. It needs to be mentioned that due to the company's policy Bronkhorst almost only cooperates with local supplier. However, the company considers lowering this policy because of an increase in competition driven by globalization. Not only expanding globally, but also revolutionizing their fixed structure is on top of their agenda. Supplier involvement mostly just happens in the product improvement stage, which is all at the end and, therefore, led to non-manufacturability. If Bronkhorst would involve the supplier earlier, that would lead to early problem recognition and a lot of errors could have been avoided. Hence by specifying quality specifications in the designing stage no supplier was involved yet, therefore, this data cannot have any impact on this research. So, the adherence to quality specifications with regard to the influence of the suppliers' national cultural background cannot be investigated. Early supplier integration is a must-have for examining the relationship of the two variables discussed in this paper.

Nevertheless, the general opinion of the project manager can be taken into account. His opinion on the influence of cultural differences on the NPD teams' performance is, that regarding communication issues (due to different values & beliefs, language barriers, formalization, etc.) the co-operation with a supplier from a country of a similar or same culture would work more smoothly compared to a supplier with a completely different culture. However, he cannot draw on past experiences.

4.2 Results

As mentioned in the section before, the last project, project F, adds no value to this research paper. But, the other five projects are of globally operating manufacturers, which have experiences with cultural diverse NPD teams. Furthermore, they all integrate their suppliers early on in the idea generation/designing stage, which makes it possible to investigate the suppliers' role in adherence to quality specifications. In this research some pattern can be presented. Project A, project C and project E show the expected pattern, that countries with a similar culture do not face so many communication issues and thereby are able to perform better within their NPD team (or the other way around); the performance is measured at the adherence to quality specifications. Project B, on the other hand, presents a contrary pattern, which indicates rather big differences in culture, but quality specifications were almost kept completely. What has to be added, however, is that there was also close cooperation between the buyers department in the suppliers' country and the supplier in India due to the joint venture of Apollo and Vredestein. This would indicate, that the culture indeed is quite similar and the pattern would change to the expected one. Furthermore, there is another error for project D, due to confidential agreements from the project manager and his supplier; there is no information about the exact country of the supplier. Apart from that, adherence to quality specifications was also not possible, because of a high uncertainty when working with chemicals. Despite this, the project manager is convinced that a cultural diverse team would perform better due to access to more expertise and knowledge. This shows the general opinion of all project managers, nevertheless, most of them also say that communication issues are mostly present in multicultural teams – especially when involving team members from different continents. It is said that even though the team performance, when involving a supplier with a not comparable culture, is rated as good this is only due to previous experience with the supplier. In the beginning most of the companies faced communication issues when working together in a cultural dispersed team. However, after completing several projects together the buying and supplying company both knew about the cultural differences and how to face them in team collaboration.

Importantly, it has to be mentioned that adherence to quality specifications might not be the best variable to measure the effective performance of the team, because often a NPD team requires flexibility within their specifications. That is why the pattern might state biased results.

5. DISCUSSION AND CONCLUSION

It is said that cultural differences can lead to communication issues within a team. Especially when those teams are not aware of the fact that intercultural communication is happening (Ongwatana and Chordia, 2008). Further, with those communication problems bad team performance could follow, so that the adherence to quality specifications would not hold. This is, according to Hoegl and Wagner (2005), one of the effective measurements for team performance. Regarding NPD teams with supplier involvement, Susman and Rey (1999), found that 'the greater the differentiation among NPD participants, the greater the challenge of integrating those different functions

toward achievement of common goals'. Thus, culture can be considered as one of the differentiating factors among NPD team members. Project A, project C and project E would proof the assumption of worse performance in the team collaboration due to increasing cultural differences within the team (project A), or good team performance due to less cultural differences within the team (project C and project E; partly project B). For project D this cannot be hold true. However, the project manager indicated that the NPD team of the buying organization has already a cultural diverse structure. This would stress the findings by Chang et al. (2015) that cultural adaptation and understanding the impact of cultural differences in a team helps to create a great team performance. It is further reflected in the opinion of all interviewees.

Furthermore, often flexibility within the quality specifications was a necessarily factor during the project. So, good adherence to quality specifications would not necessary show good team performance. Especially in the first project, project A, it was an important factor for creating the product. Due to the multicultural team construction (buyer from the Netherlands and supplier from China/Malaysia) flexibility and more importantly creativity was easier guaranteed. This confirms with the literature, which states, that the dual challenge of creativity and operational efficiency can be faced well in multicultural teams (Randel and Jaussi, 2003; Zhang et al., 2007).

Concluding, a pattern regarding the assumption made in this paper - that a NPD team with an integrated supplier coming from a comparable national culture is more able to adhere to quality specifications – could be found. Reasons are provided by the fact that communication issues concerning culture could not occur so easily and more face-to-face meetings were possible due to proximity. Moreover, different working styles were not mixed up, so that in homogeneous teams each person knew how to approach and interact with colleagues. However, after investigating all findings one has to state that adherence to quality specification might not have been the best dependent variable to choose. It was found that adherence to quality specifications not necessarily reviews the performance of the NPD team. Sometimes, flexibility within those specifications was regarded as important to successfully complete the project. The newfound quality specs during the project were most of the time met completely, despite this, not included in the indicated scale. The scale only included quality specifications from the designing stage and the final quality specifications of the product. So, it has to be mentioned that the provided information do not represent the success of the project, as well as, they do not describe the performance of the NPD team well. This is why, although a pattern could be found, the research question: *'How do differences in national culture among team members of NPD teams in which suppliers are involved affect adherence to quality specs??'* cannot be answered in every case with the collected data without leading to wrong conclusions.

Generally, one can tell that it depends on the industry the firm is operating in, if quality specs measure the team performance.

On the one hand, at Apollo, a company working in the car tyre industry, quality specs are valued as very important and a homogeneous team, therefore, performed better than a multicultural team. The homogeneous team structure helped keeping the communication flowing, so that no miscommunication could occur from wrong interpretation arising due to different cultural understandings. In the context of adherence to quality specifications it means, that all team members directly understood what is asked from them in order to reach a certain goal - realizing the quality specs.

On the other hand, AkzoNobel, a company working with chemicals, requires flexibility within their quality specifications also during trials, because there is a high uncertainty concerning the right 'chemical cocktail'. Hence, in such an industry a good performing team needs to be able to adapt quickly to changes and, therefore, does not need such a strong focus on adherence to quality specs.

Important to mention further is that also most of the interviewees agreed on stating that a heterogeneous team collaboration improved the product success due to different expertise and knowledge, and enhanced creativity. Nevertheless, it is also said that even though the teamwork with suppliers from a not comparable culture is very good now, it indeed created issues while working together for the first time. After a while, cultural differences were acknowledged and addressed when collaborating in a multicultural team, so consequently the teamwork worked out improved. It can be concluded that when cultural differences in a multicultural team are recognized and approached right by all team members it has no effect on the team performance and can even increase the performance level. However, when cultural differences are not recognized yet it can negatively affect the team performance.

6. MANAGERIAL IMPLICATIONS

Using the explanatory power of this research, this study provides consultancy for management dealing with multicultural teams. In industries where adherence to quality specifications is considered as important, cultural differences can lead to issues regarding communication, because of different values and beliefs. The project manager has to be aware of cultural differences of the team members in order to successfully divide tasks when managing team members individually. As found by Muethel and Hoegl (2010) shared leadership styles in cultural diverse teams let the team perform better. This is also highlighted in this paper, since people from different cultures need to be approached differently by their superiors. Only then the performance of the team and ultimately of the project can become good.

In addition the research points out that sometimes, when operating in industries which value adherence

to product specifications high, it might be advisable to involve a supplier with a comparable culture in the NPD project. The performance of those teams is often better, not only because of better communication, but also due to proximity and non-language issues.

All in all, when the project manager is aware of cultural differences within the NPD team and approaches them appropriately, nothing should be in the way of a well-performing NPD team.

7. LIMITATIONS AND FURTHER RESEARCH

One limitation of this study is the sampling method. Random organizations, from different industries were picked for the interview. Besides, one cannot generalize the findings, because only six interviews have been conducted, which gives no proof regarding all manufacturing firms. Also it was asked for the personal opinion of the project managers, which always can be biased due to previous experiences.

Another limitation of this research is, that adherence to quality specifications is not always considered good and does thereby not necessarily show how well a team performs. It is advisable to choose another variable to measure the team performance of a cultural diverse NPD team in the future. Conversely, another option would be to conduct the same study specified on one industry where adherence to quality specifications is considered to be important. Moreover, further research can be conducted by focusing on, for example, the influence of cultural differences within a team on the cycle time of the project. In project B it is mentioned that, people from different countries value urgency different. So, it would give an indication that cultural differences could effect the overall duration of a project. But, also other variables, apart from the cycle time, might be interesting to research with regards to cultural differences within a NPD team. That are, i.e., use of communication systems, how well the supplier is known to the company, or size of the company. Furthermore, to generalize the pattern a larger study on this topic would be necessary.

8. ACKNOWLEDGMENTS

My thanks go to my supervisor Dr. Matthias de Visser for his support throughout the whole project time, to my fellow students within the topic of supplier involvement in NPD teams for the good cooperation, and to all interviewees for their time and effort answering our questions.

9. REFERENCES

AkzoNobel (n.d.). About AkzoNobel. Retrieved from: *https://www.akzonobel.com/aboutus/*

Apollo Vredestein B.V. (n.d.). Apollo Vredestein B.V. Retrieved from: *http://www.apollovredestein.com/about-apollo-vredestein/apollo-vredestein-bv?Lang=en-US*

Azadegan, A., Dooley, K. J., Carter, P. L., & Carter, J. R. (2008), Supplier innovativeness and the role of inter-organizational learning in enhancing manufacturer capabilities. *Journal of Supply Chain Management, 44, 14–35.*

Birou, L.M., Fawcett, S.E., (1994). Supplier involvement in integrated product development: a comparison of US and European practices. *International Journal of Physical Distribution and Logistics Management, 24 (5), 4–14.*

Bronkhorst High-Tech B.V. (n.d.). About Bronkhorst High-Tech B.V. Retrieved from: *http://www.bronkhorst.com/en/about_us/*

Cao, M., & Zhang, Q. (2011), Supply chain collaboration: Impact on collaborative advantage and firm performance. *Journal of Operations Management, 29, 163–180.*

Chang, H.H., Chuang, S.S & Chao, S.H. (2011), Determinants of cultural adaptation, communication quality, and trust in virtual teams' performance. *Total Quality Management & Business Excellence, 22:3, 305-329*

Dyer, J.H. and Ouchi, W.G. (1993), Japanese-style partnerships: Giving companies a competitive edge. *Sloan Management Review, 35 (1), 51-63.*

Frese, M., Kring, W., Soose, A., Zempel, J., (1996). Personal initiative at work: differences between East and West Germany. *Academy of Management Journal 39 (1), 37–63.*

Fu, P.P.P., T. K., Kennedy, J.C., Yukl, G., (2004). Examining the preferences of influence tactics in Chinese societies: a comparison of Chinese managers in Hong Kong, Taiwan and Mainland China. *Organizational Dynamics, Vol. 33, No. 1, S, pp. 32–46.*

Gable, G.G. (1994). Integrating Case Study and Survey Research Methods: An Example in Information Systems. *European Journal of Information Systems, Vol. 3, No 2, 1994, pp.112-126.*

Handfield, R. B., Ragatz, G. L., Petersen, J. K., & Monczka, M. R. (1999). Involving suppliers in new product development. *California Management Review, 42, 59–82.*

Hartley, J. L., Zirger, B. J., & Kamath, R. R. (1997). Managing the buyer–supplier interface for on- time performance in product development. *Journal of Operations Management, 15, 57–70.*

Hiller, N.J., Day, D.V., Vance, R.J., (2006). Collective enactment of leadership roles and team effectiveness: a field study. *Leadership Quarterly, 17 (4), 387.*

Hoegl M., Proserpio L. (2004), Team member proximity and teamwork in innovative projects short

version. *Academy of Management Conference Proceedings, p. A1-A6*

Hoegl, M. and Wagner, S.M. (2005), Buyer-Supplier Collaboration in Product Development Projects. *Journal of Management, Vol. 31 No. 4, August 2005 530-548.*

Hoegl, M., Weinkauf, K., & Germuenden, H. G. (2004). Inter-team coordination, project commitment, and teamwork in multi-team R&D projects: A longitudinal study. *Organization Science, 15, 38– 55.*

Hofstede, G. (1984). Cultural dimensions in management and planning. *Asia Pacific Journal of Management January 1984.*

Hofstede, G., Bond, M.H., (1988). The Confucius connection: from cultural roots to economic growth. *Organizational Dynamics 16 (4), 5–21.*

Hong, Y., & Hartley, J. L. (2011). Managing the supplier–supplier interface in product development: The moderating role of technological newness. *Journal of Supply Chain Management, 47, 43–62.*

Hong, Y., Pearson, J. N., & Carr, A. S. (2009), A typology of coordination strategy in multi-organizational product development. *International Journal of Operations & Production Management, 29, 1000– 1024.*

House, R., Javidan, M., (2004). Leadership, Culture, and Organizations: The GLOBE Study of 62 Societies. *SAGE, Thousand Oaks, CA, pp. 9–28.*

Knapp, K., Enninger W., and Knapp-Potthoff, A. (1987). Analyzing Intercultural Communication. *Mouton De Gruyter*

Kubátová, J. and Kukelková, A. (2014), Cultural differences in the motivation of generation Y knowledge workers. *Human Affairs 24, 511–523, 2014*

Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. (2001). A temporally based framework and taxonomy of team processes. *The Academy of Management Review, 26, 356–376.*

McGinnis, M.A. and Vallopra, R.M. (1998). Purchasing and supplier involvement: new product development and production/operations process development and improvement. *CAPS: Tempe, AZ.*

McGinnis, M.A. and Vallopra, R.M. (1999). Purchasing and supplier involvement in Process Improvement: A Source of Competitive Advantage. *Journal of Supply Chain Management, 35 (4), 42-50.*

Muethel, M. and Hoegl, M. (2009), Cultural and societal influences on shared leadership in global dispersed teams. *Journal of International Management 16 (2010) 234–246.*

Muller, R., Spang, K. and Ozean, S. (2008). Cultural Differences in Decision Making in projects. Examples from Swedish – German Project teams, *in proceedings of the PMI research Conference, July 14- 16,2008,Warsaw, Poland*

Ongwatana, P. and Chordia, G. (2008). How does culture influence communication in multicultural teams in China and India. *Master thesis Umeå School of Business, Masters in Strategic Project Management.*

Paul, D.L., & McDaniel, R.R. (2004), A field study of the effect of interpersonal trust on virtual collaborative relationship performance. *MIS Quarterly, 28(2), 183–227.*

Pfeffer, J., & Salancik, G. R. (1978). The external control of organizations: A resource dependence perspective. *New York: Harper & Row.*

Potthoff, (1987). Analyzing Intercultural Communication. *Mouton De Gruyter*

Randel, A.E., Jaussi, K.S., (2003). Functional background identity, diversity, and individual performance in cross-functional teams. *Academy of Management Journal 46 (6), 763.*

Rothaermel, F. T., & Deeds, D. L. (2004). Exploration and exploitation alliances in biotechnology: A system of new product development. *Strategic Management Journal, 25, 201–221.*

Schein, E. (1985), Organizational culture and leadership. *San Francisco: Jossey-Bass.*

Sensata Technologies (n.d.). About Sensata Technologies. Retrieved from: *http://sensata.com/about/*
http://pressroom.sensata.com/phoenix.zhtml?c=210277&p=irol-factsheet

Siemens AG (n.d.) About Siemens. Retrieved from: *http://www.siemens.com/about/en/*

Smith, P.G., Reinertsen, D.G., (1998). Developing Products in Half the Time: New Rules, New Tools. *John Wiley & Sons Inc., New York.*

Susman, G.I., Ray, J.M., (1999). Test of a model of organizational contributors for product development team effectiveness. *Journal of Engineering Technology Management, 16, 223–245.*

Swink, M.L., 1999. Threats to new product manufacturability and the effects of development

team integration processes. *Journal of Operations Management, 17, 691–709*.

Swink, M. L., & Calantone, R. (2004). Design-manufacturing integration as a mediator of antecedents to new product design quality. *Engineering Management, IEEE Transactions on, 51, 472–482*.

Trenholm,S., and Jensen,A. (2000). Interpersonal communication. *Belmont, CA: Wadsworth*

Wagner, S. M., & Hoegl, M. (2006). Involving suppliers in product development: Insights from R&D directors and project managers. *Industrial Marketing Management, 35, 936–943*.

Wells, B., Spinks, N. (1994), Organizational Communication: A Strategic Approach. *Dame Publications, Houston, TX*.

Westwood, R. (1997). Harmony and patriarchy: the cultural basis for 'paternalistic headship' among the overseas Chinese. *Organization Studies 18 (3), 445–480*.

Yan, T. and Dooley, K. (2014), Buyer-Supplier Collaboration in New Product Development Projects. *Journal of Supply Chain Management 50 (2)*.

Zhang, D., Lowry, P.B., Zhou, L., Fu, X., (2007). The impact of individualism–collectivism, social presence, and group diversity on group decision making under majority influence. *Journal of Management Information Systems 23 (4), 53–80*.

10. APPENDIX

Interview template:

1. Independent variable:

Does the supplier of the project come from another country? If so, from which country?

In case it is an international operating supplier, from which country came the people involved in the NPD team?

2. Dependent variable:

What were the product specifications (concerning functionality, manufacturability, durability and robustness, optical attractiveness) from the NPD team in the designing phase and what are the final product specifications in the outcome phase?

On a scale from 1 to 5 (1= no difference; 5= huge difference) how huge is the difference of the product specifications between the two previously named phases?

3. Relationship:

Do you think the cultural background of the supplier had any effect on the NPD team performance? And if so, in what way? (E.g. through communication issues, language issues, different beliefs and values concerning teamwork and leadership).

4. General:

Is the collaboration within NPD teams better with a supplier from your own country or with a supplier from a different country (name country)? Why?