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Selected success factors of virtual teams : literature review and suggestions for future research

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Abstract

The aim of this paper is to extend the knowledge about virtual teams and above all to stress the differences between face-to-face and virtual teams as well as to define its chosen success factors. This paper is based on an extended literature review of virtual teams. The author describes virtual teams, reasons for their implementation and four factors that are prerequisites for team success.

The first finding is that the successful introduction of a virtual team and its management requires knowledge about the special characteristics of this team and the effective handling of challenges. Second, the literature review of virtual teams reveals a lack of research on the differences in motivation between face-to-face and virtual teams. The originality of the article is ensured by selection of the most important factors which, according to the literature review, lead to the success of virtual teams and by a description of areas that need to be explored in the future.

Keywords: virtual team, team building, trust, communication, leadership

Virtual team definition

Despite the fact that virtualization is becoming more popular, there is no commonly used definition of virtual teams; authors vary in their interpretation of this phenomenon [Nader et al., 2009]. Virtual teams are mostly described as a group of people contributing to accomplish a common goal. Such a description is rooted in the team definition where traditional teams are defined as "small groups of independent individuals who share responsibility for outcomes" [Hollenbeck et al., 2012, p. 82]. The most important difference appears to be the fact that a virtual team is a group of geographically distributed participants who can be dispersed around different countries or within one country. The

other difference is a strong reliance on communication and information technology as part of a daily exchange of information [Piccoli, 2003].

Another definition states that a virtual team "consists of a group of people who collaborate closely even though they are separated by space (including national boundaries), time, and organizational barriers" [Stough et al., 2000, p. 377]. In such a case the requirement of virtualization is that the team does not work as a collocated team. Another proposal is to extend the definition of technology usage and goal completion. Virtual teams are then presented as "groups of geographically, organizationally and/or time dispersed workers brought together by information technologies to accomplish one or more organizational tasks" [Nader et al., 2009, p. 2654]. Virtual teams are also defined as "teams whose members are geographically distributed, requiring them to work together through electronic means with minimal face-to-face interaction" [Malhotra et al., 2007, p. 60]. Generally, there are teams working without face-to-face contact and there are others who meet rarely [Bjorn, Ngwenyama, 2009]. Some authors even narrow their definitions to naming specific types of virtual teams. Among others, one can distinguish work, functional, production, project or product development, networked, and parallel teams [Duarte, Snyder, 2006; Nader et al., 2009].

The author of this article shares an understanding of the virtual team with Malhotra, Majchrzak and Rosen [2007]; the time separation is not as important as working from various localizations with limited face-to-face contact and a strong reliance on computer-mediated communication.

Reasons for introducing virtual teams

A few decades ago, it wasn't foreseen that people would work together on the same projects while being scattered around the globe [Kanawattanachai, Youngjin, 2002]. Today, virtualization is not only a term used in science but a part of everyday life shared by millions of people. According to Brenowitz [2003], the probability of working on a virtual team is close to 100%, regardless of the chosen career path. Many market-recognized companies owe their success to introducing virtual teams, among them Hewlett-Packard, Xerox, Procter & Gamble, General Motors, and General Mills [Griffin & Moorhead, 2012]. Among the most important factors triggering the change are: globalization [Barkema, 2002; Bergiel et al., 2008]; introduction of the internet [Bergiel et al., 2008; Hertel et al., 2005]; high-speed technology development [Trzcieliński, Wypych-Żółkowska, 2002]; demanding customers who are interested in fast delivery of high-quality goods [Nader et al., 2009], and high costs of fuel. In order to stay competitive and gain advantage over others, organizations need to rethink their operating strategies (see Graph 1).

GRAPH 1. **Factors which led to introduction of virtual teams**

| Globalization | | Technology development | | | Internet |

| | Cost of fuel | | | Demanding customers | |
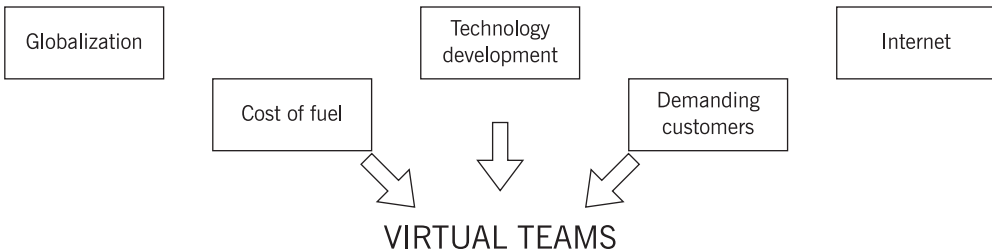
VIRTUAL TEAMS

Source: Prepared by the author.

By implementing virtual teams, companies gain the opportunity to exchange experience and knowledge with people who normally do not work at the same office (or even in the same country) [Kirkman et al., 2002]. Among other advantages of virtual teams we could include: cost reduction [Minkin, 2008; Robb, 2002; Trzcieliński, Wypych-Żółkowska, 2002; Bergiel et al., 2008], increasing innovativeness, creativity [Nader Ale Ebrahim et al., 2009], and, eventually, an increase in company profits [Kimble, 2011]. These are the reasons virtual teams have become a meaningful part of organizational structures, to the extent that "over half of all professional employees are believed to work or have worked on a virtual team" [Wakefield, Leidner, 2008, p. 434].

Furthermore, factors leading to introduction of a virtual team can be divided into direct and non-direct. Direct factors are cost reduction and the opportunity to create teams consisting of specialists from various expertise areas who are not limited by localization. The non-direct factors are those connected with globalization and thriving technological progress.

Differences between virtual and face-to-face teams

Virtual teams, in comparison with traditional ones, are believed to be "transcendent" [Stough, et al., 2000]. This means that the extensive use of telecommunication technology allowed them to overcome barriers of distance and time. Moreover, they are able to work with each other synchronously or asynchronously via voice mail, audio conferences, e-mail, bulletin boards, real-time data conferences (no audio/video), videoconferences without shared documents, real-time data conferences with audio/video and text graphics, electronic meeting systems with audio/video, text and graphics, and collaborative writing with audio/video [Brown et al., 2007]. However, there are teleconferences, webinars, groupware, Skype and other voice-over-Internet-protocol (VoIP) applications that are commonly used in the communication process [Ubell, 2010]. The effectiveness of communication is greater when using a larger number of tools that can be diversified

[Trzecieliński, Wypych-Żółkowska, 2008, p. 502]. According to Nader [2008, p. 2661], three groups of communication tools can be distinguished for virtual teams: synchronous (e.g. remote access and control, web conferencing), asynchronous (e.g. groupware/ shared services, file transfer, e-mail), and synchronous or asynchronous (e.g. instant messaging and chat, telephone).

Obviously, these methods are also common for traditional teams. Nevertheless, the role of these techniques on traditional teams is different. They only support the process of information transfer between team members, enhancing group work, and they do not replace the role of face-to-face meetings. On a virtual team, computer-mediated communication is often the only way to reach other team members.

Virtual teams gather experts from different specializations and with various types of experience. As was already mentioned, virtual teams are not limited by their localization; due to this fact they are able to work on a 24-hour cycle [Minkin, 2008]. As a consequence of operating around the globe, there is the advantage of a theoretically unlimi-

GRAPH 2. **Advantages and challenges of work in a virtual team**

Team members in virtual teams	
Teams consisting of members: • From different areas of expertise • From different locations • Having different experience	Management and communication issues: • Cultural differences • Different expectations and work habits • Working in different time zones • Lower managerial control and monitoring – internal motivation pays higher role
Distance handling	
Cost savings in terms of money and time: • Business trips • Commuting to work	Trust: • Team members often do not know each other • Lack of direct/face-to-face contact • Anonymity • Social loafing • Low trust levels Group forming: • Slower group forming processes
VT ADVANTAGES + MANAGEMENT OF VT CHALLENGES => ⬆ EFFECTIVENESS CREATIVITY PROFITS	

Source: Prepared by the author.

ted number of members working on the project. The use of information technology significantly reduces the cost of collaboration and enables many people to share responsibility while working on the same documents [Duarte, Snyder, 2006]. The unlimited number of virtual team members leads to the next difference: their anonymity. Depending on the situation, it can be an advantage or a disadvantage. This means that the virtual team members can be more open in stating their opinions, because their identity is not known, or they can avoid contributing to team work. As a consequence, the social loafing phenomenon can occur, which means that people can perform worse on a simple task when working on this type of team.

An analysis of these differences leads to the most pivotal aspect: the lack or limitation of face-to-face contact. When communicating face-to-face, part of the information is exchanged in a non-verbal manner. Such information is lost when people who are communicating do not meet in person, and must rely to a great extent on written or voice communication. Limited face-to-face contact and exchange of information through computer-mediated tools can result in many problematic issues. It can be inconvenient to team members and result in unpredictability and misunderstandings, as well as lead to stressful situations. As one of the disadvantages of working virtually, the authors point out the lack of physical interaction, which is connected with lack of verbal and non-verbal cues [Kirkman et al., 2002].

Success factors of virtual teams

Polish experts were asked to rank success factors of a virtual team on a 44-point scale. They found that the most important factor for success is trust between collaborators (40 points). In second place were collaborators' openness for communication, fast feedback between collaborators, and honesty and clearness of communication (all three received 39 points). These factors were followed by communication via Internet (38 points), format of interexchanged data and failure of the communication system (37 points) [Hejduk et al., 2008]. These results were confirmed by another survey: namely, the respondents were asked about the top six factors to ensure success of a virtual team. The results of this survey showed that to achieve success, the following elements need to take place: team leadership (86%), trust (65%), team building and development (48%), company support of virtual teamwork (43%), face-to-face meetings (29%), and technological training (20%) [Hawkrigg, 2007, p. 16]. Another author points out the importance of "a high level of trust, clear communication, strong leadership, appropriate levels of technology" [Bergiel et al., 2008, p. 100]. On the minus side, the main challenges of virtual teams are listed: "lack of physical interaction, loss of face-to-face synergies, lack of trust, greater concern with predictability and reliability, and lack of social interaction" [Nader et al., 2009, p. 2660].

The literature review of factors increasing the effectiveness of traditional teams leads to the conclusion that the authors have often pointed out: trust, clear goals and support of objectives from the management, leadership, team member competencies, experience, and task division. Table 1 presents detailed information.

TABLE 1. **Factors enhancing effectiveness in teams by authors**

Authors	Factors
Borrelli, Cable and Higgs, 1995, p. 30	"team balance, leadership, team to team, overcoming hurdles, autonomy, shared understanding of goals, recognition, full circle feedback"
Brenowitz, 2004, p. 244-246	support from management, right definition of team's goals, operational framework for work, responsible, trusted and professional team members
Parkinson, 2002, p. 111-122	trust, awareness of: team's goal, tasks, available resources, measure of the result and the team's success definition, appropriate task division between team members
Prohl, 1997, p. 139	strong and compelling performance challenge, clear goals and objectives, participative leadership, good communication based on trust, honesty and respect for other, willingness to deal with conflict, good coordination, appropriate task division between team members, consensual decision making
Wszak in Natale et al., 1998, p. 178	clear mission, experts engagement, previous experience in "team working", the eagerness to become a team member, effectiveness of group processes, balanced level of used technology
Peckham, 1996, p. 26	clear objectives, motivation by objectives, competences of the team, common engagement, cooperation climate, appropriate support and resources, management
Morris amd Mountfort, 1997	interaction, philosophy, motivation, resources

Source: Prepared by the author.

The analysis of challenges in virtual teams, as well as research on virtual teams' success factors and factors enhancing the effectiveness of traditional teams, leads the author to choose four aspects as the most meaningful for a virtual team's success: team building, trust, communication, and leadership. In the author's opinion those factors are crucial for management of challenges in a virtual team and basic for the team's success. Such a division proposed by the author is conventional and selected elements are interrelated, since trust and communication are elements of team building and at the same time team building involves leadership. Selected factors are important for each type of team, not

only for virtual teams. However, distance, anonymity, and lack of face-to-face contact especially affects virtual teams by challenging team and trust building as well as leadership, and by disrupting communication (see Graph 3).

GRAPH 3. **Dependencies between four factors leading to success of virtual team**

Source: Prepared by the author.

Communication. Researchers from Swiss Institute of Technology conducted "tele-management" studies which showed that the most common problems when "working virtually" are not connected with technology but with interaction between people, particularly with communication [Kurda, p. 17]. Most of all, people suffered from lack of information about the work process and lack of knowledge about the others in a team. Communicating problems can occur because of the communication economy; information is being communicated when the advantages of that process are greater than the costs of communicating it. It is important to stress that the low quality of communication, its reliability and unpredictability was a problem for many respondents. Even more critical, members of the virtual teams can suffer from lack of informal communication. It can result in a feeling of social isolation and a low level of trust, both between manager and team, and among team members. Communication should be treated as the most crucial task for virtual organizations because it provides efficiency and transparency [Warner, Witzel, 2005, p. 173]. It can be also extended to virtual teams. Most importantly, the effective communication enhances exchange of knowledge, increases job productivity, improves the processes of decision making, and decreases uncertainty. An analysis of deterministic technology theory, or the cues-filtered-out approach, leads to the statement that communication in computer-mediated teams can be a source of problems due to the fact that the non-verbal (i.e. visual) and para-verbal (i.e. auditory) cues are limited or they do not exist. Information can be lost due to use of specific communication channels, reduction of social presence and conventional involvement, or because communication does not transmit information about social standing and

social context. Furthermore, virtual communication is more time-consuming and more confusing: "for example, typing takes four times longer than speaking" [Purvanova, Bono, 2009, p. 344].

Virtual team members also complain about delays in getting fast responses and problems with understanding some messages, especially when the author is attempting to be sarcastic [Hunsaker, Hunsaker, 2008]. Such communication problems stem from a lack of opportunity to take advantage of informal meetings, limited possibilities of engaging in spontaneous communication, and reduced non-verbal cues about interpersonal affectations. In such a situation, the recommended solution is to set some communication conventions: defining the time within which the e-mails should be answered, using agreed technology to monitor the commitment of team members, setting deadlines for the preparation of tasks [Brown et al., 2007; Hunsaker et al., 2007]. Another useful tactic is to send in the messages not only the task but also social information: jargon, pictures, symbols and other shortcuts. With such an approach, the computer-mediated communication is enriched and the distance to face-to-face communication is smaller.

The communication constraints in virtual teams lead to confusion about a team's status at any given point in time. To cope with this problem, virtual leaders should periodically facilitate intra-team communication. This will help to create a "consolidated picture of the status" [Huang et al., 2010, p. 1099]. Virtual teams have to be proactive about communication, avoid jumping to conclusions, establish a clear escalation path, and maintain a sense of humor [Brown et al., 2007, p. 21]. There are calls as well for the preparation of special guidelines on communication processes and even protocols. The researchers stress the communication plan or schedule should include information on when people can get together on the phone protocol, which information to share, which communication method to use for each of these, how the teams are expected to communicate, and how often. It is also advisable to clarify which tools are preferred for the various types of interaction, as well as to discuss the guidelines for inter-team communication. Clearly, this would help to avoid misunderstandings and improve the way information is shared.

The communication process in virtual teams can be divided into formal and informal. Formal communication refers to the assessment of the needed data and data privacy. It is also about the delivery of information necessary to complete the job, enabling an employee to work without having to search for it. Second, informal communication is important for conflict management because it reinforces the exchange of information between the team's participants and helps in managing the project. This is the reason for giving the team an opportunity to get to know each other [Schuka, 1998]. The team members should be given goals that are measurable and concrete, and they should also understand how valuable their job is for achieving a common goal. Moreover, setting up periodic face-to-face meetings for progress reports is also advisable [Brzozowski, 2007;

Leading virtual teams, 2010]. One factor that endangers communication is the presence of cultural differences between the team members and the required communication language [Bergiel et al., 2008]. "National diversity creates different expectations for communication practices and reduces identification with the team as a whole" [Schlenkrich, Upfold, 2009, p. 112]. In case the virtual team consists of members from different cultures, the manager should try to diminish misunderstandings by introducing cultural training.

The literature review confirms that communication is one of the most difficult problems in virtual team management. What needs to be emphasized is that the inconveniences are not caused by usage of different technology or different tools but by the organization of communication, e.g. the communication program.

Trust. Trust is one of the social norms and is developed with the team's development. The atmosphere of trust enhances information flow, improves cooperation, and helps to overcome problems and conflicts as well as reach team goals [Prati et al., 2003]. In traditional teams, work is mostly controlled by the authority system in which a supervisor delegates tasks and oversees employees when they are working. In a virtual environment, such system is no longer possible; trust takes over the role of control. This means that employees need to trust each other in order to risk that others will not be acting in their own interests instead of team interest [Peters, Manz, 2007]. This is the main reason why trust is believed to be one of the most crucial elements enhancing a virtual team's success [Mancini, 2010]. In traditional teams employees are mostly working in the same office or even open space, and are informed about their peers' work progress. If they lack such information, it is always easier to attain it than in virtual team settings.

The issue of trust within virtual teams was studied by many researchers [Bergiel et al., 2008; Jarvenpaa et al., 2004]. According to the studies' results, perceptions of teammates' abilities, integrity, and benevolence are seen to be fundamental for establishing trust in virtual teams. The first two factors may be more important than benevolence [Jarvenpaa et al. 1998]. Some authors state that trust is created by various factors within the team life cycle. Initial trust is determined by both intrinsic signals and external factors, namely reputation, roles and rules. During the first phases of team cooperation, team members have the opportunity to assess mutual ability and integrity, and on such a basis cognitive trust is developed [Greenberg et al., 2007]. It is important to signal that dispersal of team members can result in a low level of trust and cooperation, which will affect the team's performance [Piccoli, 2003]. Authors deliberating virtual team management agree that managers should concentrate their efforts on trust development, because the lack of face-to-face communication is a real limitation to the introduction of trust. The development of team commitment and engagement seems to be more demanding and require more effort than in face-to-face settings. Surprisingly, studies suggest that trust can be developed in virtual teams that do not have a history of cooperation [Piccoli, 2003; Greenberg et al., 2007]. This trust is fragile and can easily

deteriorate, and its maintenance during the team life cycle is difficult. It has also been confirmed that the lack of face-to-face communication and problems with information exchange can lead to an incongruent perception of team commitments, which can eventually result in a decline in trust. The most important problems with trust arise before the project deadline, when attention is high. During this phase reneging and incongruence can decrease trust. To avoid such a situation, it is advisable to introduce one person who will be responsible for coordination of information exchange, assuring that team members are aware of individual roles, relationships, and responsibilities. The presence of such a person will sustain the team's trust and protect against incongruence [Piccoli, 2003]. The assessment of trust will be also influenced by communication patterns and incentive schemes.

In order to enhance trust, managers should communicate team members' responsibilities, maintain frequent contact, and promote team-related rewards [Antonakis, Atwater, 2002]. It is also believed that the best way to help team members develop mutual trust is to give them an opportunity to meet physically, at least at the beginning of the team's existence. It is advisable to establish a plan for meetings on a regular basis, perhaps every couple of months. However, conditions of work do not always allow this. In that case, it is important to support employees with a teleconferencing or videoconferencing system. Other methods that should be introduced in order to develop trust are "proactive behavior, rotating team leadership, clarity of task goal, role division, frequent interaction with acknowledged and detailed responses to prior messages" [Stough et al., 2007, p. 377]. These methods encourage team engagement and commitment to the common goal, and bring people together in order to achieve goals. According to another author, trust should be founded on "frequent interaction, shared information, and the development of a joint organizational culture" [Mancini, 2010, p. 2]. Trust is limited to the expectation that one's own efforts will be reciprocated by other team members and not exploited by them: this is interpersonal trust. The other kind of trust is the trust that electronic support systems are reliable: trust in system. Following the case of Orange, authors noticed the negative effects of a low trust level in virtual teams, which resulted in hindering product development and problems with reaching the company's goals [Bergiel et al., 2008, p. 101].

Trust in a virtual team is one of the angles that were studied deeply by many researchers. Yet the author did not find any studies on the relationship between the level of trust and the type of communication used in virtual teams (e.g. periodicity of arranged meetings, interaction between team members, and types of prevailing communication tools). Another interesting and still uncovered issue is a comparison of levels of trust in different types of teams, for example, whether it can be expected that self-managing virtual teams will have a higher level of trust than other types of teams.

Team building. During the process of successful virtual team formation, the most important elements are: trust, communication, leadership, goal setting and technol-

ogy [Bergiel et al., 2008, p. 101], providing support, getting acquainted and getting organized [Hasler-Waters, Napier, 2002]. However, the whole process should start with the selection of the right candidates, who will be able to work successfully in virtual reality [Bergiel et al., 2008; Stough et al., 2000; Brown et al., 2007]. This factor is crucial as some people may have difficulties with limited social contact, lack of clearly established work boundaries or using technology-based communication tools. According to the authors, a virtual team member should possess the following features: acquaintance with new media and groupware technology, capability of self-management, self-sufficiency, interpersonal sensitivity and interpersonal trust, and dependability [Hertel et al., 2005, p. 74]. When team members are selected, the next step is to share an understanding of the team's goals and decide on the level of virtualization that will be the most appropriate to achieve these goals [Hertel et al., 2005]. It is also advisable to clarify the team's structure and its place within the whole organization as well as define its roles and responsibilities. This phase also leads to establishing the core team, which will consist of functional leaders from each discipline engaged in the project [Brown et al., 2007]. Moreover, the team should receive support from a team facilitator who will be able to answer the team's questions and help during the problem-solving phase [Hasler-Waters, Napier, 2002]. Addressing the problems of "commitment to the scope of the project, agreement to time schedules, recognition of risks involved, and agreement to share information on a regular basis" will lead to avoidance of many misunderstandings and will contribute to the effective organization of a team [Sookman, 2004, p. 91]. Another way to enhance communication, trust, and cooperation is to set up an operating agreement, which can include meeting protocols (for example, a meetings schedule based on which face-to-face and computer-mediated meetings will be held), describe a communication plan (how often people should communicate and using which methods, how conflicts are resolved, and the way feedback is transferred) and the way decisions will be made (formulation of a decision-making process and selection of people responsible for decision making) [Sookman, 2004]. In traditional teams based on face-to-face contact, the value of such agreements is lower, because team members can ask questions directly and expect timely answers. Moreover, the team also has the possibility to talk about work during informal meetings such as lunch or coffee breaks. The virtual team should be also given a chance to get acquainted with each other. This means more than just learning names; it is about sharing cultural and personal information as well as exchanging information about personal web pages or other sources of information [Hasler-Waters, Napier, 2002; Duarte, Snyder, 2006]. If that is not possible, it is still recommended to conduct at least an initial meeting [Hertel et al., 2005]. The basic function of such a meeting (also in face-to-face teams) is to present expectations, a project schedule, deliverables, and the team's goals. In the case of virtual teams, the opportunity for team building and rapport building gains in importance [Brown et al., 2007]. Nevertheless, such a meeting can be also used in order to develop technology

and communication plans [Duarte, Snyder, 2006]. It has been confirmed that having the opportunity to meet before starting team work facilitates cooperation and trust [Hertel et al., 2005, p. 80]. Studies emphasize that even if a virtual team has access to the newest solutions of computer-mediated technology, face-to-face meetings still have a significant meaning [Kimble, 2011].

There is exhaustive literature covering the issue of team building from different perspectives, e.g., the choice of appropriate team members, the process of the team's launch, types of the most suitable tasks. However, not as much has been written about internal processes during the life cycle of a virtual team. Future research could focus more on the differences in internal processes of virtual teams, depending on their "level of virtualization".

Leadership. Providing the effective functioning of a team in all of the aspects mentioned above requires an appropriate leadership style. Many functions of virtual team members are different from those commonly used in face-to-face teams; one of them is the lower importance of control function [Nyddeger, Nyddeger, 2010]. More effective than direct leadership in the case of virtual settings is management by empowerment and a shift of the managerial function to team members [Nader et al., 2009].

Importantly, managers need to find a way to prevent such problems as lack of project visibility, difficulty in contact, and technology constraints, which particularly lead to the lack of physical interaction, loss of face-to-face synergies, lack of trust, greater concern about predictability and reliability, and lack of social interaction [Hunsaker, Hunsaker, 2008, p. 89]. They also have to handle the implementation of common goals, anonymity, limited social control, reduced feedback, and trust building. Appropriate leadership is especially significant when the problem is raised of challenges to the motivation of physically disconnected workers.

When various types of leadership are taken into account, it seems that the best results can be achieved when transformational leadership is introduced. Transformational leaders are those who provide their employees with vision, stimulate their followers intellectually and expect high performance [Den Hartog, Belschak, 2012]. According to research, transformational leadership gains meaning especially in teams which are connected only on a computer-mediated basis. The leaders who increase their transformational leadership behavior in such teams achieve higher levels of team performance [Purvanova, Bono, 2009]. To sum up, the implementation of transformational leadership encourages a sense of purpose and introduces certainty.

It is also confirmed that another factor leading to a higher performance is feedback. Moreover, feedback, if based on the social processes, can be a tool for enhancing the process of trust- building and increasing trust, cohesion, motivation and satisfaction, bridging spatial disconnectedness, and preventing a feeling of exploitation. Studies have already shown that regular and prompt communication that provides sufficient detail helps leaders be effective in their work [Kahai, 2007].

Scientists who were engaged in helping organizations arrange virtual teams are of the opinion that motivational tools in virtual teams should be modified. "Virtual teams often have fewer motivators, both perceived and real, to perform than those that commonly exist in face-to-face teams" [Nunamaker, 2009, p. 113]. Another aspect is that employees can be deprived of the informal appreciation, face-to-face contact, and support that is given on a day-to-day basis in traditional teams. The authors state that the reward structure should be based more on team performance [Bal, Foster, 2000, Hertel et al., 2005]. The foundation for the development of the motivation theory within the virtual teams is supplied by Vroom's theory of motivation: Motivation = Valence x Expectancy (Instrumentality). On this basis the VIST Model [Hertel, 2005] was developed, which is believed to explain the motivation within virtual teams. In this model, V=Valence, I=Instrumentality, S=Self-efficacy and T=Trust are predictors of employees' motivation. Valence is described as the subjective evaluation of the team goals. Moreover, the person is motivated when one's evaluation of the goal is high. Problems occur when the personal interests or other personal goals are in conflict with team goals. The important fact is that the high team identity leads to better evaluation of team goals. Instrumentality is the perceived importance of one's own contribution to the group outcome. When the employee is convinced about his indispensability to the team outcome, it will result in high instrumentality and eventually in better performance. Low instrumentality, on the other hand, leads to social loafing, a situation in which the person puts less effort into the team's work than into individual performance. Ringleman [Kravitz, Martin, 1986] has studied that phenomenon by asking people to pull a rope individually or in teams. The result was that people working in group did not work as hard as when each was pulling the rope alone. According to Kożusznik, social loafing negatively influences a team's effectiveness, leading to a decrease of effort by as much as 50% compared with individual performance [2002, p. 115]. The next aspect, self-efficacy, can be described as "the perceived contingency that one's own high effort leads to own high performance" [Hertel et al., 2004, p. 8]. It is crucial to note that a high evaluation of personal capabilities and a low team evaluation will lead to low job motivation; by contrast, low evaluation of oneself and high evaluation of the team results in high motivation. Trust is the last component on the VIST model. It is defined as the expectation that personal efforts will be reciprocated by other team members and not exploited by them.

A model explaining motivation in virtual teams has not yet been confirmed by the studies. The author found only a study on interdependencies between components of the VIST model, performance and satisfaction [Engel, 2004]. Future studies on virtual teams should concentrate on verification of the VIST model and a definition of factors motivating virtual teams. Lack of direct contact with the manager or supervisor and dispersion of the team's members may require specific motivational factors. In parallel, the research on differences between motivational factors in virtual and face-to-face teams could be studied.

Summary

Companies are increasingly eager to use virtual teams because there are various advantages of turning to virtualization. The most important advantages are cost reduction, the possibility to work internationally, using the knowledge and experience of experts located all over the world, more rapid and effective decision-making processes, and a greater degree of freedom among people engaged in the project. However, working virtually is a source of real challenges resulting from a lack of physical interaction, mistrust, a decrease of monitoring and control activities, and difficulties with distant management. Researchers are following current trends on team management and are studying extensively the issue of virtualization.

The literature review on virtual teams leads to the statement that much attention was paid to the problem of trust and communication. However, the relationship between different types of communication methods (e.g. prevailing communication tools, communication periodicity, communication protocol) and the level of trust has yet to be studied. It could be assumed that teams who communicate more often and have clear rules of communication will be characterized by a higher level of trust in comparison with teams who communicate seldom and do not have set rules for communication. Current research does not address the issue of differences in the level of trust between various types of virtual teams, e.g., problem-solving teams, project teams, and self-managed teams. Teams that would be given more empowerment could report a higher level of trust.

Many studies were also devoted to the issue of team building, i.e. the selection and launch processes, setting goals, and dividing tasks between team members. In comparison with the research on face-to-face teams, there is not much written about the team-building processes in virtual teams. It could be expected that they vary from the processes which occur in traditional teams. It would be worth studying if those processes change depending on the level of virtualization and how significant are those differences.

Studies on leadership in virtual teams lead to selection of the most suitable management style, draw attention to managers' tasks, and highlight the importance of feedback. Researchers have developed a model explaining motivation in a virtual team - the VIST model - however, the model has not yet been verified. Future research should concentrate on model verification as well as on the identification of factors which motivate virtual teams. When the motivational factors are defined, then it will be possible to compare them with motivators of face-to-face teams. To conclude, it can be stated that there is not as much research on motivation in virtual teams as there is on team building, communication, or trust.

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