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Effect of teamwork quality on project performance: The moderating role of project management culture in selected ICT companies in Nigeria

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Abstract

Despite the plethora of pressing efforts that usually emanate from organizational leaders to foster the achievement of project success and thus, reap the important benefits associated with this outcome, evidence from research indicates that most projects, particularly in developing countries, continue to fail due to a lack of the required level of understanding of project critical success factors by most project stakeholders. Thus, to address this shortcoming, this study advances knowledge by proposing teamwork quality as one of the important antecedents of project performance. In addition, it also introduces project management as an important boundary condition under which the above effect is likely to be exercised. By focusing on the project sector of the Nigerian Information Telecommunication Technology, research data were obtained from a total of 176 project managers who were randomly selected, and this formed the basis of analysis. Through hierarchical moderated regression analysis, it was evident that teamwork quality positively impacts project performance at a level that is statistically significant. Furthermore, in addition to positively and significantly affecting project performance, project management culture was also shown to interact positively with teamwork quality to impact project performance, meaning that this variable serves as a significant moderator in the relationship between teamwork quality and project performance. Thus, in line with these findings, it was recommended that project managers should foster the adoption of a project culture whenever they are faced with the option of making use of the inherent strength in team collaboration to enhance project performance.

Keywords: Information communication technology, Project manager, Project organizational culture, Project performance, Teamwork quality.

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1. Introduction

1.1. Background to the Study

While the achievement of organizational success and competitiveness depends on the performance outcomes (project time, cost, quality, and stakeholders' satisfaction) of its critical projects, Syamil, et al. [1] and Shafique, et al. [2] however, it has been lamented that clear evidence exists from a large body of literature indicating that most projects in developing countries usually fail to meet the performance requirements of critical stakeholders [3]. Thus, per the observation by Fabian and Amir [4], a significant number of African businesses, governments, and organizations have experienced a loss of tens of millions of dollars on a yearly basis, due to incidences of project failure or lack of ability to meet project standards [4]. This is even more so as Marzouk and El-Rasas [5] have particularly noted that virtually all the 700 projects being funded in Africa between 2005 and 2015 by the World Bank recorded a failure rate of over 50 percent, thereby making these high rates of failures an important issue of concern for all stakeholders within the African continent [6].

Within the Nigerian project management landscape, [7] stressed that there are numerous completed or ongoing projects that suffer from performance-related issues, such as an inability to satisfy customers, an inability to meet the stipulated schedule, cost overruns, and poor project quality/output [8]. Typical, high-visibility examples of failed projects in the country include the Ajaokuta Steel project [9]. Also, the failure that emanated from the inability of the Independent National Electoral Commission (INEC) to meet the schedule for the distribution of the Permanent Voters' Cards to eligible voters before the 2015 general elections, which hitherto resulted in a dismal performance of the entire electoral process [10]. By and large, and as Justina, et al. [9] lamented, "The rate of project failure in the country is indeed alarming." They found that projects of moderate scale go on interminably, thereby creating skepticism about the ability of stakeholders to create projects that meet performance standards. This is more so as Damoah [11] declared that this failure in performance has an inherent potential to culminate in slow national economic growth, loss of critical revenue for stakeholders, negative brand image, loss of employment opportunities, as well as a loss in a firm's competitive advantage [12].

Thus, considering these types of negative developments that usually emanate from failed projects, an understanding of the prerequisites for motivating higher levels of project performance is particularly important, especially given the increasing performance pressures faced by project managers [13]. Nevertheless, due to the rising complexity and ambiguity of project systems [14] which makes it difficult to understand, predict, and regulate [15] organizational leaders, having realized that management can't solve this problem alone, have therefore introduced the concept of team-based projects with the view that employees with varied knowledge, expertise, and experience can work together over the lifespan of a project to achieve a common objective of customer satisfaction, efficient cost/time management, and project quality/output [16].

In the view of Shafique, et al. [2] despite the immense potential associated with this laudable initiative, many projects continue to fall short of meeting performance standards due to the complexity, unpredictability, and diversity associated with individual team members, which makes it difficult for them to achieve effective group collaboration for optimal project performance. Thus, in response to this reality, Beshay and Sixsmith [17] clarified that an important area of consideration in project management is the human aspect and its ability to impact project success. While reacting to this line of reasoning, Khan, et al. [18] stated that people have different characteristics, abilities, and personalities, which can make managing a team quite difficult and stressful. Also, Smith [19] contended that there is a need for managers to consider the different types of roles ascribed to team members, how they interact with each other, and how teams are made up of a good balance of roles, mutual support, effort, and cohesion so that projects can be successfully implemented for a desirable level of performance. Hence, considering the urgent nature of this need, particularly within the project management industry in Nigeria, this research seeks to determine the nature of the relationship between teamwork quality and project performance by focusing on selected Information and Communication Technology companies in the country.

Furthermore, as the submission by Yazici [20] categorically highlighted organizational culture change toward sharing, collaboration, and empowerment an inevitable tools that deserve consideration when dealing with project time, budget, and expectations issues (project performance). The research takes a further step by introducing the concept of project management culture as a potential moderator that acts as a boundary condition under which teamwork quality exercises an influence on project performance, and thus provides an answer to the call by Borodako, et al. [21] on the need to determine the moderating influence of culture in the relationship between the strategic orientation of organizations and performance outcomes, especially in technological services companies.

With respect to the relationship between project team quality and team performance, Chiocchio, et al. [16] stated that teamwork quality evaluates how effectively a group collaborates and how hard they work, thereby making the quality of cooperation in project management a significant success factor [22] and an important subject of interest for academic researchers [23]. Based on this line of reasoning, Shafique, et al. [2] argued that, even though the relationship between teamwork and project performance has been investigated by academic researchers over the decade, there seems to be very little research that has examined the effect of teamwork quality on this type of performance, despite its importance to overall project success as well as its significant contribution to organizational sustainability [24]. This is even more so as Geraldi and Söderlund [25] declared that even though research has been carried out on project performance for decades, empirical research, particularly on the influence of human factors, is still in its infancy and not widely available. Thus, as a response to the call by Abdallah, et al. [24] and Shafique, et al. [2] on the need for future researchers to address this type of shortcoming with the view of determining the variation in outcomes, particularly in developing countries, this research is deemed timely.

Furthermore, in addition to the need to conduct this type of investigation in a developing country such as Nigeria, the fact remains that most results from the few studies on teamwork quality and performance outcomes have been characterized by mixed and sometimes even contradictory outcomes Schmutz and Manser [26] with results from some

studies indicating a large effect Carlson, et al. [27] while others such as Mishra, et al. [28] have reported a small or insignificant relationship, which means that this effect might be stronger or weaker under certain conditions. Therefore, there is a need to investigate potential mediating or moderating variables, whose influence may have accounted for these findings [29]. Thus, while professional composition, team familiarity, average team size, task type, and project characteristics have all been investigated as potential moderating variables in this relationship [see; [30-32]] to the knowledge of this researcher, no empirical evidence exists regarding the moderating influence of project management culture, even though the submission by Chiluwal and Mishra [33] have identified the relevance and the need for the combination of project planning and organizational culture as critical success factors for project management. while Ackon, et al. [34] have particularly noted that research on organizational culture, in the context of project planning initiatives (one of which is team management processes/procedures), has received very little attention in project management research [35].

Project management culture is the set of norms, values, and behaviors exhibited by a project organization, manifested in project management processes, methodologies, and the mindset of the people who are directly or indirectly involved and/or exercise influence on the project [36]. According to social learning theory, people learn new abilities by directly observing the mode of conduct of other people around them Mukhtar, et al. [37]. Thus, behaviors are actively learned by employees through vicarious learning or role modeling [38] through their ability to cognitively evaluate and process information regarding the standards required of them by the organization and, consequently, adopt attitudes and behaviors that consolidate these standards [39]. By implication, this tends to suggest that if organizations value, standards, and norms (culture) are structured with the view of facilitating the behaviors/performance outcomes that support the project management process, it is likely that at the individual level, project team members may embrace this type of value, norms, standards, and behavior during team collaboration, with the aim of facilitating higher project performance. Overall, this study aims to determine the interconnectivity of work outcome quality among team members, the cultural values concerning work projects, as well as the performance outcomes of these projects, all with the view that such an endeavor would not only provide a framework for motivating higher project performance, especially among project teams, but would also aid in determining the boundary conditions under which such performance can be optimized for organizational benefits.

2. Literature Review and Hypothesis Development

2.1. Project Performance

From the definition offered by Kerzner [40] the term project performance can be described in terms of its four components: project expectations, innovation, team performance, and business value. In the view of this author, while project expectations refer to the operational aspects of project performance, such as project completion within schedule, budget, and meeting customer requirements, as well as meeting the criteria set out by the management and project team, innovation refers to the degree of creativity of the project deliverables, while team performance refers to team responsiveness to customer needs, adaptability to changing requirements, efficiency, and team reputation [41]. This is even more so as business value has been referred to by Soh and Markus [42] as those boosts emanating from project execution and deliverables that tend to contribute to the company's overall performance. For Nguyen and Watanabe [43] it is the outcome that emanates from the regular collection and reporting of information about the inputs, efficiency, and effectiveness of projects, while the construct has been described by Kaplan and Norton [44] as the organization’s capacity to accomplish a project goal effectively and efficiently using available human and physical resources.

Thus, in line with this view, Yazici [20] has given their definition as the extent to which a project meets time requirements, budget requirements, and customer expectations. According to Cleland [46], project performance is only meaningful if it considers both the degree to which the project's technical performance objectives were attained on time and within budget, and the contribution that the project made to the strategic mission of the enterprise. Hence, by following the above line of reasoning, project performance in this study is defined as the degree to which an ICT project satisfies the cost, time, and quality requirements, in addition to being able to meet customer expectations and organizational objectives.

For example, if the purpose of a project is to assist a company in meeting a rise in demand, such a project is referred to as meeting performance if, in addition to the delivery of its components by the supplier, it is also producing the intended number of items and generating the projected profit [45]. This is even more so, as the performance of a project is defined in terms of its ability to be completed within a budgeted cost, and spending more than the allocated cost on the project would be deemed inappropriate performance, even though the project is complete and its deliverables are provided [46]. With respect to schedule and timing factor, Nguyen and Watanabe [43] stated that a project is considered to have performed poorly if its lateness prevents the company from executing its planned activities using the project's deliverables or results in higher financing costs, because the existing investment in the project must be maintained for a longer period, generating additional interest costs while the contribution by Waweru [47] contented that a project that fails in its capacity to fulfill its intended purpose, even though it was delivered on time and within budget, can be deemed to have performed poorly.

According to Jumba [48] when projects fail to perform in line with expectations, this may likely lead to total organizational failure because some aspects of its strategic objectives will not be delivered as planned, scarce resources will be wasted, while all relevant stakeholders who are expected to derive some benefits from the project would be negatively affected. Thus, since project performance requires a wide pool of stakeholders, it means that the organizational system should provide a leeway through which everyone who is either directly or indirectly affected by the project can be duly incorporated in both the planning and implementation processes [48].

2.2. Teamwork Quality

According to Dasí et al. [14], teamwork quality evaluates how effectively a group collaborates and how hard they work. Based on the submission by Lee and Chen [51], it has to do with the degree to which project team members interact and are motivated to work together. Thus, it refers to the ability of team members to work efficiently as a team [49] and the different types of roles ascribed to team members, how they interact with each other, and how teams contain a good balance of roles, mutual support, effort, and cohesion [50]. According to Gao et al. [54], it is the term used to describe the process of team members' integration and cooperation. This is especially true as the construct has been defined by Lee and Chen [51] as the degree to which project team members interact and are motivated to work together.

Based on the classification by Hoegl and Gemuenden [55], a team is said to be characterized by teamwork quality if it can maintain a high standard of communication, coordination, balance of member contributions, mutual support, effort, and cohesion [52]. Thus, while it is a known fact that the individual level of expertise and professionalism of team members are needed to ensure high-performance outcomes, it is also imperative that the unique expertise and capabilities of these members be combined and optimized for the most desirable performance outcomes [30]. Hence, the emergence of the need for teamwork quality in organizational settings [53]. As a result of globalization, which mandates that individuals from different cultural backgrounds, regions, and functional areas should work together on projects, and thus bring about divergent interests, perspectives, differing orientations, and problem-solving techniques, there is increasing emphasis on collaboration within and across teams for the enhancement of information sharing, to facilitate operational processes, and thus ensure superior competitive results, while also increasing organizational responsiveness and agility [54].

For instance, it has been stated by Avital and Singh [55] that a lack of collaboration among team members creates difficulties in reaching agreement on integrated action programs and the implementation of such actions. According to Salas et al. [59], regardless of how work teams accomplish an objective, the quality of teamwork can be observed in management strategies that foster innovation, cohesion, trust building, and cooperation among the workforce in any working environment. Thus, in tandem with this line of reasoning, Padhi, et al. [56] contended that when organizations emphasize quality in terms of team collaboration and interaction, this tends to culminate in idea innovation and creativity, which ordinarily may not be offered by individuals; in the sense that the strength of such a team would be derived from tapping the abilities and experiences of its other members to achieve a common goal that would have been difficult to achieve when working alone [57].

Based on the submission by Adeleke [62], through teamwork and quality, organizations tend to reap maximum benefits in the sense that common people are utilized to attain uncommon results, through the unusual power inherent in cooperative relationships. According to Hunziker, et al. [58] since collective action has been widely recognized as a positive force for teamwork in any organization, as a result of the increase in the variety of ideas among team members, team leaders are expected to utilize effective collaboration (teamwork quality) to gather suggestions before finalizing a project planning course [56, 59]. This is even more so as Oludare [60] declared that teamwork quality can be seen as one of the factors of survival and a top priority for any organization to attain market efficiency; as it sets the stage for team members to provide optimal support for each other, facilitate the coordination of work units' activities, eliminate potential conflicts arising from divergent views, and improve interaction, information exchange, and cooperative relationships. Hence, while supporting this view, Padhi, et al. [56] have identified the various key benefits of teamwork quality. Based on the opinion of this author, these can range from the improvement of communication of ideas, an increase in problem-solving culture, improved workflow quality, enhanced cross-learning, feelings of belongingness, better employee relations, shared accountability, and improved productivity, in addition to the elimination of employee loneliness.

2.3. Project Management Culture

According to Stare [47], project management culture can be described as the attitudes of top and line management towards project management endeavors. For Nguyen and Watanabe [36] it is the cultural manifestations that emanate from project participants' regular work behaviors and/or attitudes throughout the project and can be identified by examining relevant project participants' work behaviors that reflect the methods of explanation or resolution for problems encountered throughout a project [36].

Furthermore, while the submission by Kerzner [40] identified the construct as the supporting attitude, monitoring policies, prioritization, and project staffing guidelines deplored by top and line management during project execution, another from Cleland [61] describes it as a combination of organizational policies, procedures, rules, formal/informal roles, the support exhibited by the departments in the pursuit of project goals, employee commitment to the project goals in the context of balancing them with other potentially competing goals, and project planning procedures. Thus, as per the conceptualization offered by Pinto [62] it is the way work is estimated or how resources are assigned to projects, the performance of project teams, in addition to how managers evaluate it, and how they view project outcomes. Hence, to have a comprehensive and deep understanding of what this type of culture entails, it is advised to conduct a close examination of the project participants' work behavior and overall attitude.

According to Škarabot [67], project management culture, as an important part of the overall organizational culture, acts as one of the most influential factors in successful project implementation within business organizations due to its ability to exert a dominant influence on strategic planning, which gives rise to project management [61]. Based on the argument presented by Pinto [62] in addition to the fact that this type of culture has the potential to serve as a determinant of how departments interact and lend support to each other in the pursuit of project goals, it also serves as a source of influence on the level of employee commitment to project goals in the context of balancing them with other potentially competing goals. This is even more so as its influence has been declared by Stare [45] to include an influence on project planning processes

such as the way work is estimated, resource allocation to projects, in addition to how managers evaluate the performance of project teams and how project outcomes are viewed by them.

2.4. Teamwork Quality and Project Performance

It has been shown by the project management literature that the motivational climate in which teams operate is of prime importance in determining project managers' behavior and overall team performance [63]. Also, the assertion by Jumba [48] concurred that many researchers believe that effective use of teams is a necessary ingredient for a project to be successful. Based on the assertion by Padhi, et al. [56] since the individualistic approach to work has become impractical as a result of an increasingly competitive business landscape, this has made the survival of business organizations highly dependent on how business leaders achieve overall results through collective or team effort. According to Oludare [60] teamwork quality has been highlighted as a vital tool in the efficient utilization of resources. Teamwork can also be seen as a management strategy that is geared towards better team performance Padhi, et al. [56]. Through the inherent advantage in teamwork quality, cooperative behavior can be facilitated to enhance work output, in addition to providing a platform whereby team members can gather at the workplace to better understand each other's strengths and weaknesses, with the view of leveraging such outcomes for the attainment of workplace productivity [64]. According to Fröbel and Marchington [65] in the absence of teamwork quality, housebuilding and organizational goal achievement cannot be accomplished as a result of the loss of inspiration. Due to the cross-fertilization of ideas, skills, common interests, and drive associated with teamwork quality, it is expected that the potential of individual team members can be better optimized for the attainment of organizational goals, one of which is the performance outcomes of critical projects [65].

Empirically, the study by Hoegl and Proserpio [50] was able to provide proof that high-quality team cooperation, closely guided by team leadership, played an important role in team performance. Also, Lindsjørn, et al. [66] investigated the impact of team cooperation quality on team performance in software organizations. They concluded through their analysis that this kind of quality has a positive and predictive influence on team performance. This is even more so as Freire, et al. [67] made use of the Bayesian network model and case studies to provide evidence supporting the fact that teamwork quality is a significant determinant of the success of agile project teams. According to Gao et al. [54], team composition, team members' communication, cooperation, integration, and team structure, all of which are integral components of teamwork quality, are directly related to high-performance team projects. For Balkundi and Harrison [68] it has been contended by these authors that the degree to which team collaborators are motivated to work together serves as a key determinant of project goal achievement.

Nevertheless, irrespective of these findings, Schmutz, et al. [30] have declared that most of the studies investigating teamwork quality and performance outcomes of projects tend to provide mixed and even sometimes contradictory results. This is even more so as Stewart and Barrick [69] and Keck [70] particularly, it was stated that team quality does not necessarily have an absolute impact on the performance of a work project but needs to be mediated or moderated by other variables or elements before it influences the performance outcome of the project. Thus, concerning this proposed moderation and mediation hypotheses, though, researchers have as Balkundi and Harrison [68], Schmutz, et al. [30], Waldman and Atwater [71], Akhavan Tabassi and Hassan Abu Bakar [31] and Yang, et al. [32] have all investigated professional composition, team familiarity, average team size, task type, project characteristics, team cooperation mechanism, task complexity, and team leadership as potential moderators of this relationship. It is known, yet unknown, how project management culture may act to determine the boundary conditions under which teamwork quality may influence project performance optimally, which leads us to propose the following hypothesis.

Hypothesis 1: There is a significant relationship between teamwork quality and project performance in selected Information Communication Technology companies in Nigeria.

2.5. Moderating Role of Project Management Culture

Based on the definition of culture as a set of learned norms, values, attitudes, and meanings that are shared within a group of people [34] it can be contended that in situations where closely integrated and motivated project teams are expected to collaborate and work hard together for the facilitation of performance-related issues, the learned culture, norms, and attitudes exhibited by these teams towards the overall project management process are likely to act as determinants of the degree to which teamwork quality efforts (collaboration, hard work, motivation) are concentrated towards facilitating project performance. From the definition of organizational culture as a shared perception of organizational work practices within organizational units that may differ from other organizational units [72]. These practices should thus serve as a yardstick in determining the nature of project tasks and the procedures with which project teams choose to follow when collaborating for performance outcomes.

Since norms serve as a key determinant of human behavior, it is also expected to act as a determinant of the course of work practices exhibited by project teams that are responsible for facilitating the required performance in critical work projects [36]. Thus, following this line of reasoning, Hofstede, et al. [73] asserted that culture reflects the preferences of people in work and life-related issues, and therefore may play a major role in the approach devised by project teams, as well as the degree to which they are committed to the overall project outcomes [45] based on its recognition as a framework that reflects the decisions, choices, and options made by humans in their lifetime endeavors [48]

Based on the social learning theory, people tend to develop new attitudes and behavioral manifestations simply by observing other people's behavior around them, and then make use of such as a model [39]. Within the organizational context, since organizational culture acts as the set of values, beliefs, and behavioral norms that provide a guide on how members of the organization get work done [20] then it is expected within the framework of this study that for those

organizations who thrive on project management culture, the predominance of such culture would tend to form the basis of vicarious learning among project team members, and also serve as a guide for the team members whenever they engage in quality collaboration, quality interaction, and project-related hard work (teamwork quality) with the intent of facilitating higher project performance. This culture is expected to become a mode of internalization, get adopted as a driving force guiding their numerous actions and decisions [74] While they are expected to make use of it as a basis through which project-related rules, action plans, and procedures are followed, it serves as a foundation for remaining loyal and committed to the execution of the projects. Additionally, it functions as a tool for encouragement and motivation to work collaboratively and develop networks with internal and external stakeholders of different projects [75] with the view of promoting favorable project performance outcomes.

While there appears to be a lack of empirical evidence linking project management culture to a moderating role in the relationship between teamwork quality and project performance, there is scant evidence that may support these claims. For instance, the research by Stare [45] on the influence of the project management culture of top and line managers in Slovenian project-related enterprises provided evidence of a significant relationship between this type of culture and project performance. In another study by Jumba [48] it was clearly shown that the overall attitude and disposition of corporate culture in Ghanaian enterprises towards the project management process serve as a potent mechanism in delineating failed projects from successful projects. From their investigation, Xaba [76] identified the combination of communication, reward, training, and teamwork as important components of project culture that must be inculcated into all project team members to advance the overall project management process. This is even more so as Abdullahi [46] Uncovered that a project culture that promotes recognition and rewards for project participants tends to facilitate the efficiency of project management among Kenyan manufacturing industries, while the culture of contractor commitment to contract agreements, goal alignment and reliance, and worker orientation has been identified by Nguyen and Watanabe [43] as the most significant cultural factors influencing project performance. Nevertheless, since the questions on the nature of the relationship between culture and performance at the project level remain largely unanswered and have not yet been fully addressed [77] Particularly in the context of the Nigerian Information Communication Technology industry, it means that further investigation is needed in this area, which can therefore be described as an integral part of the aim of this study. Thus, given this highlighted shortcoming, the following hypothesis is also presented.

II. There is a significant relationship between project management culture and project performance in selected information technology companies in Nigeria.

III. The relationship between teamwork quality and project performance would be moderated by project management culture in selected Information Communication Technology companies in Nigeria.

2.6. Conceptual Framework

Based on the literature review presented above, and the issues arising therefrom, the conceptual framework in fig. 2 is presented.

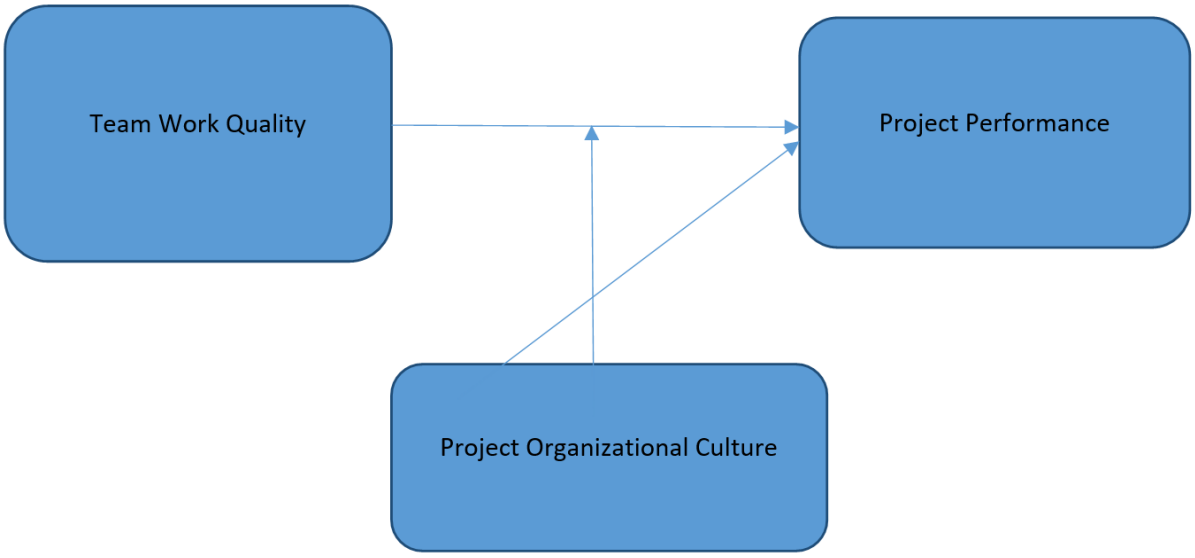

Figure 1.
Conceptual Framework showing the Proposed Relationship Between Team-Work Quality and Project Organizational Culture on one side, and Project Performance on the other Side, in addition to the Moderating Influence of Project Organizational Culture in the Relationship Between Teamwork Quality and Project Performance.
Source: From literature review.

3. Methods and Materials

3.1. Participants/Sampling Technique/Procedure

This study focused on project managers in selected ICT companies in Nigeria. Thirteen (13) of the largest ICT companies in Nigeria were randomly selected, and the project team managers in these companies, who served as team leaders in several completed projects, constitute the study population. As of June 2024, the total number of these managers,

based on information obtained from the Human Resources Departments of the respective companies, is two hundred and three (203). Regarding the sampling size of the research, this was determined by drawing inference from the work of Krejcie and Morgan [78] on sampling and sampling size determination. Through this procedure, a sample size of 196 was arrived at, and this was adopted as the sample size for the study. Thus, by making use of the proportionate stratified sampling technique, an appropriate sampling size was determined for each of the companies. Consequently, the simple random sampling technique was finally adopted to select this number of managers after obtaining the relevant sampling frame from each company.

In total, 178 questionnaires were successfully retrieved from the participants. Consequently, 2 copies of the questionnaires were discarded due to being improperly filled out and having significant omissions. Thus, our sample consisted of 129 (73.3%) men and 47 (25%) women. Additionally, 35 (20%) of the respondents attained the academic qualification of Ordinary National Diploma, while 23 (13.3%) held a Higher National Diploma. A total of 94 (54%) participants held first degrees, while the remaining 23 (13.3%) possessed various forms of postgraduate qualifications. Since the years of professional experience of the respondents could influence their assessment of teamwork quality and team performance, they were classified based on these criteria. Findings indicate that the majority, 82 (42.7%), have 1-5 years of professional experience; 70 (40%) have between 6 and 10 years; 12 (7%) have 11-15 years; and another 12 (7%) have 16 or more years of experience. To adhere to the university research ethics requirements regarding the nature of the research questionnaire and its mode of administration, approval was obtained from the ethical committee of Birmingham City University. Additionally, permission was sought and obtained from the management of the Information Communication companies whose employees constitute the research subjects. All participants were informed about the nature of the study, the non-coercive nature of participation, and their right to withdraw at any time. Furthermore, it was not required for participants to reveal their identities at any stage of the research or to sign any undertaking, as participation was strictly voluntary.

3.2. Research Strategy/Design

Given its ability to search for inferences about a larger population, while also providing results that portray statistical analysis capability, high reliability, and generalizability, as well as the fact that most research in this area of study utilized the same design with similar methodology [79] the quantitative research design was utilized in this study with the view of producing a comparison with prior studies within the same context [80]. Concerning the nature of the study, which aimed at addressing questions about the empirical relationships among several constructs and presenting a generalizable set of findings, as well as the nature of the research questions that have been raised, a descriptive cross-sectional survey research strategy was adopted. This is consistent with [81] Observation that descriptive survey research design is the most frequently used method to collect data on phenomena that are not directly observable, much like the constructs being examined for this study (e.g., teamwork quality, project performance, project management culture).

3.3. Measures

Because the goal of this study is to examine the relationships among several constructs with the intent of making inferences about predictability, a quantitatively scaled, close-ended, structured, multiple-choice questionnaire that measures the three main variables (teamwork quality, project performance, project management culture) was administered to selected project managers to elicit research data on the main study variables, thereby enabling the determination of the direct relationship between teamwork quality and project performance, in addition to the moderating role of project management culture [82]. The items utilized for this measurement are presented below.

3.3.1. Teamwork Quality

Concerning teamwork quality, a six (6) scale was adopted from a previous work of O'Sheedy [83]. This scale is an all-encompassing scale that measures the degree of collaboration by team members, their motivation, and hard work while working on projects. From a previous study by Abdullah, et al. [23] a Cronbach's alpha internal consistency value of 0.79 was obtained for these items. The scale consists of items such as “whenever disputes or conflicts occur, the participants first look at how the project would benefit rather than how they would benefit,” and “effective working relationships among the participants are promoted in terms of exploring innovative solutions and reducing costs and time spent.”

3.3.2. Project Performance

We made use of an eight-item (8) scale adopted from Nguyen and Watanabe [43] work on project performance. From a previous study by Nguyen and Watanabe [43] the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy value obtained for the items is 0.924, which is well above the suggested threshold of 0.6 [see Cheung, et al. [84]. In addition, the Cronbach alpha internal consistency of the items is 0.85, which is above the 0.70 threshold recommended by Sekaran [85]. Sample items on this scale ask questions such as whether the client was satisfied with the project quality, the client was satisfied with the project schedule, etc.

3.3.3. Project Organizational Culture

Project organizational culture was measured by making use of a ten (10) item scale adopted from Nguyen and Watanabe [43]. These items were designed to assess the cultural disposition of project participants, project managers, top management, and project contractors towards the overall project management process. From a previous study by these authors, a Cronbach's alpha internal consistency value of 0.78 was obtained for these items. Sample items on this scale

include "project managers provide clear communication, assistance, and support to their subordinates," and "all project participants on this project share a clear understanding of the objectives and values of the project."

3.4. Data Analysis

The combination of descriptive statistics and inferential statistics was utilized. While descriptive statistics was adopted as an analytical tool for processing the demographic variables of the respondents, inferential statistics was used to measure the interrelationships among the main constructs in the study. Specifically, the Pearson-moment correlation was employed as a measure of association between these variables, and hierarchical moderation analysis was conducted to determine the direct relationship between teamwork quality and project performance, as well as the moderating influence of project organizational culture in this relationship. Making use of AMOS 17 (see; [86] A confirmatory factor analysis was conducted to test the factorial validity of the measures in the study. The hypothesized measurement model, a 3-factor model in which all items loaded on the corresponding latent variables (teamwork quality, project performance, and project organizational culture), was tested and compared with two alternative models: a 2-factor model (teamwork quality and project organizational culture) and a 1-factor model (teamwork quality, project organizational culture, and team performance).

Following the appropriate recommendations as laid down by Hu and Bentler [86] the fit of the models was evaluated using various indices: (1) the Turker Lewis index (TLI), (2) the Comparative Fit Index (CFI); (3) Root Mean Square Error of Approximation (RMSEA); and (4) Standardized Root Mean Square Residual (SRMR). Thus, making use of threshold as recommended by [87] our analysis uncovered that apart from the fact that all factor loading are high >.70 and significant, p ,< 0.05, [see; [88] the 3-factor model outweighs the other factors in terms of superiority across all fit indices: $\chi 2/df = 1.78$, $p < 0.05$; CFI (Comparative Fit Index) = 0.91; TLI (Tucker-Lewis Index) = 0.93; RMSEA (Root Mean Square Error of Approximation) = 0.08; and SRMR (Standardized Root Mean Square Residual) = 0.07. Furthermore, all Average Variance Extracted values are larger than the squared correlations between the target construct and any of the other constructs, thereby indicating an acceptable level of discriminant validity [89]. Thus, with a composite reliability value ranging from .84 to 0.88 and Cronbach's Alpha values for teamwork quality (.878), project performance (.896), and project organizational culture (.844), all the items used are assumed to satisfy the assumption of reliability [85]. See Table 1.

Since a self-reported measure was relied upon in the elicitation of responses from respondents, it was considered imperative to explore the potential effect of common method variance in the responses from participants. Hence, apart from protecting the anonymity of respondents and ensuring that both predictor and outcome variables are separated, we also performed a Harman single-factor analysis as a statistical remedy [see [90]]. The result indicates that the amount of variance explained by one factor is 19.45%, which is significantly less than the median method variance of 25% found in research using self-reported data [91]. This seems to indicate that Common Method Bias is not an issue with the dataset.

3.5. Association among Variables

To understand the direction and strength of the association among the variables evaluated in this study, Pearson correlation analysis was conducted. The results revealed a positive and significant association between teamwork quality and project performance, with a coefficient of .870, $p = 0.000$ ($p < 0.05$). Additionally, teamwork quality is associated with project organizational culture, with a coefficient of .814, $p = 0.000$ ($p < 0.05$). A positive and significant association was also found between project performance and project organizational culture, with a coefficient of .855, $p = 0.000$ ($p < 0.05$). In other words, respondents who perceive a high level of teamwork quality in their project team are also likely to acknowledge that their project performance is high and that their organization has a strong project organizational culture. Furthermore, those who believe they have a high level of project performance tend to be those whose organizational culture provides substantial support to project management. The result of this test is displayed in Table 1.

Table 1.
Mean, Standard Deviation, Correlations, and Square Root of Average Variance Extracted.

	M	**SD**	**1**	**2**	**3**
1 TWQ	3.61	0.67	**(0.894)**		
2 PP N	3,75	0.71	0.870** 176	**(0.885)**	
3 POC N	3.23	0.5	814** 176	0.855**	**(0.862)**

Note: **. Correlation is significant at the 0.01 level (2-tailed).
TWQ = Teamwork Quality; PP= Project Performance; POC= Project Organizational Culture.

3.6. Hypothesis Testing

To test the three (3) hypotheses that were previously presented and thereby ascertain the direct relationship between teamwork quality and project organizational culture, as they both impact project performance, as well as to determine the moderating influence of project organizational culture on the relationship between teamwork quality and project performance, a hierarchical moderating regression analysis was conducted using the PROCESS macro, as recommended by Preacher, et al. [92]. The output of this analysis is displayed in Table 2.

Table 2.
Moderated Regression Showing Project Performance as a Function of Teamwork Quality and Project Organizational Culture.

Models	Beta	SE	T	Sig.
Constant	30.945	1.6739	18.4871	0.0000
GENDER	0.7612	0.4641	1.6401	0.1048
EDU	-0.7906	0.3291	-2.4025	0.0185
EXP	-0.8768	0.2598	-3.3750	0.0011
TWQ	0.4809	0.0642	7.4948	0.0000
PRORG TWQ	0.2511	0.0766	3.2788	0.0015
X PRORG	0.0562	0.0145	3.8864	0.0002
R-square (.8844) F (105.8337) P (.0000)				

Test of Highest Order Unconditional Interaction between Team-Work Quality and Project Organizational Culture.

R2 change	F	df1	df2	P
	15.1040	1.0000	83.0000	0.0002

Note: TWQ= Team-Work Quality, PRORG= Project Organizational Culture.

As can be observed, after controlling for potential confounders such as gender, educational attainment, and years of professional experience, a significant and positive relationship exists between teamwork quality and project performance (b = .4809, p = .0000, p < 0.05). This result implies that every unit increase in teamwork quality would tend to lead to an increase of .4809 or 48 percent in project performance. Thus, with this result, support has been obtained for hypothesis one (1), which predicted that there is a significant relationship between teamwork quality and project performance.

Concerning the second hypothesis, which also suggests that a significant relationship exists between project organizational culture and project performance, it can also be observed from the table that project organizational culture exerts a positive and significant effect on project performance (b = .2511, p = .0000, p < 0.05), indicating that this hypothesis is supported. In other words, every unit increase in project organizational culture would lead to a 0.2511 or 25.11 percent increase in project performance.

Furthermore, with the view of ascertaining if project organizational culture would act as a boundary condition under which team-work quality exercise an effect on project performance, scores on these three variables were centered to create an interaction term [see; [93]], then the centered project performance scores were then regressed on both teamwork quality, project organizational culture and their interaction term. Results indicate that a positive and significant interaction exists between teamwork quality and project organizational culture, which then consequently exercises an effect on project performance, b=.0562, p = .0000, (p < 0.05). What this suggests is that the positive relationship between teamwork quality and project performance is stronger when respondents report higher levels of project organizational culture than when they report lower levels of project organizational culture [see; [94]]. Additionally, the test of the highest order unconditional interaction in the table shows an R-squared change value of .0210, which is significant at the 0.05 confidence level, thereby suggesting that the model with the interaction term is significantly better than the model without the interaction term in explaining the variance. Therefore, this result also supports hypothesis three (3), which predicted that the relationship between teamwork quality and project performance would be moderated by project management culture.

4. Discussion of Findings

Extant literature has revealed that the rate of project failure, particularly in developing countries like Nigeria, is indeed alarming, thereby creating skepticism about the ability of stakeholders to create projects that meet performance standards. Even though failure in this type of performance tends to culminate in slow national economic growth, loss of critical revenue for stakeholders, negative brand image, loss of employment opportunities, and loss of a firm's competitive advantage, there is limited knowledge and understanding of an effective framework required to meet performance standards. This study investigates the effects of teamwork quality and project organizational culture on project performance. Additionally, it examines the moderating influence of project organizational culture on the relationship between teamwork quality and project performance, focusing on project managers in selected ICT companies in Nigeria.

Specifically, our data provides evidence that a significant relationship exists between teamwork quality and project performance, and support was obtained for hypothesis 1. What this implies is that if project-oriented organizations put in effort to ensure that their project team members effectively collaborate, work hard, continuously interact, and are motivated to work together in a team that contains a good balance of roles, mutual support, effort, and cohesion [50] there is a likelihood of project completion within schedule and budget, and the ability to meet customer requirements. Apart from this, it also means that the criteria set out by management and project teams are adequately met, and that there is a tendency for project teams to respond appropriately to customer needs, adapt to changing requirements, as well as improve work efficiency and team reputation [41].

While this findings contradicts the empirical studies by Carlson, et al. [27] where a negative effect was uncovered for these two variables among some important firms within the project industry of the United Kingdom, as well as the result from another study by Mishra, et al. [28] and Manojlovich and DeCicco [95] where a small/insignificant relationship was reported, it however, share similarity with the assertion by Jumba [48] who noted that effective use of teams is a necessary ingredient for successful projects. This is even more so, as it consolidates the opinion of Boakye [64] that the inherent advantage and cooperative behavior that is derivable from teamwork quality can serve as key ingredients for the

enhancement of work output and as a platform through which team members can engage in cross-fertilization of ideas, and thus, have a better understanding of each other's strengths and weaknesses, which can thus be utilized as leverage in terms of advancing the performance outcomes of projects.

Concerning hypothesis 2, which proposed a significant relationship between project management culture and project performance, our results also suggest that a unit increase in project organizational culture would lead to an increase of .2511 or 25 percent in project performance. In a nutshell, these findings reinforce the social learning theory [39], where it has been argued that new abilities can be learned by directly observing the mode of conduct of other people. Put in another way, if the standardized mode of conduct within an organization supports important project values, such a mode of conduct is likely to be embraced by project teams while engaging in collaborative and cooperative behavior that is needed to enhance the performance outcomes of the organization [37]. In addition, it is in line with the theory of culture [see; [73]] where it has been made clear that culture reflects the preferences of people in work and life-related issues; and therefore, it is likely to play a major role in the operational strategies devised by organizations, and the degree to which they are committed to project outcomes [45].

Empirically, these findings share similarity with another study by Jumba [48] where evidence was provided among Ghanaian enterprises to advance the argument that the overall attitude and disposition of corporate culture regarding the project management process serve as a potent mechanism in delineating failed projects from successful projects. It is also in tandem with the empirical study by Abdullahi [48], where project culture was found to serve as an antidote that promotes recognition and rewards for project participants, thereby spurring the facilitation of project management efficiency among Kenyan manufacturing industries. This is more so as it shares similarity with another finding where it was uncovered by Abdullahi [46] that a project culture, which promotes recognition and rewards for project participants, tends to act as a facilitation for the efficiency of project management among Kenyan manufacturing industries, and another, by Abdullahi [46] where contractor's culture that supports commitment to contract agreements, goal alignment/reliance, and worker orientation was uncovered as the most significant cultural factors influencing project performance.

Lastly, our findings also revealed that project organizational culture interacts with teamwork quality to promote a significant increase in the positive relationship between teamwork quality and project performance, which tends to suggest that project organizational culture is a significant determinant of the boundary condition under which teamwork quality exerts an effect on project performance. By implication, this finding seems to be in line with the pronouncement by Nguyen and Watanabe [36] that culture serves as a key determinant of human behavior and also influences the course of work practices exhibited by project teams responsible for facilitating the required performance in critical work projects. Additionally, it reinforces social learning theory [see; [39]] which holds the position that whenever an organization's values, standards, and norms (culture) are structured and aimed towards facilitating the behaviors and performance that support the processes involved in project management, individual team members who make up a project team are likely to embrace this as a standard and thereby adopt the attitudes and behaviors that consolidate it, when making use of the principles enshrined in teamwork quality to facilitate higher project performance.

Overall, while the findings in the present investigation have justified the mixed and sometimes even contradictory outcomes that characterized many previous studies on the relationship between teamwork quality and project performance [e.g; [95], [27], [30]], it has also provided an answer to the call by Schmutz, et al. [30] on the need for investigating the potential moderators of this relationship. By doing so, it makes a significant contribution by advancing knowledge of the critical roles played by human factors, organizational learning, and collaboration in the project management process.

4.1. Practical Implications

The study finds that teamwork quality exerts a positive and significant effect on project performance, indicating that an increase in teamwork quality tends to enhance the performance outcomes of project teams. This suggests that it would be beneficial for project organizations if management, line managers, and supervisors emphasize training programs that promote collaboration, hard work, continuous interaction, and motivation to work together among their project teams. Such efforts tend to reduce misunderstandings and lack of trust among team members, thereby fostering the cross-learning necessary for improving performance outcomes in project initiatives. Additionally, project organizations can benefit by ensuring their project teams have a balanced composition in terms of roles, mutual support, effort, and cohesion, as this would enable team members to contribute optimally to facilitate project performance.

Furthermore, this study also finds that project organizational culture exerts a positive and significant effect on project performance, thereby underscoring the importance of the norms, attitudes, and behaviors that predominate among organizational decision-makers, especially when the objective is to enhance project performance. Thus, by implication, the top management of project organizations is encouraged to embrace a culture that supports the project management process. In this regard, all employees, suppliers, customers, and third-party vendors should be trained and inculcated with the standards, requirements, norms, practices, and behaviors that facilitate effective project management. They should also internalize these as an integral part of the organizational culture.

Our findings also indicate that the relationship between teamwork quality and project performance is moderated by project organizational culture. This underscores the significant role that this type of culture may play whenever project organizations aim to motivate higher project performance through quality teamwork. In this regard, managers in project organizations should consistently provide customer, supplier, and related stakeholder feedback to project teams, with the goal of identifying areas where improvement is needed in project performance outcomes and how team members can collectively adjust their cultural dispositions to facilitate improvement. Additionally, when using training to promote collaboration, hard work, continuous interaction, and motivation to work together among project teams (team quality), it is

advisable to incorporate training on project-friendly culture as an integral part of the program. This approach would help ensure that project culture forms the basis of collaboration, hard work, interaction, and motivation (teamwork quality) among team members.

4.2. Limitation and Future Direction

- As with most studies on attitude and opinion surveys, it is possible that the responses provided by the project managers in this study were influenced by social desirability bias, which relates to the tendency to give answers that they believe would make them appear favorable to others, thereby concealing their true opinions or experiences. Therefore, a potential area of interest for future researchers could be to utilize more objective measures of project performance for evaluation. Such objective measures might include project completion time in days, months, or years, financial budget, innovative outputs, number of customer complaints, as well as the financial contribution of the project.
- Furthermore, given the fact that the descriptive cross-sectional technique was utilized in this study, this tends to limit the ability to make causal inferences regarding the findings that have been uncovered. Thus, as a means of addressing this limitation, future researchers are advised to employ a research design that allows tracking the effects of team quality and project organizational culture over time.
- Lastly, as this study focused on the project managers of selected Information Communication Technology companies in a specific region of the world, it may be worthwhile for prospective future researchers to focus on other parts of developing countries, other industries, or to examine the performance outcomes of projects from the perspective of the consumers of these projects.

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