The Problems of a Virtual Multicultural Team (VMT) Analyzed

Simone Jeannette van ZolingenandOmür Dönmez

Institute for Management Research,

Radboud University Nijmegen

Abstract

In this study the factors that influence the effectiveness of a Virtual Multicultural Team (VMT) were described and 14 members of Team, a VMT, were interviewed to ascertain whether the low effectiveness of Team could be ascribed to one or more of these factors. The results indicated that the factors culture, communication, and workload and work pressure influenced the effectiveness of Team most. Consequently the social-emotional processes of Team such as relationship building, cohesion and trust did not develop well. Also training was negatively influenced especially by the high workload and work pressure. Finally recommendations and implications for HRD were mentioned.

Keywords: Virtual multicultural team, effectiveness, diagnosis

The Problems of aVirtual Multicultural Team (VMT) Analyzed

Nowadays information technology provides global organizations with the possibility to organize work in virtual teams (VTs). Virtual teams are groups of geographically,organizationally and/or time dispersed workersbrought together by information andtelecommunication technologies to accomplish one ormore organizational tasks (Powell, Piccoli, & Ives, 2004, p. 7). VTs offer a range of potential benefits but the virtual context also offers many challenges (Hertel, Geister & Konradt, 2005). We still have to learn how to manage them effectively.

Problem statement

This study concerns the performance of a Virtual Multicultural Team (VMT) within a multinational organization (Organization). Organization is a global semiconductor manufacturer with operations in over 25 countries and revenue of $4.4 billion in 2010.Team (the researched VMT in Organization) includes 28 employees located in N (a town in the Netherlands) and I (a town in India). Fourteen employees (one project manager, one resource manager, two support engineers and 10 ESD, electro-static discharge engineers) are based in the Netherlands, whilethe other fourteen employees (one project manager, one design architect and 12 engineers) are based in India.

The chief problem that Team members currently face is that Team cannot solve problems and take decisions quickly. The VMT does not work efficiently. It seems possible that cultural differences between the Team members and the virtual character ofTeamare affecting the performance of Team.

Purpose of the study

The objective of this research is to understand the concept of a virtual multicultural team (VMT) and make recommendations on improving the performance of a specific

VMT(Team) by carrying out a diagnostic gap analysis between the desired situation (based on theory, Fig. 1) and theactual performance of Team.

Research Question

In order to investigate the effectiveness of Team, the answer to the following research question was sought:

How can the gap between the desired and actual values of the factors that influence the performance of the VMT be described?

Theory

Team effectiveness research has been conducted over many years and numerous reviews of the literature have been published (Ilgen, Hollenbeck, Johnson, and Jundt; 2005, Mathieu, Maynard, Rapp, and Gilson, 2008;Powell et al. 2004; Salas, Stagl, and Burke, 2004).

Originally the input-process-outcome (IPO) model was used (McGrath, 1964 in Mathieu et al. 2008 p. 412). *Inputs* describeantecedent factors that enable and constrain members' interactions.These include *individual team member characteristics* (e.g., competencies, personalities),*team-level factors* (e.g., task structure, external leader influences), and *organizationaland contextual factors* (e.g., organizational design features, environmental complexity). Thesevarious antecedents combine to drive team *processes*, which describe members' interactionsdirected toward task accomplishment. Processes are important because they describe howteam inputs are transformed into outcomes. *Outcomes* are results and by-products of teamactivity that are valued by one or more constituencies. Broadly speaking, these may include *performance* (e.g., quality andquantity) and members' *affective reactions*.

The IPO model has been criticized for failing to distinguish multiple types of processes and outcomes. Critics noted that team processes involved members' actions whereas

cognitive, motivational or affective states are also involved. They referred to these latter

mediators as emergent states (e.g., potency, psychological safety and collective affect), and

developed the input-mediator-outcome (IMO) model (Ilgen et al., 2005).

Based on a review of the literature Powell et al. (2004) developed an IPO model of

factors and processes influencing a virtual team (VT) (Fig. 1). They identified eleven relevant

factors that can influence VTs. Five input factors: design, culture, technical expertise, training

and workload and workpressure; three socio-emotional processes: relationship building,

cohesion and trust; three task processes: communication, coordination and task-technology-

structure fit.

Because the model of Powell et al. (2004) is especially developed for research into

virtual teams and Team of Organization (empirical studied in this paper) is a VMT, this

model will be applied in this paper.

Based on the model of Powell et al. (2004) we will first describe the norm for an

effective VMT for all 11 factors. An effective team can be characterized by a greater

exchange of information, adequate planning, adequate open communication,adequateface-to-

face contact, shared understanding,helping behavior, generosity,increased job satisfaction and

commitment, increased motivation and morale, conforming to group norms, and higher task

satisfaction. It hasgood problem solving abilities, high productivity, creativity, innovation,

high quality of products, services, and decisions, and lower tension and conflict, andfewer

coordination and communication problems (Gressgard, 2011).

Input factors

Design. The first input factor for the model of Powell et al. (2004),whichwe will

discuss, is the design of the team*structure*. Achterbergh and Vriens (2009) use the phrase

'organizational structure' to describestructures as particular divisions of work. According to

them,a structure (or distribution or division of work) is a network of related tasks, and

structures that attenuate disturbances (e.g. external or internal changes) and amplify

regulatory potential e.g. adaptation to changes) to deal with disturbance.

The question is how to design structures, or how to arrange the distribution of work in

teams. According to Achterbergh and Vriens (2009), the cybernetic rules and principles of de

Sittercan help to design viable structures
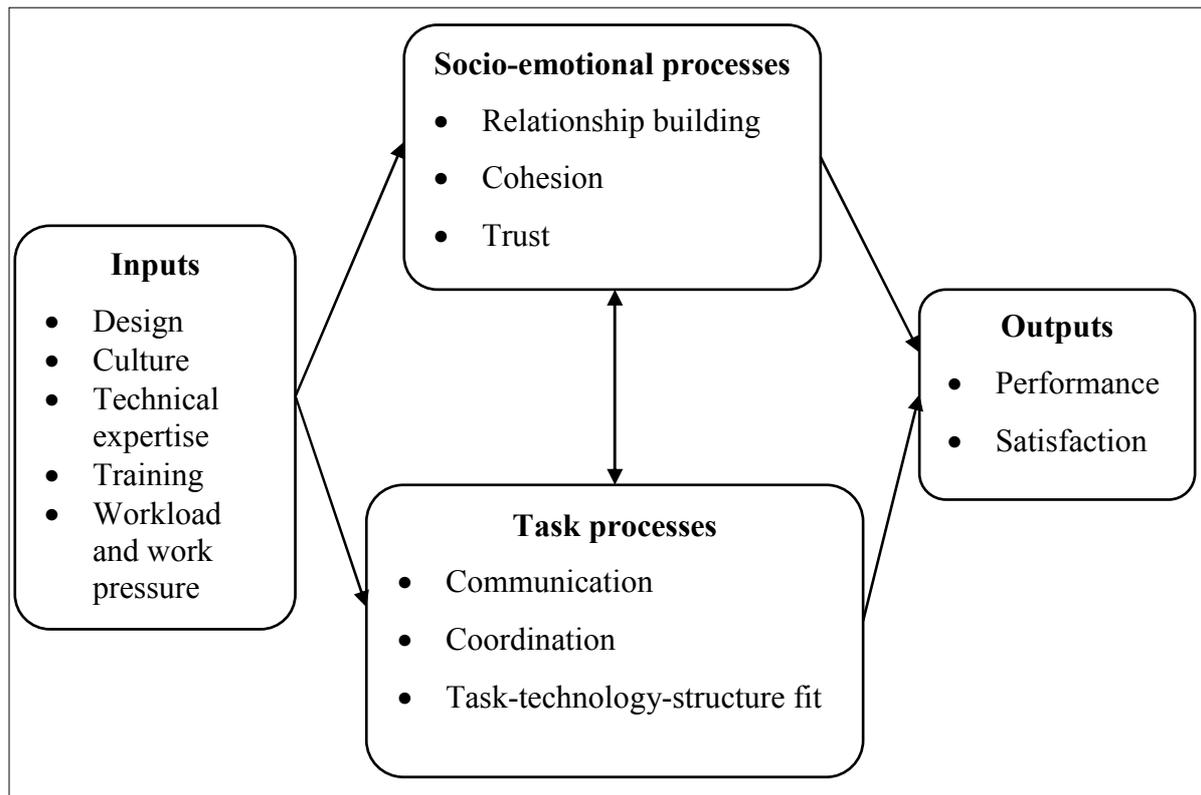
Figure 1.Factors and processes influencing a VT based on Powell et al. (2004, p.8)

De Sitter defines seven design parameters that capture the relevant characteristics of a

structure(1)the level of functional concentration; (2) the level of differentiation of operational

transformations(3). level of specialization in operational transformations(4) the level of

separation between operational and regulatory transformations(5) the level of differentiation

of regulatory transformations into aspects(6) the level of differentiation of regulatory

transformations into parts(7) the level of specialization of regulatory transformations.

Structures with low parameter values are better equipped to attenuate disturbances and

amplify regulatory potential.

Culture. The second input factor for the model of Powell et al. (2004) is culture. Cultural diversity can lead to detrimental effects for teams(Zhou & Shi, 2011). Thesenegative effects can be mitigated when Team members develop greater cultural sensitivity and awareness – or 'cultural intelligence' (Zakaria, Amelinckx, & Wilemon, 2004).

In 1980, Hofstede developed a well-known cultural framework to describe and measure cultural differences (Hofstede, 2001). He analyzed cultures according to five dimensions(power distance; individualism versus collectivism; masculinity versus femininity; uncertainty avoidance; long-term versus short-term orientation)and rated 58 countries on each dimension on a scale from 1 to 100.

Hampden-Turner and Trompenaars (2000) later added five more dimensions (universalism versus particularism*; individualism versus communitarianism*; achieved status versus ascribed status; specificity versus diffuseness; sequential versus synchronous time orientation) to those of Hofstede.We will compare the Dutch and Indian cultures using the framework of Hofstede and Hampden-Turner and Trompenaars in order to determine whether it is possible to identify some potential problem areas for the Team. The cultural differences will potentially give rise to problems between the Dutch and Indian Team members of the Team, which could influence the Team's performance. Table 1 summarizes the cultural aspects of India and the Netherlands.

Dutch culture and Indian culture are different on seven of the nine dimensions: Dutch culture scores low on power distance, while Indian culture scores high; Dutch culture is highly individualistic while Indian culture is highly collectivistic; Dutch culture is feminine while Indian culture is masculine; Dutch culture is oriented to the long term while Indian culture is short-term oriented; Dutch culture is universalistic while Indian culture is particularistic;Dutch culture is specific while Indian culture is diffuse; and Dutch culture is achievement-oriented while Indian culture is ascription-oriented.The two cultures score

relatively closely on two aspects: uncertainty avoidance and sequential / synchronous time orientation. The dimensions where there is a significant difference could cause performance problems in Team that is made up of Dutch and Indian members.

Table 1

Comparison of the Netherlands and India with dimensions of Hofstede andHampden-Turner and Trompenaars

Cultural dimensions	The Netherlands	India
Power distance (H)	38	77
Individualism - Collectivism (H)	80	48
Masculinity – Femininity (H)	14	56
Uncertainty avoidance (H)	53	40
Short-term - Long-term orientation (H)	44	61
Universalism – Particularism (HTT)	90	54
Specificity – Diffuseness (HTT)	91	46
Achieved status - Ascribed status (HTT)	30	57
Sequential - Synchronous time (HTT)	4.63	4.03

H= Hofstede (1991); HTT=Hampden-Turner and Trompenaars (2000).

Technical expertise. The third input factor of the model of Powell et al. (2004) is technical expertise. Team research indicates a correlation between the technical expertise of team members and their performance and job satisfaction. A lack of technical expertise and the inability to solve technical problems and to handle uncertainty in tasks has a negative effect on levels of individual satisfaction and trust, and the performance of teams(Powell et al., 2004).

Training. The fourth input factor of the model of Powell et al. (2004) is training. There is general agreement in the literature on the need for training for all type of teams with a preference for early and uniform trainingfor VTs (Kirkman & Mathieu, 2005). According to the literature, effective VTs need to develop task work, teamwork, and virtuality-related knowledge, skills, and abilities (KSAs) (Oertig & Buergi, 2006). Training for VMTs must be adapted to the demands and requirements of the team to develop adequate knowledge, skills and competencies.

Socio-emotional Processes

Socio-emotional processes are group processes that promote teamwork and team effectiveness. Socio-emotional processes allow teams to function, and maintain or enhance the capacity of team members to work together. VMTs face significant difficulties in fulfilling the socio-emotional needs of its team members.

Relationship building. The firstsocio-emotional process of the model of Powell et al. (2004) is relationship building. Relationships in teams create a feeling of inclusiveness or belonging and encourage cohesion, trust and the exchange of information. Relational ties demonstrate closeness or intimacy between team members. VTs often rely to a significant extent on ICT and this caninitially result in weaker relational ties and cause relational intimacy longer to develop (Beranek & Martz, 2005; Garrison, Wakefield, Xu, & Kim, 2010).

According to Gressgard (2011), early face-to-face contact during projects fosters stronger interpersonal relationships in VTs. Face-to-face contact strengthens the social presence of dispersed team members. Social presence means the awareness and the recognition of interpersonal relationships in teams. Greater social presence facilitates higher levels of trust, fewer conflicts, and betterteam performance (Staples & Zhao, 2006). In the absence of face-to-face contact, providing contextual information(e.g. in the form of text or

avatars) about remote team members and scheduling group meetings for all team members (via video-conferencing) can increase social presence(Kimble, 2011).

The literature (Powell et al., 2004)also mentionsusing humor to help communication and lighten the mood in the team; providing relational link and teamwork training; discussing the drawbacks of communicating using ICT between team members; and agreeing on common rules to improve thesetoenhancesocio-emotional relationships.

Cohesion. The secondsocio-emotional process of the model of Powell et al. (2004) is cohesion. It is a dynamic process that binds individuals to each other to achieve team goals and objectives.

It can be said that team cohesion influences group processes (e.g., trust, motivation, communication, and cooperation) and the performance of VMTs. However, this relationship is mediated by the level of cultural diversity in ateam. A VMT with high cultural diversity among its team members can hinder the development of cohesion (Powell et al., 2004).

Trust. The thirdsocio-emotional processof the model of Powell et al. (2004) is trust, the willingness of a party to makehimself vulnerable to the actions of another based on the expectation that the other will perform a particular action that is important to the trustor, irrespective of the ability to monitor or control the other party (Palanski, Kahai, & Yammarino, 2011).

Trust can have a direct or mediating effect on the effectiveness of teams.There is a positive correlation between trust and performance. Trust increases team members' reliance on one another's integrity and allows them to operate more openly and effectively. Lack of trust can affect the capability and effectiveness of VTs (Gressgard, 2011).

The developmentof trust in VTs is challenging because it is difficult to evaluate the trustworthiness of others without regular face-to-face contact. Trust in teams develops through meaningful and frequent interaction betweenteam members (Holton, 2001). Trust

reduces the need to monitor colleagues, allowing team members to work in a cooperative and productive manner. Early face-to-face contact or communication training can facilitate the development of trust in VTs (Powell et al., 2004). However, cultural differences in VTs, create psychological barriers between team members and hinder the development of trust (Garrison et al., 2010).

According to Zakaria et al. (2004), the following recommendations can increase trust in teams:focusing on similarities, responsiveness and dependability between team members; encouraging trustworthy behavior amongteam members (show good behavior); facilitating meaningful and frequent interaction; and ensuring low turnover in projects.

Task Processes

Task processes can be explained as interaction between Team members that work together to accomplish certain tasks and goals.

Communication. The first task process of the model of Powell et al. (2004) communication means the orderly and efficient exchange of information in a team.

Communication can be enhanced by creating communication routines to foster predictability, regularity, feedback and reliability; and clarifying the roles and expectations of Team members and trust (Powell et al., 2004).

According to Kimble (2011, p. 6),ICT technology "tends to inhibit participation, the creation of trust and the sense of mutual responsibility" in VTs.The level of virtualitydescribes the amount of face-to-face contact between VMT members. De Jong, Schalk, & Curseu, 2008) define the level of Team virtuality as: (1) the extent of communication; (2) the degree of synchronization or synchronicity in exchanges of information; and (3) the presence of para-verbal and non-verbal aspects of communication. The first dimension refers to the objective use of virtual communication tools (e.g. ICT technology) within teams to coordinate, control and perform tasks. The second dimension

relates to whether communication occurs through exchanges of information in real time or takes the form of asynchronous exchanges of information involving a time lag. The third dimension refers to the amount of para-verbal (e.g. visual) and nonverbal cues. It relates to the bandwidth or richness of communication media.

Basically, higher virtuality seems topromote teamwork, cohesion and trust, and lowers the chance of task-related team conflicts and misunderstandings in VMTs.The following measures can increase the level of virtuality in VMTs: creating awareness of the level of virtuality in teams; explaining how virtuality can play a positive role during conflict resolution in team; using higher bandwidth or richer communication media to promotetrust and cooperation in teams; making the responsibilities of the Team members explicit; monitoring the progress of tasks and making this information transparent; and enablingteam leaders to take corrective actions on time(De Jong et al., 2008)..

Other barriers to effective communication and information sharing are ineffective leadership; and cultural differences of team members.A communication barrier can also occur because the coding and decoding of a message occurs in different cultural contexts.(Zhou & Shi, 2011).

Coordination. The second task process of the model of Powell et al. (2004) is coordination. By coordination, we meanthe team's efforts to plan, sequence, and monitor the interdependent actions of its members. It can be argued that coordination and cooperation are the two core processes for effective teams. Effective coordination requires increased teamwork in teams.

VMTs face significant challenges some authors propose structuringteam interaction in such a way that less coordination is needed. However, others propose a decentralizedteam structure. This increases the sharing of information and is useful when teams are working on complex tasks. Other recommendations that can help to develop effective coordination in

teams are early and periodic face-to-face contact during projects,developing common communication protocols and trainingteam members to coordinate more effectively (Powell et al., 2004).

Task-technology-structure fit. The third task process of the model of Powell et al. (2004) isthe task-technology-structure fit.Theperformance of a team is influenced by the structural fit between the tasks performed, the technologies used, and the structure of the team. Kirkman and Mathieu (2005) describe this task-technology-structure fit as 'task-media-member compatibility'. They discuss the synergy between the nature of tasks performed, the technologies available, and the team's competencies. Zakaria et al. (2004) highlight the need for adequate competencies in global VTs so that Team members can work effectively and confidently with ICT, are open to learningto work with new technology, and can change their mindset to use technology to collaborate in new ways. Teams may opt for certain technologies to perform organizational tasks based on individual team member preferences, their experience with technology, the ease of use of technology, the need for documentation, and the urgency of the task.

Certain technologies and team competencies are better suited to performing complex tasks. Other technologies are better suited to the competencies and preferences of the Team members. For example, face-to-face technology is suitable for VTs when it performs ambiguous and complex functions (e.g. managing conflicts and external resources, and brainstorming). ICT is suitable when VTs perform routine tasks (e.g. routine analysis, or monitoring progress).

Method

This study is a practice-oriented qualitative case study and the data was collected through semi-structured interviews with a selected sample of Team members. Fourteen members of Team, seven Dutch and seven Indian, all of whom communicated the most

frequently with Team members overseas (selection criterion(1) and had considerable

experience (selectioncriterion(2)were selected. Additionally, the departmental manager in N

(Dutch town) and the group leader of I (Indian town) were interviewed. Interviews with

Dutch Team members were held face-to-face. Skype was used to interview Team members

located in I. All eleven theoretical concepts (Figure 1) were translated into the questions and

sub questions of the English semi-structured interview. All interviews were conducted in the

English language that Team members of the Netherlands and India use to communicate. The

interviews lasted less than two hours. One researcher conducted, taped, and transcribed the

interviews. When it came to interpreting the transcription data, the following coding

procedures were used: axial coding and concept mapping. A codebook was developed from

the interview transcripts. For each interview transcript, the important statements were marked

and compared by both researchers. All interview transcripts were structured according to the

coding guide. The 16 Team memberswere indicated with two letters in the transcripts: Team

members AN, BN, CN, DN, EN, FI, GN, HI, II, JI, KI, LN, MI, NN, OI, and PI. The first

letter of the Team member indicates the sequence of the interviews. The second letter

indicates the country of origin of that Team member – N for the Netherlands or I for India.

The data was used to perform a gap analysis of the 10 identified factors (norms based on

theory versus reality in the Team).

Results

The Team consists of smaller sub-Teams. Some sub-Teamsconsisted of Team

members who had similar roles within the Team. Other sub-Teams were based on the socio-

emotional relationships between individual Team members.

The following sub-Teamswere distinguished, based on the official roles of Team

members: (1) The *ESD[1]sub-Team*(whichconsists of one senior engineer and ten engineers.

---

[1]electro-static discharge

They are all based in N (Dutch town) and are experts in ESD-related topics). This sub-Team maintains a competency matrix, where Team members are assigned as first or second responsible for the process or technology nodes. When there are customer requests or a request by other Team members, the first responsible in the matrix will support these requests. (2) The *design sub-Team* consists of one senior engineer and six design engineers. The senior engineer in the Team is known as the design architect. The main competency of this sub-Team is to develop IOs[2]. (3) The *EDA[3]sub-Team* consists of one senior engineer and six engineers. The senior engineer is known as the EDA architect in the Team. This sub-Team develops the EDA models (characterization and modeling) of the IOs in the Team. The members of the design and EDA sub-Teams are located in I (Indian town). (4) Furthermore, there are two project managers, one silicon coordinator, and one helpdesk engineer. The project managers interact frequently with the Team members in sub-Teams in the Netherlands and India for their daily project management activities. One project manager is located in the Netherlands and the other is located in India. The silicon coordinator and helpdesk engineer are both located in the Netherlands. The helpdesk engineer delivers the EDA models of the IOs to the customers. The silicon coordinator coordinates the silicon validation of the developed IOs and manages the lab in the Netherlands. The IOs need to be validated on silicon by means of test vehicles (test chip) to confirm that the IOs will also function on customer products (chips).

Input factors

Design. Team members in I (Indian town) are managed by the local department manager, who is supported by two so called development managers. The development managers supervise the EDA and design sub-Teams. Team members in N (Dutch town) were supervised by the senior engineer.

---

[2]IO, input/output
[3]electronic design automation

Team has undergone some changes in its structure over the last couple of years. The largest change was a split two years ago that halved the size ofTeam. Half of the original Team (half in I and half in N) moved to an external organization.AlthoughTeam members believe that the split was a necessary part of the reorganization,Teamis still struggling with the consequences of this split. Furthermore, Team regularly faces more requests from customers than it can handle in the business lines (BLs), which puts pressure on Team to complete all its work.

Last year, one of the two senior architects in I accepted a new job and left Team. The other architect changed his role and became the development manager/architect of the Indian design sub-Team. This change has been positive, according toTeam members, because the architect is now more involved in the technical details of the work. Last year, a contractor in N left and was replaced by a new contractor. Two years ago, the product manager leftTeam, and the vacancy has still not been filled. The departure of the product manager wasreceived negatively byTeam members. The interviews show that five of the seven design parameters of De Sitter are low according to the norm. Only the two parameters functional concentration and specialization of regulatory transformations were relatively high.

Culture. The Team is very much influenced by the culture of its members. During the interview, Team members were asked whether they perceived differences or similarities between the Indian and Dutch cultures within the Team.Team members commented that the cultural *awareness* of the Team is inadequate, althoughthe Team members do have some degree of cultural awareness. EN says: *"Dutch people are more open to people that they know than to people that they don't know."*

BN mentions a bad experience with a Team member in India. He says: *"Well to be honest I had been very open to them and I also think I suffered because of that when I think*

about it, because I talked to them just like I talk to colleagues here, but it seems that this is

not very ...sometimes it is a bit offensive."

CN gives another example: *"If I want something from a Team member in India, I very*

often start with 'could you please do this', I don't say 'you must do this'. I try to be polite in

my emails. If you say to colleagues you must do this before certain time that is not good. That

*can also lead to escalations."*CN says: *"We need to know more about each other, each*

other's culture. In some cultures they can never say no, that is what I know about other

cultures. I don't know the details of the Indian culture. I think people here, we do not have

that knowledge in the group." and GN says: *"We can handle cultural differences; we have*

several cultures in our Team. But the big difference is that between the Netherlands and India

there is a distance of 4000 kilometers. And that magnifies the differences."

OI says: *"What is important is to find a way to work together, but it should not be that*

one culture only influences the other or vice versa. We have to look at what we have in

*common and use that to our advantage."*Team member AN mentions that he followed a

course in intercultural awareness that taught him how to approach Team members in India on

the telephone or by e-mail.

Technical expertise. Of the 16 Team members interviewed, 13 (AN, BN, CN, DN,

EN, FI, HI, II, JI, LN, MI, OI, and PI) indicated that the technical expertise of the Team was

adequate or high; three of them (GN, KI, and NN) indicated that the technical expertise was

low. Team members are not all fully developed technical experts. Several Team members

have experience of between eight to ten years in ESD or design but other engineers have

more limited expertise of between two and four years.

It can be argued that the level of technical expertise in Team is not evenly distributed,

and that Team is still raising its level of expertise from adequate to high. Three of the six

Team members in the EDA sub-Team had little technical expertise. It can be said that Team

can solve almost all complex problems, but is challenged by the pressure of its workload. Team performs also non-routine tasks.

Actual situation: Team members of the ESD and design sub-Teams are technically highly skilled, however the technical expertise level in the EDA sub-Team is average (cohesion problem).

Training. Of 16 Team members interviewed, nine (AN, BN, CN, DN, II, KI, MI, NN, and PI) indicated that the training received by Team was low or inadequate; seven (EN, FI, GN, HI, JI, LN, and OI) indicated that the training received was adequate or high.

The overall level of training was inadequate. Team members of the EDA and ESD sub-Teamsin particular do not receive adequate on the job training.

This lack of training was due to the restricted budget and the high workload inTeam. NN said: *"the only training people receive is on the job training. But that is of course constrained by the fact that we are in an overload situation."*

It can be said that training helps to develop theKSAs ofTeam. Training on the job in particular is seen as a positive way in which to broaden the experience and expertise in different areas within Team.

Work load and work pressure. Of the 16 Team members interviewed, twelve (AN, BN, CN, DN, EN, FI, GN, HI, II, MI, NN, and PI) indicated the workload and work pressure in Team were high.

Although the workload and work pressure was not found to be a factor of the definitive framework of VMTs in section two, it is important to mention the influence it has on the processes of the Team. It can be argued that workload and work pressure in Team should be treated as a separate factor. A high workload puts Team members under continuous pressure to meet their deadlines. For example, a high workload affects the communication, coordination, cohesion, and relationship-building in Team. According to De Jong et al.

(2008), major conflicts occur between Team members as project deadlines approach. Such conflicts can delay decisions if Team members are unwilling or unable to correct a product or output due to a lack of time.

LN says: *"We are indeed faced with over-demand which is difficult to handle at short notice, so that means that we do indeed need to look for opportunities to strengthen the Team to bring in new people, but that will not help on short notice."*

Socio-emotional Processes

This section will discuss the socio-emotional processes of the Team: relationship building, cohesion, and trust.

Relationship building. Of the 16 Team members interviewed, ten (AN, BN, CN, DN, EN, GN, HI, LN, NN, and OI) indicated that relationship building in Team was low; five (FI, II, JI, MI, and PI) indicated that the relationship building was adequate or high; one Team member (KI) had no opinion.

According to the Team members, relationship building betweenTeam members in the Netherlands was high (AN, BN, CN, DN, EN, and GN) and relationship building betweenTeam members in India was adequate (FI, II, and JI).

Team members mentioned that relationship building inTeam as a whole was low. Thefrequency of group meetingsis low. The management organizes GWO group meetings twice a month where the IO, memories, and standard cell Teams from the Netherlands and India are present at a teleconference. During the GWO meetings, department-related topics are shared withinTeam.

Involvement and teamwork such as taking more ownership and responsibility forTeam membersis low. Team members from the Netherlands indicated thatTeam members inIndia lacked commitment.The management confirmed this and were seeking to activateTeam members inIndiaby allowing them to choose implementations and by

challenging the ESD experts during the development of the IOs. It could be argued thatTeam

members in Indiahave more respect (high power distance) for the expertise of the ESD

experts, and do not easily challenge the solutions proposed by these experts. OI says: *"In the*

engineering skills, people in India have kind of grown over the years. But they still believe

jobs are defined either in Europe or US because the center of activities is there, the business

is there."

Four Team members indicate that the lack of relationship building in Team was partly

related to culture and partly to the distance (CN, DN, EN, and LN). CN says: *"Partly it is*

culture but partly it is the distance between these two Teams." Team members AN and OI

point out the influence of relationship building on performance and trust in the Team. EN

indicates that the physical distance between Team members in the Netherlands and those in

India has more influence on relationship building than the cultural differences. EN says: *"For*

me this doesn't play a role. But the main difference is really in fact that they are remote. So

of course this can than also increase kind of distance between people." HI mentions that the

cultural differences play a negative role for new and junior Team members, but after some

time of being exposed to the other location (India or the Netherlands), they would develop a

cultural awareness.

Cohesion. Of the 16 Team members interviewed, six (AN, BN, CN, DN, KI, and MI)

indicated that cohesion in Team was low; eight Team members (EN, FI, GN, HI, LN, NN,

OI, and PI) indicated that cohesion was adequate or high; two Team members (II and JI) did

not have an opinion.

The results show that cohesion between Team members in the Netherlands and

cohesion between Team members in India was high. Within their own countries, Team

members showed the behavior of a highly cohesive team: helping behavior, generosity,

cooperation, open communication, decision-making, and problem-solving.

DN says: *"Again, in the Netherlands it is all right, but when you have to cross to the Indian Team there is no trust and cohesion. I think trust is also built on personal trust. If you can trust somebody personally, you can also obviously trust him professionally."*

Furthermore, communication within Team was less predictable and reliable due to the distance, time zone difference, and cultural differences.

According to Team members, decision-making and problem-solvingwere adequate but inefficient – they said it takes too much iterations to make a final decision or solve a problem. This creates tensions and undermines trust in Team. Team members in N and I disagreed on whether a Team member in the Netherlands or India makes the final decisions. EN says: *"Decision making this is also really… this is very weak. Because it is not that efficient I also have the example of this IO library …where we made a really very small Excel sheet … and we needed many emails to say, please put this name, this number."*

Trust. Of the 16 Team members interviewed, seven (AN, BN, CN, DN, GN, KI, and NN) indicated that trust was low in Team; nine Team members (EN, FI, HI, II, JI, LN, MI, OI, and PI) indicated that the trust was adequate or high.

DN says:*"There is no trust between Team members in the Netherlands and in India. You can't really cooperate in that sense."* It could be argued that trust is low in the whole Team and high between Team members within the Netherlands and within India.

According toTeam members there is no predictable communication patternin Team.

Trust in Team seemed to be based on earlier face-to-face contact and work-related relationship building betweenTeam members. This explains why the senior Team members perceived no barriers to making contact with each other. The new and junior Team members, having missed earlier face-to-face contact had more difficulty making contact with Team members from the other country. For example, junior Team members in India would hesitate before calling Team members in the Netherlands directly and used more e-mail.

Task Processes

This section discusses the task processes of Team communication and the level of virtuality, coordination, and task-technology-structure fit.

Communication. Of the 16 Team members interviewed, eight (AN, BN, CN, DN, EN, KI, NN, and OI) indicated that communication in Team was low; the other eight (FI, GN, HI, II, JI, LN, MI, and PI) indicated that communication was adequate or high.

The level of virtuality inTeam can be described as follows. (1) CommunicationbetweenTeam members inthe Netherlands and India was mainly electronic communication.There was very little face-to-face communication due to the distance and time zone difference between the Netherlands and India. Team members in both the Netherlands and India used face-to-face communication when they communicated with colleagues, or with customers based in their own country. (2) The degree of synchronizationbetween Team members in the Netherlands and India was generally adequate to low. The degree of synchronization, for example in email communication, depended on theTeam members involved, and on the complexity and/or urgency of the question. For urgent matters, response times were appropriate – within one or two hours. It can be argued that some Team members were very responsive to e-mail communication while others did not react at all. (3) The presence of para-verbal and nonverbal aspects of communication seemed to be adequate. Team members mention that they socialized first during email or communication before coming to the point, asking their question or making their request. All Team members were aware of the physical distance between the Netherlands and India and of the impact this has on the quality of the communication. Most Team members indicated that they use smileys with communicator.

Coordination. Of the 16 Team members interviewed, six (BN, DN, EN, II, KI and NN) indicated that coordination in Team was low and/or problematic while nine (AN, CN, GN, HI, JI, II, MI, OI, and PI) indicated that the coordination was adequate and/or could be further improved; one (FI) indicated that the coordination was high. The general opinion of Team members was that coordination in Team, especially between Team members in the Netherlands and India, needed to be further improved, although competencies and tasks were strictly separated.

In addition to their planned project activities, Team faces a continuous stream of interruptions (e.g. customer requests, or bug fix requests). Team member NN mentions that the coordination challenge faced by Team is a cyclical struggle between Team members in the Netherlands and those in India. When there is a coordination problem, management intervenes and coordination improves for a time. However, when there are changes, for example when key Team members leave, coordination is affected and Team members start acting as individuals instead of as a cohesive Team.

Coordination outside projects is problematic, because a formal coordinator role is lacking and the workload in Team is high. Before Team split two years ago, a senior ESD engineer was leading the formal coordination role between the ESD and design sub-Team members. Since the split, this coordinator role has disappeared, making coordination between the design and ESD sub-Teams problematic. JI says: "*I would say during the ESD review. There we can have better coordination I think. It is also management that has to play role there in synchronizing these two Teams.*"

Another coordinator role that is missing is the product manager of Team. The management is still struggling to hire a product manager, who can coordinate between customers and Team on the one hand and between Team members of N and I on the other.

Some Team membersbelievethat this role is critical for the coordination ofTeam members in the Netherlands and India.

Task-technology-structure fit. Of the 16 Team members interviewed, two (AN and OI) indicated that the task-technology-structure was not suitable for the Team; 13 (BN, CN, DN, EN, FI, GN, HI, II, JI, KI, LN, MI, and NN) indicated that the task-technology-structure was suitable; one of them (Team member PI) had no opinion.

To sum up,there is an adequate fit between the tasks, the technologies or tools used, and the work structure of Team. The main concern inTeam is the lack of technical expertise of the ESD back-ups and some of the EDA Team members. Other missing roles inTeam are the roles of an architect and product manager.

Outputs

Team is slow in decision making, also because of the bureaucracy involved and the many iterations needed to reach a decision. Team members like to innovate, they always want to develop more efficient and error free IOs. However work pressure leaves too little time to innovate. The same goes for problem solving. Within the Dutch and Indian sub Teams performance is well. Problems can arise when both sub Teams need to work to getter. On the composite performance measures such as responsiveness of Team; bugs per units produced; effort and schedule slip and product or service quality Team performs too low.

Summary

What is striking is thatTeam members talk about the Dutch and Indian parts ofTeam as two separate Teams. Team members in the Netherlands and India also sometimeshave different opinions with regard to the factors and processes that influence the effectiveness of Team. This is problematic, because the success of Team depends on efficient interaction between the Netherlands and India.

Table 2

Summary of the current performance of Team

Performance	Low	Adequate	High
Decision-making	x		
Creativity and innovation		x	
Problem-solving	x		
Intra-group conflict		x	
Composite performance measures	x		

Actually Team has low virtuality, because it uses no rich virtual communication methods and the distance and time-difference between India and the Netherlands hinder communication. Furthermore, the content of the messages that are exchanged in Team between the Netherlands and India is distorted by low cultural awareness and little knowledge of the communication conventions ofTeam members of the other culture.

Together with the high workload and work pressure, this low virtuality and cultural diversity of Team affects team learning and its socio-emotional and task processes. The effect is a lack of relationship building, mistrust, and low cohesion especially between the Dutch and Indian members of Team. This is detrimental to communication between the Indian and Dutch Team members. For example,Team members from the Netherlands and Indiathat have never met before can only communicate by e-mail, which is very inefficient. Furthermore, the lack of face-to-face contact hampers any further development of individual socio-emotional relationships in Team.

Summing up during the interviews with Team members, it became clear that more interaction and teamwork were required betweenTeam members in the Netherlands and India.

This result corresponds with the general opinion of Team members that the performance of Team was adequate but needed to be improved.

Table 3

Summary of the input factors and processes of Team

Factors and processes	Low	Adequate	High
Design		X	
Culture	X		
Technical expertise		X	
Training	X		
Relationship building	X		
Cohesion	X		
Trust	X		
Communication	X		
Coordination		X	
Task-technology-structure fit		X	

Conclusion and Discussion

The empirical study and gap analysis ofTeamshowed large gaps between the actual situationand the desired situation in terms of culture, workload and work pressure, relationship building, cohesion, trust, and communication. Furthermore, problem-solving and decision-making were alsoproblematic inTeam. Closing these gaps wouldimprove the functioning and performance of Team.

Within the sub-Teams in the Netherlands and India, socio-emotional processes, relationship building, cohesion and trust and the task processes communication arenot serious problems. Workload and work pressure and coordination and its consequences – such as too little training/learning and a missing product manager – were more serious problemswithin

the Dutch part of Team. Meanwhile, the Indian part of Team struggled with in-group behavior bythe EDA sub-team.

However the most serious problems werecaused by the cultural differences between the Indian and Dutch Team members and the virtuality of Team. These aspects of Team disturbed the social and task processes, resulting in lower performance. Relationship building, cohesion, and trust could not develop because many Team members never met face-to-face. Communication between the Dutch and Indian Team members could not improve because there was little trust, there were no communication rules/patterns and many Team members did not know how to communicate with Team members from the other country.

Recommendations for Organization and Implications for HRD

The recommendations that can be made to Organization have implications for HRD and are very relevant for its HRD practitioners.

Firstly,cross-cultural training organized by the HRD department ought to teachTeam members to respect cultural differences. Team members should also learn how to communicate with Team members of a different cultural background.

Secondly, HRD practitionerscouldarrange training on the job and coaching for some of the Team members fromthe EDA and ESD sub-Teams to improvetechnical expertise in Team. An individual or group-based training can be arranged based on the needs of Team. For example, training the junior Team members couldimprove their technical expertise, and coaching senior Team members could enhance their soft skills. A distinction needs to be made between training for Dutch Team members (self-focused training) and Indian Team members (group-focused training).

Thirdly, it is essential that the HRD department balances workload, product quality requirements and project schedule requirements in Team by selecting or hiring employees for

the positions that are currently vacant (architect and product manager) in Team. These positions requireindividuals who are creative, collaborative, and strong communicators.

Fourthly,HRD practitionersshould improve relationship building, cohesion, and trust, by organizing a team-oriented training at one location forTeam members in the Netherlands and/or India. As a follow-up, regular exchanges betweenall Dutch and Indian Team members wouldimprove socio-emotional relationships and trust within Team. Furthermore,individual Team members should be encouraged to share openly and comfortably their concerns, thoughts and feelings about the tasks they perform. To facilitate effective communication and information sharing inTeam, communication routines for good behavior need to be defined to foster predictability, regularity, feedback and reliability.

Finally HRD practitionersshould help clarifying the roles and expectations of Team members,and help increasing virtuality inTeam by encouraging (traning)the use of rich media such as video-conferencing and/or more opportunitiesfor face-to-face contact. This will increase effective communication inTeam.

Summing up the implications for HRD: Virtual multicultural teams benefit when HRD practitioners organize cross-cultural training, communication training, face-to-face contact between all team members, and training in the use of rich media.Further the HRD department should keep a sharp eye on the continuous development of the employees and the hiring of new employees to prevent crucial positions becoming vacant.

References

Achterbergh, J., & Vriens, D. (2009). *Organizations: social systems conducting experiments*. Heidelberg: Springer.

Beranek, P.M., & Martz, B. (2005). Making virtual Teams more effective: improving relational links, *Team Performance Management. 11,* 200-213. doi: 10.1108/13527590510617774

De Jong, R., Schalk, R., & Curseu, P.L. (2008). Virtual communicating, conflicts and performance in Teams. *Team Performance Management, 14,* 364-380. doi: 10. 1108/13527590810912331

Garrison, G., Wakefield, R.L., Xu, X., & Kim, S.H. (2010). Globally Distributed Teams: The Effect of Diversity on Trust, Cohesion and Individual Performance. *The DATA BASE for Advances in Information Systems, 41*(3), 27-42.doi: 10.1145/1851175.1851178

Gressgard, L.J. (2011). Virtual Team collaboration and innovation in organizations. *Team Performance Management, 17,* 102-119.doi: 10.1108/13527591111114738

Hampden-Turner, C., & Trompenaars, F. (2000). *Building Cross-Cultural Competence: How to Create Wealth from Conflicting Values.* London: Yale University Press.

Hertel, G., Geister, S. and Konradt, U. (2005), "Managing virtual teams: a review of current empirical research", *Human Resource Management Review*, 15 (1), 69-95.doi:10.1016/j.hrmr.2005.01.002

Hofstede, G. (2001). *Culture's consequences (second edition).*London: Sage.

Holton, J.H. (2001). Building trust and collaboration in a virtual Team. *Team Performance Management, 7,* 36-47.doi: 10.1108/13527590110395621

Ilgen, D.R., Hollenbeck, J.R., Johnson, M., & Jundt, D. (2005). Teams in organizations: From Input-Process-Output Models to IMOI Models. *Annual Review of Psychology, 56,* 517-543. doi: 10.1146/annurev.psych.56.091103.070250

Kimble, C. (2011). Building effective virtual teams: How to overcome the problems of trust and identity in virtual teams. *Global Business and Organizational Excellence*, *10*, 6-15.doi:10.1002/joe.20364

Kirkman, B.L., & Mathieu, J.E. (2005). The Dimensions and Antecedents of Team Virtuality. *Journal of Management,31*, 700-718.doi: 10.1177/0149206305279113

Mathieu, J., Maynard, M.T., Rapp, T., & Gilson, L. (2008). Team Effectiveness 1997-2007: A Review of Recent Advancements and a Glimpse into the future. *Journal of Management, 34*,410-476.doi: 10.1177/0149206308316061

Oertig, M., & Buergi, T. (2006). The challenges of managing cross-cultural virtual project Teams. *Team Performance Management, 12,* 23-30. doi: 10.1108/13527590610652774

Palanski, M.E., Kahai, S.S., &Yammarino, F.E. (2011). Team Virtues and Performance: An Examination of Transparency, Behavioral Integrity, and Trust. *Journal of Business Ethics, 99,* 201–216.doi: 10.1007/s10551-010-0650-7

Powell, A., Piccoli, G., & Ives, B. (2004). Virtual Teams: A Review of Current Literature and Directions for Future Research. *The DATA BASE for Advances in Information Systems, 35(1),* 6-36.doi 10.1145/968464.968467

Salas, E., Stagl, K. C., & Burke, C. S. (2004). 25 years of team effectiveness in organizations: Research themes and emerging needs. In C. L. Robertson (Ed.), *International Review of Industrial Organizational PsychologyVol. 19*(pp. 47-92). New York: John Wiley.

Staples, D.S., & Zhao, L. (2006). The Effects of Cultural Diversity in Virtual Teams versus Face-to-face Teams. *Group Decision and Negotiation, 15*, 389–406. doi: 10.1007/s10726-006-9042-x

Stewart, G.L. (2010). The Past Twenty Years: Teams Research Is Alive and Well at the Journal of management. *Journal of Management, 36*, 801-805. doi:10.1177/0149206310371512

Zakaria, N., Amelinckx, A.,& Wilemon, D. (2004). Working Together Apart? Building a Knowledge-Sharing Culture for Global Virtual Teams. *Creativity and Innovation Management, 13(1),* 15-29.doi: 10.1111/j.1467-8691.2004.00290.x

Zhou, W., & Shi, X. (2011). Special Review Article: Culture in groups and Teams: a review of three decades of research. *InternationalJournal of Cross Cultural Management, 11(1),* 5-34.doi: 10.1177/1470595811398799