



UNIVERSITI PUTRA MALAYSIA

***DEVELOPMENT OF STRATEGIES TO IMPROVE COMMUNICATION
MANAGEMENT WITHIN VIRTUAL CONSTRUCTION PROJECT TEAMS***

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**DEVELOPMENT OF STRATEGIES TO IMPROVE COMMUNICATION
MANAGEMENT WITHIN VIRTUAL CONSTRUCTION PROJECT TEAMS**

By

FATHOLLAH EFTEKHARI

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfillment of the Requirements for the Degree of Master of Science**

October 2015

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DEDICATION

This thesis dedicated to my lovely wife and kindness daughter who have supported me in many ways along this journey.



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UPM

Abstract of thesis presented to the senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

DEVELOPMENT OF STRATEGIES TO IMPROVE COMMUNICATION MANAGEMENT WITHIN VIRTUAL CONSTRUCTION PROJECT TEAMS

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October 2015

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Virtual project management emerged for reaction to the growing need for low-cost, high-quality, and rapid solutions to complex organizational problems. Virtual project teams enable organizations to select the talents and expertise of employees by eliminating time and distance barriers.

However, there are numerous evidences that the virtual nature create many challenges to effectively manage the communication within project teams and place a risk on project performance. Also, poor communication within virtual project teams cause projects to fail. This issue is due to the lack of study on strategies to clarify and emphasize the behaviours of the virtual project teams to deal with these barriers. The main objective of this study is to address this gap by identifying, examining and analysing the factors that influence the communication management among virtual project teams. In addition to this, the study aimed to identify factors that develop the sustain trust and prevent the misunderstanding within virtual team.

The research process was conducted in two main phases. First phase consists of the qualitative study based on a semi structured interview method. A sampling frame was designed comprising two groups of academicians experts in communication, and project management. Initially ten factors that influence communication management among virtual project teams were drawn from the literature. Subsequently, the factors subjected to a ranking process through interview. Finally, the degree of influences of these factors on communication management processes was assessed by experts. Mann Whitney U test and Pareto analysis were performed initially to achieve data reduction. The two most important factors (Lack of trust and Misunderstanding) were selected. In the second phase, respondents were selected from the three groups of construction contractor companies (G5-G7) in Malaysia (Klang Valley). Data was collected by questionnaire survey, participated by 98 valid respondents. Exploratory factor analysis, frequency distribution and descriptive analysis (mean, weight and standard deviation) were used as data analysis methods in this phase.

Findings indicated that, *lack of trust* and *misunderstanding* are the two most critical barriers of communication management within virtual project teams. Moreover, findings revealed that *Managing communication* is the most vulnerable process of communication management against the barriers. Finally, two groups of factors that contribute to develop sustained trust and reducing misunderstanding among virtual project teams were identified. These factors were suggested as a project management strategy. This research has contributed to the field of project management. The first contribution of this study is the added two factors as most critical barriers for success of communication management within virtual project teams. In addition, this research has contributed to existing literature by emphasizing in factors and behaviours that affect the success of communication management within virtual project teams. It provide strategies to improve communication management within virtual project teams.



Abstrak tesis yang dikemukakan kepada senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

PEMBANGUNAN STRATEGI MENINGKATKAN PENGURUSAN KOMUNIKASI DALAM PASUKAN PROJEK PEMBINAAN VIRTUAL

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Pengurusan projek maya muncul sebagai reaksi kepada keperluan yang semakin meningkat penyelesaian masalah-masalah organisasi yang kompleks yang berkos rendah dan berkualiti tinggi. Pasukan-pasukan projek maya membolehkan setiap organisasi memilih bakat dan kepakaran pekerja dengan cara mengeneipkan masalah-masalah masa dan jarak.

Namun begitu, terdapat pelbagai bukti bahawa keadaan maya mencipta banyak cabaran dalam mengurus komunikasi efektif pasukan projek dan memberi risiko kepada prestasi projek. Komunikasi yang lemah juga, dalam pasukan projek maya menyebabkan projek boleh gagal. Isu ini adalah disebabkan oleh kurangnya kajian ke atas strategi-strategi yang bertujuan memperjelaskan dan memberi penekanan kepada pasukan-pasukan projek maya dalam mengendalikan halangan-halangan ini. Objektif utama kajian ini ialah merujuk kepada jurang ini dengan mengenalpasti, memeriksa dan menganalisa faktor-faktor yang mempengaruhi pengurusan komunikasi di antara pasukan-pasukan projek. Tambahan pula, kajian ini bertujuan untuk mengenalpasti faktor-faktor yang dibangunkan untuk mengekalkan rasa percaya dan mengelak dari adanya kesalahfahaman di antara pasukan maya ini.

Proses kajian telah dijalankan dalam dua fasa. Fasa pertama terdiri dari kajian kualitatif berdasarkan kaedah temuramah separa struktur. Satu kerangka persampelan telah direkabentuk dan ia terdiri dari dua kumpulan pakar akademik dalam komunikasi, dan pengurusan projek. Awalnya, sepuluh faktor yang mempengaruhi pengurusan komunikasi di kalangan pasukan projek maya telah diambil dari literatur. Akibatnya, faktor-faktor yang tertakluk kepada satu proses perkadaran melalui temuramah telah diambil-kira. Akhir sekali, tahap pengaruh faktor-faktor proses-proses pengurusan komunikasi telah dinilai oleh pakar-pakar berkenaan. Ujian-U Mann Whitney dan analisis Pareto analysis telah dijalankan, pada mulanya untuk mencapai pengurangan data. Dua faktor yang paling penting (Kurang kepercayaan dan kesalahfahaman) telah dipilih. Dalam fasa kedua, para responden telah dipilih dari tiga kumpulan syarikat kontraktor pembinaan (G5-G7) di Malaysia (Lembah Kelang). Data telah dikumpul melalui tinjauan kajeselidik, dan ia disertai oleh 98 orang responden yang sah. Analisis

faktor eksploratori, pengagihan kekerapan dan analisis deskriptif (min, berat dan sisihan piawai) telah digunakan sebagai kaedah analisis data dalam fasa ini.

Dapatan menunjukkan bahawa kurangnya kepercayaan dan kesalahfahaman adalah dua halangan penting dalam pengurusan komunikasi dalam pasukan projek maya. Tambahan pula, dapatan menunjukkan bahawa *Menguruskan komunikasi* adalah proses yang paling lemah dalam pengurusan komunikasi untuk mengatasi halangan-halangan yang dinyatakan tadi. Akhir sekali, dua kumpulan faktor yang menyumbang kepada aspek menanam rasa percaya dan mengurangkan kesalahfahaman telah dikenalpasti. Faktor-faktor ini dicadangkan sebagai strategi pengurusan projek. Kajian ini menyumbang kepada bidang pengurusan projek. Sumbangan pertama kajian ini ialah dengan menambah dua faktor sebagai halangan-halangan paling penting kepada kejayaan pengurusan komunikasi dalam pasukan projek maya. Tambahan pula, kajian ini telah menyumbang kepada literatur sedia ada dari aspek faktor-faktor dan perilaku yang memberi kesan kepada kejayaan komunikasi dalam pasukan projek maya. Ia memberikan beberapa strategi untuk memperbaiki pengurusan komunikasi di antara pasukan-pasukan ini.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

AIPM	International Project Management Association
CIDB	Construction Industry Development Board
CPM	Critical Path Method
DV	Dependent Variable
EFA	Exploratory Factor Analysis
ICT	Information and Communication Technology
IPO	Inputs- Processes- Outcomes
IV	Independent Variable
KMO	Kaiser Meyer Olkin
PERT	Program Evaluation and Review Technique
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
RO	Research Objective
RQ	Research Question
VRL-KciP	Virtual Research Laboratory for Knowledge Community in Production
VPM	Virtual Project Management
VPT	Virtual Project Team

CHAPTER 1

INTRODUCTION

1.1 Introduction

This research starts with an introductory chapter. The researcher's purpose is to introduce the reader the background of this study, clarify the relevance of the research problem and explain the benefits and importance of this study. This chapter will also outline the research problem, research questions, research objectives, limitation of the study and brief on the research methodology. This chapter also outlines the thesis as a whole.

1.2 Background of the Study

Modern sense of project management began with development of "Project Evaluation Review Technique" (PERT) and "Critical Path Method" (CPM) in 1958s (Stretton, 2007). Subsequently, the concept of virtual project management evolved during the mid-1990s when companies began organizing project over distance with distributed teams (Bergiel, Bergiel, & Balsmeier, 2008).

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

The growing popularity of virtual teams in organization are result of new technological era (Walvoord, Redden, Elliott, & Coovert, 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 (Kurupparachchi, 2009).

As shown by Khazanchi and Zigurs (2006) , and William, Dow, and Taylor (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, 2007; Oyeleye, 2013), and, most of all, the lack of face- to- face communication (Reed & Knight, 2011; Rosen, Furst, & Blackburn, 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, Ahmed, and Taha (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), indicated in their research that cultural differences and time zone affect communication as well as team relations on project. Some of their comments are as follows:

- Communication is essential for efficient coordination, particularly in large construction projects.
- Inappropriate communication management can lead members to "not being the same page" and "working at cross purpose".
- Weak communication management can lead to confusion that can add more cost and more time.
- Projects fail to start from misunderstanding.

According to the recent report by cultural training service (RW3. LLC), (45) percent of employees who are working as virtual team members, claimed they had never met their virtual team groups and (30) percent said they only met them once a year. 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) percent do not have enough time during virtual meeting to build relationships. Additionally (81) percent said that it is difficult to establish rapport and trust in virtual teams (Solomon, 2010). Cultural misunderstanding further makes communication complex due to differences in language, verbal styles and nonverbal styles which influence team effectiveness (Shachaf, 2008).

According to McLean (2007), some of the challenges associated with leading virtual teams are related to trust building, which requires time, effort, and commitment from all team members, including the leader. Set of dynamics that created by virtual teams are different from traditional teams that work in one physical location. Some factors such as communication structures and leadership behaviour take on different settings, and have to be understood and performed with attention of this new environment (Araujo, 2004). Virtual team members face communication challenges dealing with the distributed structure of their groups (McKinney & Whiteside, 2006). As the use of virtual teams accelerates, research is also accelerating on understanding the issues involved in effective remote communication (Powell, Piccoli, & Ives, 2004). 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., 2005). 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 collaboration (Oyeleye, 2013). There are many nascent stages in virtual project management that have not been examined (Badrinarayanan & Arnett, 2008). Hence the

reason suggested more research to explore the way to enhance the execution of virtual teams (El-Tayeh, Gil, & Freeman, 2008).

Finally, a thorough literature review revealed that there are many factors influence on success of communication management in virtual project teams. However, missing piece of knowledge in existing literature are evaluate the influence of these factors on processes of communication management to find the most vulnerable stage. As mentioned in PMI (2012), communication management consist of planning, managing, and monitoring processes. This study focuses on influence of these factors on communication management processes to fulfil that gap in literature. Another research gap is the lack of study on strategies to elucidate and emphasize the behaviours of the virtual project teams to deal with the most critical factors that influence on success of communication management within VPTs.

1.3 Problem Statement

According to Construction Industry Development Board Malaysia (CIDB 2012), as part of Malaysian government initiative to encourage construction contractors to venture into the global project, the investment increased fifty times in this area between 1997 and 2011. Malaysian construction contractors involved in 690 globally projects worth 29.7 USD Billion in 49 countries around the world (Appendix A). The total amount of international projects indicate the importance of virtual teams to successful implementation. Virtual team allow companies to procure the best talent without geographical restriction. Working in a virtual team presents many challenges. Communication is one of the most important challenge, especially when a virtual team includes members from different countries and cultures.

As recent study conducted by the project management institute PMI (2013), revealed one out of five project is unsuccessful due to ineffective communications. It indicated that ineffective communication is to blame for 56% of projects that fail to meet objectives. Additionally, from US\$ 135 million at risk on every US\$ 1 billion spent on projects, US \$ 75 million- more than half- is on the line because of poor communication. As regards, the research conducted by Clark (2014), (70%) of project manager do not use communication methods properly. So, they must deal with many challenges while working with virtual teams because of ineffective communication.

Awareness of the barriers of communication management in VPM by project manager has contributed to plan communication management properly by using suitable tools, skills and method. Weak communication would make the virtual project teams 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 are not same. The only way to success a system is 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, as stated above, the researcher believes it is beneficial and timely that determine

the critical barriers of communication management within virtual project teams and how these barriers influence on communication processes, in order to find out the strategy which could enhance effective communication management in VPM and achieve the goal of an organization.

1.4 Research Questions

From the statement of problems and background of the research study, three (3) research questions are raised. These questions are directed to address the issues pertaining to communication management within virtual project teams. This research efforts to answer the following questions:

- i. What are the critical barriers cause ineffective communication in virtual project management?
- ii. How do the barriers influence on communication management processes in virtual project management?
- iii. What are the strategies employed by organizations to enhance communication in virtual project management?

1.5 Research Objectives

The main objective of this research is to study the factors influencing the success of communication in virtual teams to improve communication management within virtual construction project teams. To achieve the main objective of this study, the following specific objectives have been defined:

- i. To determine the critical barriers that cause ineffective communication in virtual project management.
- ii. To examine the influence of barriers towards communication management processes in virtual project management.
- iii. To develop the new strategy which could enhance effective communication in virtual project management.

1.6 Significance of the Study

Organizations have perceived the importance of virtual project teams, which cause to change teams from fixed team to shifting teams. Despite the plethora of literature on virtual project management, it is evident, a lack of study conducted in Malaysia to examine factors that influence the communication management process. Hence, the following are the reason why this research is significant.

Therefore, awareness of the barriers of effective communication helps to provide a communication plan properly by using suitable tools, skills and methods. As well as the

only way to success a system is to assess the existing vulnerability, and determine the degree of risk for process. This research is an attempt to study the factors influence on communication management process to contribute to plan, manage and control communication within virtual teams effectively. Another significance of this study is recommended new strategies to improve communication management among virtual project teams. The researcher hopes that the result of this study will benefit the managers of virtual project teams, project management students, and practitioners, through providing greater insight into the challenges and practices of managing communication within virtual project teams in global projects.

1.7 Scope of the Study

This research study is primarily concerned with the subject of communication in virtual project management. In this way factors that influence communication were applied to determine the most critical barriers of effective communication management. In the current study data was obtained from academician experts in three universities of Malaysia (UPM, UM and MMU).

The efforts also include an analysis of questionnaire survey from Malaysian construction contractors to develop new strategies to enhance the communication management from perspectives of "lack of trust" and "misunderstanding". Malaysian construction contractors in Klang valley that were members of CIDB in three groups of G5, G6 and G7 are the respondents by which the items are studied. It is noted that the study of external communication is beyond the scope of this study.

1.8 Limitation of the Study

This particular research has a number of limitations which affect generalization of research findings. Although a thorough literature review was conducted to obtain the factors that influence communication management it is expected that some factors were inadvertently missed out. Therefore it is expected some factors are omitted in this study.

While it is believed that this study creates in- depth understanding of the communication within virtual construction teams in global projects, because of time limitations and the small non- probability sample, finding cannot be generalized and are not representative for the whole virtual teams. So the findings of this study are applicable to virtual construction project teams in Malaysia or other countries with similar condition. The most profound limitation is that this study focuses on the management of internal communication between the project managers and virtual team members, to find out the problems of ineffective communication in construction organizations. Therefore external communication is not evaluated in this research.

1.9 Content of the Thesis

The current research study is organized into five chapters as follows:

Chapter one (1), this research starts with an introductory chapter, which outlines the background and approach to the research questions and the overall objectives of the thesis.

Chapter two (2), the relevant literature review is performed in the second chapter which presents the theoretical framework of this thesis. In this chapter, the researcher discusses what information was known prior to research and narrows down the selected literature to pinpoint the main focus areas of this study.

Chapter three (3), identifies the most appropriate research methodology, detailing its design and strategy for data collection and analysis that, the researcher used in order to answer the research questions.

Chapter four (4), discusses and illustrates data collection, analysis and findings, themes that emerged from each of the interview, observations and documentation review that address the aims and objectives of this research are presented. Over the discussion, the researcher illustrates how the findings are relevant to answer the research questions.

Chapter five (5), consist of conclusion from the finding of the research study and recommendations for further research.

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