LINKING THE PROJECT SCOPE WITH PROJECT SUCCESS: THE MODERATING ROLE OF MANAGERIAL EXPERTISE IN IT

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Abstract

This study aims to reveal the effect of formal definition of project scope on project success. Furthermore, it also intends to examine the moderating effect of managerial expertise in information technology on the above stated relationship. The study followed a cross sectional research design, purposive sampling technique, and self-administered questionnaires. 120 respondents are selected that are working in six information technology based organizations. The results show a significant and positive relationship between formal definitions of project scope with project success. It also revealed that IT project manager's expertise in information technology field has a positive moderating effect on the relationship between project scope and project success. It contributes in existing knowledge of information technology in the perspective of project management. The finding may be fruitful to win the game from the competitors. It also explores the new insights for researchers, practitioners, and consultants of project management. The moderating effect of managerial expertise in IT is unique addition to research.

Keywords: Project, Scope, Moderating Role, Managerial Expertise.

JEL Classification: Z000

Introduction

The firms while entering the international competitive markets have to keep watching the market demand and scenario of supplies from their international compatriots, the most daunting and challenging task in nature they face. Competitive positioning of a firm is not confined to a firm' indigenous capacities but linked with a firm' association with fellow organizations as well. Based on these, it was concluded that in the wake of diversity of economies, in future the competition will not be among

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companies but would be due to difference in managerial expertise. This study aims to unpack the direct effect of project scope on project success. Projects are temporary and unique in nature and are initiated to accomplish some specific objective or goal (Turner & Müller, 2003). This is evident from the fact that in South Africa only 35% projects were completed successfully, 46% were challenged and caused over cost (Emam & Koru, 2008). Lower level of employee involvement in decision making, lower level of managerial expertise, and poor project planning can enhance the chances of project failure rates across the world (Verner et al., 2008).

For the last two decades, the paradigm of knowledge is transformed from traditional way to innovative way (Muqadas, Ilyas, & Aslam, 2016; Chien & Tsai, 2012). Organizations are continuously involved in exploring new avenues for gaining knowledge that is beneficial for better performance (Blackler, 1995). The acquiring of knowledge is a continuous and ongoing process through which employees gain new and updated knowledge to deal with organizational issues effectively (Muqadas et al., 2017; Zack, McKeen, & Singh, 2009). The increasing trend of business uncertainty demands creativity, innovation, competitive advantage and sustained performance for existence and progress of organizations. Extant literature suggests two key drivers to insure performance; innovation and competitive advantage(Duchek, 2015; Meihami & Meihami, 2014; Vargas, 2015; Wang & Wang, 2012; Xu, Houssin, Caillaud, & Gardoni, 2011).To speed-up the innovation process and ensuring the sustained competitive advantage, employees' creativity has to be flourished in organizations (Zhang & Bartol, 2010). High level of managerial expertise has gotten the attraction of researchers' side because of its significance to generate organizational outcomes such as effectiveness, innovation, reputation, competitive advantage and performance (Cheung & Wong, 2011; Dewett, 2006; Gong, Huang, & Farh, 2009; Aslam et al., 2015; Aslam et al., 2016; Muqadas et al., 2017; Yin, et al., 2014; Zhang & Bartol, 2010). To promote these organizational outcomes, effective and updated knowledge emerges as the key to success. Innovation in information technology has redefined how work can be done and complete smoothly and effectively (Reyck et al., 2005; Muqadas et al., 2016). At present, the success of information technology projects is not satisfactory. Recent studies have shown that the overall success rate of information technology projects is very low because whenever a project moves to agile development stage, most of the time project managers are not considered into the project development phases, which results in the failure of most of the IT projects (Reyck et al., 2005; Emam & Koru, 2008; Verner et al., 2008) . For the success of information technology projects a project manager plays a vital role along with other departments.

The purpose of this research is to highlight the major hurdles in the success of IT projects, their impact on IT industry as well as a project manager's role in revising the failure probabilities into success stories. Most organizations are facing this real problem of challenges of delivering increased number of projects, while they are failing in so, causing huge projects failures. If success percentages of these categories of information technology projects are considered, results are not better as expected. Most organizations are running through software applications and there are moderate chances that it fails, in fact huge amount is paid for these failures; during the last few years only in USA the

incurred cost of failed information technology projects was an estimated $75 billion.

Literature Review

Creative behavior of employees and managers need flexibility and autonomy to generate ideas, arranging resources and effective implementation of these ideas to accelerate innovative ability (Muqadas et al., 2017; Rahman et al., 2017). Recently, an IT project can be defined as "A new or enhanced technology, software or IT services" (Khanam et al., 2016). Project management discipline has touched maturity line in the last decade but it is somewhat low in IT project management. As IT project management is a crucial issue for organizations today because failure rate of IT projects is outstanding (Whittaker, 1999). For the last two decades investment in IT projects has been gotten high day by day but the performance of IT projects is not satisfactory with respect to cost and schedule (Turner, 2009).

Investment in project played an important role to boost demand and employment, economic growth, and country prosperity. Project initiatives and project success is based on knowledge regarding facts and creativity of project managers and project team players. At the core of knowledge base view organizing is the conception of organizational entities such as project team as vehicles for integrating tacit and explicit knowledge that is distributed among many individuals (Grant, 1996). In every project, good managers play their positive role in its success. There is general agreement that a project's success or failure hinges on the abilities of the project manager (Gillard, 2009; Rahman et al., 2017).There is also agreement among researchers that the technical expertise of the project manager in relevant field is of paramount importance for success (Derus & Abdul-Aziz, 2016; Hodgson & Paton, 2016; Rehman et al., 2016; Kayworth & Leidner, 2000). It is suggested that interpersonal or soft skills are the primary determinant of success (Dinsmore & Cabanis-Brewin, 2006; Need, 2007; Pant & Baroudi, 2008) but at the same time it is also observed that both technical background and leadership skills are necessary for project management success (Gillard, 2009). Authors such as Baca (2007) argues engineers who are pressed into the role of project managers often focus on technical issues and became successful most of the time.

*H1:* Formal definition of scope has significant and positive impact on project success.

H2: Project manager's technical expertise moderates the relationship between formal definition of scope and project success.

Research Methodology

A field survey was conducted to test the hypothesized relationships. Data were collected from project team members. The respondents include multiple members from each project teams working in information technology projects in Pakistan. This approach was appropriate for the study, because the objective was to empirically test the proposed model.

Research Philosophy and Approach

Positivism expresses that the objective methods can be used to measure the external existence of social world, rather than making subjective derivations by the use of instinct or sensation, (Aslam et al., 2015; Aslam et al., 2016). This statement comprises of two assumptions. First is epistemological that knowledge is made significant only by observing the external reality. Second is Ontological that the truth is both external and objective; which is the result of empirical verification (Burns & Burns, 2008). This study follows the assumptions of positivism approach with the purpose to analyze the reality scientifically and objectively. Furthermore, the basis of this research developed based on existing literature and deductive reasoning so it can categorize as positivistic research paradigm. By following positivistic paradigm and deductive reasoning approach assumptions, I have constructed several hypotheses for testing in specific settings. Recently this approach is also highlighted by Aslam et al. (2016) for it usability in cross sectional explanatory and temporal studies. In the current study positivistic approach is used as recommended by Ponterotto (2005) with help of adequate literature on social sciences.
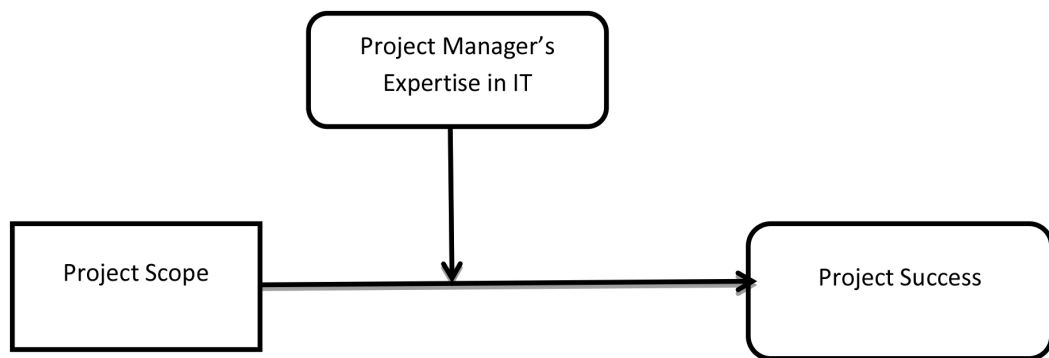
Figure 1: The Research Model

Research Design

This research aims to examine the cause and effect relationship between formally defined project scope and project success in IT firms in a developing country context. "Pakistan Software Export Board (PSEB) is an apex Government body mandated to promote Pakistan's IT Industry in local and international markets. PSEB facilitates the IT industry through a series of projects and programs (Source: www.pseb.org.pk)". Top 10 IT exporting companies which received PSEB IT Award 2016 are selected for this study. A total sample of 135 is calculated by WHO manual with 80% power of test and 95% confidence level with expected satisfactory performance to be 92.3%. Questionnaires were distributed randomly to 135 respondents. Only 123 questionnaires were collected back after repeated e-mails. Due to omissions 3 questionnaires were rejected. Final results are

supported by 120 questionnaires.

Data Analysis Tools

Various well accepted and recognized statistical tests have been used for data analysis purpose. There are various statistical techniques that were used to find out the results. For example, reliability and validity tests were performed to measure the internal consistency and construct validity of scales. Whereas linear regression, and Aguinis (2004) multiple moderation regression (MMR) tests were used to examine the relationships in proposed hypotheses.

Measures

Aslam et al. (2016) described self-administered questionnaires as the best data collection tool, as self-administered questionnaires can be helpful in collecting data at low cost. Multi items self-administered questionnaire are adopted for this study. Project scope definition is measured on the basis of scale developed by Marnewick and Labuschagne (2009). The 21 items scale is adopted for this study. Project success is measured with the help of 8 item adopted and adapted scales from the work of Componation et al. (2008). Project manager's expertise in IT is measured by using previous study scale of Zenger et al. (2011).

Results and Analysis

The study is conducted in information technology sector in the context of a developing country context. There were 80 male who make 66.7% of the sample size. There were 40 female, who comprises 33.3% of the total number of the respondents. The key respondents of the study are IT experts who are directly involved in IT project development process of the selected companies.
The sample consists of 25 project managers, while rest of the sample size made-up by other team members who are directly involved in project development. Project manager's experience in said field and job tenure in current organization are two critical factors which really matter in project success and in identification of expertise level. There are 39 respondents with 1-5 years of experience, 56 with 6-10 year experience while 25 respondents claim that they have 11 year or above experience in information technology project development. All of the respondents having a master's or equal degree in computer sciences. While there were 37 respondents having 2nd degree of master's in project management.

Reliability Analysis

The scale reliability is tested using Cronbach (1951) and reliability of the all constructs is > 0.07, which is acceptable according to (Bland & Altman, 1997).

Validity Analysis

As we discussed earlier, all scales for this study are adopted from well-known studies and modified after counseling with the IT experts. Hence its worthy to conduct a factor analysis to find out the covergetn and constructs validity using recommendation of a previous study (Clark & Watson, 1995). Initially, factor analysis is done and loaded all 21 items, same as factor 2 and factor3 loaded all 8 and 8 items for project success and technical expertise respectively. Kaiser-Meyer-Olkin (KMO) and Bartlett's test results were also appropriate and acceptable.

Descriptive Statistics

The mean value of the data set highlighted a positive trend and standard deviation is near to 1 that is acceptable (Muqadas et al., 2016). It is also observed that Pearson coefficient of correlation was found to be low to strong correlation among variables of the study.

Table 1
Descriptive Statistics and Correlations

	Variable Description	**Mean**	**S.D**	**1**	**2**	**3**
1	Project Scope Definition	4.7761	1.12			
2	Project Success	4.8434	0.99	.684**		
3	Technical Expertise	4.683	1.05	.112	.173	.225

Hypothesis Results

In testing, level 1 model examine the relationship project scope definition and project success while level 2 model examine the moderating influence of project manager's expertise in IT on project scope definition and project success. Hypothesis H1 is supposed that "Formal definition of scope has significant and positive impact on project success". It is found that formal definition of project scope has significant positive impact on project success, the model significance value is $p < 0.05$ and the R^2 value shows that there was 46.8% variation can be explained in project success due to formal definition of project scope. Furthermore ANOVA test is also significant having an F value 218.250. Hypothesis H2 predicted that project manager's expertise in IT would moderate the relationship between formal definition of project scope and project success. The moderating effect measured by following the famous study guidelines (Aguinis, 2004). At step 1 the direct effect of formal definition of scope on project success is tested and found to be significant ($\beta=.664$, $t=14.773$, $p< 0.05$). After comparing the results of Model 1 and model 2, the results reflect a moderation effect of managerial

expertise in IT on relationship between formal definition of project scope and project success. Project manager's expertise in IT strengthens the existing relationship between formal definition of project scope and project success. The overall model is significant."R Square Change", shows the increase in variation explained by the addition of the interaction term. Change in R2 is reported as .035. We can say 3.5% increased variation can be explained by the addition of the interaction term. The increase is statistically significant (P<0.05). Hence hypotheses H1 and H2 both are supported. These results are presented in table 4.

Table 2
Regression Analysis

		Dependent Variable Project Success						
	Independent Variable	B	R^2	t	F	ΔR^2	ΔF	
Model 1	FDPS	.664	.468	14.773	218.250			
Model 1	FDPS*PMEI	.096	.503			.035	17.504	

N= 120 FDPS= Formal Definition of Project PMEI= Project Manager's Expertise in IT P<0.05

Conclusion

Innovation in information technology has redefined how work can be done and complete smoothly and effectively. But at the same time success of information technology projects is not satisfactory. Most of the time project managers are not considered into the project development phases, which results in failure of most of the projects. Project manager plays a vital role along with other departments. Detailed implementation of procedures and policies in defining and base lining the scope any IT project indicates project manager's importance in the successful completion of a project. Therefore, the importance of a project manager in any field or category cannot be overlooked, but specifically for organizations, working in the field of IT projects, an experienced project manager plays a vital role in its success. At the moment many researches are available on causes of project success and failure aspects but there is not a single research that has check the formal definition of scope, allocation of time and cost effect with respect to moderation of managerial expertise with respect to Pakistani culture and trend of management, so in this regard this study is novel. Regression analysis shows that there is a significant positive relationship (R square) between formal definition of scope and project success. Moderation analysis shows that managerial expertise in IT moderates the relationship between formal definition of scope and project success.

Recommendations and Implications

It is highly recommended that management and organization should adopt more project specific approach while working on IT projects. Organizations should adopt a formal step of project classification to the traditional planning phase. The specific project type should choose specific type leader. Organizations should adopt various methods to reduce risk; one best way is to determine it at planning phase in project scope. Organizations that want to pursue for IT related project management, can use this information in project management. Organizations that already in the arena can win the game efficiently and effectively than their competitors, by implementation of research findings.

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