INTERNATIONAL DESIGN CONFERENCE - DESIGN 2008
Dubrovnik - Croatia, May 19 - 22, 2008.

DESIGN 2008

EXPERIENCE WITH CULTURAL INFLUENCES IN DISTRIBUTED GERMAN-CHINESE DEVELOPMENT PROJECT COOPERATIONS

A. Meyer-Eschenbach, V. Gautam, W. Wildung and P. Schüler

Keywords: culture, distributed product development, international projects, China, experience, consumer products

1. Introduction

Globalisation and growing international markets increasingly lead to international project cooperation. Since China became a member of the *World Trade Organization* in December 2001, a major liberalisation of Chinese markets has begun and fully integrated China in the process of globalisation. Many international companies have started or intensified cooperation with Chinese business partners. Many companies are developing their products in international projects, and project managers, engineering designers and other specialists find themselves working with project members in various countries and continents, with different cultures, educational backgrounds, and languages [Baumgärtner 1999], [Felgen 2004], [Larsson 2003], [Meyer-Eschenbach 2005], [Petermann 2007] and [Whitfield 2002]. For many project teams, distributed product development in particular with European and Chinese project members is a new challenge.

1.1 Distributed product development

A typical example is the distributed development of consumer goods like household appliances or cars. These are produced in large quantities and often sold in various countries and continents. Because of different customer expectations in these markets, localised product variants will be realised. Many influences on distributed product development in general have been already discussed in the literature, [Larsson 2003], [Whitfield 2002], [Petermann 2007]. Key factors for geographically distributed teams are different time zones, languages, organisational structures, educational systems and cultural backgrounds. Important prerequisites include good data management, especially for distributed design coordination, as described in a case study of blades for a steam turbine [Whitfield 2002].

1.2 Advantages and challenges with distributed development

Opportunities of geographically distributed teams are time zone differences, cultural variety, market proximity, mobility, and heterogeneity [Larsson 2003]. Distributed product development offers several advantages, e.g. additional resources of locations, expertise of personnel and training opportunities for subsequent development of variants after the initial product launch. Challenges faced by geographically distributed teams include time zone differences, cultural differences, communications problems, constraints on mobility, and general heterogeneity [Larsson 2003]. Typical problems, include communication difficulties, frictional losses because of cultural differences, shortage of management capacity, conflicting targets, resistance of employees, dependence on cooperation partners, and loss of expertise to partners.

1.3 Experience with distributed development

In a study of distributed development of household appliances, project managers and design engineers were interviewed about their experiences [Meyer-Eschenbach 2005]. Ten project members ranked influences in order of importance from their point of view. The influences most frequently mentioned by the project members are (in descending order).

- Use and understanding of a common working language.
- Intensive communication and data transfer.
- Definition and agreement of common targets of project partners.
- A very systematic and detailed project organisation more intensive than project organisation in non-distributed development.
- An understanding of the cultural backgrounds of the project partners.
- Harmonised development process.
- An understanding of the preferred approaches and methods.

1.4 Importance of cultural influences

+According to the responses [Meyer-Eschenbach 2005], the importance of cultural backgrounds depended on the experience of the project member in international projects. The different average rankings can be seen in figure 1. Interviewees with experience of one international project ranked cultural backgrounds sixth, but interviewees with experience of more than one international project ranked cultural backgrounds first.

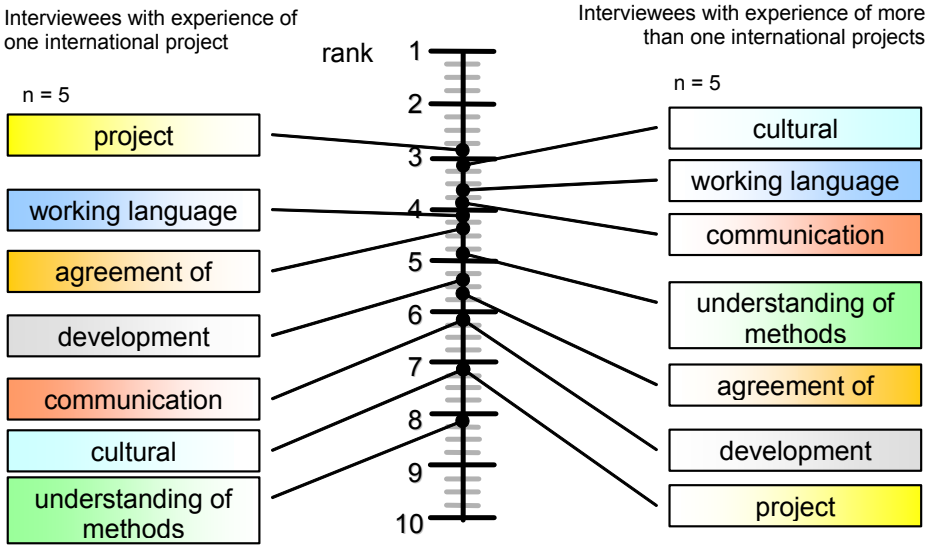

Figure 1. Average ranking of the most important influences

More culturally experienced project members also talked about frictional losses because of misunderstandings between project partners in intercultural projects [Meyer-Eschenbach 2005].
According to Hofstede, culture is defined as a sort of 'software of the mind' [Hofstede 2001]. Every person carries patterned ways of thinking, feeling and reacting. These are partly unique and partly shared with others. The unique part belongs to individual personality level. The common part belongs to collective level and is shared at least partially with other people living in the same social group.
A typical cultural aspect is the form of communication. Germans generally perceive themselves to communicate directly, so people express their opinion without detour in clear words. In contrast, in

Chinese culture it is common not to communicate directly as this is considered impolite and so people use other routes of communication which seem more complex [Kasperk 2006].

2. Objectives and Methods

For international project teams it is helpful to be aware of the profiles of the various cultures and the different processes. In this paper, the experience of project managers and engineering designers who have worked on international projects is discussed and characterised to clarify the cultural influence in European-Chinese project cooperation. Based on a survey of the literature, relevant facts for distributed development and intercultural collaboration are analysed and compared. The conclusions can be helpful for product developers and project managers working on international product development projects with Chinese participants. Recommendations are made for methods and the skills needed by design engineers in distributed development.

2.1 European-Chinese project collaboration

Many European and Chinese companies have intensified their collaboration [Kasperk 2006]. Many new products for the Chinese market are developed by international companies in distributed development projects. The production of consumer goods and producer's goods is rising very fast.

2.2 Workshop

To clarify the main topics for intercultural product development, the authors conducted a workshop with a company which produces and develops household appliances in particular for Germany, Spain, Poland, Turkey, China and USA. Cooperation with China has been carried out in various projects for about twelve years. The project cooperation is to be intensified and a group of engineering designers in Germany, Spain and China is looking for possibilities to optimise intercultural collaboration.
The workshop was organised in two half-day meetings with five experienced engineering designers and project managers of the company, the authors and two researchers of the Technical University Berlin. At the time when the studies were made the first author was Chief Engineer in the group "Engineering Design and Methodology" of the Technical University Berlin.

2.3 Topics of the workshop

At first the engineering designers and project managers of the company explained and discussed their experience of the German-Chinese collaboration in the last three development projects. Topics of this cooperation were collected and classified. Finally the topics were focused on the following seven questions:

What are the different profiles of the cultures involved?

1. What are the advantages of the different profiles of the cultures (including education)?
2. How can German development engineers coach their Chinese colleagues to work more independently?
3. Which profiles of cultures fit together?
4. What is the influence of personal relationships in China?
5. Which processes are different?
6. How should one deal with persons from the other culture?

These questions and the results of the workshop were used for the preparation of interviews.

2.4 Interviews

Based on results in the literature, the experience of the authors and the results of the workshop, the questions for the interviews were formulated. As an introduction to the interview some questions about the project experience of the interviewees were asked. The interview consisted of 17 open-ended questions divided into seven topics, (see table 1 for an overview of the questions).

The first author and a research assistant carried out the interviews in the company. The interviewees were four Chinese and four German engineering designers and project managers. The time allocated for each interview was 30 to 40 minutes. All interviews were conducted in English and recorded on audio tape.

Table 1. Interview questions (slightly abbreviated for the purpose of clarity)

General impression
1. In which areas and activities are cultural differences of project team members most noticeable?
Communication
2. Which form of communication is most important in your company?
3. What is most important in a meeting?
4. When you are looking for information or making decisions in a design process, what is the form of communication?
Advantages and risks
5. What are the advantages when you think of developing products together with European/Chinese engineers?
6. Where do the risks lie in such a case?
Design activity
7. Which activities in a design process do you carry out alone and which ones do you carry out in a team?
8. Which are your main sources of information when you are designing?
9. How do you take decisions in a design process?
10. Which activities in a design process do German and Chinese engineers carry out in a similar way?
11. Which activities in a design process do German and Chinese engineers carry out in a different way?
Self-Management
12. How often are you working on a process or are you managing a sub-project for the first time?
13. How often are you managing a process or project under the guidance of seniors?
Project-Management
14. Which project management activities are carried out by German and Chinese engineers in a similar way?
15. In which cases are the activities carried out in a different way?
Needed support
16. Which are the areas and activities of intercultural collaboration where you see a need of improvement?
17. Do you have ideas for improvements for intercultural collaboration?

3. Results of the workshop and the interviews

The results which were produced in the workshop and the interviews are presented in sections 3.1 and 3.2. The discussion of these results can be found in section 3.3.

3.1 Results of the workshop

The questions which were defined for the workshop (see section 2.3) were discussed with the group of engineering designers and project managers of the company.

1. What are the different profiles of the cultures involved?
   This also underlines typical properties and patterned ways of thinking, feeling and reacting. So culture influences the priorities of issues such as quality, innovation, costs, time, harmony, teamwork, etc..

2. What are the advantages of different profiles of the cultures (and education)?
   A good combination of different profiles of cultures will enrich a development project. Different structures of education systems are also very important. In European education systems, self-management and teamwork are usual, whereas education in China is more rigidly structured and traditional.

3. How can German development engineers coach their Chinese colleagues to work independently in teams?
   Many Chinese engineering designers who have industrial experience of less than one or two years are not used to work in teams. They often need instruction in small steps.

4. Which profiles of cultures fits together?
   In some projects, different culture profiles fit together well. Often a special mixture of characteristics can help to get good results. German engineering designers aim for high quality solutions with many detailed variants, whereas Chinese colleagues prefer a fast solution with one variant and a high speed of development.

5. Which is the influence of personal relationship in China?
   Personal relationships are very important in China. As a consequence in meetings personal relationships can have a big influence on the final decision.

6. Which processes are different?
   The product development process description of the company describes the main processes, but the way to execute these processes can be very different in the two cultures. It is assumed that this is particularly true in the early stages of development.

7. How should Chinese or Germans be dealt with?
   From a German point of view, cultural differences with China seem to be much bigger than with Spain, Poland, Turkey or the USA. In past projects, this sometimes led to misunderstandings.

3.2 Results of the interviews

The open-ended nature of the questions in the interviews provided a richness that on the one hand provided much insight into cultural aspects of product development projects, but on the other hand makes a presentation of all, often very interesting, details impossible. In this section the key statements, distilled from the interviews are presented in a summarised form.

Views of at least five of eight interviewees:

- Communication between the team members is very important.
- Language skills of German and Chinese colleagues are often inadequate. A typical statement of a Chinese design engineer was *"... our spoken English is not efficient to express our feelings and ideas - it takes a long time..."*.
- Personal contact is very important not only in the group meetings but also in face-to-face dialogues.
- Visiting and becoming acquainted with the project partners is especially important in the initial stages of the project work.

Views of at least two or more Chinese interviewees:

- In meetings it is very important that everybody takes part in the discussion and everybody's opinion is considered.

- The German engineering designers have more experience but sometimes it is hard for a Chinese engineer to convince his German project partner of his new idea.

Views of at least two or more German interviewees:

- In meetings it is very important that everybody is well informed and has got a clear agenda. At the end an agreement or a decision is important.
- The Chinese project partners do not have as much experience as the German engineering designers.

3.3 Discussion of the results

The open-ended nature of the questions in the interviews provided a richness that on the one hand provided much insight into cultural aspects of product development projects, but on the other hand makes a presentation of all, often very interesting, details impossible. In this section the key statements, distilled from the interviews are presented in a summarised form.

Communication and language skills:
In international projects the importance of communication is very high. In an earlier study of the first author [Meyer-Eschenbach 2005] about distributed development projects, the use and understanding of a common working language was seen as the most important influence. Most developers wanted to be able to talk about complex things with their project partners in an easy way. In German-Chinese collaboration it is necessary to use and understand a common working language very well. This means that the less direct communication, which was mentioned in section 1.4 as the cultural preference of the Chinese, is easier for them to understand.
Furthermore, the use of communication media is interesting. Most interviewees talked about the intensive use of e-mail correspondence between international project partners. German interviewees talked about a ping pong of e-mails where the most important information is not described exactly. Communication by e-mail was much more common than communication by telephone.

Personal contact and visiting each other:
The personal face-to-face contact is very important for distributed project work in general. In international student projects in which the former group of the first author was involved, the personal contact was the basis for good collaboration. The project teams were composed of students from three nations – USA, Germany and South Korea. Only after a personal meeting, further collaboration by video conferences or other media was really possible.

Meetings:
It is apparent that for Chinese engineering designers in a meeting the result is not the only priority but also their (social) standing in the group. It was felt that everybody should have the chance to give their opinion. Harmony is obviously very important. Extending the meeting is usually not a problem. German engineering designers talked mostly about preparation of meetings with a clear agenda, an organised procedure, and finally a clear decision.

Experience:
In the company in which the studies were made, the German engineering designers had generally worked longer in the company and had more experience then their Chinese counterparts. The interviewees talked about different kinds of educational systems. In a Chinese university, nearly all tasks are defined and explained in detail and guided by a teacher. Moreover, teamwork which is necessary in a company is not trained at university. As a consequence, the company organises special training sessions for young Chinese engineering designers. A big problem, however, is the greater fluctuation in China [Kasperk 2006].

3.4 Recommended prerequisites for German-Chinese collaboration

Based on the results of chapter 3.1 and 3.2, the following recommendations can be made for German-Chinese collaboration:

- Use and understanding of a common working language is very important. Language courses and continuous training is a prerequisite.
- Especially in the initial stages of the project work, visits between the project partners are important. These would offer opportunities for face-to-face communications and informal contacts, including going out for a meal or local excursions. This would establish a good basis for subsequent project discussions. However, many participants will feel that they should get started with the real project work as quickly as possible, and it will also be necessary to take practical considerations and time constraints into account.

4. Final Conclusion

This study shows that many important influences for German-Chinese collaboration are related to soft skills. Interviews of the design engineers of a company which has worked in German-Chinese and European-Chinese projects for about twelve years showed that a number of measures can be adopted to optimise this collaboration. In particular, better language training and more visits between the project partners can be recommended. Especially in difficult project situations the communication and understanding of the project partners is very important. Further studies will be necessary.

References

Baumgärtner, C.E. and Blessing, L.T.M. Characteristics of successful collaboration between engineering consultants and clients in the automotive industry. In International Conference on Engineering Design, Munich, August 1999, pp. 983-988 (U. Lindemann, H. Birkhofer, H. Meerkamm, S. Vajna (eds.), WDK 26, TU Munich).

Felgen, L., Grieb, J., Lindemann, U., Pulm, U., Chakrabarti, A., Vijaykumar, G.: The Impact of Cultural Aspects on the Design Process. International Design Conference – Design 2004. Dubrovnic, May 2004.

Kasperk, G., Woywode, M. and Kalmbach, R.: Erfolgreich in China – Strategien für die Automobilzulieferindustrie. Springer-Verlag Berlin Heidelberg 2006.

Larsson, A., Toerlind, P., Karlsson, L., Mabogunje, A., Leifer, L., Larsson, T. Elfstroem, B.-O.: Distributed team innovation – a framework for distributed product development. International Conference on Engineering Design, ICED '03, Stockholm, August 2003.

Hofstede, G. Culture's consequences, 2001 (Sage Publications Ltd, Beverly Hills).

Meyer-Eschenbach, A. and Blessing, L.: Experience with Distributed Development of Household Appliances. International Conference of Engineering Design, ICED '05, Melbourne, August 2005.

Pauwels, M. Interkulturelle Produktentwicklung – Produktentwicklung mit Wertanalyse und interkultureller Kompetenz, 2001 (Shaker Verlag Aachen).

Petermann, M., Trevelyan, J., Felgen, L., Lindemann, U.: Cross-Cultural Collaboration in Design Engineering – Influence Factors and their Impact on Work Performance. International Conference of Engineering Design, ICED '07, Paris, August 2007.

Whitfield, R.I., Duffy A.H.B., Coates, G., Hills, W.: Distributed design coordination. Research in Engineering Design 13 (2002) 243-252. Springer-Verlag 2002.

(Andreas Meyer-Eschenbach, Hamburg University of Applied Sciences, Vivek Gautam, Technical University Berlin, Wilfried Wildung, BSH Bosch und Siemens Hausgeräte GmbH, Patrick Schüler, BSH Bosch und Siemens Hausgeräte GmbH)

Prof. Dr.-Ing. Andreas Meyer-Eschenbach
Professor for Engineering Design
Hamburg University of Applied Sciences,
Department of Mechanical Engineering and Production Management
Berliner Tor 21, 20099 Hamburg, Germany
Tel.: +49 40 42875 8715
Email: andreas.meyer-eschenbach@haw-hamburg.de
URL: http://www.mp.haw-hamburg.de/pers/Meyer-Eschenbach/