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Information and Communication Technologies – Creating Oneness in Globally Distributed IT Project Teams

Olga Stawnicza *

European University Viadrina, Grosse Scharrnstr. 59, 15230 Frankfurt (Oder), Germany

Abstract

Information and communication technologies (ICT) are indispensable to globally distributed projects. ICT enables communication among geographically dispersed project teams and positively impacts project team efficiency. Furthermore, information and communications media help to create and maintain trust within geographically distributed units. These factors are particularly significant for creating a bond between project team members and establishing a sense of team unity. Since communications tools and methods develop at a fast pace, the author attempts to investigate the current trend toward ICT in modern global IT projects and their impact on creating this feeling of oneness in geographically distributed projects. The contribution of this research to the field is twofold. First, it fills the gap in prior literature on the impact of ICT on the performance of globally distributed project teams and their unity. Secondly, it increases project practitioners' awareness of the importance of striving for oneness in spite of the geographical distance that exists between project team members.

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* Corresponding author. Tel.: +49-335-5534-2304; fax: +49-335-5534-2321.
E-mail address: stawnicza@europa-uni.de

1. Introduction

Globally distributed information technology (IT) projects have become common practice within today's organizations mainly due to outsourcing, globalization, and the ever increasing internationalization of companies. Moreover, the rapid development of information and communication technologies (ICT) has impacted the increasing use of dispersed project teams.

Communication and trust are essential to every type of business setting but they undeniably play a dominant role in virtual organizations, and for this reason also in globally distributed IT projects [1]. Regular face-to-face communication among team members of collocated projects supports the building of trust and the sense of "teamness" [2]. Since face-to-face communication is not always applicable to globally distributed IT projects, information and communication technologies play a major role in communicating and creating trust within global project teams. Though companies extensively use ICT to enable and support communication in distributed project teams, communication is still often recognized as one of the biggest challenges encountered in globally distributed projects [3]. Another challenge, strictly related to communication, is creating a bond among geographically dispersed project team members. Project team members located at different sites are less likely to perceive themselves as part of the same team than members of a collocated project team [4]. As globally distributed projects strongly rely on communication media [5], it is important to ensure that project team members are able to use the available means effectively.

Since communication in globally distributed IT projects is still recognized as particularly challenging, it requires further in-depth analysis. The goal of this research is twofold. First, the author attempts to identify new trends toward ICT use in globally distributed IT projects. Second, the author aims to fill the gap in prior literature by analyzing how ICT can be used for developing this sense of teamness within globally dispersed project teams. In light of the increasing importance of globally distributed project teams, this study contributes to the research on global project team unity.

The paper begins by initially presenting a theoretical background related to the study. Subsequently, the research method implemented in this study is justified, followed by the preliminary results of the research. The author concludes by evaluating the limitations of the current study as well as offering an outlook on the future research.

2. Theoretical Background

According to Binder (2007), global projects involve people distributed across various countries and organizations [6]. Likewise, DeSanctis and Monge (1999) defined a virtual organization as "a collection of geographically distributed, functionally and/or culturally diverse entities that are linked by electronic forms of communication and rely on lateral, dynamic relationships for coordination" [1]. Available evidence indicates that while an IT project can be global – although it is conducted within a single organization – it cannot function without sufficient ICT involvement (e.g. a software development project at Motorola, which involved engineers from Motorola's software development centers in six different countries [7]).

The communication problems that global projects often face tend to be a result of missing informal communication, which is a constant struggle for internationally distributed teams [8]. Past evidence indicates that communication in global software development (GSD) is less frequent [4] and less effective [9] than in classical, collocated project teams. Thus, the ICT must strive to strengthen the effectiveness and efficiency of communication practices between geographically distributed team members. Furthermore, communication media should enable rapid information exchange and promote regular communication. Previous research results indicate that ICT reduce the negative effects of intercultural communication and support the positive aspects of decision making in global virtual teams [10].

Another reason for communication problems in globally dispersed projects is a strong dependence of project team members on technology [5]. An unforeseen technical problem, such as a sudden power outage at one location, can lead to temporary communication breakdown. This, in turn, can result in increased anxiety felt by team members at the other site. Furthermore, a high information load due to excessive use of e-mails can lead to delays as well as increasing the risk of overseeing important information [11, 12]. In addition, slow or delayed feedback due to communication media has negative impact on global project team performance. When using asynchronous communication tools, such as e-mail, discussion boards, shared documents, web logs, etc. for solving urgent issues, the lack of immediate response can delay the decision making process. Delayed response is perceived as an obstacle

to the development of ‘familiarity’ and a sense of unity among dispersed project team members [13]. Thus, choosing the right communication media in particular situations is crucial.

Communication media differs according to the level of information richness [14]. The Media Richness Theory (MRT), proposed by Daft and Lengel (1986), is used to define the ability of different communication media to transfer information [15]. The communications medium with the highest level of richness is face-to-face communication, followed by video conferencing, phone, and chat respectively. The lowest richness level is represented by e-mail, text messaging and written documents [14]. A loss of communication richness is considered as one of the major communication problems and one of the main collaboration challenges facing typical global software development projects [16, 17]. The ongoing research attempts to study the preferences of global project managers toward different communication tools.

The basic infrastructure that any organization conducting global projects must be equipped with consists of the computer-mediated communication systems (CMCS) [18]. Rice (1987) described computer-mediated communication systems as those that “use computers to structure and process information and use telecommunications networks to facilitate its exchange” [19]. These systems include e-mail, voice messaging, computer conferencing, etc. The rapid development of technologies that support communication and facilitate the exchange of data and information, including the Internet, telephony, broadcast media, and all kinds of audio and video transmission technologies, improves the team work undertaken within geographically distributed project teams.

Current trends demonstrate an increased use of social media by many organizations [20, 21]. Social media and the related applications are used extensively in globally distributed projects, as they enable quick communication between project teams and stakeholders dispersed across the globe. Perpetual communication and the possibility of direct response plays an important role in global settings, particularly in conflict management [22] but also in relation to building up trust between project team members [12] and nurturing a sense of unity.

Cooperation between project team members is crucial for successful project team performance [12]. However, establishing a sense of unity, also referred to as “oneness” or “teamness”, is recognized as one of the challenges facing global teams [23]. Teamness is defined as an intangible feature of a team’s performance [24]. It is the ability of individuals to collaborate and work effectively as a team [25]. Teamness is characterized by close relationships among team members, their strong commitment to the team’s success, and a perceptible unity of team members. Teamness is a synonym of oneness with an emphasized aspect of striving for a common team achievement.

Creating a sense of unity in globally distributed projects poses a challenge, in particular due to the distances existing between project team members and lack of regular face-to-face communication that would strengthen trust among team members. Distant project team members often feel less teamness and perceive their other colleagues as being less cooperative and helpful in the event of increased workloads [4]. Prior literature recognizes the need to reduce distance separating parts of globally distributed projects [9, 26, 27]. However, the author found that previous research on the significance of teamness in global projects as well as the literature on the impact of ICT on creating a sense of unity in geographically dispersed project teams is scarce.

3. Research Objectives and Research Design

The research described in this paper attempts to examine the role of ICT in the creation of teamness in globally distributed IT projects. The following topic areas play an important role in the ongoing research: challenges related to culture and cross-cultural differences, conflict prevention and management, communication, trust, and a sense of unity in dispersed project teams. In each of these fields, information and communication technologies play a significant role. The scope of the presented paper is limited to the relation between ICT, communication, trust, and the one-team approach in globally distributed IT projects.



Fig. 1. The influence of ICT on global project related topics.

This research is founded in sociological orientations [28]. The study follows explanatory research design based on a case study. Explanatory design aims at determining how events occur and which events may influence particular outcomes [29]. In addition, this research investigates the ways in which global project managers and team members use ICT tools in the communication process to improve the feeling of oneness within globally distributed projects. Yin (2008) distinguishes three types of case studies: single, holistic, and multiple case studies [30]. Since this research encompasses the analysis of responses offered by several project managers belonging to a single organization, this research is based on a single case with embedded units [30].

The data collection for this qualitative research was conducted by means of semi-structured interviews. The case study was conducted in India. The author spent two weeks visiting the case company's locations in three different cities, participating in the daily activities of project teams and conducting interviews with global project managers. The case company is a large, multinational enterprise providing IT services, business consultancy, and business process outsourcing for nearly 20 years.

The case study contributes to the prior literature by answering the following research questions:

Q1: How do information and communication technologies impact the creation of a feeling of oneness in distributed project teams?

Q2: What is the current trend toward ICT use in globally distributed projects?

Examining the interviewees' responses, the author attempts to analyze the ICT influence on creating a sense of team unity in globally distributed projects. The importance of ICT to such projects has been widely recognized and investigated.

Participants responded to a set of questions, conveyed to them beforehand. Any additional comments not strictly related to the question were allowed. The interviewer was able to ask follow-up questions during the interview. All participants involved in this study were informed of the purpose of the research and gave their permission for interviews to be recorded. During interviews, additional notes were taken which could afterward be compared to the audio record in case of possible ambiguities arising from the recordings.

The initial interview set consisted of seven interviews with eight global project managers (six one-on-one interviews and one group interview with two respondents) as well as one interview with a global project team member. The interview with the project team member is excluded from the presented study, though it will be included in future research. Furthermore, two interviews with global project managers are not included in this analysis – one due to a missing permission slip for audio recording, and one due to insufficient quality of the audio record. As a result, the answers of six experienced global project managers were transcribed. Each interview lasted between one and two

hours. The possible length of the interview was communicated to the participants beforehand. The first interview set resulted in approximately six hours of audio record and a 79-page interview transcript.

All interviewees are Indians, male, and employed by a single organization. Taking the experience of the company into consideration, the author believes that the corporate culture and carefully developed global communication procedures at this company may have impacted the interview results. As the interviewed project managers were positioned in different locations, the interviews were conducted in three different cities in south and south-west parts of India. Each interviewee has several years of experience as a project manager of both globally distributed and co-located IT projects (a span of 8-23 years of experience, which is visualized in table 1).

Table 1. Overview of study participants

	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6
Current position	Director – Projects	Program Manager	Associate Director	Director – CRM	Senior Project Manager	Senior Consulting Manager
Years of IT work experience	21	16	16	23	18	8
Engineering background	n/a	Yes	Yes	Yes	Yes	n/a

In order to analyze the interviewees' responses, the audio records were transcribed and coded line by line. A matrix was created to categorize the responses of each study participant. The categories were based on the interview questions and consisted of a definition of 'globally distributed IT project', communication, trust, cross-cultural issues, one-team approach, conflicts, communication and collaboration tools, and other challenges globally distributed IT projects raise. Subsequently, the audio records transcriptions were carefully analyzed, key words were marked, the relevant quotations were inserted into the matrix, and the responses compared and contrasted.

Due to the very limited number of respondents and the strong homogeneity of their profiles, only a few patterns could be observed. A few early observations are presented in the following section.

4. Preliminary Results

Research evidence has indicated that communication is still a dominant challenge for globally dispersed project teams. This was confirmed by all six interview partners. Furthermore, it is clearly stated that communication plays a major role in building trust and creating a sense of unity in distributed project teams (e.g. "The most important thing [in trust building] is that we consider a timely communication. It is very important." [Interviewee 1]). Thus, these three factors – communication, trust, and oneness – are identified as salient factors influencing team performance in globally distributed projects. Due to the strong dependence of such teams on the use of information and communication technologies, all three aspects are heavily impacted by ICT.

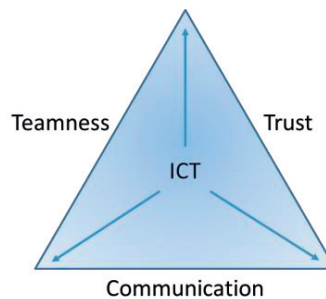


Fig. 2. The effective distributed team work triangle

The levels of trust and teamness depend on the quality or amount of communication. The better team members communicate, the stronger the bonds between them are and the higher the trust level in the project team is. As one participant stated, in a global project team “people do not see [each other] face-to-face, people talk on phone, but are not together. Sometimes the teams are so disposed that they [will never meet at one location]. But the management has to take conscious effort to bring them together because if they do not talk to each other, they do not feel each other, it will not work. The feeling of oneness is not there. Bonding is important, connecting is important, connection is important.”

In particular, the interviewees frequently highlighted the significance of teamness. A lack of teamness has been identified as one of the challenges revealed by Carmel [23]. Furthermore, Holmstrom et al. revealed that due to geographical distance, establishing a feeling of trust and belonging, i.e. teamness, within global project teams is hampered [31]. Despite this fact, the significance of teamness is generally neglected in prior literature on global project management, the interview results confirm its role in globally distributed projects. The results demonstrate that project managers need to strive for a visible oneness in the project team in spite of its geographical dispersion.

Frequently, parts of the distributed teams become local teams during the project, but in relation to this team in another location they are disconnected. Thus, the best way to unite the entire team is to use information and communication technologies, which is emphasized by one interviewee: “The only way we can bring them [team members] together is through the video conference (...) What we have is weekly calls, monthly calls and we have a senior management, which is also within the location so that we interact and share the information. But mostly this is the big challenge for me to make the whole team as one team.” As stated by several study participants, the onsite team additionally supports developing trust and the sense of oneness.

Furthermore, companies require convenient communication technologies and a structured communication process, as confirmed by an interviewee stating: “When we have this cross-cultural team across various time zones, it is necessary that there is an established or a structured communication process that happens between these teams, so that the project objective is tracked and it is seen that there is fulfillment of this objective. So this communication is of most importance, if you have to really manage these global distributed teams.” Additionally, communication should be encouraged. An appropriate means of encouraging project team members to communicate regularly is making various information and communication technologies available at any time and accustoming team members to the communication process. By frequent communication, the feeling of unity is strengthened.

Moreover, modern companies frequently adapt ICT to their employees’ preferences and communication habits. Some project teams require daily calls, nightly calls, weekly status reports, etc., but some teams also create a Facebook page dedicated to a particular project, where they are also able to “keep sharing some good memories, e.g. photographs” [Interviewee 4]. Sharing experiences and photographs certainly increases a sense of oneness in the project team. Moreover, project members using social media can post an inquiry to the community and receive response from that community. As one participant concluded, organizations should encourage communication through social channels as it has several benefits to the project team work across borders [Interviewee 3]:

- It enables reaching out to many people
- It becomes instantaneous
- It creates a body of knowledge
- It assures that the knowledge that already exists is disseminated to multiple people.

Since frequent communication increases the level of trust in distributed project teams, using social channels undeniably has a positive influence on the feeling of oneness as well. In particular due to the fact that computer-supported social networks have low limitation in regard to distance and time [27], they can considerably diminish the cognitive distance between project team members. This can strengthen the shared knowledge between project members by reducing temporal and geographical limits as they affect the motivation for sharing knowledge [32].

The so-called ‘millennial generation’, i.e. the generation of 1980-2000, in particular tends to use cell phones to communicate. Adopting mobile or social channels enables them to communicate faster. Writing an e-mail and waiting for a response is seen as time consuming. Thus, they prefer using instant messenger, the company’s internal communicator, or even short messaging service (SMS) to contact the manager. According to one interviewee, this way

of communication is frequently more efficient because “whenever somebody sends you a message through a communicator, you tend to respond instantly.” This trend toward ICT use is confirmed by several study participants.

Global organizations have extensive communication platforms to support communication and information sharing, as well as to bridge cognitive distance within distributed project teams. As one interviewee concluded, “thanks to the network and the modern communication facilities, work can be done where there are people, who are skilled and [available] at the reasonable cost.” Additionally, the recent trend toward ICT in globally distributed projects demonstrates a focus on instant communication, lower reliance on e-mail, and higher relevance of phone and video calls, communicator tools, and social channels.

Silveira and Sbragia (2010) studied communication practices in the global product development projects of Brazilian multinational firms and found a trend toward the use of more traditional ICT tools, such as telephone and e-mail, by companies that encourage formal communication. On the contrary, the companies that encourage informal communication foster among other things, instant messaging, which is perceived to be an informal communication practice [33]. The case study presented in this paper does not distinguish between formal and informal communication practices, but the interviews results confirm the trend toward the use of more instantaneous communication tools.

5. Conclusions and Future Work

The main purpose of this paper was to investigate the phenomenon of using ICT to foster a feeling of teamness among globally dispersed project team members. Research to date involves initial interviews with Indian project managers. The author transcribed the interview audio record available at present and analyzed the results. An initial literature review on ICT usage in global projects encountered significant gaps in previous research. In particular, the author found that previous research on the impact of ICT on globally distributed project team performance as well as research on the significance of creating a sense of unity in such teams is scarce. This study contributes to the research on globally distributed project teams and their unity.

However, the current state of the research exposes some limitations. First of all, prior interviews involved six project managers from one multinational company. The future research work will ensure a greater range of respondents. The single case study will be expanded into multiple case studies research involving other companies from the IT sector in Germany, Poland, and India, which will provide more evidence.

Given that corporate culture has a strong impact on information and communication technologies usage [26], project managers from multiple organizations should be involved in the research. Furthermore, all previous interviewees are global project managers from India. Since culture influences the attitude toward trust and group association (collectivism vs. individualism), practitioners from other countries will be involved in the future interviews. Having more respondents, the author expects to cluster and classify the study fields into clearly distinguished categories as well as to find common patterns [34].

The interviews were initially conducted in English. For the future follow-up research the questions will be translated into German and Polish as the following study will be conducted among German and Polish project managers respectively. Standard blind translation procedures will be used during this step [35]. In an attempt not to limit the interviewees’ ability to respond freely and with ease, the language of the interview will be left to the respondent to decide. The standard blind translation procedures will be applied anew for the results translation. In addition to interviews, surveys will be conducted to ensure different views of the cases and to avoid the problem of observation bias.

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