Impact of Project Risk Management and Leadership Development on the Project Success with Moderating Role of Risk Manager

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ABSTRACT

Purpose: This article evaluates the impact of project risk management (PRM) and leadership development (LD) on the project success (PS). The aim of the study is to investigate the linkage between PRM and PS, to study the relationship between LD and PS. To evaluate the moderating effect of Risk Manager on relationship between PRM and PS; and between LD and PS.

Design/Methodology/Approach: The study was intended to understand the relationship of LD and PRM with PS in the overall setting of different construction projects in Karachi and surroundings. The research was carried out adopting a quantitative method using the deductive approach, by using statistical techniques to identify the casual relationship between variables. The data was collected through survey questionnaires.

Findings: Our research results empirically support the hypothesized relationship between PRM and PS. Significant correlation was found between LD and PS at tow-tailed level with a value of .542** at p= .000 indicating high level of significance.

Implications/Originality/Value: This research was conducted in and around Karachi city on the construction projects from public and private sector. The future research may be conducted with the same variables on all types of projects of Pakistan for generalizability of results.

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Introduction

The domain of project management (PM) has developed during the recent past and now the world is becoming ‘projectified’ at a fast pace (PMI, 2019). Accordingly, the field of PM has drawn lot
of interest and gained importance (Ika, 2009). However, the overall success rate of projects has not been very optimistic (Bilir and Yafez, 2021; Gupta, Gunasekaran, Antony, Gupta, Bag and Roubaud, 2019); and a number of outfits suffer huge losses to the tune of millions of dollars because of failed projects (Gupta, et al., 2019). The Pules of Profession report asserts that overall about twelve percent of organizations’ investment is wasted on the failed projects (PMI, 2019). The failure of public private partnership (PPP) projects is a universal occurrence; and the failure of international PPP projects has generally been attributed to issues related to feasibility, construction, operational aspects, procurement, sociopolitical issues and other external factors (Tariq and Zhang, 2020). The loss due to construction related failed projects amounts to approximately $127 million out of every $1 billion expended and about 13 percent construction projects simply fail (PMI, 2019). Literature suggests that project success (PS) is under continuous focus of research scholars (Shafi, Iqbal, Shahzad, and Unterhitzenberger, 2021), especially in the context of developing country like Pakistan.

One of the processes of PM is the PRM that spans over the entire project life cycle (PMI, 2013); and is a widely practiced causing creation of value (Willumsen, Oehmen, Stingl and Gerald, 2019). The literature suggests that poor PRM may increase the prospects of project failure (Hughes, Dwivedi, Rana, and Simintiras, 2016). Thus, the PRM contributes to project performance to a significant extent (Marle, 2020). The PRM is, therefore, an important critical success factor (CSF) of PS (Imbrizi, and Mazieri, 2018), and also impacts the PS significantly (Alkhaifat, Abdullah and Magassouba, 2019).

Belout and Gauvreau, (2004) have suggested that research work on the human resource (HR) management has been very basic and undeveloped in the PM domain; and except few endeavors, investigation on PS regarding behavioral aspects id generally lacking (Shafi, et al., 2021). The leadership has been a subject of focus for the last few decades (Daniëls, Hondeghem, and Dochy, 2019); and it may be described as a course of influence that is founded on the vision of leaders, and related values and beliefs (Daniëls, et al., 2019; Bush and Glover, 2003). LD is understood as an organization’s preplanned methodical program meant to refine the quality of its leadership (Micha and Raanan, 1993). In context of LD in education sector, Daniëls, et al., (2019) have concluded that instructional leadership has main focus on the teaching and learning process; whereas the transformational leadership’s emphasis is on the motivational aspects of workforce. The risk manager explores the social atmosphere and identifies potential risks by collecting ideas and data from different sources (Österlund and Jens, 2019). Therefore, appointment of risk manager would probably make a difference in the project outcome as it would result in execution of risk management procedures (Raz, et al., 2002).

This research has been designed for studying the impact of PRM and LD on the PS with appointment of Risk Manager as a moderator in the construction projects setting of Karachi and surrounding area.

**Research Objectives**
The study aims to achieve following objectives: -
1. To investigate the linkage between PRM and PS.
2. To study the relationship between LD and PS.
3. To evaluate the moderating effect of Risk Manager on relationship between PRM and PS; and between LD and PS.

**Statement of the Problem**
Literature review suggests that PM is a relatively new field (Raz, et al., 2002). In the same vein, the rate of PS in developing countries, especially Pakistan is not very encouraging, hence needs further evaluation (Sohaib, Mukaram, and Aamir, 2021). The World Bank report suggests that
projects under the Social Action Program (SAP)–I and II of Pakistan, each costing US$ 250 Million, were the most notorious specimens of project failure (Rehman, Khan and Khan, 2011). The risks and uncertainties can be the key causes attributable to project failure (Ou-Yang, and Chen, 2019). However, though the significance PRM is acknowledged, the on ground implementation PRM is generally lacking (Raz, et al., 2002). Tahir, Tahir, and Shujaat, (2019) maintain that a large number of infrastructural projects are underway in Pakistan which underpins significance of PRM for achieving a reasonable degree of PS.

The main reasons of construction project failure have been attributed to poor leadership and process direction; and numerous projects in Pakistan fail due to leadership issues (Shahu, Pundir, and Ganapathy, 2012). The usual hierarchy based leadership model has now been replaced by shared leadership through team based, multi-disciplinary leadership skill development (Cain and Cocco, 2013). LD is an organization level broad-based structure meant to train and develop leadership through on-job learning in the workplace setting (Dalakoura, 2010; Day, 2001). LD programs result in better management of human resources (HR), good productivity and efficiency (Shamsi, Kousar and Ahmad, 2017). Therefore, risk manager will be judged for its moderating effect in this study. Therefore, the need arises to study relationship of PRM and LD with PS with the Risk Manager as moderator in Pakistan’s perspective.

**Research Questions**
1. What is the impact of PRM on PS?
2. What is the impact of LD on PS?
3. Does Risk Manager moderate relationship between PRM and PS?
4. Does Risk Manager moderate relationship between LD and PS?

**Research Gap**
The notion of projects success has been subject of lot of research activity (Iqbal, Long, Fei, and Bukhari, 2015). In order to survive in the present business milieu that is characterized by competitiveness, the firms need to avoid wastage of precious resources and improve the PM (Qureshi, Warraich and Hijazi, 2009). In context of China-Pakistan Economic Corridor (CPEC) road construction projects, Alam, Yin, Ali, Ali, Noor, and Jan, (2019) suggest that risks pose a significant challenge to PS due to probability of overruns, temporal lags and consequent legal issues. Thus the effect of risks on the PS is determined by the quality of PRM (Alkhlaifat, et al., 2019). Shamsi, et al., (2017) suggest that in future, research scholars should evaluate the influence of leaders on the culture and surroundings in an organizational context. Thus a developing country like Pakistan is required to enhance the project effectiveness and chances of PS by adopting the tools and techniques of advanced countries (Qureshi, et al., 2009). This study, therefore, investigates the impact of PRM and LD on PS with the appointment of risk manager as a moderating variable in the construction sector of Pakistan.

**Literature Review**

**Project Success (PS)**
There has been increasing interest of researchers in the PM domain as it helps the firms to stay competitive in today’s transitory business milieu (Ika, 2009). However, for achievement of better outcomes, an in-depth understanding of PS is essential (Ika, 2009). The definition of project as stipulated in the Project Management Body of Knowledge (PMBOK) terms it as temporary task taken on for meeting unique goals, and it has certain start-point and end (PMI, 2013). The concept of PS can be conventionally determined on the basis of ‘iron triangle’ of triple criteria – the stipulated time, budget and scope (De Bakker, Boonstra and Wortmann, 2010; Hussein, 2013). Some of the definitions by different scholars are enumerated in the Table-1 below which indicates that the PS is a quite broader concept embracing multiple dimensions: -

| Authors       | Definitions                                                                 |
|---------------|------------------------------------------------------------------------------|

483
Project Success and Construction Projects in Developing Countries

The developing countries like Pakistan earmark quite significant amount of resources on developmental packages including infrastructure, residences and transport related projects; however, their particularities pose challenges in the form of procedural and local restrictions (Banihashemi, Hosseini, Golizadeh and Sankaran, 2017). This shows that human influence has significant impact on the projects’ outcome. A similar research in a developing country’s perspective by Ofori, (2013), evaluates the PM practices in Ghana by assessing the CSFs that facilitate PS and the CSFs that militate against the PS; summarizing the positive factors in ‘4Cs’: competency, commitment, communication and coordination.

Project Risk Management (PRM)

We may term a risk as an uncertain occurrence or situation that is likely to impact the objectives of a project positively or negatively (Abd El-Karim, Mosa El Nawawy, and Abdel-Alim, 2017; Tahir, et al., 2019; Kasap, and Kaymak, 2007). The PRM may be described as a methodical procedure that identifies the project risks, analyzes and responds to risks (Tahir, et al., 2019). PRM optimizes the chances of positive events and reduces the negative occurrences in a project (Tahir, et al., 2019; Abd El-Karim, et al., 2017; Kasap, et al., 2007); however, investigation indicates that the PRM tools and practices are relatively more pertinent in higher risk projects (Raz, et al., 2002). Hussein (2013) has suggested that in order to avoid subsequent risks, following risk factors must be initially addressed: unrealistic targets, incomplete identification of success criteria, diversity of stakeholders’ expectations and vagueness of measures. Willumsen, et al., (2019) have carried out study on the PRM and value creation; the gist of literature review on the PRM is as follows:-

| Source | Context | Findings |
|--------|---------|----------|
| De Carvalho, et al., (2015) | 263 Brazilian projects | Soft dimensions of PRM have a strong impact on PS dimensions; and hard ones have lesser effect |
| Oehmen et al., (2014) | New product development (NPD) projects | Six types of PRM practices are the most significant: develop expertise and resources; adapt the PRM and assimilate; weigh the effects; Main aims: support the critical decisions with PRM results |
| Raz et al., (2002) | 100 different types of projects | The PRM practices like risk identification, analysis, planning and trade-off; PRM practices apply differently on different projects |
| Teller, et al., (2013) | 167 different organizations | Risk transparency positively affects the project portfolio success, |
| Thamhain, (2013) | 17 outfits; 560 respondents | Important aspects: Early identification and treatment of risks; Cross-organization collaboration; and Alignment of projects’ strategic objectives with the enterprise level objectives |
| Voetsch et al., (2004) | Public and private sector projects | TMS for the PRM, PRM implementation and risk monitoring contribute to PS |
| Zwikael, et al., (2011) | 701 project managers from various countries | Project risk planning positively impacts the PS; PRM be integral part of PM process |

Table 2: Literature Review on PRM (Source: Willumsen, et al., 2019)
Phases of PRM
The PRM is considered as an all-embracing process of PM spanning over the whole project life cycle (Raz, et al., 2002). Its phases include risk identification, analysis and response; whereas monitoring and controlling is a continuous activity that runs through the entire project (Tamošaitienė, Zavadskas and Turskis, 2013). There are several models of risk management. Generally the three steps of PRM may be the identification, analysis, and response actions and control (PMI, 2013). However, Ahmad, et al., (2018) assert that PRM process, in context of the Malaysian BLMT (build, lease, maintain and transfer) projects, mainly involves three phases; risk assessment, treatment and monitoring. Tahir, et al., (2019) have concluded that an efficient PRM process involves four stages: identification of risks, assessment of risks, response to risks and lastly the risk control. Whereas the methods of risk response generally include the risk avoidance, reduction, sharing and retention (Tahir, et al., 2019; Ahmad, et al., 2018).

Project Risk Management (PRM) and Construction Projects
The construction projects are executed only once and produce unique products; therefore, they are quite prone to risks from start till end. Mainly the reasons of such uncertainty lay in the ad-hoc project teams, complicated design and locality related issues (Tamošaitienė, et al., 2013). It is believed that due to their very nature, the construction projects are exposed to risks (Garrido, et al., 2011). Raz, et al., (2002) have conducted study on 100 projects and concluded that different projects require different techniques and tools of PRM as per their nature.

Project Risk Management (PRM) and Project Success (PS)
The review of literature suggests that PRM and PS are significantly correlated (Tahir, et al., 2019; Reed and Angolia, 2018). In the perspective of Pakistan’s construction projects, Tahir, et al., (2019) conclude that there is an association between PRM and PS in terms of compliance to schedule and budget. Willumsen, et al., (2019) assert that the typical techniques of PRM like fixing the risk responsibility, evaluating the impact of risks, and communicating vital risks to the management contribute significantly to the PS. Hussein (2013) asserts that probability of PS enhances even if a modest PRM planning is conducted. Moreover, the appointment of risk manager has an impact on the project outcomes (Raz, et al., 2002).

Leadership Development (LD)
The subject of LD has evolved as an interesting field of investigation; though it has a relatively shorter research history (Day, Fleenor, Atwater, Sturm, and McKee, 2014). The LD paradigm is multi-tiered and longitudinal (Day, 2014) that requires the leaders to form structures where the employees may continuously broaden their knowledge and contribute to organizations’ vision (Dalakoura, 2010). The leadership skills can also be developed through project based learning including teamwork, goal setting and decision making (Cain, et al., 2013). In the overall setting of Belgian educational institutions, Daniëls, et al., (2019) suggest that the professional LD could involve structured training programs, face to face learning, on-job casual learning or online coaching activities. The review of literature suggests that need for LD at all levels is vital for the firms to stay competitive (Dalakoura, 2010).

Need for Leadership Development (LD)
The efficacy of leadership is a tough challenge in the face of varying dynamics of organizations’ operations, shapes, sizes and other complexities (Shamsi, et al., 2017). The ever changing corporate milieu, marred by uncertainty and intense competition, need exceptional leaders; hence there is a need for developing leadership capable of implementing the business strategy (Dalakoura, 2010). Grunberg, Barry, Callahan, Kleber, McManigle and Schoomaker, (2019) maintain that leadership education and development is a challenging undertaking; and have discussed a leadership theoretical model comprising of traits like character, competence, context and communication. Presently the PM is a weaker link in Pakistan as well; and there is no
efficient mechanism for training and development which is essential for boosting its capacity (Rehman, et al., 2011).

**Leadership Development Perspectives**
LD undertakings need to adopt a multi-pronged strategy including the inculcation of self-efficacy, motivation awareness and polishing the talents (Micha, 1993):

Self-efficacy. The self-efficacy is belief in one’s abilities to perform that forms the foundation of a LD plan, through coaching and success experiences. The individuals lacking this trait may not effectively discharge the leadership functions (Micha, 1993).

Motivation. Since the spirit of leadership is motivating the workforce, the leaders need to understand the ways of motivating the workforce (Micha, 1993).

Skill Development. Leadership skills are utilized for effective interactions; these involve verbal and written communication, group conferences, interviews and feedbacks. Improving the leadership skills can have a positive influence on development of effective leaders (Micha, 1993).

**Institutional Leadership Development**
Studies show that formal training has a marginal contribution towards LD; however, intuitional LD is quite effective that may have six learning approaches; imitation of a mentor, role learning, learning through doing, learning by validation, conceptual learning and personal growth (Akin, 1987 as cited by Micha, 1993).

**Research Framework**
The research framework is explained with the help of Figure-1 below:-

![Figure-1: Research Framework](image)

**Hypotheses**
H1: There is a significant impact of PRM on PS.
H2: There is a significant impact of LD on PS.
H3: Appointment of Risk Manager moderates the relationship between PRM and PS.
H4: Appointment of Risk Manager moderates the relationship between LD and PS.

**Research Methodology**
**Research Strategy**
The study was intended to understand the relationship of LD and PRM with PS in the overall setting of different construction projects in Karachi and surroundings. Resultantly, the focus of research was on different ‘projects’ in the area. The research was carried out adopting a quantitative method using the deductive approach, by using statistical techniques to identify the casual relationship between variables. The data was collected through survey questionnaires.

**Population and Sampling**
The population of study was different construction projects in Karachi with unit of analysis as the ‘individuals’ working at projects. To make the sample true representative of the population, an assortment of construction projects of different types and sizes was shortlisted from public as well as private sectors including public private partnership (PPP). The selection of respondents was limited to consultants, top executives, project managers and those individuals who had first-hand knowledge of respective projects. The non-probability sampling technique, convenience sampling was used in this study by identifying appropriate respondents who were key position holders in the organizations, and who were willing to respond to the survey.

Data Collection
Measures for the constructs were adopted from previous studies; for the PS, 11-item scale has been taken from Wu, et al., (2017); for LD, 13-item scale from Dalakoura, (2010); and for PRM, 5-item scale from Raz, et al., (2002). For all the measurement instruments, 5-point Likert scale was utilized to rank respondents’ answers. However, for the moderating variable one of the items of PRM was “A risk manager was appointed for the project”, which was included in the demographics and judged at nominal scale of ‘yes’ or ‘no’.

Method of Analysis
Statistical Package for the Social Sciences (SPSS) version-22 was used data analysis including the reliability, correlation and regression analysis.

Research Results
Demographics of Respondents
The demographic data set shows that private projects are dominant in the study (71.7 percent) followed by public sector projects (22 percent). The majority of respondents were project managers (52.5 percent); and though the data was collected from diverse sectors related to construction industry, the housing sector was predominantly targeted (58.1 percent). Moreover, out of the total 322 projects, the Risk Manager was appointed only in 37 cases (11.2 percent) which is in line with Raz, et al., (2002). This shows a clear disregard to PRM as a formal discipline of PM in Pakistan. However, the results show that informally the risk mitigation and risk management are inbuilt features of all the projects.

Reliability Analysis
The results of reliability analysis indicate that Cronbach’s Alpha of all the independent, dependent variables are within acceptable range, which means that the adopted instruments for all the study variables are reliable.

| Variable                        | Cronbach's Alpha | Items |
|---------------------------------|------------------|-------|
| Project Success (PS)            | .806             | 11    |
| Project Risk Management (PRM)   | .785             | 4     |
| Leadership Development (LD)     | .836             | 13    |

Correlation Analysis
In order to identify statistically significant relationship between variables, the Pearson Correlation analysis was conducted. The results suggest that statistically significant correlation exists between PRM and PS at two-tailed level with a value of .464**. This correlation signifies as p = .000 which indicates high level of significance. This implies that a strong association exists between PRM and PS as predicted in H1.

Similarly, significant correlation was found between LD and PS at two-tailed level with a value
of .542**, where \( p = .000 \) indicates high level of significance. This result shows a strong association between LD and PS which is in conformity with the prediction made in H2. Moreover, PRM and LD are also significantly correlated at .564**. 

**Table 4: Correlation Analysis**

|                      | PS        | PRM | LD        |
|----------------------|-----------|-----|-----------|
| Project Success (PS) | 1         |     |           |
| Project Risk Management (PRM) | .464**     | 1   |           |
| Leadership Development (LD) | .542**     | .564** | 1       |

Correlation is significant at the 0.01 level (2-tailed).

**Regression Analysis**

The value of R-square as .330 which is significant at \( p \) value of .000. In case of relationship between PRM and PS, the value of Beta is .164 and value of t statistics is 4.199 at \( p = .000 \). Similarly, for the relationship between LD and PS, the value of Beta is .405 and value of t statistics is 7.394 at \( p = .000 \). Thus both H1 and H2 are confirmed.

**Regression Analysis for Moderating Effect of Risk Manager**

As stated in demographic data, very few projects (11.2) had exclusively appointed risk managers which reflect relatively poor risk management culture in Pakistani construction projects. In order to assess the moderating effect risk manager, the data was split on the basis of risk manager and regression was run again. The results of regression after splitting the data file on the basis of “Risk Manager Appointed” shows interesting results.

The value R square for Risk Manager ‘Yes’ is .189 with \( p \) value less than .05; and value of R square for Risk Manager ‘No’ is .356 at \( p \) value less than .001. Thus model is fit in both the cases. However, coefficient value is Not Significant in case of ‘Risk Manager Yes’; whereas it is Significant in case of ‘Risk Manager No’. Therefore, Risk Manager moderate’s relationship between PRM and PS and also relationship between LD and PS (conforming to H3 and H4).

However, interesting thing about the moderating effect of Risk Manager is that contrary to the usual expectations of positive contribution to PS, appointment of a risk manager negatively moderates the relationships.

To understand this phenomenon, experts were consulted, who suggested two probable reasons; firstly, risk managers are generally employed on very risky projects whose probability of success is relatively lesser, and secondly, when a risk manager is employed on a project, the remaining project team takes it for granted that the ‘risks part’ of the project is amply taken care till it is too late.

**Hypotheses Summary**

**Table 5: Summary of Hypotheses Acceptance/Rejection**

| Hypothesis | Statements                                                   | Results |
|------------|--------------------------------------------------------------|---------|
| H1         | There is a significant impact of PRM on PS.                 | Supported |
| H2         | There is a significant impact of LD on PS.                  | Supported |
| H3         | Appointment of Risk Manager moderates the relationship between PRM and PS. | Supported |
Discussion And Conclusions

Discussion

Results of the research reveal valuable information on the relationships between different variables as explained in theoretical framework, within the context of construction sector in a developing country like Pakistan. The findings of the research are elaborated in the succeeding paragraphs.

Hypothesis 1

There is a significant impact of PRM on PS.

Our research results empirically support the hypothesized relationship between PRM and PS. Statistically significant correlation exists between PRM and PS at two-tailed level with a value of .464** that is highly significant at p= .000. The regression analysis also indicates similar results: values of PRM as predictor are: \( b = .164 \), \( t(319) = 4.199 \), \( p = .000 \) – which is significant. For every 1-unit increase in PRM, the PS increases by .164 units. Thus PRM significantly impacts the PS.

Hypothesis 2

There is a significant impact of LD on PS.

Significant correlation was found between LD and PS at two-tailed level with a value of .542** at p=. .000 indicating high level of significance. This implies that increase in LD will significantly increase the prospects of PS. Similarly, results of regression analysis indicate the values of LD as predictor: \( b = .405 \), \( t(319) = 7.394 \), \( p = .000 \) – which is significant. This implies that for every 1 unit increase in LD, the PS increases by .41 units. Thus significant association exists between LD and PS.

Hypothesis 3 and 4

Appointment of Risk Manager moderates the relationship between PRM and PS.

Appointment of Risk Manager moderates the relationship between LD and PS.

The regression tests were run on the split data on the basis of ‘project manager appointed’. The value of beta coefficient is ‘Not Significant’ in case of Risk Manager ‘Appointed’; whereas the value of beta coefficient is ‘Significant’ in the case of Risk Manager ‘Not Appointed’. This indicates that Risk Manager moderates the relationship between PRM and PS and also the relationship between LD and PS in conformity with H3 and H4.

Major Conclusions

The major conclusions from current study are as follows:-

The subject of risk management, though practically addressed, is not adequately formalized in the construction industry of Pakistan.

Mostly, the risk managers are not employed exclusively; and where employed, they are not utilized judiciously, causing the projects to be more risk prone due to a sense of complacency. Thus employment of risk managers has proven counterproductive.

The PRM in the construction sector positively impacts the PS.

LD significantly enhances the success prospects of construction projects in Pakistan.

The risk manager moderates the relationship between PRM and PS; and between LD and PS in the context of Pakistani construction projects.

Recommendations

The PM experts and project managers need to be cognizant of the fact that logically conducted PRM process bears a significant impact on the outcome of projects. Therefore, following measures must be taken in the construction sector:

- Organizations need to ensure that PRM is systematically taught and practiced including the
strategies for risk response.
Regular review of the risks during execution of projects should be made a second habit at all levels.

The risk managers should be exclusively employed and their efficiency should be monitored through extensive interaction. However, appointment of risk manager does not absolve other team members from the risk monitoring responsibility.

Organizations should develop overall culture of training the employees and developing leadership traits by involving them in decision-making and giving a degree of control over their job.

Limitations of the Study and Directions for Future Research
This research was conducted in and around Karachi city on the construction projects from public and private sector. The future research may be conducted with the same variables on all types of projects of Pakistan for generalizability of results. Moreover, future study on the moderating role of risk manager may be carried out for further investigation and clarity.

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