

A Conceptual Management Model of Virtual Project Team in International Companies

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Abstract. Globalisation and technological advancement have an enormous impact on how businesses operate. Technological evolution, economic challenges, and different generations working in one workforce impact businesses to seek flexibility and adopt techniques that support virtual teamwork. In the modern international business environment increasing number of teams that work in virtual environments through project execution, leads to the need for theory and research on how successfully manage virtual project teams. In this paper the analysis of the scientific literature allowed to formulate the definition of a virtual project team, the analysis was able to show the management aspects, which are related to the features of the virtual project team, review of scientific literature also let to disclose the emerging problems faced by managers. These results were used to conceptualise the virtual project team management model in international companies.

Keywords: *virtual project team, management of virtual project team, management in international companies.*

Introduction

Relevance of the article

To be competitive in an international environment, businesses need to adapt to changing times. Author Ozguler (2016) emphasises that to reap the benefits of globalisation, multiculturalism, and survive in a global and competitive environment, companies should establish an appropriate organisational strategy, goals, and implement them through portfolio management. Virtual project teams are becoming a necessity in this environment and are replacing traditional teams. Units managing high value-added projects are more likely to implement the existence of virtual teams than traditional ones (Guinalú, Jordán, 2016). Thus, the theory and research of virtual project team management are still relevant topics in management science.

Level of problem investigation

Common themes examined in the literature of virtual teams was the relationship of trust between team members. This aspect has been investigated by authors Alsharo, Gregg, and Ramirez (2017), Tan et al. (2019). The operation of communication technologies in a virtual team has been studied by authors such as Laitinen and Valo (2018), Lim (2018). The effectiveness of a virtual team was studied by authors Joe et al. (2014). However, it should be noted that the problem under review is not sufficiently disclosed, as the researchers focus on different aspects of a virtual project team. Therefore, it is important to analyse all aspects of virtual team management, which would provide a meaningful understanding of how to successfully manage virtual project teams.

The main problem of the article is how to manage virtual project teams in international companies.

The object of the article is a conceptual management model of a virtual project team in an international company.

The aim of the article is to determine a conceptual management model of a virtual project team in international companies.

Objectives of the article:

1. To reveal the theoretical aspects of virtual project team management.
2. To disclose the level of research of virtual project team management in international companies.
3. To introduce a conceptual management model of a virtual project team in international companies.

Methods of the article: analysis of literature sources, synthesis, comparative data analysis, systematisation, and generalisation.

1. The concept of a virtual project team management in an international environment

1.1. Definition of a virtual project team

Various authors name existing teams in an international environment connected in a virtual space differently global teams, virtual teams, virtual international teams. Organisations often do not even

emphasise the “global” and “virtual” aspects when talking about their global virtual teams, as cross-border work has become a clear principle of organisational team operation rather than an exception (Jimenez et al., 2017). Therefore, it is important to define and understand the key features of virtual teams in international companies. Table 1 provides various authors definitions of teams that operate virtually in a global environment.

Table 1

Definitions of virtual teams in the literature

Author	Definition	Features
Potter, Cooke, and Balthazard (2000)	Virtual team	Virtual teams are typically made up of geographically dispersed experts, supported by computer-based communication technologies.
Hertel, Geister, and Konradt (2005)	Virtual team	Virtual teams consist of (a) two or more persons who (b) collaborate interactively to achieve common goals, while (c) at least one of the team members works at a different location, organisation, or at a different time so that (d) communication and coordination are predominantly based on electronic communication media.
Zander, Mockaitis, and Butler, (2012)	Global team	Global teams that are characterised by national, cultural and linguistic heterogeneity and operate in a globally dispersed virtual environment
Laitinen and Valo (2018)	Virtual team	Have a unique ability to work across geographic and temporal boundaries throughout organisational structures.

Source: created by the author.

The analysis of a virtual project team literature highlights several key features. *Geographically dispersed and technologically advanced*. Global teams are those that operate in a globally distributed virtual environment (Zander, Mockaitis, and Butler, 2012). In this environment, team members connect with each other over time, space boundaries, also span national, geographical, and other boundaries using information and communication technology (ICT) (Bhat, Pande, and Ahuja, 2017; Laitinen, and Valo, 2018). Virtual team communication and cooperation are maintained in a virtual environment of computer technology (Potter, Cooke, and Balthazard, 2000). ICT can be e-mail, telephony, instant messaging, and more sophisticated forms of video conferencing, shared workspaces, and group decision support systems (Laitinen and Valo, 2018). Authors Duran and Popescu (2014) also emphasise the value and significance of information and communication technologies, stating that it is they that help to create a virtual team, a new workgroup. *Culturally diverse*. Virtual teams are characterised by geographical spread team members that give the team cultural diversity. Team members have different countries of birth, nationality, and language, which gives the team a competitive advantage (Bhat, Pande, and Ahuja, 2017). A virtual project team has the discussed features of a virtual team, but in addition, the team is positioned to work for a specific project, the team is *temporary*. Virtual team members are which regularly works together, in a virtual project team the members work for a certain time frame, for example until the project is completed. Authors Zuofa and Ochieng (2017) state that a virtual project team formed comprise of a collection of personnel assembled for definite time frames to meet the specific objectives of the project. Authors, Bhat, Pande and Ahuja (2017) also point out that virtual project teams are organised for specific task and management time.

After analysing the scientific literature, it is possible to define a virtual project team in an international environment. A virtual project team is a team with geographically dispersed members whose communication is maintained in a virtual environment of computer technology, the team members are culturally diverse, and the operation of the team itself is defined in terms of time.

1.2. Virtual project team management aspects

Due to the complexity of international tasks and team diversity, multinational corporations must establish effective team leaders and management behaviours (Gundersen, Hellesøy, and Raeder, 2012) therefore it is important to examine the aspects of virtual project team management.

The use of information and communication technologies in a virtual team is a necessity without which the team would not be able to function. As authors Laitinen and Valo (2018) state, information and communication technology is an indisputably important tool in the communication process and is an essential part of a virtual workgroup. Another important aspect of communication using information

technology and various team, or task tools is that they shape the experience and operational aspects of virtual collaboration (Zhanga et al., 2018). Researchers Zhanga et al. (2018) state that virtual team communication, such as team composition, task complexity, and tool functionality, determine the quality of projects and effectiveness of virtual collaboration. Advances in communications and information technology provide organisations with new opportunities to create and manage virtual teams, contributing to the development of social interactions through trust and knowledge sharing through technology (Bhat, Pande, and Ahuja, 2017; Olaisen and Revang, 2017).

Leadership aspects in management. In virtual teams, the main part of leaders is to define goals, resources, and processes of the whole team for the team members (Savanevičienė, Šilingienė, 2007). Examining the aspects of virtual team management, the phenomenon of “emerging” leadership has been observed. This approach to leadership suggests that virtual teams as networked or self-managed forms often lack a centralised, formally appointed leader (Gibbs, Sivunen, and Boyraz, 2017) in other words, leaders are more likely to emerge through the group rather than appointed to a leadership role (Charlier et al., 2016). Other authors emphasise that global team leaders should be technologically savvy, and they should be inclusive, culturally sensitive, and easily accessible, communicating frequently with all members (Zander, Mockaitis, and Butler, 2012).

Management of motivational and emotional processes. When it comes to managing motivational and emotional processes in a virtual team, the scientific literature analyses process in groups as trust, cohesion among team members, and team satisfaction, these aspects are equally important in traditional teams. Authors Harvey, Nicicevic, and Garrison (2004) clearly define the meaning of training in global teams stating that the processes of learning and knowledge transfer develop not only at the organisational level but also into global virtual teams. Team cohesion according to Hertel, Geister, and Konradt (2005) is related to motivation as an assessment of team goals, cognitive processes, assimilation of team roles and norms. Also, members of global virtual teams often rely on team leaders to provide direction and inspiration from a distance (Zander, Mockaitis, and Butler, 2012). Conflicts in a virtual team can arise from teamwork caused by cultural differences in communication and problem-solving styles or attitudes. This aspect of management has been studied in more detail by Harvey, Novicevic, and Garrison (2004). According to them, effective social control, properly implemented to reduce the potential for conflicts of identity in the teamwork of global virtual teams, will bridge the gap between personnel policies and practices.

In conclusion, it can be stated that the management of virtual project teams has three key aspects which are distinguished by various authors. Firstly, managing through information and communication technologies should empower virtual collaboration, diversity of tools and systems, social interaction. The second aspect is leadership, characterised by defining goals, resources, processes, emerging leadership, technologically savvy leaders, frequent communication. Thirdly management of motivational and emotional processes should embrace training, team cohesion, inspiration, and conflict management.

1.3. Emerging problems in managing virtual project teams

Unlike classical project management, project managers working with international teams face more diverse and complex problems, thus it is important to distinguish emerging problems in virtual project team management.

Virtuality causes emerging problems. Authors of the scientific literature Hertel, Geister, and Konradt (2005), Dulebohn, and Hoch (2017) emphasise that the virtual nature of these teams poses challenges to effective collaboration and team performance. According to Hertel, Geister, and Konradt (2005), communication in virtual teams is mainly based on electronic media, the main problem is that electronic media reduces the richness of information exchange compared to online communication. Among the mentioned authors, Dulebohn and Hoch (2017) single out the following virtual team management problems: difficulties in communication and cooperation, potentially lower participation of team members, difficulties in building trust, isolation, the high social distance between team members. When organisations create and manage virtual project teams, there may emerge legal problems that are less mentioned in the literature. They were analysed and singled out in 2017 by Mark Roehling. Determining whether there is a legal employer-employee relationship, according to Roehling (2017), is even more

difficult when virtual teams are involved in multiple organisations and, as a result, there are several potential “employers”. There are also some significant differences between the parties regarding the consequences of determining that an employee is an “employee” (e.g., compensation, if any, is paid to an employee upon termination of employment). The researcher Roehling (2017) believes that greater use of technology and reliance on traditional team settings give employers more opportunities to monitor employees in ways that raise privacy concerns. Conflict management in virtual teams is a challenge for organisations. Conflict issues in these teams were examined by the authors Guinea, Webster, and Staples (2012). According to them, people try to explain their own or others behaviour. A person’s initial attribution of other behaviours is usually dispositive (i.e., a fundamental attribution error) and is then corrected based on the person’s knowledge and/or situation. Virtual teams are likely to cause attribution errors because members have less knowledge of their team members and environment (Guinea, Webster, and Staples, 2012). Members of virtual teams often differ from each other, which are not limited to cultural or demographic differences. Jimenez et al. (2017) argue that some of the biggest challenges may indeed arise from institutional differences. Global dissemination typically means that members of a global virtual team represent different organisations, but even if they work in different regional offices within the same organisation, their local institutional and organisational environments may differ. Jimenez et al. (2017) state that the predominance of different distances as economic, technological, and cultural creates differences within the same team that can be difficult to eliminate with virtuality.

To sum up, the results of the scientific literature analysis indicate emerging problems in managing a virtual project team in consideration of specific team features. Technological advancement of the team could evoke problems as the reduced richness of information exchange, difficulties in building trust, or high social distance between team members. Cultural diversity can evoke problems of conflict/bullying, attribution mistakes caused by knowledge sharing and/or situation, cultural differences. Geographically dispersed team members could contribute to emerging problems like legal issues (workplace privacy, employee status), economic/institutional differences.

2. Level of research of virtual project team management in international companies

This section provides a scientific research analysis of the paper object. The analysis of research will help to formulate the conceptual virtual project team management model and understand the ongoing processes.

A relationship of trust between team members in a virtual team was analysed by Alsharo, Gregg, and Ramirez in 2017 and by Zakaria and Yusof in 2018. The authors Alsharo, Gregg, and Ramirez (2017) conducted a quantitative study. The results of the study showed that in virtual teams, knowledge sharing has a positive effect on trust, collaboration, and team effectiveness. Other authors Zakaria and Yusof (2018) conducted a study and in two years (2014–2016), 57 individuals from 16 countries were interviewed. The authors state that after analysing the results, the influence of rapid trust formation in global virtual teams is based on team use of the internet, which reduces geographical distance and influences culturally coordinated team behaviours, thus creating an effective virtual teamwork culture.

An often analysed aspect of virtual team management is the influence of information technology. Researchers Laitinen and Valo (2018) examined virtual team communication. Their 2018 article presents a qualitative study of the meanings of communication technologies in virtual team meetings. The results revealed that communication technology has several meanings, and results recommend the development of both technological systems and how their members are used, it is also proposed to ensure that virtual teams use technological systems that support their unique communication needs. In 2014, the authors Saafein and Shaykhian conducted a study analysing the factors that affect the performance of a virtual team in terms of communication tools, cohesion and collaboration, leadership, trust, team member location, and team size. The results showed that one of the main problems of virtual support is the reliability of communication, which was perceived as the most important factor related to the operation of virtual support teams. This suggests that virtual support team leaders need to focus on increasing the reliability of their IT infrastructure more than planning on-site visits and face-to-face meetings.

The role of a leader in a virtual team and the impact of leadership actions on the team was researched by Guinalíu and Jordán (2016). The results of the study revealed that a leader’s physical characteristics

and behaviours build trust in a virtual leader. On the other hand, according to the authors, signs of leaders' treatment of subordinates also have a positive effect on trust. Specifically, the empathy that subordinates perceive in their leader makes them more likely to give the leader confidence.

Author Boyraz (2019) tried to find out how certain team processes mitigate the impact of negative consequences on team performance across teams distributed globally. Analysing 165 global team members representing 27 teams in a multilateral high-tech organisation. The results of this study show that the performance of distributed and culturally diverse teams depends not only on matching their team diversity characteristics and team distribution but on how likely teams are to develop a common team identity, foster a psychologically safe communication climate.

Having summarised the analytical part of the researcher conducted on the topic, Table 2 shows and represents the findings of the studies conducted by various authors and highlight the recommendations that complement the theoretical analyst and help to conceptualise the virtual project team management model.

Table 2

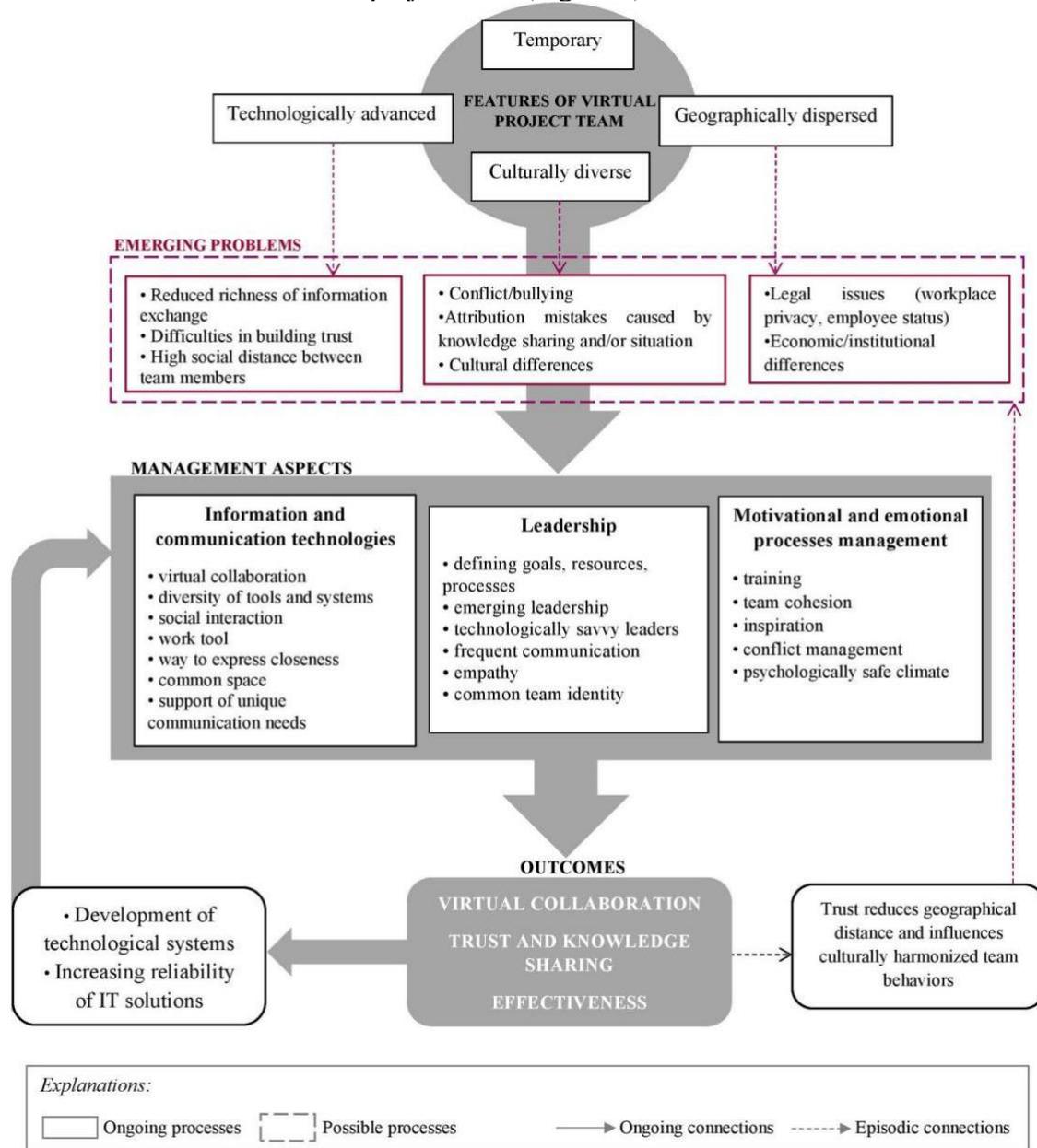
Analysis of the research conducted on virtual team management

Author	Field of research	The findings and recommendations that complement the theoretical analysis
Alsharo, Gregg and Ramirez (2017), Zakaria and Yusof (2018)	A relationship of trust between team members in a virtual team	<ul style="list-style-type: none"> Trust strengthens the effectiveness of the virtual team, and knowledge sharing is important for trust, which should be supported not only at the technological level but also at the social level.
Laitinen and Valo (2018), Saafein and Shaykhian (2014)	The operation of information technology in a virtual team and its significance for the management of these teams	<ul style="list-style-type: none"> Trust creates a culture that reduces geographical distance and influences the behaviours of culturally harmonised teams. The role of a leader in trust was also an important aspect. These leaders can actively promote work through the efficient use of resources and relevant practices that promote its development.
Guinalú and Jordán (2016)	The role of a leader in a virtual team and the impact of leadership actions on the team	<ul style="list-style-type: none"> Members of virtual teams give a lot of meaning to information and communication technology - it is considered a tool of work, cause of uncertainty, benefits, challenge, an object of competence, subject of technical characteristics, orientation, way of expressing closeness, and common space.
Duran and Popescu (2014), Boyraz (2019)	The operation of a virtual team to understand the effectiveness of that team	<ul style="list-style-type: none"> The team platform must operate and execute teamwork goals, tasks, and processes. Communication must also be reliable, as this is one of the most important factors in the operation of virtual teams.

Source: created by the author.

Based on the insights of the researchers presented in the paper, the conceptual management model (Figure 1) of a virtual project team in an international company is presented. A conceptual model represents international companies' management system of a virtual project team. In management, there are ongoing processes and ongoing connections, as well as possible process and episodic contentions. Management is based on virtual project team features geographically dispersed, technologically advanced, culturally diverse, and temporary. Key ongoing processes aspects which are going on constantly are represented first, through information and communication technologies by implementing virtual collaboration, diversity of tools and systems, social interaction, work tool, way to express closeness, common space, support of unique communication needs. Second, leadership by defining goals, resources, processes, emerging leadership, technologically savvy leaders, frequent communication, empathy, common team identity. The third management aspect in the conceptual model is motivational and emotional processes management by implementing training, team cohesion, inspiration, conflict management, psychologically safe climate. Using highlighted management aspects, there are ongoing processes that are the outcomes of managing virtual project teams, i.e. virtual collaboration, trust and knowledge sharing, and effectiveness. Seeing that the management process is constant and ongoing with clear outcomes is important to constantly develop technological systems and increase the reliability of information technology solutions, thus accordingly adapt the changes to management aspects and tools.

During the management process of the virtual project team exists possible processes as emerging problems due to features of the virtual project team (Figure 1).



Source: created by the author.

Figure 1. A conceptual management model of a virtual project team in international companies

Firstly, since the team members are technologically advanced it could be reduced richness of information exchange, difficulties in building trust, the high social distance between team members. Secondly, team cultural diversity could cause problems conflict/bullying, attribution mistakes caused by knowledge sharing and/or situation, cultural differences. Lastly, whereas members of a virtual project team in intentional companies are geographically dispersed this could arise legal issues (workplace privacy, employee status), economic/institutional differences. It could be mentioned that virtual team features temporary (a team formed for a specific task) were not mentioned in the literacy or other scientific research as a feature to cause problems in managing a virtual team. Furthermore, it is highlighted that the outcomes of management trust and knowledge sharing can implement emerging

problems whereas trust reduces geographical distance and influences culturally harmonised team behaviours.

Conclusions

The analysis of the scientific literature let to formulate the definition of a virtual project team. The virtual project team in an international environment is characterised by geographically dispersed members whose communication is maintained in a virtual environment of computer technology, the team members are culturally diverse, and the operation of the team itself is defined in terms of time. Furthermore, the analysis was able to distinguish the key management aspect through information and communication technologies, leadership, management of motivational and emotional processes due to this letting to highlight the characteristic of the mentioned key elements. Theory analysis also showed possible emerging problems related to virtual team features.

A review of scientific research pointed out the scope of studies conducted about virtual team management, the main areas were a relationship of trust between team members in a virtual team, the operation of information technology in a virtual team, and their significance for the management of these teams, the role of a leader in a virtual team and the impact of leadership actions on the team, the operation of a virtual team to understand the effectiveness of that team. Various authors findings and recommendations complement the theoretical analysis and help to understand ongoing and possible processes in managing virtual project teams. These results were used to conceptualise the model.

A conceptual management model of a virtual project team in international companies was introduced. It represents international companies' management system of a virtual project team, which is based on virtual project team features geographically dispersed, technologically advanced, culturally diverse, and temporary. The model shows ongoing processes and ongoing connections, as well as possible process and episodic contentions, as a result enhancing an individual understanding of the representative system. A conceptual model is useful for companies that seek to properly manage virtual project teams, as well as to achieve productive teamwork. The application of the model to managers is recommended because by using the model managers can change their applied management tools accordingly to successfully manage virtual project teams.

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