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Exploring the Nexus between Project Cost, Quality and Stakeholder Management Maturity and Performance of Building Construction Projects in Pakistan

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Project Cost, Management Maturity, Performance of Construction Projects.

ABSTRACT

The results of this study demonstrated the complex relationship that exists between project quality, cost, stakeholder management maturity, and the success of construction projects in Pakistan. The building business was defined by a variety of obstacles and dynamic socio-economic issues, which made for an engaging background for that investigation. This study produced the conceptual framework that included the interaction between these important variables and integrated the theories of project management. Surveys were used to collect empirical data, and the research's theoretical implications helped to shape the conversation around project management. On the other hand, the research's practical consequences provided project managers with useful advice. Nevertheless, there were certain limitations to this study, such as the cross-sectional design and possible biases in the self-reported data. Even with certain limitations, the results open up new avenues for future investigation. For example, recommending the need for long-term research and the creation of useful instruments to improve project management techniques in Pakistan's construction sector. A sample size of 203 professionals working on projects in Pakistan's construction industry were chosen for the study. A key factor in project performance is the maturity of project management.

INTRODUCTION

With an annual growth rate of more than 7%, construction was one of Pakistan's fastest-growing industries (World Statistics 2022). The government's modernization of the infrastructure was primarily responsible for this expanding growth. However, because of the environment's complexity and dynamic nature, there are substantial hazards associated with building projects, including delays, poor quality, and cost overruns (Parse Mohr et al., 2022, Sambas Ivan and Soon, 2007; Kermanshah et al., 2022,. Nguyen et al., 2019). Modern

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technology is employed by firms these days to increase the effectiveness of their project management procedures.

The fact that many projects failed in spite of using cutting edge tools and methodologies for project planning, was a point that needed to be noted. Many initiatives were unable to meet their deadlines, budgets or quality standards, and as a result, they were unable to produce the desired results. Researchers found that poor scheduling and methodological tools account for over 75% of project failures. (Yazidi, 2009).

The term "project management maturity" describes the extent to which businesses have adopted and adhered to project management procedures, as well as the use of project management-defined techniques and tools. The scholars have presented a number of models pertaining to project maturity. Recently, the PMI unveiled a model that integrates, assesses, and enhances project management performance (Yazidi 2022). It was thought that an organization's level of project management maturity would positively impact the project's overall performance. Despite the fact Wheatley (2017) said that no business could be advised to follow any optimal project maturity levels for success

Project performance has multiple dimensions since different individuals evaluate it based on different perspectives. Due to their similarities and differences, it was crucial to distinguish between project performance and project management performance. Traditionally, the completion of a project on schedule, within budget, and in compliance with the specifications has been used to determine project success. As client welfare and happiness became crucial, meeting stakeholder expectations was included to these metrics (Mulley, 2006). Reaching the budget and deadline was one of the team's benchmarks when projects were finished. Conversely, effectiveness was primarily measured by customer satisfaction (Banana 2005, Diver et al 2006).

It also shows that even with poor project management techniques, a project can succeed if the best practices are used; on the other side, if resources are misused, a project could fail miserably. Modeling the performance of project management was crucial. Because it emphasizes the use of project management and project execution. Yazidi (2009) elucidated that project performance can be assessed along four dimensions, the first of which is task competence as it relates to achieving project objectives.

Organizational culture was a shared objective linked to the outside world. It was described as a collection of shared morals, values, and conduct guidelines that helped the team members carry out their duties. It was once thought that expectations and experience make up an

organization's culture. According to its ideology, the principles that bind all of its departments together, as well as how it engages with the outside world and prospects its goals as an organization (organizational culture 2013). Project management practices and company culture were strongly correlated with improved performance.

This study aims to investigate how organizational culture and project management maturity which includes cost, quality, and stakeholder management maturity that affect project performance in Pakistan's construction industry.

LITERATURE REVIEW

It was a more comprehensive idea that demonstrated a project's aptitude in several managerial specialties. As a result, the project can be considered mature when a certain level of competence is maintained while maintaining process consistency (Hartono et al. 2019). The current condition of a construction assignment can be compared to the exceptional in class to close significant gaps, which was the first step towards improvement (Hartono et al., 2019').

Being mature implies having reached full growth. It can be either positive or negative, but it has always been preferred in the context of project management maturity (Schlitter, 2019). Additionally, maturity was a developmental stage where corrosion was occurring at its strongest. Various studies define project management maturity differently. For example, Zafar (2010) defines it as a quality of maximal development in project management. Additionally, he clarified that an organization's project management maturity would be considered the optimal state in which to handle their project (Zafar 2010).

Project management maturity refers to the extension of specific procedures that are high probability and repetitive in character. Project adoption increases the likelihood of success in the future since it instructs the system on how to carry out projects efficiently. Because of the intricacy and scope of the projects, the construction industry has adopted project management maturity (Zafar, 2010)

Project quality management took the initiative to address quality issues and satisfy client requirements in the worldwide market for construction projects. Because there were numerous parties involved, construction projects were rather complex. The primary objectives of quality management were to achieve cost effectiveness, customer satisfaction, and flawless performance through ongoing improvement and training. The majority of building projects had quality problems, such as poor craftsmanship and incompetence, which led to early revisions or terminations. One of the key elements in the building industry's success was quality.

Both project success and quality in the construction sector can be defined as the project participants' expectations being met. Client satisfaction and the application of quality management were linked to quality in the construction sector (Patel, J. R., and Mane, P. P. 2015). The quality management system comprises quality assurance, which is an assessment of the overall performance of the project, and quality control, which is essential to obtaining satisfactory performance on construction sites. Quality management is implemented, an organization's standing, client satisfaction, and potential market share all improve (Machado, F., Duarte, N., and Amoral, Arwen, 2023). It created a positive work environment where all staff members enjoyed by achieving construction-quality performance, focused on the needs of the customer, and worked to increase overall productivity and efficiency of construction industry.

Every project had its own stakeholders and was unique from the others (Piozzi 2017a). Every project featured a wide range of stakeholders, each with a distinct role to play (Mock et al., 2017). As per PMI (2008), project stakeholder management is an endeavor to accomplish the objective by means of dialogue, cooperation, accommodation, and fostering relationships. The projects and the organizations working on them would both benefit if appropriate stakeholder management strategies were used (Khan et al., 2017). Research has widely recognized the significance of stakeholders in construction projects (Yang and Shen, 2015). Due to their differences in terms of occupation, degree of education, gender, and geographic location, these stakeholders offer a wide range of interests that had to be satisfied by the project's conclusion. (Pandey, A., Singh, R., and Kumar, V.,2024). To ensure that the demands and preferences of the stakeholders are in line with the project objectives, management in the construction sector should actively involve the stakeholders. Stakeholders with a high likelihood of effect must also be included in decision-making processes. Construction projects required cost management in the beginning to finish the project on schedule. It was a crucial stage in the project life cycle.

It was thought to be one of the most crucial elements in building projects' success. Due to the increased competition in the construction market, Omid Kebriyaii & Raman Rezaei (2023) the commercial space had become more constrained and the cost management of construction projects had become more challenging. These factors contributed to the poor scope definition, inaccurate activity cost estimate, and ineffective frequency of project budget updates that caused the projects to suffer from cost overrun. However, the actual cost of construction projects has become unpredictable, which ultimately raises the actual cost and increases the

risk associated with construction operations. Construction companies initially estimated the cost of their projects primarily using sophisticated and experienced models (Masinda, I., Fieri, G., and Mulayam, F., 2024). The term "constructions cost" describes the total cost of all the actions done to limit the duration and deadlines of contracts. Construction projects can be expedited to cut costs and shorten the production cycle.

An organization's culture can be defined as its set of conventions, values, and behavioral standards that dictate how work should be done (Machado, F., Duarte, N., and Amoral, A., 2023). The team effectiveness was attributed to many organizational elements. The management procedure, organizational structure, and organizational culture that may exist within an organization are referred to as the organizational context. Research has shown that businesses that prioritize important managerial elements, such as customers, employees, and stakeholders, perform better (Kotter & Heskett, 1992; Wagner & Spencer, 1996).

Jan and Prasarnphanich (2003) emphasized the dominance of a knowledge-centered culture and found a significant relationship between the cooperative learning and organizational culture. Other variables that can be used to define organizational culture were based on the parameters to that extent. For example, organizational culture favors the positive interterm interactions or the interaction of the team member into the rest of the organization. Niamh, Vonderembse, and Koufteros (2004) address how organizational culture affects performance in time-based manufacturing. A favorable correlation between belief and customer orientation performance is expected to be discovered, based on Schein's (1992) understanding of culture and customer orientation.

It was a fundamental premise of Eskerod and Skriver (2007) that organizational culture itself can limit the processes of knowledge transfer. They asserted that a project-oriented approach could limit knowledge and result in knowledge silos. Schein (1992) defended the importance of organizational culture and described the hierarchy of artifacts that supported the underlying presumptions. The dimensions of danger, warmth, reward, and support were used to measure it. In essence, risk was the attitude toward potentially creative endeavors with unpredictable results. Rewards served as a gauge for recognizing employee performance.

Warmth served as a proxy for the organization's overall level of friendliness. Additionally, assistance served as a gauge of the organization's concern for the employee's well-being (Kosmin, Pihlanto, and Vanharanta, 2003). In an organization that is project-based, the function of organizational culture was essentially that of knowledge transfer.

The Project Management Institute recognizes that organizational culture and projects have a significant impact on one another (Riollano, 2020). Organizational culture can be defined as the shared standards and values that have been established over time and that contribute to the behaviors that the construction industry uses to solve problems. The final results of the initiatives are affected by the organizational culture. The organizational culture, according to PMBOK, is characterized by a generalized utilization of procedures. According to Dmitri Litvinenko (2020), an employee's ability to interact with project management processes is a determining factor in the overall success criteria.

Effective sponsorship and governance, the defining of project scope and success, the availability of financing and resources, and the organizational context all contributed to the project's success. This is where the influence of organizational factors ends. Positive work environments, good leadership, and the development of new products have all been found to have a substantial association with project performance. Of particular importance in the organizational context is the size of the company, which was thought to be a significant factor (Parviz F. Rad and Vittal S. Anantatmula, 2018).

Integration of knowledge and the defined knowledge are handled by organizational strategy and organizational culture, according to PMI. According to Coroner, D. and Sundqvist, E. (2015) organizations have a life cycle and must develop and modernize throughout time by taking lessons from past errors or best practices. Yazıcı, H. (2022), organizational planning also affects initiatives that are determined by their financing, level of risk, and organizational strategic plan. Because the construction sector has to deal with classifications, particular business lines, risk infrastructure, and process optimization, organizational planning has been quite important.

H1: *In Pakistani construction projects, there were a strong positive correlation between project performance and the maturity of project cost management.*

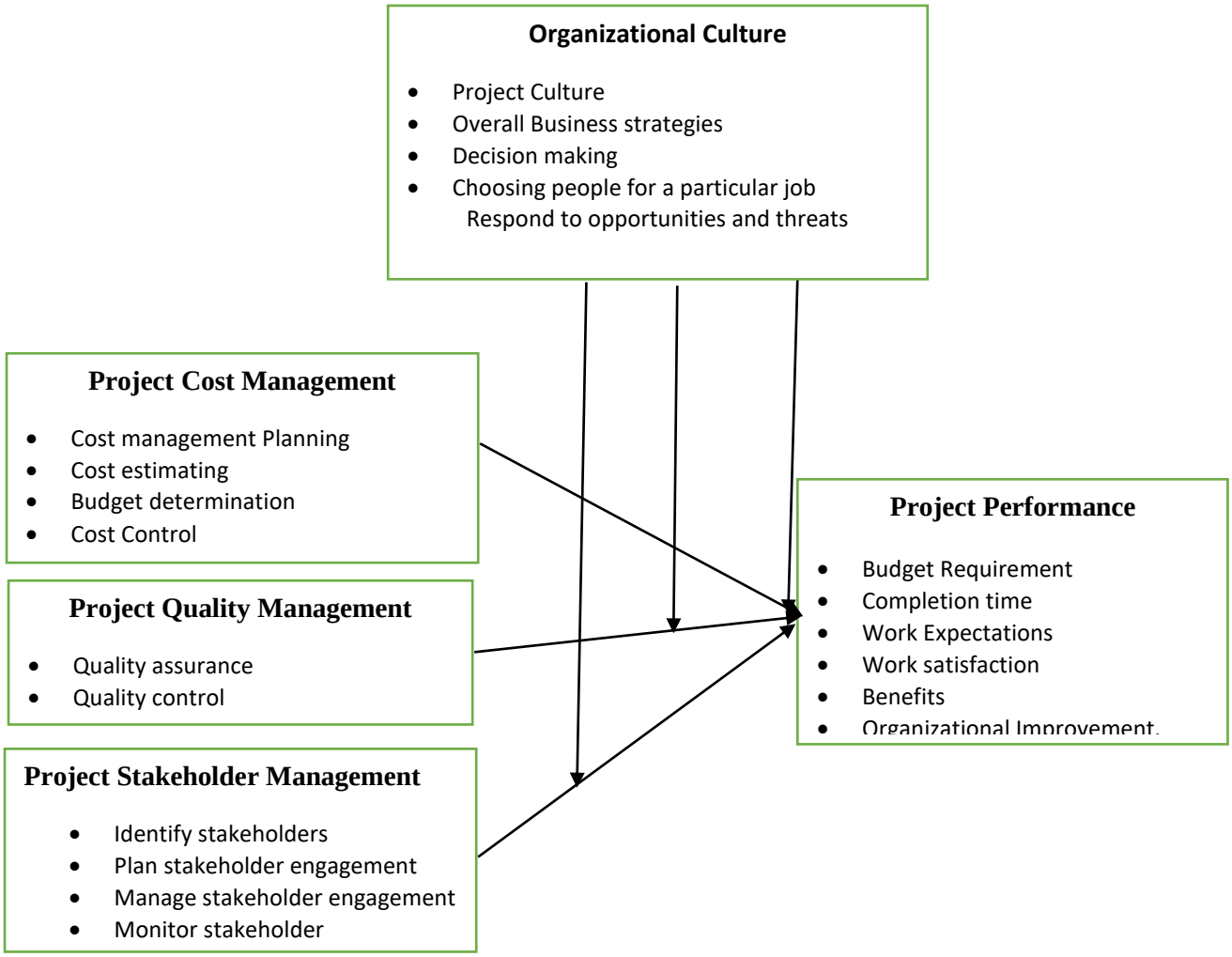
H2: *The building construction project in Pakistan had a remarkable and positive correlation between the maturity of project quality management and performance.*

H3: *In Pakistani building construction projects, there was a clear correlation between project performance and stakeholder involvement.*

H4: *In Pakistani building construction projects, organizational culture had a big impact on project cost and performance.*

H5: *The relationship between stakeholder management and project performance was significantly impacted by organizational culture in building construction projects in Pakistan.*

H6: *In Pakistani building construction projects, the relationship between project performance and quality management was moderated by organizational culture.*



METHODOLOGY

The research methodology focuses on methods for collecting information in order to investigate the relationship between project cost, quality, maturity of stakeholder management, and performance in construction projects in Pakistan. By using a deductive research methodology, the study gathered data for a thorough analysis that showed how organizational culture influences the relationship between project performance and project management maturity. A five-point Likert scale was used to score the data from structured questionnaires that were delivered in Rawalpindi and Islamabad as part of a quantitative research plan.

With 202 respondents, the sample group comprised project managers, vendors, coordinators, employees, and clients from the construction business. Data were gathered using convenient and random sampling approaches, which decreased sampling mistakes. Three independent variables—cost, quality, and stakeholder management—one dependent variable—project performance—and one moderator—organizational culture—were included in the study.

Random sampling, a statistical analysis standard, was used in data analysis to reduce sample errors even more. Strict adherence to research ethics ensured respondents' voluntary involvement, informed permission, and privacy. The importance of transparency in data sharing was highlighted, encouraging data accessible for collaboration and analysis. Questionnaires were carefully designed to prevent inappropriate wording and participant anonymity was respected. Participants in the survey were free to leave at any moment without facing any repercussions. Peer reviews and consultations prior to data collection were carried out in order to improve the caliber of the outcomes.

ANALYSIS

This study's primary goal was to investigate the relationship between project performance and maturity, specifically as it relates to cost, stakeholder, and quality management. Substantial effects were obtained after testing, observing, and distorting data in SPSS to conclude the findings. In order to begin a thorough examination of the outcome, the participant profile is taken into consideration. The information was gathered from Islamabad and Rawalpindi's building industries. 165 out of the 203 respondents identified as male, and 37 out of the respondents identified as female.

Table 1 is of correlation and Correlation reveals the association or relationship between the two variables. It was used to measure the degree of change in one variable and the relationship between that change and the change in another. The correlation statistical technique was crucial in determining the relationship between the variables. There were multiple correlation techniques. The most popular tool for measuring the linear relationship was the Pearson correlation coefficient, which ranges from 0 to 1 and includes both positive and negative values while indicating the presence or absence of correlation between variables (Sedgwick, 2012). There is weak connection between 0 and 0.2, moderate correlation between 0.3 and 0.4, and substantial correlation between 0.7 and 1.0.

Table 1: Correlations

		SM	CM	QM	OC	PP
SM	Pearson Correlation	1	.361**	.211**	.418**	.343**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	202	202	202	202	202
CM	Pearson Correlation	.361**	1	.321**	.408**	.341**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	202	202	202	202	202
QM	Pearson Correlation	.211**	.321**	1	.272**	.167**
	Sig. (2-tailed)	.000	.000		.000	.009
	N	202	202	202	202	202
OC	Pearson Correlation	.418**	.408**	.272**	1	.444**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	202	202	202	202	202
PP	Pearson Correlation	.343**	.341**	.167**	.444**	1
	Sig. (2-tailed)	.000	.000	.009	.000	
	N	202	202	202	202	202

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

Regression Analysis: -

In this study, a regression analysis technique was employed to assess the hypothesis of relationship between the variables. Because it produces an intelligible and lucid result, this basic technique was widely utilized to investigate how one variable influence another (Fargerland & Sandvemo, 2023). In this work, the initial hypothesis and inquiry testing were conducted by using linear regression.

Moderation effect of OC between SM and PP

Table 2: Moderation effect of OC between SM and PP

Coif	se	t	p	LLCI	ULCI
Constant	.1327	.5205	.2549	.3515	-1.3672	1.8721
SM	.3475	.1169	2.9721	.0072	.0488	1.0840
OC	.7829	.2381	3.2881	.0021	.1150	1.3156
Int_1	-.0476	.0312	-1.5256	.0012	-.1292	.0561

The constant term represented the expected value of PP when both SM and OC were 0. In table 2 case, it was 0.1327; yet, p = 0.3515 suggests that it was not statistically significant. The SM coefficient was 0.3475, with a p-value of 0.0072 and a standard error of 0.1169. This suggests that SM had a notable positive effect on PP. The coefficient for OC is 0.7829 with a

p-value of 0.0021 and a standard error of 0.2381. This implies that PP was also markedly enhanced by OC. The coefficient of the interaction term (Int_1) is -0.0476, the p-value is 0.0012, and the standard error is 0.0312. This suggests that there is a statistically significant ($p < 0.05$) moderating impact (interaction effect) between SM and OC on PP. Overall, this study demonstrated that OC greatly attenuated the link between SM and PP, and both SM and OC significantly improve PP. This implies that OC mediated the impact of SM on PP and that the degree of OC determines the relationship between SM and PP.

Moderation effect of OC between QM and PP

Table 3: Moderation effect of OC between QM and PP

	Coif	se	t	p	LLCI	ULCI
Constant	.1437	.7205	.1994	.4515	-1.3627	1.7701
QM	.4625	.2568	1.8010	.0189	.0587	1.0704
OC	.6258	.2491	2.5122	.0029	.3350	1.5165
Int_1	-.0167	.0292	-0.573	.0634	-.0019	.0036

The results of a moderation study in table 3 examined how Organizational Culture (OC) impacted the relationship between Project Performance (PP) and Quality Management (QM) are displayed in the table he showed. The moderating impact (Int_1) and the effects of OC and QM on PP are displayed by the coefficients. As suggested by the positive coefficient (0.4625) and significant p-value (0.0189) for QM, higher PP appears to be associated with higher QM. In a similar vein, OC displayed a positive coefficient (0.6258) and a significant p-value (0.0029), indicating a relationship between greater OC and higher PP. However, the moderating effect (Int_1) appears to be non-significant ($p = 0.0634$), suggesting that OC may not have a substantial influence on the relationship between QM and PP. Therefore, although QM and OC affect PP independently, their interaction does.

DISCUSSION

In order to examine the effects of project management maturity—including cost management (CM), quality management (QM), and stakeholder management (SM)—on project performance (PP) and the moderating role of organizational culture (OC), this study used a quantitative survey to target individuals from Pakistan's construction industry. The results showed that project performance and cost management maturity (H1) had a significant positive link, with a Pearson correlation coefficient of 0.341. Likewise, a statistically significant positive correlation of 0.343 was found between stakeholder involvement and project performance (H3) and 0.167 and 0.167 between quality management maturity and project performance (H2).

The interaction term coefficients of -0.0867 and -0.0476, respectively, show that organizational culture strongly affected the link between stakeholder management and project performance (H5) and between cost management and project performance (H4). Project performance was impacted by organizational culture and quality management separately, but this link was not substantially moderated by their interaction (H6). The study underscores the significance of advanced project management methodologies and a nurturing organizational culture in augmenting project efficacy within Pakistan's construction sector.

CONCLUSION

This study explores the complex links between organizational culture, project performance, and the maturity of quality, cost, and stakeholder management in the dynamic landscape of building construction projects in Pakistan. By moderating these interactions, organizational culture adds complexity and reveals how cultural influences and impact project dynamics. The study provides important theoretical and practical contributions to project management through theoretical frameworks, empirical data collection, and sophisticated statistical analyses. The study used SPSS and Andrew Hayes' Process Macros for regression analysis and integrated the Resource Dependency Theory (RDT). It was based on 203 answers from construction enterprises in Rawalpindi and Islamabad. The results highlight how important organizational culture is in regulating the connections between project performance, quality, cost, and stakeholder management.

In order to effectively manage building projects in Pakistan, the study emphasizes the necessity for a comprehensive approach to project management theories that integrates cultural considerations. In real terms, it offers useful information that organizational leaders and project managers can use to match project management procedures with dominant cultural norms. This will improve stakeholder relations, decision-making procedures, and the effectiveness of the project as a whole. The study also emphasizes how crucial it is to design training curricula that take cultural influences on stakeholder management maturity into account.

Limitations of the Study

The study has limitations despite its contributions, such as the prevalence of male respondents, potential biases from self-reported data, and a focus on Pakistan's construction industry that limits generalizability.

Recommendations

Future studies should analyze certain organizational culture elements, broaden the scope to include a variety of countries and industries, and examine longitudinal studies to capture dynamic interactions across time. Furthermore, analyzing the contribution of innovation and technology, along with sustainability and environmental factors, can offer a more thorough comprehension of modern project management difficulties. In Pakistan's multicultural construction business, investigating cross-cultural competencies across stakeholders and project teams might further improve cooperation and project outcomes.

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