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Article

A Quantitative Study of the Impact of Organizational Culture, Communication Management, and Clarity in Project Scope on Constructions' Project Success with Moderating Role of Project Manager's Competencies to Enhance Constructions Management Practices

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Abstract: The construction industry is considered a driver of economic growth, especially in developing countries. However, the successful completion of construction projects is a major challenge, due to the lack of competencies. The current study explores the effects of communication management practices, clarity in the scope of the construction project, and organizational culture to enhance project success. A project manager is essential in running a project smoothly and according to the schedule. Keeping in view the predominant role of the project manager, this study aims to find the moderating impact of manager competencies to improve the construction project routine and generate successful projects. A questionnaire survey was conducted to collect the data and determine how these variables influence construction project progress. The current research results show an excellent association between a construction project's success and the discussed independent variables. Additionally, it was found that a competent project manager can play a better role in preventing the uncomfortable influences of independent variables on the dependent variable. The obtained outcomes highlight the importance of adequately handling organizational culture, communication management, and clarity to achieve project success. These outcomes are helpful for the professionals working in the construction sector to raise the project success rate and enhance their construction management capabilities.

Keywords: construction management; project success; scope clarity; organizational culture; moderators; communication management

1. Introduction

In Pakistan, the construction sector is plagued by a severe lack of competent construction project management execution. Significant project management flaws in client and contractor businesses are ineffective for contract administration, poor planning, poor project control, sluggish decision-making, poor communication, and a lack of leadership. There is a relatively low tendency for project management functions to be used in different

project stages, except for the construction phase [1]. The main reasons for delays in Pakistan's construction sector are often terrorism, political unrest, strikes, a weak economy, inadequate planning, a lack of management expertise, and low worker productivity [2]. The construction sector significantly boosts societal development by providing the necessary infrastructure for living and employment [3]. The multi-faceted, nonlinear nature of the construction process often puts it at the point of a stir. Over the past 20 years, the number of complicated projects in the construction sector has increased significantly [4]. Construction projects are, therefore, more concerned with the policy's failure, time delay, and expense overruns than its successes [5]. Contrarily, the construction sector has been blamed in several countries for inefficiencies in budgets and schedule infringements, reduced efficiency, and worsening stakeholder satisfaction [6]. Doloi [7] reported that it was not easy for clients and contractors to complete current building projects satisfactorily. Due to growing design difficulties and numerous stakeholders, a project must meet specific criteria to accomplish its performance and objective within a budget and schedule.

In the past, time, money, and quality were used to define project management success in a limited manner [8,9]. In the 1990s and the beginning of the 2000s, a broader perspective on project success evolved. This acknowledges the value of effectiveness and stakeholders' satisfaction [10] and achieving client acceptance [11,12]. Organizational cultural differences will result in disputes over individual communication and undermine the competence of the building organization [13]. Although corporate culture is regarded as an influential factor, the construction management literature does not focus as much on it [14]. Cultural and organizational differences impact the performance or execution of construction projects. Liu and Fellows [15] talked about how cultural differences might affect the goals of building projects. Different researchers have structured the literature to note the impact on various cultures, as well as management methods, such as contract management [16], quality management written [17], and conflict resolution [18]. One of the most unpleasant effects of poor communication is project failure [19,20]. Due to the dynamics of the construction project, various parties must participate; therefore, complex communication mechanisms will be necessary to complete a task [21]. The project's data interchange involves a lot of detailed data [21]. The help of a medium in transferring data between a sender and a receiver depends fundamentally on communication [22]. This process is regarded as fruitful, while the receiver can understand the content precisely and gives the sender timely and valuable feedback [23]. It is, nevertheless, riddled with issues and challenges to achieve the primary goal of project completion; people from diverse backgrounds and occupations collaborate in various ways [24]. Peter [25] acknowledges that ineffective communication is a project's most significant obstacle to success. With the help of the project's description, owners may address project risks, take advantage of chances to advance a project, and execute a more effective project implementation plan [26].

Furthermore, a significant reason for problems with construction projects is an ambiguous interpretation of the project's goals or scope and anticipated outcomes [27]. Instead, a lack of clarity in the project's objectives, scope, and expected results is a common cause of issues with building projects [28]. As a result, it becomes essential to maintain the project's scope, which would be necessary for its success [29]. It is widely acknowledged that the clarity of the project concept determines whether a construction project succeeds. The concept's consistency significantly impacts the project's ability to be completed. Numerous studies show that an inadequate definition of project scope can cause costly revisions, postponements, alterations, budget overruns, breaches in timelines, and a total project collapse [30,31]. In integrated design-build projects, appropriate scope definition is even more vital to project success than in traditional delivery systems [32].

Research on project manager competencies has revealed a substantial correlation between emotional intelligence and several crucial tasks, including leadership, cooperation, the output of the workgroup, and conflict resolution [33]. Project managers must reconcile conflicting stakeholder claims, manage expectations, and influence decisions [34]. The team's collective effort and the project manager's leadership are necessary for the plan to

be entirely successful and for the goals to be met [35]. Well-defined priorities, management support, project leadership, scope control, engagement with multiple stakeholders, customer management, and adaptability for unanticipated circumstances are the few elements that affect project success in various sectors [36]. The project manager's talents determine whether a project will succeed or fail [37].

In the context of the Pakistan construction industry, it appears to be a serious problem to keep the projects on schedule [38]. Generally, the main cause of this failure is the lack of knowledge of the essential elements for a public sector project's success. It is necessary to determine how success factors contribute to the project's successful completion and how they affect its overall quality [39]. Khattak, M.S. [40] has discussed that, in dealing with the complexity of Pakistan's public sector infrastructure projects, the competences of leadership, management, communication, effectiveness, and result orientation influence the success of construction projects. Maqbool [41] has suggested finding the relationship between cultural practices, project manager competencies, and construction project success. Many large-scale construction projects have failed due to cultural differences among companies [42]. Given the importance of the construction industry, it is essential to pinpoint the key problems hindering its effectiveness and implement solutions to boost Pakistan's economic growth and development [43]. To improve the construction sector's effectiveness and advance Pakistan's economic development, it is essential to identify the key problems and take remedial action [44]. The previous studies have identified and discussed several success and failure factors for construction completion. Additionally, studies show a need to enhance project management practices. However, there is a gap in empirical studies regarding determining the weightage of the impact of different factors. To fulfill this research gap, the current study was carried out to describe the empirical impact of the above-discussed variables on the construction project's success. Additionally, the moderating role of project managers' competencies in the Pakistan construction industry is less focused on in the previous studies. So, this research explores the moderating role of project manager competencies to achieve successful construction projects. The results of this study will provide an empirical weightage of these variables, so that policies can be designed to deal with the issues related to these variables' impact on construction project success and modify construction management practices.

Keeping the above discussion in view, the specific research inquiries or objectives for this research work are termed as follows:

- How can construction projects' results differ, depending on organizational culture?
- What effect does communication management have on how well construction projects turn out?
- What impact does project scope clarity have on the outcome of the building project?
- How can project manager's skills improve the successfulness of projects in the construction industry by minimizing the detrimental impacts of organizational cultural differences?
- How much do the project manager's abilities contribute to lowering the influence of communication management on construction project success?
- To what extent do the project manager's abilities contribute to reducing the adverse effects of project scope clarification on the progress of the construction project?

This research study comprises five sections: the introduction, literature review, methodology, data collection and results in interpretations, a discussion of numerous concerns and issues raised in elaborating on the study topics, and the conclusion.

2. Theoretical Background

Considering that this research investigates the influence of an organization's culture, communication management, and project scope clarity on construction project success and the project manager's competencies as the moderating role in [43] that relation, the following paragraphs present the theoretical background of these concepts.

2.1. Construction Project Success

Project participants may select several success criteria they deem crucial in evaluating the success of the project in the construction industry [45]. Investigating the success of a project is a multi-dimensional philosophy [46]. While dealing with a project in the construction industry, different project stakeholders have different interest needs. As a result, many stakeholders must make modifications for the project to succeed, which calls for an explanation of project success [47,48]. Morris and Hough [49] described the criteria for success as factors used to quantify the project's collapse or successfulness. The project's successfulness is assessed based on these criteria as dependent variables. The project's success criteria have changed from the "iron triangle" of evaluable time, scope, and cost, which are primarily linked to project competency [50].

2.2. Organization Culture

The notion of culture varies remarkably, depending on the research field (Hofstede) [51]. Organizational culture is the collective mental programming that separates groups from one another [52,53]. Corporate culture, comprised of the team's great work habits and dedication to the company, determines the team's overall success [54,55]. Additionally, it can be concluded that social interactions between organization members impact the organizational culture's creation and growth [56]. Another explanation of organizational culture is a shared past, collection of standards, set of beliefs, or set of ideas among group members [57]. This culture is a collection of norms, principles, tactics, viewpoints, and dispositions that are the foundation for all organizational actions and thoughts [49].

2.3. Communication Management

Muszynska [58] discovered that project managers might ensure timely and efficient project knowledge production, processing, distribution, retention, restoration, and temperament by implementing communication management techniques. Ineffective communication may be made clear in the absence of the performance and efficiency of the communication mechanism [59]. Improper communication is a communal dilemma in construction projects, which might affect a project's implementation and should not be overlooked [60]. Consequently, Maria-Sanchez [61] stated that poor communication was one of the critical factors driving project hazards. Construction projects now frequently involve multidisciplinary and cross-organizational partnerships, emphasizing the importance of solid communication for successful knowledge transfer [62].

2.4. The Clarity in Project Scope

The effectiveness of project description directly affects the outcomes of a project [63,64]. Numerous studies have demonstrated that a poor understanding of scope can cause costly changes, postponements, work revisions, budget overruns, timetable rearrangements, or even the total failure of the project [31]. According to the project's guiding principles, the owner will have access to technical know-how to handle project risks, optimize project success prospects, and provide project execution solutions [29]. One well-known cause of problems in construction projects is the lack of clarity about the main priorities of the project scope and expected outcomes, which dramatically raises the chance that the owner will not be satisfied with the result [65]. Consequently, it is a prevalent belief that a detailed project definition is necessary for the project to succeed. [32].

2.5. Project Manager's Competencies

Project management is more complicated than traditional management; project managers should collaborate with divisions that operate separately from each department. Project-based industrial sectors have universally acknowledged the value of project managers, especially in construction [66–68]. Cech and Chadt [35] described that project management competencies are produced by gathering knowledge, skill, appropriate experience, and behavioral and attitude techniques. The project manager's abilities and positions

determine whether the project will be successful or unsuccessful [58]. Steyn [69] contended that the project manager acts as the connecting element of the undertaking. The choice of the project manager affects whether a project succeeds or fails. Typically, the project manager is expected to be knowledgeable about different structural techniques, organizing, problem-solving, etc. Understanding this should help with the project's organizational management [70].

2.6. Research Framework and Hypotheses Development

The way individuals and organizations function daily is primarily influenced by culture. Businesses face several obstacles, most of which are brought on by the conflicts that the variety of cultures produces [71]. Ankrah and Proverbs [72] said these ideas are becoming increasingly significant in construction, due to contracting, the globalization of procurement, joint ventures, and collaboration in this industry. Due to people's interactions with other cultures, the emergence of strategic alliances in construction, as in other sectors, often increases the relevance of cultural diversity [31]. Studies on the construction industry's culture, the connection between culture and project completion, and the influence of local and international cultures are becoming increasingly popular [73]. Murray-Webster and Simon [74] examined a Russian–British joint venture corporation and explored how organizational culture variations affect project progress. They found that organizational culture differences significantly impacted partner organization project performance. Hall [75] examined the connections between cultural variety and global building activity from a British perspective. He concluded that British construction companies had an ethnocentric approach to dealing with cultural differences while working remotely. Maqbool [76] identified cultural barriers as a problem for achieving a sustainable construction project. Shore and Cross [77] explored how country culture affects the direction of large-scale research initiatives. Social scientists, such as [78,79], have recently started to see culture more discursively in standard connections, meanings, and communication patterns. Obsolete cultural models, such as Hofstede's [80], were condemned by Franklin [81], claiming that these models do not account for situations of frequent contact and do not provide insight into cross-cultural relationships. However, the issues surrounding organizational culture's impact on project progress in construction projects remain unresolved and require further study. As a result, our research project aims to fill this knowledge gap from the standpoint of Pakistan's construction industry. For the analysis, the suggested assumption is as follows:

Hypothesis 1 (H1): *The success of construction projects is positively impacted by the proper management of organizational culture.*

As the initiatives go forward, communication issues or misunderstandings will inevitably result in a significant rise in unnecessary spending. Contact enables project teams to work well together to fulfill their mission and decrease the probability of conflicts [82]. Construction projects today often include multidisciplinary and cross-organizational partnerships, emphasizing the need for solid communication for successful knowledge transfer [62]. With enough communication, the project team may more easily deduce the rights, obligations, and advantages, which helps with teamwork. On the other side, ineffective communication causes data to be distributed inappropriately among project participants, which, in turn, causes conflicts among teams [83]. Wu [84] established that collaboration requires effective group communication and that team engagement enhances effective communication. Oberlender [85] demonstrated that, when ambiguous information is provided, such as project drawings, documents, contract paperwork, and job instructions, communication issues occur. Subsequently, Maria-Sanchez [61] stated that poor communication was one of the critical factors driving project hazards. Muszynska [58] found that project managers could guarantee timely and effective project knowledge creation, processing, dissemination, retention, recovery, and temperament by using communication management techniques. One primary reason for disputes and misunderstandings among project

stakeholders is poor communication [86]. Poor communication might result in the failure of a project [8]. Therefore, it is reasonable to believe that informal interactions between project participants are related to how well a construction project performs. Research is being conducted to determine the link between communication management and the construction project's success in Pakistan's construction sector, in light of the aforementioned backdrop. The proposed hypothesis for this research is as follows:

Hypothesis 2 (H2): *Effective communication management positively impacts the success of a project in the construction industry.*

Numerous studies have shown that an incorrect understanding of scope may result in expensive revisions, postponements, work revisions, budget overruns, timetable postponements, and even the collapse of the project as a whole [31]. According to the project's guiding principles, the owner will have access to technical know-how to handle project risks, optimize project success prospects, and provide project execution solutions [29]. Lack of clarity on the project's scope and desired results is a well-known reason why construction projects go wrong, and it dramatically raises the chance that the owner will receive a defective product [65]. Consequently, it is commonly believed that a thorough project definition is essential to the project's success [32]. The consistency of the project's purpose is related to the degree of alignment and understanding of a set of project missions and goals that guide development operations [87]. The performance levels will be outstanding if the team members and companies are clear on the objectives [88]. If the goals are not clearly stated, team members may lack confidence in the project's purpose and intent [89]. The team members may self-regulate their activity with clear directions [90] that assist them in achieving their predetermined objectives.

Consequently, a project is anticipated to be effective in a situation where project objectives, client expectations, and management expectations are all apparent to the project manager and followers [91]. Here, the study's goal is to determine how project scope clarity relates to the success of projects in Pakistan's construction sector. The proposed hypothesis for this work is as follows:

Hypothesis 3 (H3): *Clarification of the scope of a project has a favorable influence on the project's success in the construction industry.*

The competence of a project manager relates to how well they manage people and tasks [92]. The project manager's abilities and position within the project determine whether it succeeds or fails [41,58]. Steyn [69] argued that the project manager is a bonding member keeping the project together. The project manager needs leadership characteristics and management capabilities [93]. Anantatmula, V. S. [94] claimed that a project's performance and outcomes influence the participants' and shareholders' leadership roles and responsibilities. One of the skills necessary for the success of a construction project is the project manager's capacity to comprehend the cultures of the people on their team [95]. Identifying organizational cultural impacts and consequences is crucial in international projects, and multicultural project management skills have become an essential aspect [96]. According to Punzo, V. A. [97], the project manager must bridge the cultural difference between team members to promote effective communication, interpersonal relationships, problem-solving, collaboration, and synergy. The leadership of multicultural teams is a severe issue for global organizations [78]. Team members from different cultures see appropriate leadership conduct differently and prefer other types of leadership [98]. Leaders of multicultural teams must modify their management approach in light of the team's cultural variety [99] and steer through the many hierarchical behaviors. To understand how organizational culture and construction project performance are related, this study endeavor will examine the moderating role that project management skills play. The proposed hypothesis to study this relation with Pakistan's construction industry is as follows:

Hypothesis 4 (H4): *Positive effects of moderating the role of project manager competencies enhance the impact of organizational culture for successful construction projects.*

The chosen engagement style might differ from project manager to project manager and project to project, but communicating with stakeholders is still a crucial part of a project manager's skill set [100]. To prevent issues with comprehending the timelines, quality, and cost, the project manager should develop proper communication channels [101]. Leaders who lack strong communication skills are not leading at all [102]. Heldman [103] noted that "communication skills are the most important skills that a project manager possesses." Campbell [104] stated that "good communication and strong leadership go hand in hand." Barrett [105] characterized how project leaders monopolize other people's attention. Because of this, a project manager has to be a great communicator. It is crucial to continue the project and identify and address any problems [60]. When communication breaks down between partners, the project results may suffer. The project manager is aware of the communication, that it was delivered to the intended audience, and that everyone can comprehend it in the target language [96]. The project manager will increase the project team's effectiveness by coordinating among the participants. This study effort proposes the following hypotheses to examine the influence of project manager competencies on project success by modifying the communication management difficulties in Pakistan's construction sector.

Hypothesis 5 (H5): *Moderating the role of project manager competencies shows a positive impact on the communication management for construction project success.*

The project manager's primary responsibility is determining the team members' roles and duties and their overall objectives and aims [95]. It affects the effectiveness of the design process and stakeholder project management, as well as the final cost, time, and quality performance of the project [106]. Experts and researchers have determined the crucial quality indicators that characterize a project's success [107]. Ali et al. [108] said that a modest leader is likelier to create project goals by recognizing followers' dedication, capability, and input to accomplish the project's aims. For the whole process, the leader must be able to employ skilled and efficient staff and have a clear vision and clear thinking [109]. A successful project manager must ensure that the project's short- and long-term priorities are met and carried out following the client's specifications [110]. The project team members are educated on the project objectives, customer and management requirements, and transactional leadership style to reflect team member expectations [111]. The project team members must be informed of the broad scope, aims, and objectives of the project [112]. Team strength and success result from clear goals and effective leadership [113]. The project manager should explain the construction project's early priorities, and participants should be reminded constantly of the original aims [114]. The assertion of the following hypothesis is intended to explore the project managers' ability to modulate the link between project success and scope clarity in Pakistan's construction sector.

Hypothesis 6 (H6): *Project manager competencies will moderate the relationship between clarity in project scope and construction project success.*

The conceptual structure of the study is shown in Figure 1. Project manager competencies serve as a moderator, while factors including organizational culture, communication management, and project scope clarity operate as independent variables. The success of a construction project is related to these variables in this research work.

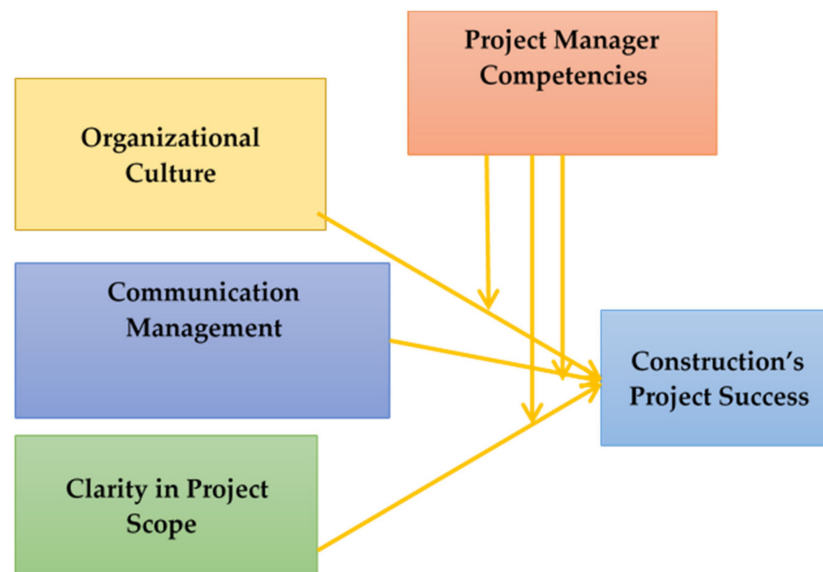


Figure 1. Conceptual framework.

3. Research Methodology

3.1. Research Design-Research Onion

Research strategy is a practice or established procedure that enables research to be conducted. The visual representation of the many study stages is called a “research onion.” Respecting each level of the research onion, Saunders et al. [115] originally suggested the concept in 2007. It inevitably covers each step in creating a research policy. Every level of research onion, when viewed from the outside, exposes additional details. Its utility stems from the fact that it can be adapted to nearly any research approach and from the variety of frameworks it can support [116]. In Figure 2, Saunders et al. [115] discussed an onion research study and put into reality the idea that establishes the research method to produce results.

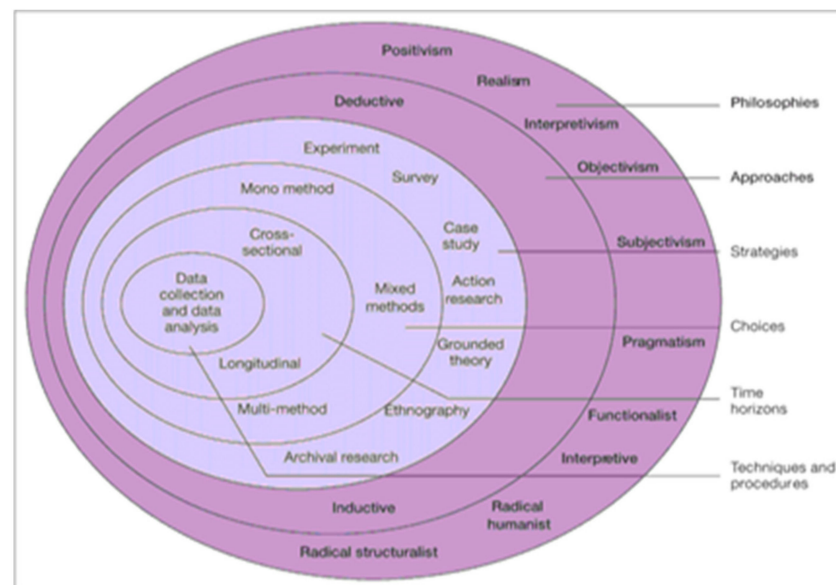


Figure 2. Research onion, after: [115].

3.2. Research Approach Followed

Research strategy is essential, since it determines the framework or technique used in research. Several approaches may be employed, in the context of a research study that

explicitly lays out the roles of engagement, the methodology, and the instruments to be used for a particular approach. Positive epistemology served as the foundation for the study methodology [117], utilizing hypothesis testing and deductive theory creation [118]. Figure 3 presents a clear road map and demonstrates the research technique used for this study.

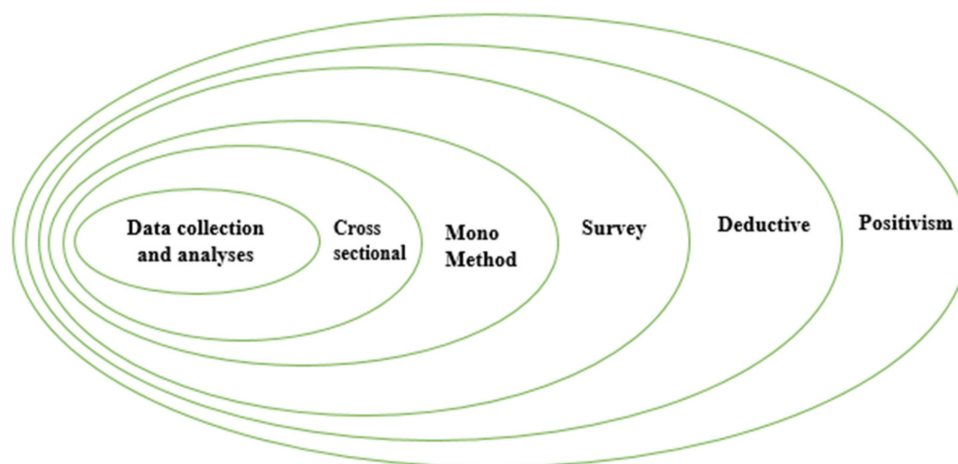


Figure 3. Approach Followed for Research.

3.3. Sample and Data Collection Procedure

The collection of people or things with comparable features is considered the research population [119]. Professionals in the construction industry are the population for this research work, such as project coordinators, project advisers, project teammates, and project managers. Information was acquired through surveys using questionnaires. The surveys for data collection were conducted in two phases. In the first phase, a survey was conducted between February 2022 to April 2022. In the second phase, a survey was conducted between May 2022 to July 2022. Additionally, questionnaires are simple to read, understand, and complete [120]. Questionnaires were sent to respondents in two phases, using the convenience sampling approach. This kind of sampling was chosen because the sample participants were simple to reach and deal with [121]. It shows that researchers mainly select samples from people they can access easily. The material was, thus, meant to come from sources representative of all the professionals who had taken part in significant construction and development projects in Pakistan.

Given that the research variables were on an ordinal scale, ordinal logistic regression was used (i.e., a five-point Likert scale) [122]. Every research variable was recorded on a Likert scale of 1–5, with one representing strongly opposed and five representing highly agreed. An eight-item scale was used to measure the influence of organizational culture on construction project success, which originated from [14]. A five-item scale was used to measure the influence of communication management on project success derived from the work [123]. A four-item scale was used to measure the influence of clarity in project scope on project success, which was also generated from [123]. Moderating impact of project manager’s competencies, were assessed utilizing a nine-item scale that was derived from the work of reference [37]. This scale included three dimensions: skills competency, knowledge competency, and experience competency. The construction project’s success depended upon the described variables and was assessed using a nine-item scale developed by [37]. This scale assessed project success in three dimensions: achieving quality in project success, fulfillment of the project within the prescribed time, and the accomplishment of the project within a predetermined budget. To prevent respondents from coming up with their hypotheses about potential cause-and-effect linkages, the questions (independent and dependent variables) were positioned individually in the order of the questions from reference [124]. The questionnaire for this research work is attached in Appendix A.

4. Data Collection and Result Analysis

The information from the survey-based data is presented in this section. The success of a project may sometimes be illusory, as enterprises that were once judged to be total failures go on to achieve astounding success and vice versa. Such results rely on important stakeholders' satisfaction and perceptions of success [125]. In light of this, longitudinal data collection was performed (i.e., at 3- to 4-month intervals). Two identical phases of data gathering were completed, and various analyses were used to evaluate the hypotheses. These evaluations sought to present conclusive research of the proposed hypotheses. Diagnostic tests were run before the regression analysis to check for any assumptions that could have been broken. The data distribution was determined to be expected for all research variables, and none of the variables had any missing values. As a result, SPSS version 23 was used to perform the ordinal regression analysis. Before constructing the interaction, the independent and moderating factors were mean-centered to reduce the latent problem of multi-collinearity [126]. SEM is a technique to evaluate and describe the relationship among multiple variables [127]. A correlation test was run, following descriptive analysis, to gauge how strongly the variables were related [128]. Regression analysis was used to evaluate the connection between the dependent and independent variables [129,130], while moderation analysis was used to ascertain the role of the moderating variable [131]. The research outcomes are given in tables, which are discussed next to each table. Graphs and figures that illustrate the data results are also provided. The no. of respondents' data for both phases of data collection is shown in Table 1.

Table 1. Total questionnaires sent and their turnover.

Data Collection	Total	Received	Valid	Invalid
Phase 1	300	160	135	25
Phase 2	430	250	233	17

A total of 730 professionals were approached in both phases to fill out the questionnaire, out of which 410 respondents filled. Table 1 expresses the collected data. In the first phase, 135 of the 160 replies were deemed valid and utilized for further SPSS analysis. The remaining 25 submissions, however, were deemed invalid and eliminated because of some missing or incorrect information. Percentages of answers are shown in Figure 4; 53.3% of respondents provided answers, of which 15.40% were deemed invalid, and the remaining 84.60% were legitimate. These responses will be utilized for future research and to perform various analyses under the needs of the study.

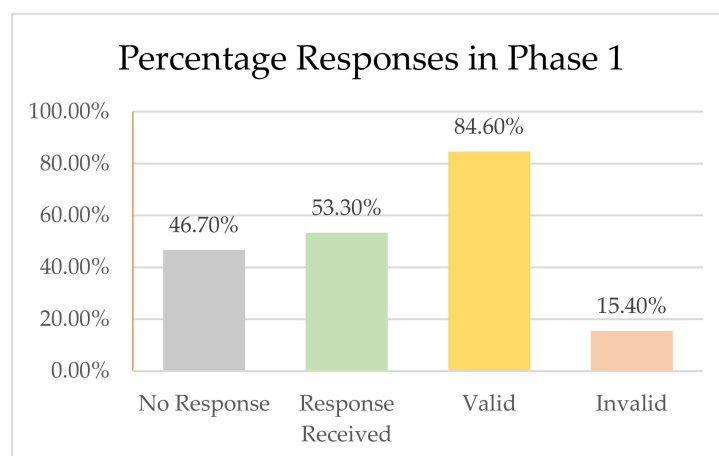


Figure 4. Percentage of total questionnaires sent and their turnover.

In the second phase of data collection, 430 questionnaires were distributed among professionals, and 250 responses were received, from which 17 questionnaires were discarded. At the same time, the remaining 233 were taken for further analysis. Figure 5 provides the percentages of survey turnover; about 58.1 percent of respondents responded, of which about 7 percent were deemed invalid, leaving about 93 percent that were considered genuine and utilized for additional research and other analyses under the needs of the study.

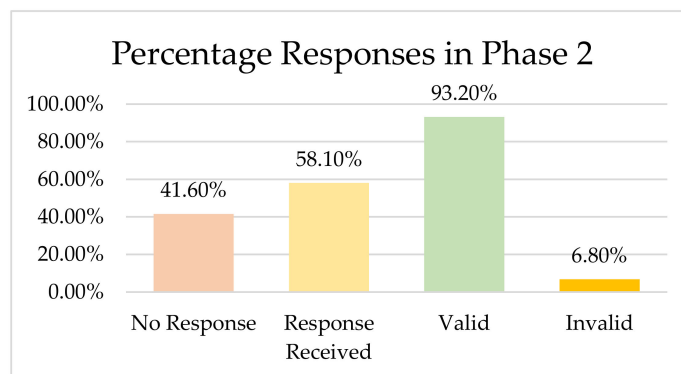


Figure 5. Percentage of total questionnaires sent and their turnover.

4.1. Characteristics of Participants

Workplace deviation among employees is influenced by gender, age, education, and experience [132,133]. Consequently, the research has taken the demographics into account. We used one-way ANOVA to determine if these demographic factors impacted the building project's success in this research [134]. No discernible variations between early and late replies were seen in the data. Respondents consisted of males (123 and 208), or 91.1% and 89.3%, respectively, and females (12 and 25), or 8.9% and 10.7%, respectively, in both phases. According to this study, the maximum percentage (43.7 and 51.5, respectively) of respondents working in the Pakistan construction industry are qualified for the B-Tech level. In the first phase, the maximum number of respondents (36.3%) belonged to the 28–36. While in second phase, the respondents belonging to the age group 36–44 had a high percentage (34.4%). Most of the respondents (45.2% and 51.9%, respectively) worked as supervisors on their construction projects. The respondents having experienced 11–15 years responded to the survey with a higher percentage (39.8% and 47.6%) in both phases, respectively. Table 2 shows the overall characteristics of the participants of the study.

Table 2. Characteristics of the participants.

Characteristics of Participants in Phase 1 and Phase 2				
Gender	Phase 1		Phase 2	
	Frequency	Percentage	Frequency	Percentage
Male	123	91.1	208	89.3
Female	12	8.9	25	10.7
Qualification				
B-Tech	59	43.7	120	51.5
Masters	58	40.7	98	42.1
MS/M Phil	8	13.3	13	5.6
PhD	3	2.2	2	.9
Age				
20–28	36	26.7	68	29.2
28–36	49	36.3	79	33.9
36–44	44	32.6	80	34.3
44–52	3	2.2	3	1.3
Above 52	3	2.2	3	1.3

Table 2. Cont.

Characteristics of Participants in Phase 1 and Phase 2				
Designation				
Site Engineer	32	23.7	52	22.3
Supervisor	61	45.2	121	51.9
Project Manager	13	9.6	24	10.3
Administration	29	21.5	36	15.5
Experience				
1–5	43	31.9	51	21.9
6–10	24	17.8	56	24.0
11–15	53	39.8	111	47.6
16–20	15	11.1	15	6.4

4.2. Mean and Std. Deviation

The mean and standard deviation values for variables derived from survey data are shown in Table 3. This will provide an overview of how survey participants responded to the questions [135]. The demographic and study variable std. deviations and means are shown in Table 2. Here, the norm departs from the mean values of all demographic and other variable responses [136].

Table 3. Mean and std. deviation.

	Phase 1		Phase 2	
	Mean	Std. Deviation	Mean	Std. Deviation
Gender	1.1005	0.30113	1.1073	0.31016
Qualification	1.6250	0.69692	1.5579	0.64148
Age	2.1359	0.90293	2.1159	0.89025
Designation	2.2255	0.99355	2.1888	0.95523
Experience	2.3533	0.95123	2.3863	0.89836
Organizational Culture	3.5935	0.79758	3.6261	0.77777
Communication Management	3.3600	0.82455	3.4678	0.81051
Clarity in Project Scope	3.5370	0.94361	3.5440	0.93826
Project Manager Competencies	3.4774	0.83910	3.5031	0.82770
Construction Project Success	3.6181	0.59303	3.6274	0.57110

The mean and standard deviation values for gender show that most of the respondents were males, as, during statistical analysis, the gender type for males was denoted by the number 1. The mean and std. deviation values for qualification suggest that more of the respondents were qualified to master level as, during statistical analysis, the qualification level for the master was denoted by the number 2. The mean and std. values for age suggest that more of the respondents were aged between (28–36 years) as, during statistical analysis, the age between (28–36 years) was denoted by the number 2. The mean and std. values for designation suggest that more of the respondents were working as supervisors, as during statistical analysis, the designation for supervisor was denoted by the number 2. The mean and std. values for experience suggest that more respondents had an experience of 5–10 years, as the experience interval for 5–10 years was denoted by 2 during statistical analysis. Similarly, the mean and standard values for the independent and dependent variables expressed that most of the responses lied between the range of (3–4), as during statistical, highlighting that most respondents agreed or were neutral to the questionnaire statements.

4.3. Reliability Analysis

The quality of the questionnaire or scale adopted to gather the replies of responders has a significant impact on how well a quantitative research study turns out. The validity and reliability of the instrument (questionnaire) are substantial for obtaining valid and

trustworthy results. As a result, the instrument's validity and reliability were examined on SPSS software. The data source and position of the individual who filled out the questionnaire were both factors that affected how reliable the data was [137]. The instrument's reliability was assessed using SPSS to compute and monitor Cronbach's alpha. Measurement scales were developed from the literature that was already out there and had been verified by academics. All scales exceeded the suggested 0.6 thresholds for composite reliability [138,139] and displayed significant coefficient alpha values. The Cronbach's alpha value for each variable is more effective than 0.60, showing the reliability and validity of the instrument for that variable. Table 4 provides the Cronbach's alpha value for all 35 of the questionnaire's questions, which is 0.948 and 0.943 in both phases, respectively, are above 0.60, indicating consistency and connection between items demonstrating the validity and reliability of the survey's components.

Table 4. Reliability test phase 1 (combined all variables).

Reliability and Validity Statistics			
Phase 1		Phase 2	
Cronbach's Alpha	No. Of Items	Cronbach's Alpha	No. Of Items
0.948	35	0.943	35

As a result, the information gathered via the questionnaire was accurate for further statistical analysis. Furthermore, the same researchers suggested that priority should be given to the reliability of individual indicators [140].

The reliability statistics for each variable are shown in Table 5, above. Additionally, it can be seen from the table that the value of Cronbach's alpha for each variable remained at more than 0.6, indicating the validity and reliability of the questionnaire.

Table 5. Test for reliability phase 1 (individual variables).

Statistics for Reliability				
	Phase 1		Phase 2	
Variable Name	Cronbach's Alpha	No. of Items	Cronbach's Alpha	No. of Items
Organizational Culture	0.889	8	0.858	8
Communication Management	0.780	5	0.744	5
The clarity in Project Scope	0.811	4	0.796	4
Project Manager Competencies	0.875	9	0.867	9
Project Success	0.728	9	0.704	9

4.4. Impact of Independent Variables on Dependent Variable

A combination of statistical techniques, known as regression analysis, were used to assess the correlations between a dependent variable and one or more independent variables [141]. Linear regression enables the linear function of one or more independent variables to be used to model a continuous dependent (outcome) variable [142]. Regression analysis enables the calculation of the concentration corresponding to a specific amount of effect corresponding to a defined concentration by constructing an equation for the concentration effect connection [143]. An equation expressing the link between engagement and impact was generated and used to compute the findings using regression analysis [144]. Regression analysis offers a straightforward method for extrapolating results to concentrations that have not been tested. At the same time, hypothesis testing provides quantitative data on the attention that has been put to the test [143]. Regression analysis is an effective statistical technique that enables you to investigate the connection between two or more relevant variables [145]. It is used to determine if one variable is dependent upon another.

Furthermore, it aids in anticipating data and creating predictions [146]. Due to thesis characteristics, regression analysis was adopted to find out the results of this study. Linear

regression was used in this study's examination of numerous variables to explore the effect of independent factors over dependent variables. It is simpler to utilize linear regression [147], easy to interpret [148], and gives more statistics that help to assess the model. The study's results will highlight the value of the independent variable model. The value of the beta indicates how much the independent variable influenced the dependent variable. The study framework is deemed legitimate if Sig. is fewer than 0.05, demonstrating a considerable impact of the IVs on the DV. However, if the significance level exceeds 0.05, the study framework is deemed invalid, showing that an independent variable has no impact on a dependent variable.

Linear Regression Analysis

To ascertain the correlations between each independent variable and dependent variable in this research project, linear regression analysis was used. The findings are shown in Table 6 below.

Table 6. Linear regression analysis.

Hypothesis	Regression Weights	Beta (β) Coefficient	R^2	F	t-Value	p-Value	Hypothesis Summary
Phase 1 (impact of individual variable on dependent variable)							
H ₁	OC→PS	0.437	0.346	70.273	8.383	0.000	Supported
H ₂	CM→PS	0.508	0.500	132.807	11.524	0.000	Supported
H ₃	CPS→PS	0.426	0.460	113.265	10.643	0.000	Supported
Phase 2 (impact of individual variable on dependent variable)							
H ₁	OC→PS	0.430	0.343	120.371	10.971	0.000	Supported
H ₂	CM→PS	0.478	0.460	196.464	14.017	0.000	Supported
H ₃	CPS→PS	0.389	0.409	159.557	12.632	0.000	Supported

First, to understand each impact on the dependent variable, linear regression analysis is discussed in this section for both phases of data collection. The coefficient of determination (R^2) is often considered the best metric to describe how well model predictions match those experimentally observed. The coefficient of variation (R^2), a crucial measure of a model's fitness, measures how much deviation in the reliant variable can be described by the independent variable (s). The stronger the independent variable's explanation, the better the model's fit as R^2 's value rises [149]. At $p < 0.05$, the results were deemed significant. As shown in Table 6, the dependent variable, the success of the construction project, was moderately correlated with organizational culture in both phases ($r = 0.346$, $p < 0.05$ and $r = 0.343$, $p < 0.05$), communication management ($r = 0.500$, $p < 0.05$ and $r = 0.460$, $p < 0.05$), and clarity in project scope ($r = 0.460$, $p < 0.05$ and $r = 0.409$, $p < 0.05$).

The results of the hypothesized relationships between the independent and dependent variables are shown by the beta values [150]. The independent variable's impact value is represented by the beta coefficient [149]. The overall approach for predicting the success of construction projects was important. The outcomes of the linear regression analysis for the beta values showed that construction project success, the dependent variable, was impacted positively by organizational culture in both phases ($\beta = 0.437$, $p < 0.05$ and $\beta = 0.430$, $p < 0.05$), communication management ($\beta = 0.508$, $p < 0.05$ and $\beta = 0.478$, $p < 0.05$), and clarity in project scope ($\beta = 0.426$, $p < 0.05$ and $\beta = 0.389$, $p < 0.05$). The amount by which the outcome variable changed for each unit that the predictor variable changed was measured by the beta coefficient [151]. The outcomes for β value showed that the dependent variables were being changed, due to the change in the independent variables individually.

4.5. The Combined Impact of All Independent Variables on Construction Project Success

The cumulative impact of all independent variables on the dependent variable was examined using multiple regression analysis. Linear multiple regression was the name

given to linear regression that includes several variables. The procedures for multiple linear regression resemble basic linear regression quite closely. Estimation makes a difference. This can determine which factor influences the anticipated output and how different elements are related [152]. The formula (1) for numerous reversals is as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \quad (1)$$

here, "Y," or the construction project's success, is the dependent variable.

Multiple Regression Analysis

A deeper analysis of the variables influencing the building project performance was carried out by examining the simultaneous effect of every element operating together. It is advantageous to distinguish between the variables that substantially affect the dependent variable prediction in this manner between the impact levels given by the beta coefficients [149]. Multiple linear regressions were carried out for this objective. The outcomes are shown in Table 7, given below.

Table 7. Multiple regression analysis.

Hypothesis	Regression Weights	Beta Coefficient	R ²	F	t-Value	p-Value	Hypothesis Summary
Phase 1 (combined impact of all variables on dependent variable)							
H ₁	MeanOC→PS	0.135			2.568	0.000	Supported
H ₂	MeanCM→PS	0.269	0.604	66.599	4.698	0.000	Supported
H ₃	MeanCPS→PS	0.215			4.666	0.000	Supported
Phase 2 (combined impact of all variables on dependent variable)							
H ₁	MeanOC→PS	0.160			3.838	0.000	Supported
H ₂	MeanCM→PS	0.256	0.552	94.071	5.691	0.000	Supported
H ₃	MeanCPS→PS	0.170			4.572	0.000	Supported

The beta coefficient represents each independent variable's effect value. The outcomes show how all the previously mentioned variables influenced the dependent variable at once. Accordingly, construction project success, the dependent variable, was impacted positively by organizational culture in both phases ($\beta = 0.135$, $p < 0.05$ and $\beta = 0.160$, $p < 0.05$), communication management ($\beta = 0.269$, $p < 0.05$ and $\beta = 0.256$, $p < 0.05$), and clarity in project scope ($\beta = 0.215$, $p < 0.05$, $\beta = 0.170$, $p < 0.05$). The R²(0.604 and 0.552) values in both phases indicated that the current sample R² reflected a good indicator of population variation.

The model of the multiple regression Equation (2) will be provided based on the Table 7 coefficients:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \quad (2)$$

here, "Y," or the construction project's success, is the dependent variable. Organizational culture, communication management, and project scope clarity are the independent factors, given as X₁, X₂, and X₃. The multiple regression Equation (3) for phase 1 will be constructed using the values obtained from the tables mentioned earlier, as follows:

$$\text{Construction's Project Success} = 1.456 + 0.135 (OC) + 0.269 (CM) + 0.215 (CPS) \quad (3)$$

The multiple regression Equation (4) for phase 2 will be constructed using the data obtained from the tables, as mentioned above, in the manner described below:

$$\text{Construction's Project Success} = 1.558 + 0.160 (OC) + 0.256 (CM) + 0.170 (CPS) \quad (4)$$

The results of the multiple regression analysis are significant and positive for all independent variable coefficients. Positive values also suggest that the dependent and independent variables are related in a direct proportion, meaning that the dependent

variable will rise in importance, as the independent variable does. How strongly each independent variable predicts the dependent variable is shown by its significance. The null hypothesis for each variable was refuted because their relative relevance was less than 0.05. The regression coefficient's sign also indicated a favorable correlation. Based on the findings of multivariate regression analysis, it is feasible to evaluate whether the assumptions believed to be true should be accepted or rejected.

4.6. Correlation Analysis

Clarifying the level of reliance among all the variables under consideration is the purpose of the correlation test. A Pearson correlation coefficient describes this type of relationship [153]. Internal consistency is the extent to which items within a scale are correlated with each other in a questionnaire [154]. The correlation that emerges from this analysis demonstrates the intensity of the association between the variables, including the existence or absence of a relationship, the degree to which the variables are dependent upon one another, and the type of relationship, i.e., whether it is positive or negative. Correlation analysis provides a quick and uncomplicated summary of the direction and strength of the association between the discussed variables.

In correlation testing, "Sig" and "Pearson Correlation" are the two values of interest. The significance can be determined if there is a relationship between the variables, based on the strength of the connection. The variables are interdependent if the value of Sig. is less than 0.05, and variables are not interdependent if the value of Sig. is more than 0.05. The sign of a Pearson correlation value with a positive value signifies a direct relationship and reflects the proportionality of the link between variables. Pearson correlation values vary from 0.00–1.00. There is scarcely any link if the Pearson connection value is between 0.00–0.20. Values between 0.21–0.40 demonstrate a weak association, while the value of 0.41–0.60 suggests a modest correlation. Additionally, the values between 0.61–0.80 indicate a high correlation value; values between 0.81 and above indicate an ideal degree of correlation. The values of the correlations for the study's variables are predicted in Table 8, below, which also explains the nature of the relationships between the variables.

Table 8. Correlation analysis.

No.	Variable	1	2	3	4	6
Phase 1						
1	Organizational Culture	1				
2	Communication Management	0.612 **	1			
3	Clarity in Project Scope	0.516 *	0.646 **	1		
4	Project Manager's Competencies	0.555 **	0.760 **	0.773 **	1	
5	Constructions Project Success	0.588 **	0.707 **	0.678 **	0.778 **	1
Phase 2						
1	Organizational Culture	1				
2	Communication Management	0.594 **	1			
3	Clarity in Project Scope	0.544 *	0.665 **	1		
4	Project Manager's Competencies	0.662 **	0.783 **	0.781 **	1	
5	Constructions Project Success	0.585 **	0.778 **	0.639 **	0.735 **	1

Note: Sig. (2-tailed) is 0.000, * $p < 0.01$, ** $p < 0.05$.

The outcomes of the correlation analysis have shown that the all-independent variables were positively and significantly correlated with the dependent variable (construction project success).

4.7. Moderation Analysis

Moderation analysis finds the influence of moderators on the relationship between IVs and DV. The influence moderator may be constructive or vice versa. The project manager competencies (PMC) were investigated in this research as a moderator. The analysis was

carried out by creating interaction terms between independent and moderating variables, and the structural equation model is presented as discussed by reference [155].

The results of the moderation analysis are represented below in Table 9, given below:

Table 9. Moderation analysis.

Hypothesis	Regression Weights	Beta Coefficient	R^2	F	t-Value	p-Value	Hypothesis Summary
Phase 1							
H1	Mean OC→PS	0.163			2.856	0.005	Supported
H2	Mean CM→PS	0.220			3.950	0.000	Supported
H3	Mean CPS→PS	0.264			5.416	0.000	Supported
H4	OC × PMC → PS	0.030	0.712	42.665	2.146	0.034	Supported
H5	CM × PMC → PS	0.028			2.010	0.046	Supported
H6	CPS × PMC → PS	0.033			2.569	0.011	Supported
Phase 2							
H1	Mean OC → PS	0.160			3.838	0.000	Supported
H2	Mean CM → PS	0.256			5.691	0.000	Supported
H3	Mean CPS → PS	0.170			4.572	0.000	Supported
H4	OC × PMC → PS	0.036	0.613	59.662	3.260	0.001	Supported
H5	CM × PMC → PS	0.033			2.782	0.006	Supported
H6	CPS × PMC → PS	0.017			1.597	0.012	Supported

The results of the moderation analysis describe an improvement in the model, as the values of R^2 ($r = 0.712$, $p < 0.01$ and $r = 0.613$, $p < 0.01$) increased in both phases, respectively. The value of R^2 was obtained by performing multiple regression analysis when the project manager's competencies were introduced as the moderator by producing interaction terms. The impacts of all the independent variables and moderators were assessed simultaneously with the dependent variable. This increment in the value shows that project manager competencies have strengthened the relationship between separate and independent variables, which supports the proposed Hypotheses (4)–(6).

Comparison of R^2 values (Phase 1): Table 9 summarizes the IV and the moderator's impact on the DV. The R -value is 0.712, which shows a significant association between DV and IVs. According to " R^2 ", equivalent to 0.712, the construction project success will vary by 71.2% because of independent variables, when the moderator influences these. The model greatly enhanced when judging these findings, compared to the prior regression ($R^2 = 0.604$) studies that did not consider the moderator. The current model of R^2 had a value of 71.2% percent, which suggests that project manager competencies have positively influenced the independent variables to achieve project success.

The function of a moderator is seen in Figure 6a. The graph below illustrates how the moderator strengthened the relationship between the independent variables and construction project progress.

The statistical model of our theoretical framework is computed in this Table 9. In other words, it indicates whether the gathered data can be utilized to roughly approach the regression equation we created using a theoretical model. The Sig. column is crucial in this scenario. A significance level of less than 0.05 is necessary for the research model. The research model of this study is noteworthy and accurately captures the data received from the respondents (significance = 0.000). After that, it may generate a regression equation to determine whether the hypotheses are correct. The equation below (5) must be used to compute regression. In a structural equation model, latent variables are abstract and complex to see directly, but they are represented by several observable variables [156]. One of SEM's numerous advantages as a second-generation multivariate analytic approach is that it allows for the exploration of a broad range of complicated interactions using a single model or the representation of ambiguous constructs with several observable components [157,158].

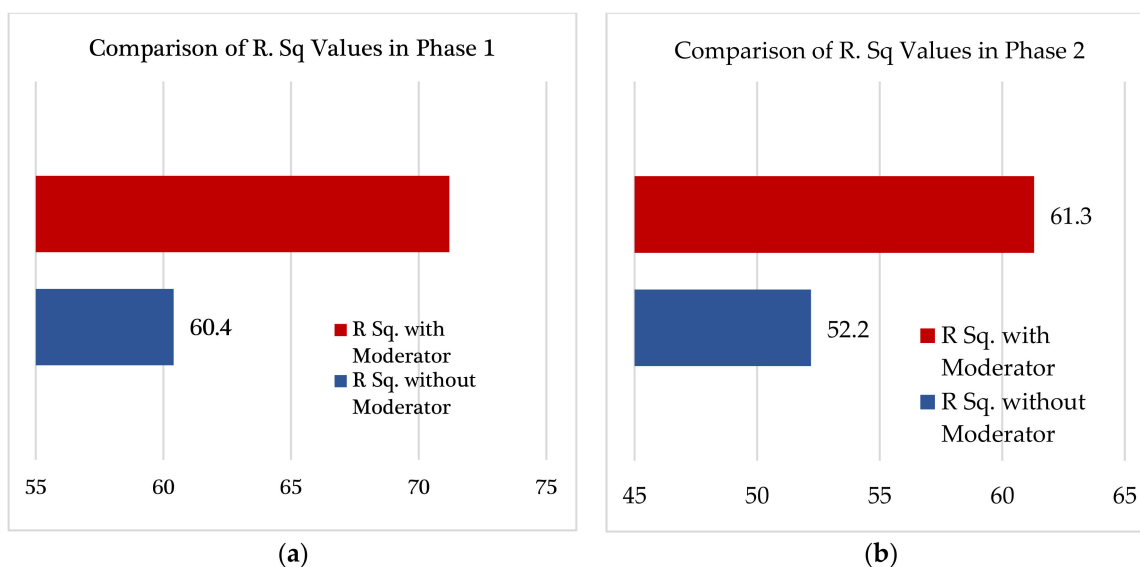


Figure 6. (a). Comparison of R-Square in Phase 1. (b). Comparison of R-Square in Phase 2.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_1 M + \beta_5 X_2 M + \beta_6 X_3 M \quad (5)$$

Table 9 gives the values of unstandardized beta when project manager competencies act as a moderator, and the regression Equation (6) from these can be concluded as follows:

$$PS = 1.465 + 0.163 (OC) + 0.220 (CM) + 0.264 (CPS) + 0.030 (PMC \times OC) + 0.028 (PMC \times CM) + 0.033 (PMC \times CPS) \quad (6)$$

There is a clear correlation between DV and IVs, as seen by all the significant and positive regression analysis coefficients. The spark of the association is the moderator. If an independent variable accurately approximates the value of the dependent variable, it is regarded as significant.

Comparison of R^2 values (Phase 2): The significance of the link between DV and IVs is demonstrated in Table 9. The success of the building project was influenced by IVs and the moderator, to the tune of 61.3% ($R^2 = 0.613$). The model considerably improved when comparing the analysis outcomes with and without moderating variables ($R^2 = 0.552$). The current model's R^2 value was 61.3%, which describes that that introduction of moderating variables improved the impact of the IVs on the DV.

Figure 6b compares the R^2 values with and without a moderator. The moderator influenced the performance of construction projects and independent variables.

Table 9 gives the values of unstandardized beta to be considered for use in the regression Equation (7), which can be concluded as follows:

$$PS = 2.510 + 0.160 (OC) + 0.256 (CM) + 0.170 (CPS) + 0.036 (PMC \times OC) + 0.033 (PMC \times CM) + 0.017 (PMC \times CPS) \quad (7)$$

The significant and positive regression analysis coefficients indicate a direct relationship between the DV and IVs. The moderator is the reason why the link took off. Each independent variable successfully estimated the dependent variable's value.

4.8. Operational Model

Figure 7 shows that the operational model made it abundantly clear that the relationship between independent variables and the dependent variable, project success, was positively influenced by independent variables and moderated by the moderating variable (project manager competencies). Statistics have shown this moderating impact. It suggests that having strong project management skills increases the likelihood of completing a

construction project successfully, increasing the firm's production. As in phase 2, more remarkable respondents were studied, so for the operational model description, it would be more fruitful to consider the data collection outcomes in this section for the practical model of the research work.

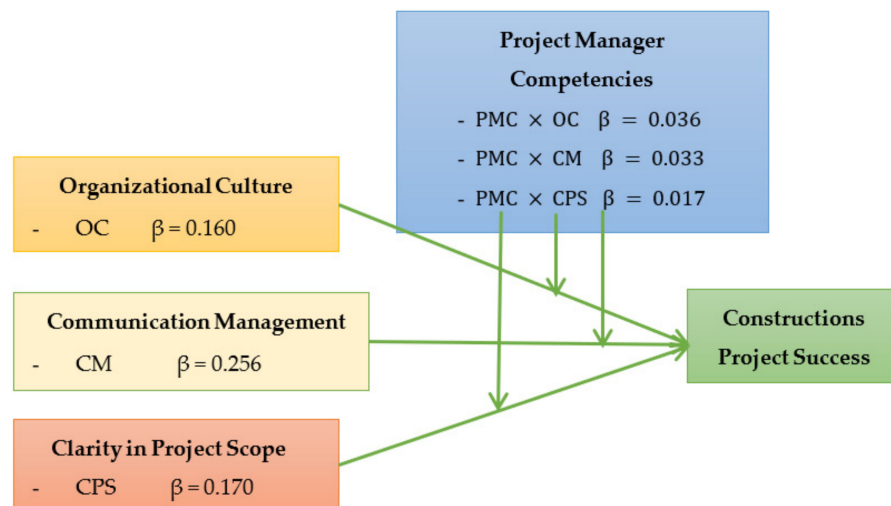


Figure 7. Operational model for Phase 2.

5. Discussion

This research/study sought to understand the relationships between organizational culture, communication management, and project scope clarity to achieve project success in Pakistan's construction industry. It also sought to demonstrate the influence of the moderating role of project manager competencies on the above-discussed relationships. According to the study's findings, organizational culture, effective communication, and a clear understanding of the project's scope all impact how well a construction project goes. Additionally, it has been clear from the study of moderating project manager competencies that project managers can play a vital role in minimizing the adverse effects of these independent variables. Additionally, past studies have shown that corporate culture impacts different project stages [159,160]. Most people agree that an essential element of the corporate environment is culture [161].

The findings of the two research phases have shown that the variation in construction project success is related (by 43.7% and 43.0%) to organizational culture when observed individually. Additionally, while the combined impact of all variables is still being studied, it was found that the construction project's success was related to 13.5% and 16% of an organization's culture. The organizational culture has been seen to impact the success of building projects significantly, and this research is consistent with the results of references [73,77]. Ponomarenko, E. A. [162] claims that organizational culture is one of the most crucial variables in a project. Although its influence is generally known, it may not be easy to pinpoint because of how the culture interacts with other factors. Alas et al. [163] have highlighted organizational culture as one of the critical elements influencing an organization's effectiveness and production. The efficiency of businesses and, ultimately, the construction industry may be improved by establishing and preserving a favorable culture to drive performance improvement [164]. So, in light of this research and the previous discussed studies, it can be said that there is a need to produce a positive organizational culture within Pakistan's construction industry, which would support the increased rate of success of construction projects, as described by Alas et al. [163], in which effective corporate cultures allow organizations to be advanced. To do this, construction businesses must create a culture that inspires and supports their employees' creative behavior. As suggested by [83], construction firms should also create a culture where they reward their staff and welcome innovative ideas for maintaining their performance and competitive ad-

vantages. Considering the above discussion and the results of quantities analysis, it can be assumed that the first hypothesis (H1), that organizational culture impacts the construction project success, falls true. It is recommended that construction firms working in Pakistan urgently need to improve their organizational culture. It is suggested that the organizational culture of construction companies has to be examined for defects and weaknesses. Appropriate measures need to be taken to address these issues. Regular workshops and training can play a vital role for the team members in overcoming organizational culture issues. Kivrak et al. [165] should develop strategies to address the cultural problems.

People's ability to communicate with one another is crucial to the completion and success of projects. Conflict occurs when people with diverse origins, cultures, customs, and behaviors encounter it [166]. Salman et al. [167] has said that the influence of communication on project success requires consideration since project success has grown more complex with time. Due to their decentralized character and the fact that different project teams have varying duties and variable times to join the project, building projects place an even greater emphasis on communication [168]. This study's research question was to determine the impact of communication management on construction project success in Pakistan's construction industry. The results of this study's two phases of data collection revealed that the variance in construction project success is associated with (50.8% and 47.8%) communication management, when observed individually. Additionally, while the combined impact of all variables is still being studied, it was found that the construction project's success is related to (22.0% and 26.5%) communication management. These results strongly support the second hypothesis (H₂), i.e., that a construction project's success is positively impacted by effective communication management, according to research that is consistent with studies of references [169,170]. According to the global context, the communication gap is a challenge for project success [171]. In addition to progress meetings, document distribution, and routine information sharing across project teams, informal conferences and one-on-one chats among team members also count as forms of communication in the construction industry [172]. Poor communication is a common problem in construction projects, and as its effects might affect a project's performance, it should not be overlooked [60]. As a result, there is a strong and positive correlation between effective communication management and the success of building projects. As a result, it can be inferred that construction organizations in Pakistan need to strengthen their methods for managing communication, as doing so would make communicating with team members on a project more manageable. Construction companies should avoid any ineffective, failed, or insufficient communication methods. Lack of, or poor, communication management may cause a construction project to fail. Thus, it is critical to avoid negligence in the processing and delivery of information during construction in the construction industry. It might be claimed that effective communication is crucial for a construction project to succeed.

It is well-acknowledged that clear project definitions are essential to the success of building projects [173]. Fageha and Aibinu [27] noted that a weak project brief might have a detrimental impact on the project's success. A methodology that had been designed to help the project management team evaluate how thorough the briefings were for building projects was used to reach this conclusion. Xia et al. [93] spoke about how a clear project brief may directly impact project performance. Vahabi. A [174] has addressed how improving clarity early on minimizes the need for quick adjustments and further brief explanations during the latent briefing phase, reducing the cost and time of the latent briefing process. Similarly, he says that, by improving the design constructability in construction projects, a properly defined project brief in the first phase may increase project time performance.

There is compelling evidence that an independent and adequate understanding of project goals may encourage team members to accomplish projects on schedule and within budget [175]. When objectives are not conveyed properly, people may not understand the project's direction or purpose. It is easier for followers to self-regulate their efforts with clear instructions [176]. According to several studies, poor scope definition results in costly revisions, delays, rework, cost overruns, schedule overruns, and project failure [27,31].

Most experts agree that a precise project definition is essential for project success [177]. This research study aimed to determine how project scope clarity affected the success of building projects in the Pakistani construction sector. The findings of this study's two rounds of data collecting have shown that the variance in construction project performance is related (by 46.0% and 40.9%) with clarity in project scope, when observed individually. Additionally, while the combined impact of all variables is still being studied, it was found that the construction project's success is related to (21.5% and 17.0%) the clarity of the project scope. These results strongly support the third hypothesis (H₃) of the study, i.e., that communication management has a positive impact on the success of a construction project, which is in line with studies [178,179]. This research supports prior claims that organizations and project managers may raise team member knowledge, interpersonal engagement, and problem-solving skills via an efficient goal-clarification process, all of which positively impact project success [180]. According to the study's findings, there is little prospect for success without a well-defined project scope. For a project to go forward in a coordinated way, the project's capacity must be defined and documented. Therefore, it can be presumed that it is necessary to improve the clarity of project scope concepts while executing construction projects in Pakistan.

The ability of the project manager to accomplish the strategic business goal is essential for project success. Numerous studies have shown that having strong leadership qualities may be a critical factor in a construction project's success [175]. Crawford [181] and Edum-Fotwe and McCaffer [182] investigated the specific abilities of project managers in construction projects and the relationship between those qualities and project success. The compatibility of project managers' skills with the project type was considered by Muller and Turner [183,184]. To effectively manage teams and supervise numerous projects, successful construction project managers must possess a broad range of abilities and experiences [185]. Based on research conducted by Oshinubi, O.O. [186], a frequent issue that impacts a group's performance stems from the project manager's leadership style. So, it is an important task to appoint a competent and skilled project manager for a construction project. According to [187], in construction, the decision-making process for choosing a project manager is complicated and ambiguous. Setting up adequate and methodical criteria that consider the project client's goals and expectations is, thus, essential for effective project manager selection. Mazur and Pisarski [188] thought that project managers should be in charge of managing both internal and external stakeholders. A successful project manager may be predicted with growing accuracy by their abilities [189,190]. Studies completed more recently, between 2015 and 2019, indicated that the emphasis on examining and assessing project managers' abilities in building projects has been maintained [191,192]. The research questions sought to determine the moderating influence of project manager abilities between the independent variables of this study and construction project success, keeping in mind the significance of project management for the success of a construction project. The quantitative analysis found that the project manager's competencies have moderated and strengthened the relationship between independent and dependent variables. As for every unit increase in the construction project success, project manager competencies will enhance the relationship by 3% and 3.6% for construction project success, 2.8% and 3.3% for communication management, and 3.3 and 1.7% for clarity in project scope. These outcomes supported the study's fourth, fifth, and sixth hypotheses (H₄, H₅, and H₆). This research also intended to evaluate whether the shift in project management competencies influenced the relationship between organizational culture and the effectiveness of building projects. A moderation evaluation found that altering project manager competencies may influence organizational culture and project success. These findings demonstrate that project managers should be knowledgeable about company culture and, consequently, well-qualified [95,193]. The study found that a shift in project manager skills moderates the relationship between communication management and the success of building projects. These findings are consistent with reference [194,195] Stronger communication between the parties is facilitated by project management competency. This research aimed to ascertain if

the relationship between project manager competence and project success may be moderated. This research discovered that the project manager's competence mediates the success of construction projects. These results are supported by [196,197]. The regression analysis validates every hypothesis derived from these study topics. Therefore, it can be said that, if the construction industry wants to increase efficiency, the factors mentioned should be considered. There should be appropriate workshops to improve worker skills and limit the adverse effects caused by organizational cultural differences, poor communication management, and unclear project scope. For project managers to fulfill their role in better arranging project processes, there must also be an appropriate framework for enhancing project management competencies. In terms of labor, value creation, and gross domestic product contribution, the construction industry is an essential component of every economy [198]. As Pakistan is a developing country, the findings of this research work should be adopted to enhance construction management practices.

The practical implications of the study lie in the sense that, from the outcomes of the previous studies, it can be said that delays in the construction industry of Pakistan are widespread. This ultimately replicates the industry's problem with project management or construction management practices. The current study results have shown a positive association between the studied variables and proved that the success of construction projects is influenced by organizational culture, communication management, and clarity in project scope. So, this study implies a need to improve these project management sections within Pakistan's construction industry. Additionally, the role of project manager competencies in achieving the success of the construction is recognized. So, there is a need to deal with factors with great care and professionalism. Some suggestions are enlisted as follows:

- The research outcomes emphasize the significance of organizational culture, concerning every aspect of project success (time, cost, and quality). The research shows that a progressive corporate culture enhances project efficiency, inspires project teams, strengthens the company's competitive advantages in the market, and provides new opportunities for the future. To improve construction management practices, the results of this study emphasize that construction firms should have a proper framework for adapting organizational culture, which should be designed by keeping in view the actual ground condition of the construction sites. Additionally, as in Pakistan, there is a lot of diversity in the traditional cultures of the population from different geographical areas, and the people are bounded by their linguistic prejudices. Due to this, people from diverse cultural backgrounds feel it challenging to work together. Therefore, construction organizations should set a welcoming organizational culture for the workers, creating harmony and teamwork between workers from different backgrounds.
- The findings of this study demonstrate that project communication has had a favorable and substantial impact on the project's success. This implies that effective communication promotes project success. There is a strong and positive correlation between the two variables. Proper communication between project team members fosters understanding, which results in the timely and efficient completion of project goals. In construction projects, several stakeholders are involved, such as clients, consultants, and contractor firms. So, a proper flow of information and communication management becomes more critical. This study highlights the importance of communication management in the Pakistan construction industry. It suggests adopting formal and informal communication methods, according to the ground conditions and scenarios. Proper communication management among all project participants must be maintained at every project step to avoid misunderstandings.
- The research shows that project success and goal clarity are causally associated. In Pakistan's construction industry, goal clarity becomes an issue when construction projects are started in the countryside, where the local inhabitants are not aware of the importance of the projects. So, this study suggests that the project scope should be clear to all participants early on, and they should be informed of the benefits and drawbacks

of a successful or unsuccessful project. The organization should use the most effective methods for this aim, as determined by the local circumstances, such as seminars, meetings with stakeholders, and advertising. Project success is a multidimensional construct, and project participants may choose a variety of parameters for project success that they consider essential to determine project success. Interest demands vary across project stakeholders in the perspective of a construction project. Therefore, the explanation of project success should be precisely defined according to adjustments that arise between multiple stakeholders.

- This study provides quantitative proof for the role of a project manager to moderate the impacts of organizational culture, communication management, and goal clarity on project success. A project manager practically faces all the problems on the construction site. As a result, project managers' abilities play a crucial role in raising project success rates. A skilled project manager will make the objectives and specifications evident to everyone involved. In this regard, this study suggests adopting a proper mechanism for hiring a project manager, in which project manager competencies should be a primary selection criterion.

6. Conclusions

With a population of over 220 million and a sizable emerging economy, Pakistan has distinctive qualities and problems in the building sector. In Pakistan, the construction industry faces many unprecedented problems different from the world's construction industries. One of the significant problems being faced is terrorism. One recent example of this type of incident is the suicide attack on Chinese workers working at the construction project at the Dasu dam in Kohistan on January 2022. Additionally, large construction projects are always under the threat of security issues. This situation causes continuous intimidation and chaos and negatively impacts the efficiency of the workers and the success of the projects. Political instability is a problem for the delays of public construction projects, as the priorities change with the change in the political leadership. The robust devaluation in the local currency creates unclear circumstances for the investors in the sector and severely impacts the progress of megaprojects, due to budget revisions. Another issue the construction industry faces is regional linguistic and cultural differences within the country, due to its diverse range of regional cultures. It is observed that, in many cases, the local inhabitants of the low-developed areas of the country produce severe hurdles in the development of construction projects, due to their cultural or religious beliefs. In this background, the clarity in the project scope with the construction stakeholders becomes more critical, so that fewer hurdles would be faced during the construction phase. The organization should also be improved and designed in such a way that they can bear and deal with the local cultures. Additionally, with the start of the CPEC, it has been observed that a lot of problems are being faced, due to linguistic differences between the local and foreign workers, for which it is suggested that improved communication management processes are necessary for the smooth flow of the information and overcoming the issue of linguistic differences. In Pakistan construction, the other main issue is the lessened adoption of advanced project management practices, such as BIM. Most organizations rely on traditional methods, which are drawbacks to other developed countries' construction industries.

The proposed objectives of this study were to find the roles of organizational culture, clarity in project scope, and communication management in achieving a successful construction project. According to this study, the results of the quantitative analysis have shown that corporate culture, effective communication, and project scope clarity affect how well construction projects turn out. Therefore, it may be claimed that a construction project's success depends on how well the above-described factors are managed. Project failure depends on how poorly or negligently these variables are managed. So, it can be claimed that there is a dire need to improve organizational cultures, communication management, and clarity in project scope. An improved mechanism for these variables will be fruitful for increasing the success rate of construction projects and construction

management. In this regard, the project manager's competencies were also found to be playing their role in moderating the influences of the independent variables for a successful construction project. Additionally, it can be concluded from the study's outcomes that a competent project manager can better control the negative impacts of the elements that negatively influence a construction project's progress. To address the issues brought on by bad organizational culture management, ineffective communication, and unclear project scope, recruiting professional and more experienced project managers who can operate in various cultures and scenarios is essential. The project manager should also be able to foster peace among employees and workers from different backgrounds and cultures. To prevent any unwelcome difficulties, such as grouping and demoralization among the subordinates, it is crucial to effectively manage the language disparities, diverse cultures, and conventions of the individuals working on the same project. Additionally, a competent project manager can play his role to provide a clear understanding of goals to stakeholders of a construction project.

Today's globalization, digitalization, and business world changes are quickly and unpredictably occurring. As a result, the organization's ability to carry out the project with greater efficiency has become essential to its survival and development. The study's findings support all the hypotheses produced from these research questions. Therefore, it can be concluded that, if the construction industry wants to increase efficiency, the above variables should be considered. There should be appropriate mechanisms and workshops to improve worker skills and limit the adverse effects caused by organizational cultural differences, poor communication management, and unclear project scope. Additionally, there must be a suitable framework for raising project manager competencies to fulfill the responsibility for better organizing project processes because the regression and moderation analyses back up all the hypotheses based on these research topics. The conclusion, in this respect, is that failing to adhere to the project plan is a significant problem most construction firms deal with, and several types of issues, such as time overrun or budget overrun, can occur in a construction project and, thus, have unfavorable effects on accomplishing the prescribed goals.

The contextual factors for these outcomes are traditional/orthodox methods, and laws that formerly regulated the building sector in Pakistan still apply today. This impacts worker productivity and prepares a new generation of managers who share the same ideas and ideals. Instead of being more committed to the prevailing spectrum of shared values, beliefs, and company norms, this generation develops their views with similar concepts because they have seen them work successfully. This makes it even harder to see any shortcomings in the current culture. The manager's myopia sees everything through the lens of their own set of beliefs, which is another crucial factor in this situation. Second, managers react to evolving circumstances, according to their cultural framework. Understanding how organizational culture affects current functioning is necessary for all processes, including hiring, selecting, training, socializing, designing incentive systems, designing, and describing positions, as well as general or generational design concerns. The construction sector of Pakistan has difficulties on national, regional, and worldwide scales, due to projects becoming more complicated, dwindling project backlogs, and a lack of new project engagements, due to continued economic instability. Cultural diversity, which refers to language, religion, and culture variations, is another contextual aspect affecting Pakistan's construction business. One positive part of this cultural variety is that Pakistan's construction industry offers employment possibilities throughout the nation. However, it often compromises workplace safety.

There are some shortcomings in this study. First, the sample size was minuscule, given the extensive nature of the research, which may have affected the study's findings. Increasing the sample size may lead to discoveries. Second, since supervisors made up most of the respondents, the results may be biased. English being a second language may have made it difficult for the response to understand the inquiries. This study examined, evaluated,

and quantified only three independent factors: organizational culture, communication management, and project scope clarity.

In contrast, the outcomes can differ if additional aspects are included in the research model. The construction industry has unique characteristics and structures, compared to other industrial sectors. It is a complex, quickly developing business that has evolved into a community and accommodates the burgeoning population. The industry involves both public and private entities. These aspects have made it more difficult and complex to maintain effective, sustainable, and acceptable project performance.

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Appendix A

Survey Questionnaire

Please tick the right option.

Section 1	
Demographics	
Gender:	<input type="radio"/> Male <input type="radio"/> Female
Highest Qualification:	<input type="radio"/> Bachelors <input type="radio"/> Masters <input type="radio"/> MS/M.Phil <input type="radio"/> PhD
Designation:	<input type="radio"/> Site Supervisor <input type="radio"/> Supervisor <input type="radio"/> Project Manager <input type="radio"/> Administration
Age:	<input type="radio"/> 20–28 <input type="radio"/> 28–36 <input type="radio"/> 36–44 <input type="radio"/> 44–52 <input type="radio"/> above 52
Experience:	<input type="radio"/> 01–05 <input type="radio"/> 05–10 <input type="radio"/> 10–15 <input type="radio"/> 15–20
Company Name:	_____
No. of Employees:	_____

Section 2					
Organizational Culture					
Organizational Culture describes that in an organization's relationship, the cultural difference is the combined mindset that differentiates one group of people from another.					
Please check the right option according to your understanding					
1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree					
Statement	1	2	3	4	5
1. All project participants this Project shared a clear understanding of the objectives and values of the Project.					
2. All project participants understood each other's objectives, expectations and values.					
3. When disputes or conflicts occurred, participants looked at how the Project would benefit instead of themselves.					

Section 2					
Organizational Culture					
Organizational Culture describes that in an organization's relationship, the cultural difference is the combined mindset that differentiates one group of people from another.					
Please check the right option according to your understanding					
1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree					
4.	There were effective working relationships among the participants in exploring innovative solutions and reducing costs and Time.				
5.	The project participants shared a high level of mutual trust.				
6.	The participants were not willing to exchange ideas and help each other.				
7.	Assigning blame and accountability issues were prevalent when things went wrong.				
8.	All project participants were viewed as essential contributors to the Project's Success.				

Section 3						
Communication Management						
Communication is a basic procedure that involves the transmission of information between a sender and receiver with the help of a medium. This procedure is deliberated as fruitful while the receiver recognizes the message and provides the sender within time response and timely feedback.						
Please check the right option according to your understanding						
1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree						
	Statement	1	2	3	4	5
1.	Appropriateness of communication system used in the Project					
2.	Two-way communication between the project participants and your project team					
3.	Willingness to share knowledge between participants and your project team					
4.	Participant support in providing information					
5.	Level of understanding between participants and your project team					

Section 4						
The clarity in Project Scope						
Presentation of Project Scope happens in the first phase of a construction project. It contains the purpose of what are the possessor necessities and requirements, the conversion of these necessities and requirements into design criteria, and the formation of a design concept.						
Please check the right option according to your understanding						
1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree						
	Statement	1	2	3	4	5
1.	Clarity of client's explanation of the Project					
2.	Quality of project brief (e.g., needs and requirements)					
3.	Completeness of project brief					
4.	Certainty of a project brief					

Section 5						
Project Manager's competencies						
Project Manager Competencies are a constellation of related knowledge, attitudes, skills, and other personal characteristics that affects a significant part of one's job, such as the ability to control processes and\ events in a result-oriented mode, guarantees project development, and pressure forbearance.						
Please check the right option according to your understanding						
1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree						
	Statements	1	2	3	4	5
	Skills					
1.	The project manager communicates with their teams frequently.					
2.	Encourages creative ideas.					
3.	Tracks his weaknesses and strengths					

Section 5					
Project Manager's competencies					
Project Manager Competencies are a constellation of related knowledge, attitudes, skills, and other personal characteristics that affects a significant part of one's job, such as the ability to control processes and\ events in a result-oriented mode, guarantees project development, and pressure forbearance.					
Please check the right option according to your understanding					
1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree					
Knowledge					
4.	The project manager Investigates facts				
5.	Makes judgments based on reasonable assumptions and is aware of the impact of such assumptions				
6.	Identifies opportunities and threats and is sensitive to stakeholder's needs				
Experience					
7.	Organizes all resources and coordinates them efficiently and effectively.				
8.	Communicates instructions clearly to staff with communications tailored to the audience's interests.				
9.	Willing to make decisions involving significant risk to gain a business advantage.				

Section 6						
Construction's Project Success						
Project success has been comprehensively examined in project management works. Cost, quality and Time have been conventionally used as the elementary benchmarks to examine project success.						
Please check the right option according to your understanding						
1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree						
Statement		1	2	3	4	5
Cost						
1.	There were no primary with-cost change requests during the Project					
2.	The project manager's experience helped to eliminate unnecessary resources.					
3.	The Project was finished on or under budget					
Quality						
4.	The Project was handed upon the company's overall standards					
5.	The project deliverables consistently fulfill the customer requirements					
6.	Setting alternative plans has reduced the possibility of unexpected risk.					
Time						
7.	The Project met most of the scheduled milestones					
8.	The Project was finished on Time					
9.	The critical tasks and delivery dates were not slipping.					

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