

Enhancing Project Performance through Stakeholder Engagement: Unveiling the Mediating role of Project Communication and Innovation

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ABSTRACT

Keywords:

Stakeholder
Engagement,
Project Performance,
Project
Communication,
Innovation,
Stakeholder Theory.

The present research investigates the crucial correlation between stakeholder engagement (SE) and project performance (PP) in the Pakistan IT sector, specifically considering the prevailing political instability in the nation. This study, utilizing stakeholder theory, investigates the direct impact of stakeholder engagement on project performance and explores the mediating roles of project communication (PC) and innovation (IN) in this connection. The research validates that stakeholder engagement greatly improves project performance, with actual data demonstrating that stakeholder engagement and innovation play crucial roles in converting stakeholder contributions into better project results. The results highlight the need to prioritize stakeholder engagement, project communication, and innovation, particularly in unpredictable settings like Pakistan's, in order to achieve successful project performance. This academic study employed a quantitative approach and a cross-sectional survey, involving 205 active practitioners in the IT industry. The SPSS software, version 27, significantly improved the analytical process by facilitating the development of thorough path analysis. To mitigate the possible distortions caused by common method bias, the research used a time-lagged data collection approach. The results demonstrate positive and significant correlations among the constructs.

INTRODUCTION

Successful project outcomes in the dynamic and fast changing IT sector of Pakistan depend on the skillful management of intricate stakeholder interactions (Zhang et al., 2023). The stakeholder theory, which highlights the requirement of meeting the demands and expectations of all stakeholders, offers a useful foundation for comprehending how stakeholder engagement (SE) may enhance project performance (PP) (Zhang et al., 2023).

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Within this particular framework, stakeholder engagement is not just a means of communication, but rather a deliberate method of engaging stakeholders in meaningful manners that may have a substantial influence on the results of IT initiatives (Oladeinde et al., 2023). Nevertheless, the present atmosphere of political uncertainty in Pakistan introduces additional levels of intricacy to this procedure, as political instability has the potential to interrupt corporate activities, shape the expectations of stakeholders, and impact the general economic conditions (Malik et al., 2023).

In light of these difficulties, the significance of Project Communication (PC) and Innovation (IN) is more crucial (Khalifa, 2023). An efficient project communication strategy guarantees that stakeholders are well-informed, actively involved, and in agreement with the objectives of the project, therefore minimizing misinterpretations and promoting a culture of collaboration (Khalifa, 2023). Conversely, innovation, propelled by robust engagement of stakeholders, may result in the creation of novel solutions that improve project efficiency and flexibility, which are essential in an industry that flourishes on technological progress (D'Adamo, 2023).

The role of project communication and innovation in mediating the link between stakeholder engagement and project performance is not well understood, especially in the context of Pakistan's IT sector operating in a politically unstable environment (D'Adamo, 2023). The lack of insight in this area of knowledge impedes the capacity of IT companies to effectively use stakeholder engagement, therefore impacting their project results and overall competitiveness in a demanding market (Malik et al., 2023). The present study will address this gap.

LITERATURE REVIEW

Project Performance (PP)

Project performance can be assessed using several methods. For example, a project can be evaluated based on its adherence to the planned cost and schedule (Zhang et al., 2024). Additionally, the project should effectively contribute to achieving the organization's objectives or ensuring customer satisfaction. Some consider enhanced collaboration, efficient project communications, and stakeholder engagement as key indicators of success (Mir & Rezania, 2023). In order to examine the impact of stakeholder engagement and the role of project communication and innovation in influencing project performance, it is crucial to have a comprehensive understanding of project performance metrics (Zhang et al., 2024). Implementing rigorous metrics to assess project performance, such as adhering to

predetermined cost lines, meeting milestones, managing project scope, mitigating risks, meeting project quality standards, and ensuring safety, environmental, health, and security requirements, enhances the rationality of project performance measurement (Mir & Rezania, 2023). Prior research indicated that among technology-oriented organizations, a mere 10% of problems may be attributed to a deficiency in technical proficiency (Mir & Rezania, 2023).

Furthermore, information technology is used to evaluate the business performance of technology-related firms by collecting and evaluating data via IT systems (Chege et al., 2020). In project performance relevant to IT companies, several tools and techniques are employed. These include performance indicators, quality management tools in ISO 9001: 2000, agile project management, scoring methods, net present value, economic value-added, balanced scorecards, and Internet of things (Klute-Wenig & Refflinghaus, 2020; Oriol et al., 2020). Moreover, it is important to consider the operational expenses associated with the maintenance, operation, enhancement, and expansion of the Internet of Things system (Haaker et al., 2021). It is essential to consistently maintain and upgrade the hardware and software that are relevant to the Internet of Things. It is advisable to allocate an annual expenditure of 10–15% of the hardware and software investment cost. Although electricity costs for infrastructure operation are often very cheap compared to other expenditures, the Internet of Things is no exception as Green IT efforts gain increasing importance (Karyotakis & Antonopoulos, 2021). In addition to maintaining the technical infrastructure, daily activities like data storage and analysis, as well as general infrastructure improvements and upgrades to accommodate expansion, are accumulating considerable ongoing expenses. However, by efficiently utilizing this system, project performance in technology-related firms can be greatly improved (Karyotakis & Antonopoulos, 2021).

Stakeholder Engagement (SE)

Stakeholders refer to persons or groups who have the ability to exert influence on or are affected by the achievement of an organization's objectives and aims (Freeman, 2023). Project stakeholders include all individuals or groups that have a direct financial interest in the project and a vested interest in its success or failure (Pinto, 2021). Garvare and Johansson (2010) define stakeholders as the individuals or groups involved in a project who provide the necessary support to the organization in achieving its goals and objectives. It is essential for a firm to meet the expectations of stakeholders in order to prevent losing their support, which may eventually lead to the failure of both the project and the company (Freeman, 2023). During stakeholder analysis, firms should consider the following primary stakeholder groups:

individuals (such as project managers, functional managers, and project team members), organizational stakeholders (including project sponsors, clients, top management, and shareholders), and global society comprising consumer groups and special interest groups (such as environmentalists, community activists, local and global communities) (Freeman, 2023). Hence, enterprises must understand and implement a holistic approach to meet the needs of all stakeholders, rather than only prioritizing the financial goals of the shareholders (Pinto, 2021).

Stakeholder Engagement (SE) and Project Performance (PP)

The interdependence between Stakeholder Engagement (SE) and Project Performance (PP) is profound, as stakeholder engagement assumes a crucial function in determining the attainment of project success and effectiveness (Zhang et al., 2023). Diverse stakeholders, including as customers, team members, suppliers, and the wider society, possess different degrees of influence and interest in a project. Establishing successful engagement with these stakeholders is crucial to ensure comprehensive understanding and resolution of their requirements, expectations, and concerns throughout the whole project lifetime (Zhang et al., 2023).

Active involvement of stakeholders may enhance decision-making by providing valuable insights that contribute to the identification of possible risks, difficulties, and opportunities that may not be readily evident to the project team alone (Malik et al., 2023). Engaging in proactive participation may result in improved congruence between the project's goals and the expectations of stakeholders, therefore enhancing the overall project performance. For example, by engaging stakeholders from the beginning of the project, managers may get valuable perspectives that enhance the project's scope, optimize the allocation of resources, and enhance risk management techniques (Malik et al., 2023).

Fundamentally, stakeholder engagement has a direct impact on project performance by molding the context in which the project is carried out (Zhang et al., 2023). The correlation between stakeholder engagement and project performance is based on stakeholder theory, which asserts that companies need to effectively negotiate and incorporate the concerns of all stakeholders in order to achieve success (Freeman, 2023). Stakeholder theory informs the implementation of stakeholder engagement, which highlights the need of actively engaging stakeholders, who are affected by or have the ability to influence the project, during the whole project lifetime (Freeman, 2023). Thorough stakeholder engagement guarantees that the requirements, expectations, and concerns of stakeholders are acknowledged, resulting in

improved congruence between project goals and stakeholder interests. Accurate alignment is essential for improving project performance by reducing disputes, minimizing risks, and creating a supportive atmosphere. This ultimately guarantees that the project achieves its objectives in terms of scope, time, money, and quality (Zhang et al., 2023). In contrast, failing to involve stakeholders may result in misalignment, discontent, and project delays, highlighting the crucial need of system engineering in attaining high project performance (Zhang et al., 2023). In light of the above argument, the first hypothesis of the research is:

H1: Stakeholder engagement has a positive impact on project performance.

The mediating role of project communication between stakeholder engagement and project performance

Project Communication ensure the efficient transmission of information and insights acquired from stakeholders to the project team, therefore enabling improved decision-making and problem-solving (Ramsing, 2009). By facilitating stakeholder engagement, project coordination enables the conversion of stakeholder participation into practical tactics that directly influence project performance (Barbara & Dorota, 2020). Consequently, this results in enhanced precision in project planning, punctual implementation, and superior quality results, as the project stays in line with the requirements and expectations of stakeholders (Barbara & Dorota, 2020).

Stakeholder theory highlights the crucial function of project communication in mediating the relationship between stakeholder engagement and project performance (Beck & Storopoli, 2021; Lauff et al., 2020). This role is essential for understanding how successful project outcomes result from effective stakeholder engagement. The stakeholder theory posits that companies must analyze and control the interests of all stakeholders in order to get the best possible outcomes (Beck & Storopoli, 2021). Project communication serves as the intermediary that enables the exchange of information, the sharing of expectations, and the provision of feedback between stakeholders and the project team (Beck & Storopoli, 2021).

Effective project performance depends significantly on strong project communication to guarantee that stakeholders are well-informed, their concerns are acknowledged, and their opinion is included into project decisions (Mir & Rezania, 2023). Continuous, open, and transparent communication channels facilitate stakeholder engagement, enhance their sense of value, and maintain confidence in the project process (Mir & Rezania, 2023). Continual communication facilitates the clarification of project objectives, the alignment of

expectations, and the early resolution of problems, all of which are essential for improving project performance (Mir & Rezania, 2023).

In essence, under the context of stakeholder theory, project communication assumes a crucial intermediary function between stakeholder engagement and project performance by guaranteeing the collection and efficient use of stakeholder inputs to direct project operations (Freeman, 2023). Through the cultivation of a collaborative atmosphere where stakeholders and project teams work in harmony to accomplish common goals, this mediation increases the probability of project success (Mir & Rezania, 2023). Based on the above literature, the study second hypothesis is formulated as:

H2: Project communication mediates the relationship between stakeholder engagement and project performance.

The mediating role of innovation between stakeholder engagement and project performance

Innovation acts as an intermediary between stakeholder engagement and project performance by transforming involvement of stakeholders into concrete improvements in project design, procedures, or results (D'Adamo, 2023). For example, a project that successfully incorporates input from stakeholders may create a new technology, modify a method, or introduce an innovative product feature that greatly enhances project performance (D'Adamo, 2023). These innovations not only synchronize the project more closely with the expectations of stakeholders but also impart competitive advantages that augment the overall success of the project (D'Adamo, 2023).

The mediating function of innovation in the relationship between stakeholder engagement and project performance is an important construct that emphasizes the ability of stakeholder participation to stimulate new ideas, thereby improving project results (Haider et al., 2023). Informed by stakeholder theory, which underscores the requirement of meeting the demands and interests of all stakeholders for the achievement of organizational success, this connection underscores how social entrepreneurship may act as a driving force for innovation inside a project (Haider et al., 2023). Within this particular framework, innovation serves as the means by which the contributions of stakeholders are transformed into tangible and advanced solutions that enhance the efficiency, effectiveness, and flexibility of the project (Haider et al., 2023).

Furthermore, stakeholder theory proposes that active participation of stakeholders in the innovation process enables projects to more effectively predict and address the changing

requirements of these stakeholders, therefore mitigating risks and enhancing the probability of project success (Ozdemir et al., 2023).

In conclusion, in the context of stakeholder theory, innovation plays a vital role in mediating the relationship between stakeholder engagement and project performance (Ozdemir et al., 2023). By cultivating innovation via proactive engagement of stakeholders, businesses may improve the performance of their initiatives, guaranteeing that they not only fulfill but beyond the expectations of all parties concerned (Ozdemir et al., 2023). Therefore, the above discussion postulates the third hypothesis of the study as follows:

H3: Innovation mediates the relationship between stakeholder engagement and project performance.

The proposed theoretical framework, apart from its main hypotheses, there are various sub-hypotheses outlined as follows:

H4: Stakeholder engagement has a positive impact on project communication.

H5: Stakeholder engagement has a positive impact on innovation.

H6: Project communication has a positive impact on project performance.

H7: Innovation has a positive impact on project performance.

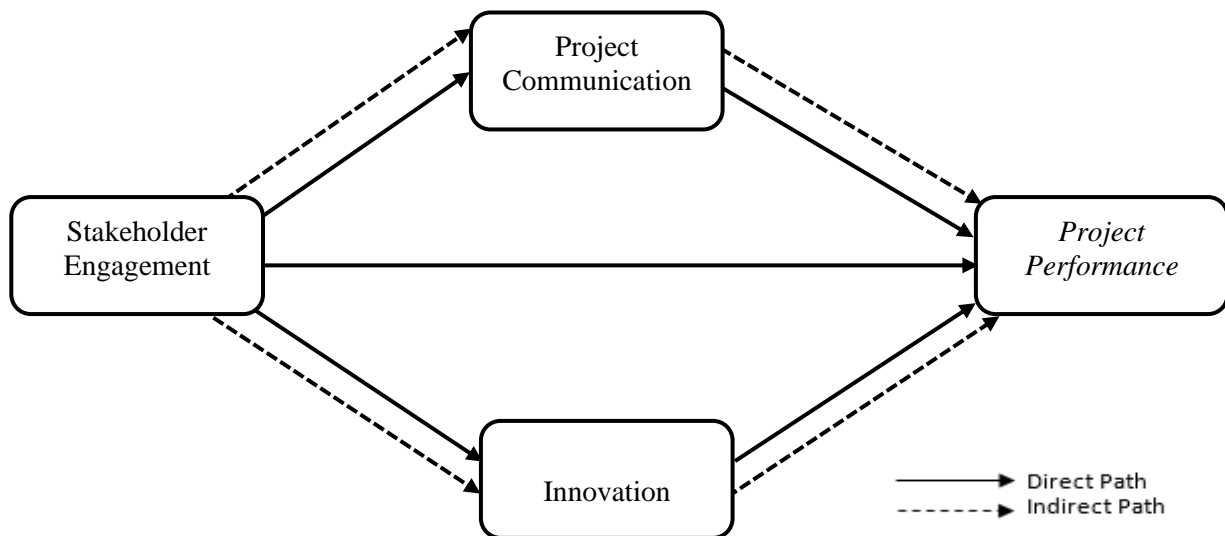


Figure 1: Theoretical Framework

Source: Author's own work

METHODOLOGY

The root of the model lies in stakeholder theory which delineates the operational and interactional strategies that a corporation should use, with its stakeholders. Donaldson and Preston (1995) proposed that it is a management framework that encompasses descriptive,

prescriptive, and instrumental aspects concurrently. Freeman et al. (2018) emphasized that the primary aim of stakeholder theory was to tackle the issue of value generation in the corporate context. The stakeholder theory encompasses the generation of value, commercial activities, and effective administration of successful enterprises. The stakeholder theory emphasizes the creation of value, commerce, and the successful prospering of a corporation. According to Freeman et al. (2018), the concept of "effective" is defined as the objective of generating maximum value. For the purpose of tackling the matter of value generation and commerce, stakeholder theory must illustrate how stakeholder connections may effectively define a corporation. The demonstration must illustrate the operational procedures of a corporation that thoroughly take into account its responsibilities towards stakeholders and the resulting impact on them, in order to effectively tackle the ethical quandary presented by capitalism (Freeman, 2023). Moreover, it should choose a feasible resolution that integrates ethical and business principles to tackle the problem of organizational attitude.

Data and methods

The current research used a quantitative methodology to examine the proposed correlation between the anticipated model and the commonly used technique for cross-sectional analysis in project management, using a deductive approach (Joslin & Müller, 2016; Ul-Musawir et al., 2017).

The study was carried out in the IT/software development industry of Pakistan, specifically targeting full-time professionals involved in several software development initiatives. Due to the substantial impact of Pakistan's software sector on the GDP, it was chosen as a representative sample for examining the effect of stakeholder engagement (SE) on project performance (PP). The study used purposive sampling, building upon prior empirical investigations conducted in comparable settings (Campbell et al., 2020). The survey instrument was disseminated to participants via the authors' social network and personal connections, using both physical and electronic modes inside the Google Forms platform. The research comprised participants who fulfilled two essential conditions: (1) they had been a member of a project team for the last 12 months and (2) the project had to be finished.

Sample and Procedure

The sample size has a substantial impact on the analysis of the research. An analysis of power was performed using a cross-sectional design to establish the minimal sample size required to provide statistically significant results. The survey involved 437 participants and had statistical metrics including a p-value of 0.05, a statistical power of 0.95, and an effect size of

0.30 per participant. Although the research intends to include at least 205 individuals (Cohen, 2016), it actually obtained 209 replies for analysis.

The data collection technique used a time-lagged methodology to mitigate the occurrence of common method variation (CMV). Two consecutive periods of data collection were conducted, with each phase separated by a one-month gap. In the first stage (**T1**), data was collected on the Stakeholder engagement and demographic characteristics of the study participants. In the next stage (**T2**), data was gathered on the project performance, project communication and innovation. Table 1 displays the demographic characteristics of the research.

| Measures | Items | Frequency | %age |
|------------------------|----------------------|-----------|--------|
| Gender | Male | 120 | 57.42% |
| | Female | 89 | 42.58% |
| Age (years) | 25 – 30 | 103 | 49.28% |
| | 31 – 40 | 67 | 32.06% |
| | 41 and above | 39 | 18.66% |
| Education | MS/M. Phil Degree | 79 | 37.80% |
| | Master's Degree | 87 | 41.63% |
| | Certification holder | 43 | 20.57% |
| Work Experience | Less than 2 years | 33 | 15.79% |
| | 3 – 5 years | 43 | 20.57% |
| | 5 – 7 years | 76 | 36.36% |
| | 7 years and above | 57 | 27.28% |

Table 1: Demographics

Source: Author's own work

Measures

The measurements used in this study were derived from prior research undertaken in the corresponding area. Participants were given instructions to answer the questions related to their own projects. The survey used a 5-point Likert scale, where 1 represented strongly disagree and 5 represented strongly agree.

Project Performance (PP): 6 item scale was adopted from Irfan et al. (2023). The Cronbach alpha is 0.858 which signifies the high reliability of the scale.

Stakeholder Engagement (SE): 8 item scale of Jang et al. (2017) was adopted for the study. The Cronbach alpha of the scale is 0.892 indicating that the scale is highly reliable.

Project Communication (PC): 6 items scale of Dozier et al. (2013) was adapted to measure project communication. The Cronbach alpha value of the scale is 0.778 endorsing its reliability.

Innovation (IN): 6 items scale of Remneland-Wikhamn and Wikhamn (2011) was adopted for the present study. The Cronbach alpha value of the scale is 0.802 which shows its high reliability.

ANALYSIS

Descriptive Statistics

| | Mean | SD | Data Normality | | Collinearity Statistics | |
|------------------------|-------|-------|----------------|----------|-------------------------|-------|
| | | | Skewness | Kurtosis | Tolerance | VIF |
| Project Performance | 2.825 | 0.780 | 0.370 | 1.976 | - | - |
| Stakeholder Engagement | 2.993 | 0.714 | 0.485 | 2.541 | 0.807 | 1.239 |
| Project Communication | 3.272 | 0.713 | -0.570 | 1.894 | 0.849 | 1.179 |
| Innovation | 2.628 | 0.690 | 0.331 | 3.129 | 0.777 | 1.287 |

Dependent variable: Project Performance

Table 2: Mean, SD, Skewness, Kurtosis, Multicollinearity

Table 2 reports the mean, standard deviation (SD), skewness, kurtosis, and multicollinearity values of the examined constructs. Table 2 displays the ratings given by participants on all criteria using a 5-point Likert scale ranging from strongly disagree to strongly agree. The measurements of Mean and SD provide valuable information on the average rating and the extent of variation in the replies, respectively. More precisely, the standard deviation numbers show the statistical distribution of responses around the mean.

To determine the normality of the data, the skewness and kurtosis were assessed, following the guidelines of Kline (2023). According to the established standards, data is considered to follow a normal distribution if the skewness value is within ± 2 and the kurtosis value is within ± 7 , as described by Hair Jr et al. (2014) and Kline (2023). The data corresponds to a normal distribution, as shown by the skewness and kurtosis values provided in Table 2. To evaluate the existence of multicollinearity, the variance inflation factor (VIF) and tolerance were used. Daoud (2017) defines multicollinearity as the presence of a correlation between variables. Daoud (2017) states that a variance inflation factor (VIF) value of 1 indicates no correlation, a VIF value ranging from 1 to 5 indicates moderate correlation, and a VIF value over 5 indicates a substantial relationship. Additionally, a tolerance value below 0.1 indicates the existence of collinearity. Based on the tolerance and VIF values in Table 2, there is no evidence of multicollinearity in the data.

Data Analysis

The present work used Harman's single-factor test (Harman, 1976) to evaluate the existence of common method variance (CMV). To assess the component structure, reliability and validity of the construct is performed. The analysis was performed using the SPSS v27. To examine the hypothesis and the indirect influence was examined by mediation analysis utilizing Process Macro Model 4 of Preacher and Hayes (2008).

Confirmatory Method Variance

Significantly, Common Method Variance (CMV) may provide a substantial risk to the integrity of data in research investigations. Common method variance (CMV) may be detected when an unrotated factor analysis produces just one component or when a single factor explains a substantial amount of the overall variation. After doing an exploratory component analysis, we found that 7 variables accounted for 90.125% of the total variation. The most important factor explained 42.904% of the variance, which is significantly over than the threshold of 50% . Hence, CMV does not pose a problem in our investigation. The effectiveness of the time-lagged approach was confirmed by empirical findings, which were statistically validated using Harman's single-factor test (Harman, 1976).

Reliability and validity analysis

Following the first phase of the study, the latent variables were assessed for their composite reliability (CR), convergent validity, and discriminant validity. According to the criteria of Fornell and Larcker (1981), the composite reliability (CR) values of all latent variables were determined to be above 0.90, suggesting the lack of any internal consistency issues. The assessment of convergent validity was conducted by examining the values of average variance extracted (AVE), which is considered a critical benchmark. Sarstedt et al. (2016) defined a threshold value of 0.5 for AVE. All constructs in the present study had Average Variance Extracted (AVE) values over 0.5, suggesting that there are no relevant concerns about convergent validity. To establish discriminant validity, the criteria established by Fornell and Larcker (1981) were adhered to. According to the above assumptions, the square root of the mean of all variables must exceed the correlation among all variables. The metrics shown in Table 3 were factor loading, composite reliability (CR), average variance extracted (AVE), and the square root of AVE (SQRT of AVE). Furthermore, the discriminant validity of the components was evaluated in Table 4.

| Construct | Items | Factor Loadings | CR | AVE | SQRT of AVE |
|------------------------|-------|-----------------|------|------|-------------|
| Project Performance | PP1 | 0.807 | 0.94 | 0.72 | 0.850 |
| | PP2 | 0.936 | | | |
| | PP3 | 0.802 | | | |
| | PP4 | 0.805 | | | |
| | PP5 | 0.932 | | | |
| | PP6 | 0.806 | | | |
| Stakeholder Engagement | SE1 | 0.855 | 0.96 | 0.76 | 0.873 |
| | SE 2 | 0.962 | | | |
| | SE 3 | 0.890 | | | |
| | SE 4 | 0.949 | | | |
| | SE 5 | 0.899 | | | |
| | SE 6 | 0.860 | | | |
| | SE 7 | 0.750 | | | |
| | SE 8 | 0.801 | | | |
| Project Communication | PC1 | 0.594 | 0.90 | 0.61 | 0.783 |
| | PC2 | 0.914 | | | |
| | PC3 | 0.637 | | | |
| | PC4 | 0.837 | | | |
| | PC5 | 0.894 | | | |
| | Pc6 | 0.765 | | | |
| Innovation | IN1 | 0.923 | 0.95 | 0.75 | 0.866 |
| | IN2 | 0.894 | | | |
| | IN3 | 0.814 | | | |
| | IN4 | 0.853 | | | |
| | IN5 | 0.861 | | | |
| | IN6 | 0.847 | | | |

Table 3: Factor loading, CR, AVE, and SQRT of AVE

Source: Author's own work

Table 4 shows the values for analyzing discriminant validity.

| Constructs | PP | SE | PC | IN |
|------------|---------------------|---------------------|---------------------|---------------------|
| PP | <i>0.850</i> | | | |
| SE | 0.660** | <i>0.873</i> | | |
| PC | 0.362** | 0.298** | <i>0.783</i> | |
| IN | 0.406** | 0.407** | 0.350** | <i>0.866</i> |

Table 4: Correlation matrix with SQRT of AVE values

Source: Author's own work

Note(s): PP = Project Performance, SE = Stakeholder Engagement, PC = Project Communication, IN = Innovation, **.p < 0.01

Following a thorough analysis of the statistical data in Table 4, it is clear that the bold and italicized numbers are diagonally aligned to indicate the square root of the average variance extracted (AVE), revealing that all values in the columns are less than the square root of AVE, suggesting that discriminant validity is held.

Structural Model testing

A comprehensive assessment of the reliability and validity of the constructs in the measurement model was carried out during the first phase. Proceeding to the second stage, the prediction accuracy and interrelationships among the variables in the structural model provided by Hair Jr et al. (2014) were assessed. Please see Figure 2 for a graphical depiction of the route diagram.

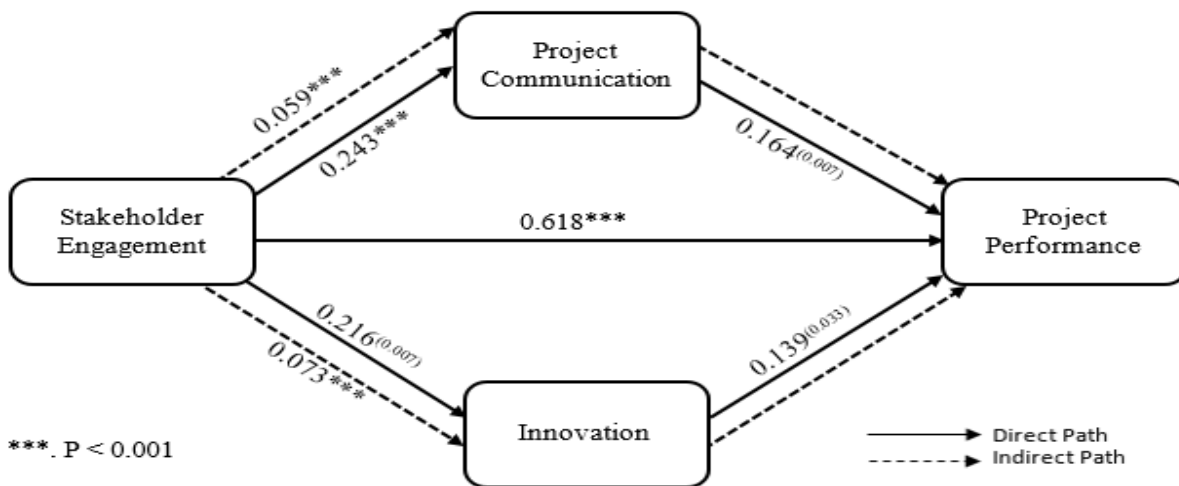


Figure 2: Path Diagram. Source: Author's own work

Based on the standardized coefficient of **H1** ($\beta = 0.618, P < 0.001$), the structural equation model showed a statistically significant and positive correlation between stakeholder

engagement and project performance. Thus, the main hypothesis (**H1**) of the research has been confirmed. The sub-hypotheses (**H4, H5, H6, and H7**) are directly relevant to the dependent variable (DV) being studied in this work. The study's results confirm the **H4** hypothesis ($\beta = 0.243$, $P < 0.001$), which suggests a direct relationship between stakeholder engagement and project communication. For **H5**, the study indicates a significant and positive relationship between stakeholder engagement and innovation ($\beta = 0.216$, $P = 0.007$), thus accepting the **H5** hypothesis. Based on these findings, we can affirm the **H5** hypothesis as a legitimate and plausible explanation for the observed phenomena. Moreover, it is important to mention that the results of the study's **H6** suggest a significant and positive correlation between project communication and project performance ($\beta = 0.164$, $P = 0.007$), as presented in the **H6** conclusion, thus supporting hypothesis **H6**. Finally, the **H7** result shows a significant positive correlation between innovation and project performance ($\beta = 0.139$, $P = 0.033$), which therefore supports the adoption of **H7**.

Specifically, the research developed hypotheses **H2** and **H3** to align with the indirect impact, namely mediation. The researcher adhered to the standard protocol outlined by Preacher et al. (2007) and conducted a bootstrap analysis. Wang et al. (2017) demonstrated that the bootstrap method is a reliable technique for precisely estimating confidence intervals (CI) to evaluate the indirect impact. To ensure reliable calculation of estimates, the researcher used a dataset consisting of 5000 bootstrap samples to compute 95% bias-corrected confidence intervals. Table 5 displays the findings of the mediation analysis for additional examination and interpretation.

| | Total Effect | T | Sig. | Direct Effect | T | Sig. | Path | Indirect Effect | SE | LL 95% CI | UL 95% CI |
|-----------------------------|--------------|--------|-------|---------------|--------|-------|--------------------------|-----------------|-------|-----------|-----------|
| H2: SE → PP | 0.722 | 12.648 | 0.000 | 0.663 | 11.366 | 0.000 | SE → PC → PP | 0.059 | 0.028 | 0.011 | 0.120 |
| H3: SE → PP | 0.722 | 12.648 | 0.000 | 0.648 | 10.572 | 0.000 | SE → IN → PP | 0.074 | 0.034 | 0.011 | 0.148 |

Table 5: Bootstrap results for Indirect effect Process Macro Model 4

Note (s): PP = Project Performance, SE = Stakeholder Engagement, PC = Project Communication, IN = Innovation, SE = Standard Error, LL = Lower Limit, UL = Upper Limit, CI = Confidence-Interval, Bootstrap Samples = 5000

The bootstrap analysis findings indicate that **H2** is supported by a statistically significant positive mediation effect of project communication between stakeholder engagement and project performance ($\beta = 0.059$, $SE = 0.028$, 95% CI [0.011, 0.120]). Furthermore, the bootstrap analysis of **H3** provides evidence that there is a statistically significant positive indirect impact of innovation between stakeholder engagement and project performance ($\beta = 0.074$, $SE = 0.034$, 95% CI [0.011, 0.148]). The presence of partial mediation is indicated by the substantial direct and indirect effects (Baron & Kenny, 1986; Zhao et al., 2010).

DISCUSSION

The results of this research provide strong empirical validation for the main hypothesis (**H1**) that stakeholder engagement has a substantial and favorable effect on project performance in the IT sector of Pakistan (Zhang et al., 2023). The statistically significant correlation (**H1**) highlights the need of actively involving stakeholders in enhancing project performance, especially in a multifaceted and crucial industry like IT, which is further exacerbated by the present unpredictable political climate in Pakistan (Zhang et al., 2023).

An in-depth analysis of the sub-hypotheses provides more understanding of the processes by which stakeholder engagement affects project performance. This research validates the **H4** by showing a clear and positive correlation between stakeholder engagement and project communication (Zwikael et al., 2023). This finding indicates that stakeholder engagement improves project communication by promoting seamless exchange of information, openness, and synchronization among stakeholders and project teams. Enhanced project communication is essential for effectively managing stakeholder expectations and maintaining clarity and support for project goals (Zwikael et al., 2023).

Furthermore, the research provides evidence in favor of the **H5** hypothesis, demonstrating a substantial and positive correlation between stakeholder engagement and innovation (Woo et al., 2023). This finding emphasizes that including stakeholders not only enhances communication but also fosters creativity by integrating unique viewpoints and specialized knowledge into the project (Woo et al., 2023). Within the IT sector, where innovation plays a crucial part in achieving success, this finding underscores the need of involving stakeholders in order to promote creativity and original ideas. These are vital for sustaining competitiveness in a demanding setting (Woo et al., 2023).

Moreover, the evidence also supports the **H6** hypothesis, which investigates the correlation between project communication and project performance (Rehan et al., 2024). This finding supports the notion that efficient project communication is a crucial element in attaining

high project performance. Project communication enhances project execution efficiency and success by effectively informing stakeholders and incorporating their input into project decisions (Rehan et al., 2024).

Finally, the data validates the **H7**, showing a robust positive relationship between innovation and project performance (Haider et al., 2023). The aforementioned correlation implies that innovation plays a crucial role in facilitating project performance by converting the creative ideas produced via stakeholder involvement into concrete enhancements in project performance (Haider et al., 2023).

In addition, the research examined the mediating functions of project communication and innovation in the relationship between stakeholder engagement and project performance, as proposed by hypotheses **H2** and **H3**, respectively. The **H2** and **H3** hypotheses indicates that stakeholder engagement fosters innovation, which in turn contributes to improve project performance, highlighting the importance of fostering an innovative environment through active stakeholder engagement (Haider et al., 2023; Rehan et al., 2024).

Overall, these findings suggest that both project communication and innovation are critical mediators in the stakeholder engagement - project performance relationship, providing pathways through which stakeholder engagement translates into improved project performance (Haider et al., 2023; Rehan et al., 2024). In light of the political uncertainties that define the present climate in Pakistan, the study's findings emphasize the necessity for IT companies to give priority to stakeholder engagement, project communication, and innovation (Haider et al., 2023; Rehan et al., 2024).

CONCLUSION

In the Pakistan IT sector, this research highlights the substantial influence of stakeholder engagement on project performance, proving that stakeholder engagement improves project performance both directly and indirectly via project communication and innovation. The use of effective stakeholder engagement enhances project results by promoting improved communication and stimulating creative ideas, which are essential in the politically volatile setting of Pakistan. The results emphasize the need of giving priority to stakeholder engagement, project communication, and innovation in order to attain project performance. To overcome the study's shortcomings, such as its industry-specific emphasis and cross-sectional methodology, future research should investigate other mediators and moderators, and broaden the analysis to other sectors and locations.

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