Strategies to Improve Communication Management within Virtual Project Teams

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ABSTRACT

Working in a virtual team presents many challenges. Communication is one of the most important challenges, especially when a virtual team includes members from different countries and background. Virtual project management enables organizations to save on resources such as cost and time. Organizations often struggle with poor communication in their geographically dispersed teams and ineffective communication have been identified as one of the main causes project failure. The aim of this study is to determine the most critical barriers to effective communication in virtual teams. A mixed method of data collection was adopted using semi structured interview with communication and construction experts, and questionnaire approach with construction companies that are G5-G7 rated. Data were analyzed using pareto and exploratory factor analysis for the development of a strategy for enhancement of communication management within virtual teams. The result shows that lack of trust and misunderstanding are the most important barrier to communication within virtual teams. However, managing communication process has been identified to have more impact on the barriers, while planning communication has the least impact. Establishing rule for response and changing focus from individual to group

were identified as the two most important factors required in order to sustain trust within virtual teams.

Keywords: Communication, virtual project management, virtual team

INTRODUCTION

The modern sense of project management began with the development of "Project Evaluation Review Technique" (PERT) and "Critical Path Method" (CPM) in 1958s (Stretton, 2007). Subsequently, the concept of virtual project management evolved in the mid-1990s when companies began organizing project over distance with distributed teams (Bergiel et al., 2008). Virtual project teams are emerging as an essential component for organizations to save resources such as cost and time. However, due to their structures, they create different challenges, particularly associated with communication management (Kuruppuarachchi, 2009).

However, there are many definitions of virtual project management in literature. Krill and Juell (1997), defined virtual project management as "collaborative effort towards as specific goal or accomplishment which is based on 'collective yet remote' performance". A similar definition was proposed by Rad and Levin (2003) as "working across time zone, culture, space and organizational boundaries through advanced communication and information technologies to achieve common objectives".

Virtual project teams enable organizations to quickly use human resources, experiences, capabilities, and expertise of personnel who might be in different organizations and places to provide solutions to their problems within the shortest possible time and to save cost. Communication is regarded as an integral component of success for any project team, inclusive of virtual teams to work effectively. Even though communication has been recognized as a key factor to have a successful team in a virtual environment, organizations often struggle with poor communication in their global project. A report from a study conducted by project management institute PMI (2013), revealed that 56% of every $1 billion spent on project risk was as a result of poor communication which led to failure of projects in meeting their objectives.

In the same light, Clark (2014) predicted that 70 percent of project manager did not use communication methods properly which was the main cause of the different challenges they faced while working with virtual teams. Some of these challenges are as a result of cultural diversity, different time zones, level of technology between virtual team members, lack of trust in a team and, most of all the lack of face to face communication. Communication is a very important tool for managing an engineering team and for facilitating knowledge sharing among team members (Lewkowicz et al., 2008). During the communication process, misunderstandings and errors can appear as a result of communication complexity (Hassanaly, 2006).

There are many reasons for poor communication within virtual teams, these may occur at any stage within the communication process. Some of these reasons may include the team's structure, different time zones (Aslam & Khan, 2010), language barriers (Solomon, 2010), trust (Oyeleye, 2013), and cultural differences (Shachaf, 2008). The presence of weak communication within virtual project team makes them prone to low individual commitment, role ambiguity, role overload, absenteeism, and social loafing (Jarvenpaa & Leidner, 2013).

When a team identifies barriers as the root cause of poor communication they can work to solve the issues. Unknown barriers more often have caused projects outcome be at risk. The vulnerability of these steps against obstacles is not the same in all projects. It is important to assess the existing vulnerability, and determine the degree of risk for process (Cao & Malik, 2006). Hence, due to the potential risk to the projects because of poor communication in virtual project teams, the aim of this study is to determine the critical barriers of communication management within virtual project teams and how these barriers influence on communication processes, in order to develop strategies to improve communication management in virtual project management (VPM) and achieve communication success in virtual teams.

RELATED WORK

The growing popularity of virtual teams in organization are as a result of new technological era (Walvoord et al., 2008). In addition, universal project teams are vital components of modern organizations that enable them to select the talents and expertise to innovate, solve complex problem, and save on resources (Kuruppuarachchi, 2009).

As stated by Khazanchi and Zigurs (2006), and William et al. (2010), "project management is a challenging activity in the best situations, and in the virtual environment it has become even more challenging". Manager must deal with many challenges while working with virtual teams, such as cultural diversity (Daim et al., 2012), different time zones (Aslam & Khan, 2010), technology (Hosseini & Chileshe, 2013), lack of trust in a team (Greenberg et al., 2007; Oyeleye, 2013), and, most of all, the lack of face- to- face communication (Reed & Knight, 2011; Rosen et al., 2007). Although some of these challenges have always existed for traditional project managers, as observed by Osman (2011), they are amplified several times over for virtual project managers.

Communication is an integral component of success for any project team, also for virtual teams to work effectively. Everyone has to know of outside events that will affect the team, and make sure that a problem or delay in one area is immediately communicated to those whom it may affect. As stated by Ebrahim et al. (2009), "communication is the most challenging component of project management, particularly among virtual teams, which can also make it more difficult to overcome cultural barriers." Lee-Kelley and

Sankey (2008), stated in their research that cultural differences and time zone affected communication as well as team relations on project. Similarly, cultural misunderstanding further made communication complex due to differences in language, verbal styles and nonverbal styles which influenced team effectiveness (Shachaf, 2008).

The recent study conducted by the project management institute PMI (2013), revealed that ineffective communication has negative impact on project execution. It revealed that, 56% of total project cost was at risk as a result of ineffective communication. It also showed that, ineffective communication is the primary contributor to project failure one third of the time, and had a negative impact on project success more than half the time. Similarly, Clark (2014) stated that 70% of project managers did not use communication methods properly. As such, they must deal with many challenges while working with virtual teams.

The consequence of weak communication is that the virtual project team is prone to low individual commitment, role ambiguity, role overload, absenteeism, and social loafing (Jarvenpaa & Leidner, 2013). According to PMI (2012), communication management includes three processes: plan communication, manage communication, and control & monitoring communication. The vulnerability of these steps against obstacles is not same. The only way to success in a system is to assess the existing vulnerability, and determine the degree of risk for process (Cao & Malik, 2006).

According to the recent report by cultural training service (RW3. LLC) (Solomon, 2010), 45% of employees who are working as virtual team members, claimed they had never met their virtual team groups and 30% said they only met them once a year. In the report, "the challenges of working virtual teams" was based on survey of nearly 3000 employees from multinational companies. The survey also found that virtual team members 97% did not have enough time during virtual meeting to build relationships. Similarly, 81% said that it was difficult to establish rapport and trust in virtual teams (Solomon, 2010).

The distance present in virtual teams introduces problems for effective methods of communication in task coordination as social interaction and team relationships (Anderson et al., 2007). Organizational leaders must also understand how establishing trust through social interaction affects virtual team communication (Corvello & Migliarese, 2007). The lack of effective communication, resulted by challenges, in virtual teams can make ambiguous potential understandings of objectives and complicate the communication and collaborations (Oyeleye, 2013).

Communication Management in Virtual Teams

The most satisfied virtual team members exist in teams with effective communication structures and patterns (Oyeleye, 2013). As stated by Clark et al. (2010), in order to ensure that the virtual teams meet their objectives, daily communication between a team leader and individual team member is the glue that hold a virtual team together. According to

Walvoord et al. (2008), "communication between virtual team members serves not only in the exchange of critical information among team members that are working in different places, but also to build interpersonal relationships". Although both virtual and traditional teams share the common characteristic of communication, the difference lies in the fact that asynchronous communication is required in virtual teams (Bergiel et al., 2008).

Similarly, Bilczynska-Wojcik (2014) was of the opinion that project managers had to understand how to approach a new project with team members from various regions, countries and time zones. The researcher described that work schedules and meeting times had to be considered more than with face-to-face project teams and to reduce the impact of space and time, the project team members needed effective communication and appropriate use of the communication tools throughout the project from planning to closure. Reed and Knight (2011), also stated that while the use of virtual teams had become quite commonplace, the initiation and rapid growth of virtual project work was not accompanied by customized processes and procedures, standards, methodologies or guidelines developed specifically for the virtual environment.

Most project management practitioners instead rely upon existing traditional project risk assessment and handling methods, originally designed for co-located project teams. However, unique issues have been documented in virtual environments, including communication issues" (Lee-Kelley & Sankey, 2008), trust issues (Majchrzak et al., 2004; Powell et al., 2004), and issues with invisible team members, sometimes referred to as "deadbeats" or "freeriders" (Rubin et al., 2002). Although such issues can occur in traditional projects, these means that the problems may occur more frequently or with greater intensity when the environment is virtual. similarly, Reed and Knight (2011) stated that the lack of or inadequate communication risk factor refered to communication problems on a project that impacted project success. This included missing communication, where project team members were not adequately informed about important aspects of the project work, resulting in confusion. Inadequate communication can also occur when there is so little communication that problems result because team members do not know what to do or what is expected of them.

Communication Challenges in Virtual Project Management

There are several reasons that have made communication risk to be anticipated higher in virtual projects. However, since virtual projects have little or no face-to-face communication, team members rely on ICTs such as video conferencing, e-mails, wikis and blogs, collaboration tools and instant messaging. But in spite of their numerous advantages, virtual teams face greater communication challenges than face-to-face teams. The advancement in technology has made virtual workplace communication more prevalent for business meetings globally. Lookwood (2015), reported that most business leaders

encountered more challenges in virtual communication than in face-to-face communication. However, the precise cause of these challenges is unknown due to the complexity of the business environment.

PMI's 2013 Pulse of the Profession report revealed that US$135 million is at risk for every US$1 billion spent on a project (13.5%). Further research on the importance of effective communications uncovers that a startling 56 percent (US$75 million of that US$135 million) is at risk due to ineffective communications. Contrary to this, Morgan et al. (2014) stated that the limited range of communication methods was not a major contributing factor to a team's effectiveness.

Researchers are trying to determine how virtuality impacts teams effectiveness (DeSanctis & Poole, 1997; Pauleen, 2003), focusing on a variety of success predictors (Dubé & Paré, 2001; Furst et al., 2004), such as conflict management, leadership (Kayworth & Leidner, 2002), trust (Jarvenpaa et al., 2004; Kanawattanachai & Yoo, 2007; Piccoli & Ives, 2003), communication (Maznevski & Chudoba, 2000), norm development (Majchrzak et al., 2000), boundary crossing (Espinosa et al., 2003), creativity, team size (Bradner et al., 2003), control, and technology appropriation (Majchrzak et al., 2000). The effect of virtual team composition on performance seems very important; e.g., cultural diversity influences virtual team effectiveness (Dafoulas & Macaulay, 2002).

However, literature suggests that cultural diversity is a critical predictor of effectiveness, empirical findings that support this claim are rare (Martins et al., 2004; Walsham, 2002). Therefore, it is important to gain a better understanding on the effect of cultural diversity on team effectiveness and to understand how ICT mitigates or amplifies this influence (Buckley, 1999). The concept of "trust" in virtual teams has been widely researched (Kanawattanachai & Yoo, 2007). Many dimensions of trust have been identified including cognitive trust, calculative trust and institutional trust (Erdem & Ozen, 2003). Studies have been carried out to examine trust in relation to the abilities, benevolence and integrity of team members. Trust is critical to the cooperative behavior that leads to the success of all teams, but it is especially important in virtual teams.

Two interrelated factors, diverse locations and technology-enabled communication contribute to making trust more difficult to develop in virtual teams than in traditional hierarchical relationships and on-site teams (Greenberg et al., 2007). In a nutshell, the review of related literatures reveals that there are many factors that influence the success of communication management in virtual project teams. However, missing piece of knowledge in existing literature is the evaluation of the influence of these factors on processes of communication management to identify the most vulnerable stage.

METHODOLOGY

The research process was conducted using both qualitative and quantitative methods (mixed

method) in two main phases. The first phase was the qualitative study which was conducted using semi-structured interview method. A sampling frame was designed comprising two groups of academician experts in communication, and project management from three universities in Malaysia (UM, UPM, and MMU). These institutions were selected because they are the top three universities within the study area that have experts in communication, construction and virtual project management. There were 20 experts interviewed in the first phase. The purpose of the interview was to rank the important challenges of communication among virtual teams, this was conducted to identify the most critical communication challenges faced by virtual teams by conducting Pareto analysis on the items (Neuman, 2005). The second phase which was the quantitative study was conducted through the use of closed ended questionnaires to collect data from the targeted respondents. The respondents were selected from the construction contractor companies with experience of managing virtual team in project execution. The targeted population were construction companies that were registered with the Construction Industry Development Board (CIDB) Malaysia under the class G5, G6, and G7. Based on questions selected from comprehensive literature review, 118 valid responses were collected for the development of a new strategy, which focused on behaviours that affected the success of communication within virtual teams and project managers in the construction industry. The methodological framework is summarised in Figure 1 below.
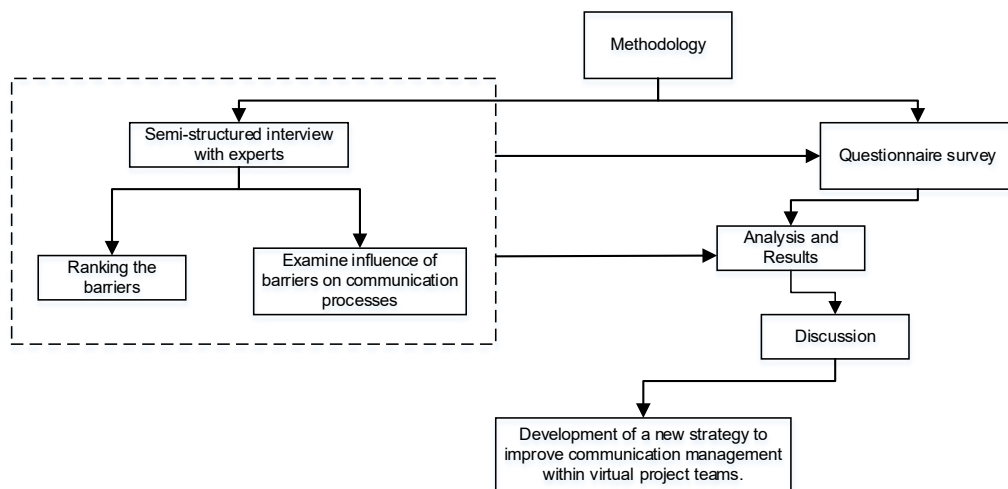

Figure 1. Methodological framework

ANALYSIS AND RESULTS

Data were collected through the use of semi-structured interview by asking participants

to rank factors that are critical barriers to effective communication in virtual teams. Lack of trust, misunderstanding, level of knowledge & technology, language barriers, and multiple time zone respectively were ranked as most important communication barriers that are faced by virtual teams. This finding is in agreement with the research conducted by Greenberg et al., (2007) and Yang (2014). This shows that lack of trust is the most important challenge within virtual environments. However, the ranking in Figure 2 underscores the insignificance of some factors, such as diversity and local laws in virtual work environment.

Figure 2 shows the overall results of the ranking of communication barriers faced by virtual teams. More also, Pareto analysis was conducted on the items been ranked by the respondents. Pareto as 80% to 20% rule under the assumption that in all situations 20% of causes determine 80% of problems, this ratio is merely a convenient rule of thumb and is not nor should it be considered immutable law of nature. It should be noted that the 20% are root causes of the remaining 80%. Lack of trust and misunderstanding were selected according to the Pareto principle as the top portion of the causes that need to be addressed to resolve the majority of communication problems in virtual teams. The application of the Pareto analysis in management allows management to focus on those items that have the most impact on their project (Neuman, 2005). The result from the Pareto analysis shows that the "Lack of Trust" was observed to be the highest weight percentage of importance (13.70%), followed by "Misunderstanding" (12.63%).

The second phase of the enquiry which was quantitative, was conducted through the use of questionnaires. This was conducted in order to identify the most important factors to improve communication in virtual teams from the perspective of misunderstanding and lack of trust. The factors were analysed for reliability and validity, this was evaluated using Cronbach's coefficient alpha (α). The result of the reliability test (α) was above 0.70 as shown in Table 1. An "α" value of 0.70 or above indicates a reliable measurement
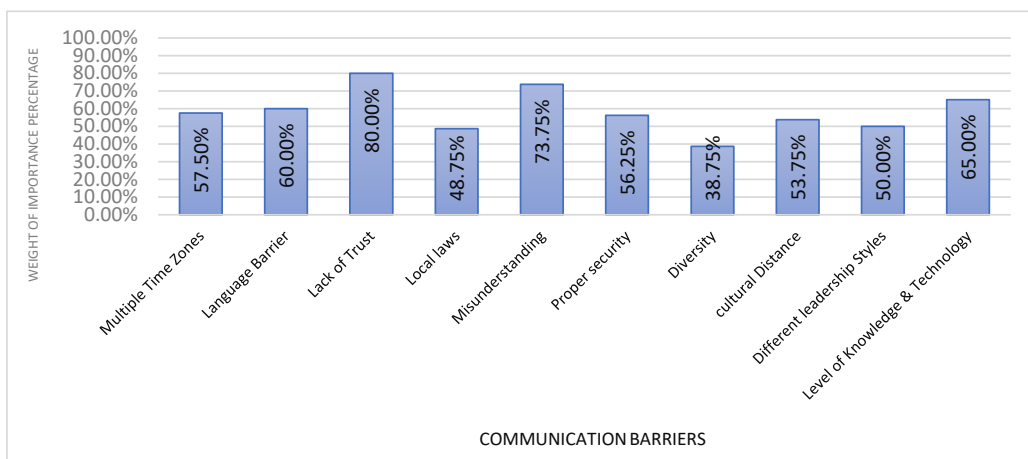

Figure 2. Importance of communication management barriers among virtual project teams.
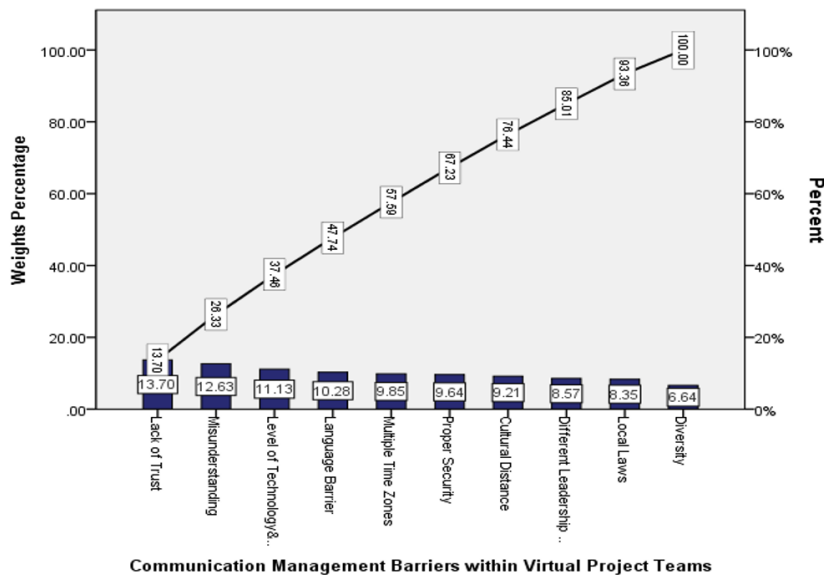
Figure 3. Pareto Analysis of Communication Management Barriers

instrument (Cronbach, 1951). Subsequently, exploratory factor analysis (EFA) was used to determine the factor structure among all variables. The principal component method was applied to evaluate the factorability of 20 items. Several well-known criteria for the factorability of correlation were used. First, Kaiser-Meyer- Olkin measure of sampling adequacy was 0.930, and Bartlett's test of sphericity was significant. The diagonals of the anti-image correlation matrix were all over 0.5, supporting the inclusion of each item in the factor analysis (Hair et al., 2006). Finally, the communalities of items were above 0.4, further confirming that each item shares some common variance with other items. As result of EFA, two components with eigenvalues greater than 1 were found (Table 2). The first component consisted of 10 items which were related to trust dimension with load point of items between 0.822 and 0.593. In the second component found in the scale, there were 10 items related to misunderstanding dimension with load point of items between 0.865 and 0.544. The four items with the highest rank from two components selected to develop a new strategy for effective communication among virtual teams (Figure 3).

In other to develop sustain trust within virtual teams, there is need to;
- Establish rules for response.
- Change focus from individual to group.
- In other to prevent misunderstanding in communication among virtual teams, there is need to;
- Use communication guideline within the virtual project teams.
- Summarizing, recapping, and identifying the next steps.

Table 1

Cronbach's Alpha Value of the Instruments

	Items	α	Cronbach's Alpha
Items to Sustained Trust	Change focus from individual to group	0.815	**0.844**
	Encourage participation of organizing activities.	0.841	
	Establish rules for response.	0.815	
	Meet face to face if practical.	0.832	
	Use the most effective method of communication.	0.851	
	Clarify tasks and processes, not just goals and roles.	0.822	
	Membership of the professional global associations.	0.806	
	Introduce team members to one another (experience & abilities).	0.846	
	Being counted on to do what the team members say they will do.	0.827	
	Share and rotate power (different members lead the team at different times)	0.840	
Items to Prevent Misunderstanding	Team member learn the different task that the team performs.	0.761	
	Clarify individual tasks.	0.781	
	Setting and managing expectation.	0.768	
	Summarizing, recapping, and identifying the next steps.	0.756	
	Define an appropriate communication model.	0.772	
	High education to increase team's knowledge.	0.788	
	Considering all viewpoints.	0.776	
	Fact finding to identify or confirm information.	0.788	
	Selecting communication method.	0.795	
	Using communication guideline within the team.	0.750	**0.792**

Table 2

Factor Analysis after extraction components using principal component method

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.874	59.37	59.37	7.086	35.43	35.43
2	1.452	7.258	66.628	6.24	31.20	66.63

DISCUSSIONS

Virtual teams are dispersed geographically, as such, it is important for project managers to find a clear and controllable method to communicate and cooperate. For this purpose, project managers have to select proper strategy for communication. The results of qualitative study showed that "managing communication" process had the highest impact against the barriers and "plan communication" process having the lowest impact against the barriers. Similarly, the study also found out that "establishing rule for response" and "changing focus from individual to group" were the most important factor required in order to sustain trust within virtual teams. A developed trust will also increase the pace at which virtual team builds cohesiveness.

The results of this study also reveal that team diversity shows itself in both the social and technical skill sets of the virtual team members. These are reflections of the diversities found in co-located teams, but with additional complications due to distance. Socially diverse members have varied backgrounds and life experiences and may form incorrect assessments of fellow team members. This is more pronounced within members from different cultural backgrounds that have had conflicts in the past. Statements that are acceptable by one group are often not taken in the same context as intended resulting in emotional disconnects.

Furthermore, a strategy to improve communication from perspectives of trust and misunderstanding among virtual teams is proposed. Developing new communication strategy processes starts from the determination of the objectives of communication and identifying people who are involved, affected, and interested in communication processes. A strategy provides answer to "what", "why", "when", and "how". A communication strategy is coherent narrative that illustrates a solution to an obstacle or a package of obstacles in communication management.
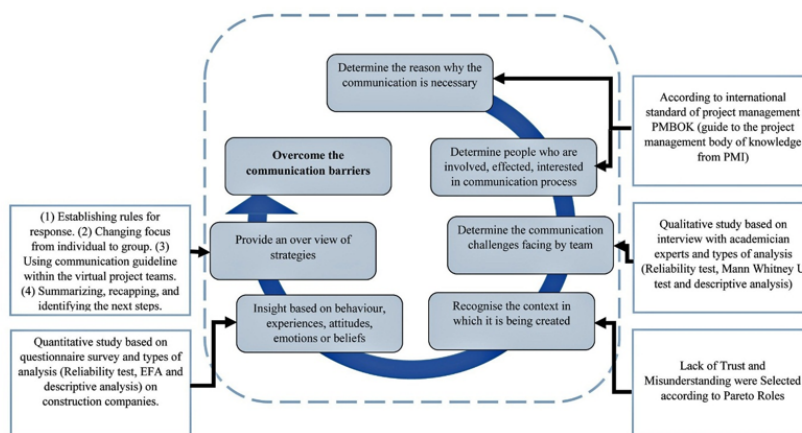

Figure 4. Process of developing communication strategy

Figure 4 above was developed from the findings of this research and it shows the proposed recommended strategies that virtual project managers should consider in communication processes (planning, managing, and monitoring) to improve their project communication programs.

In other to develop sustain trust within virtual teams, there is need to;
- Establish rules for response.
- Change focus from individual to group.
- In other to prevent misunderstanding in communication among virtual teams, there is need to;
- Use communication guideline within the virtual project teams.
- Summarizing, recapping, and identifying the next steps.

The results of this study reveal that "establishing rules for response" was the most important factor required in order to sustain trust within virtual team development stages and to improve communication management. A developed trust will also increase the pace at which the virtual team builds its cohesiveness; thus, the team members will improve their knowledge dissemination through communication. Trust is the major behavioral process associated with teams and if team member cannot communicate with each other, trust cannot be developed. Bell and Kozlowski (2002) referred to trust as the lens that helped to define the level of communication, coordination and cooperation within a virtual team. Thus, establishing rules is the first stage of developing trust between team members."

CONCLUSION AND RECOMMENDATION

It is important for organisations to understand virtual team structure and ensure that they are supported with training and resources for the success of the team. Using virtual teams in organizations is the new epoch for organizations to expand globally and to maintain their profit margins. Having a better understanding of how a virtual team should be managed is crucial to the success of an organization. It is important for organisations to resolve critical issues such as lack of trust and misunderstanding to effectively manage communication within virtual teams as well as emphasizing on the significance of trust development and reduced misunderstanding within virtual teams. More also, practitioners should focus on factors and behaviours of their different virtual teams to develop a strategy to effectively manage communication.

The findings from the study recommend the following strategies for managing communication processes;
- Establishing rules for response.
- Changing focus from individual to group.
- Using communication guideline within the virtual project teams.

- Summarizing, recapping, and identifying the next steps.

The current study can be further explored by investigating the role of communication tools to improve leadership trust within virtual teams. In addition to this, further research can be carried out to examine the impact that culture might have on trust and communication in virtual teams. Finally, further research as a follow-up to this study should be conducted in other countries paying attention to the relationship between trust and communication in other to create best practices for setting up virtual teams.

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