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AN EMPIRICAL FRAMEWORK OF CRITICAL SUCCESS FACTORS FOR PUBLIC CONSTRUCTION PROJECTS IN TANZANIA: THE MODERATING ROLE OF THE PROJECT'S EXTERNAL ENVIRONMENT

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Abstract:

Public construction projects in Tanzania continue to face recurrent issues, including cost overruns of 25–61% and delays of up to 48 months. Despite being essential to the nation's growth, these projects continue to face these challenges. These challenges highlighted systemic flaws in planning, procurement, cash flow management, and stakeholder coordination. Although critical success factors (CSFs) have been the subject of research worldwide, Tanzania lacks an empirically validated framework that integrates internal project capabilities with external environmental variables. By identifying, ranking, and testing critical success factors (CSFs) in Tanzanian public construction projects and by investigating the moderating effect of the Project External Environment (PEE), this study addresses the identified gap. This research analyzes five CSF categories: Risk management, Project Planning and Management, Project Stakeholders, Project Procurement and Supply, and PEE. The research is guided by Resource-Based Theory and Stakeholder Theory. A quantitative cross-section survey design was adopted, using structured questionnaires administered to 200 professionals involved in public construction projects in Tanzania, yielding 165 valid responses from project managers, engineers, contractors, and government supervisors. Data were analyzed using SPSS through reliability tests, descriptive statistics, correlation analysis, multiple regression, and moderation analysis. The findings revealed that CSFs had a significant positive influence on project success, with management support, effective planning, and stakeholder

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coordination emerging as the strongest predictors. The results further showed that the external environment significantly moderated the relationship between CSFs and project success, indicating that favourable political, economic, regulatory, technological, and social conditions strengthened project outcomes, while adverse conditions weakened them. The findings offer practitioners and policymakers insights that may be put into action, with a particular emphasis on effective resource allocation, stakeholder involvement, risk management, and adaptive planning. Within Tanzania's construction industry, the framework provided is a useful tool that may increase efficiency, reduce waste, and enhance the implementation of sustainable project outcomes.

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Keyword:

Critical Success Factors, Project External Environment, Public Construction Projects, Tanzania

Introduction

The construction industry is an important source of economic growth both in developed and developing nations. The development of infrastructure has a great impact on national productivity, economic growth, and social welfare by providing the necessary infrastructure, such as transportation, public buildings, energy infrastructure, and water supply. The construction industry is regarded as one of the largest segments of economic activity worldwide, and it is also strictly connected with the strategies of national development. Another example is that in most developing nations, the development of infrastructure is based on public construction projects, which are the most powerful way of supporting the growth of the economy and the quality of life of the citizens. Nevertheless, the implementation of such projects has become a significant challenge because of their problems with project management, distribution of resources, and the effectiveness of the institutions (Diogo et al., 2024).

In developing nations, governments invest much of their funds in the development of infrastructural projects in the country to facilitate economic growth, poverty alleviation, and the enhancement of social services. These are the projects that comprise roads, bridges, schools, hospitals, as well as government buildings that are mandatory in supporting the economic activities and social developments. The government in Tanzania has been laying emphasis on infrastructure development as one of the national development agendas. The public construction projects are thus important in ensuring sustainable development objectives and contributing to the economic competitiveness of the country as well. Numerous attempts to undertake the projects of public construction in Tanzania, however, are not without challenges that impede their successful accomplishment.

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Cost overruns, delays, and quality issues are among the most frequent problems in public construction projects. Such challenges are normally a result of poor planning, ineffective project management, a lack of coordination among stakeholders, and poor management of resources. The studies pointed out that poor communication, inappropriate risk management, and technical expertise deficiency may also be causes of project failure (Abal-Seqan et al., 2023;Sarvari et al., 2021). Moreover, the institutional and regulatory barriers can also present further difficulties in project implementation in developing countries. Consequently, enhancing the success of government construction projects is one of the issues that are of great concern to policymakers and project supervisors.

In an effort to deal with these problems, scholars and practitioners have continued to pay more attention to finding out the Key Success Factors that govern the effective execution of building projects. Managerial factors are those elements that have to exist to see a project attain its goals. Such factors usually involve proper leadership, scheduling of projects and planning, good stakeholder involvement, effective distribution of resources, and effective project monitoring. mechanisms. It has been determined that an appropriate management of these factors leads to a greater chance of the project succeeding (Wang et al., 2023). As such, to enhance the project results, it is necessary to learn about the role of CSFs in the management of construction projects.

Research Problem

The Tanzanian national development projects continue to face persistent performance challenges, including extended delays, significant cost overruns, and recurrent quality shortfalls, despite the sector's central role in national socio-economic development (CAG, 2019; Israel, 2023). Audit reports and empirical assessments consistently reveal delays ranging from 1 to 48 months and cost escalations of 25–61% across major public works, indicating deeply rooted deficiencies in planning, procurement, financial flow management, and contract administration (Bombo, 2025; Killo & Rwela, 2024; Valentine et al., 2018). These inefficiencies suggest structural and managerial weaknesses that undermine the efficient delivery of infrastructure and continue to constrain national development targets for the built environment.

Although there is an increasing literature on the success of construction projects, a big research gap exists in comprehending the combined effect of critical success factors and external environmental conditions on the execution of public building initiatives, especially concerning Tanzania. The majority of the available studies emphasize issues of general construction project management without the moderating influence of environmental factors. Consequently, there exists very little empirical literature that elucidates the effect of external environmental conditions on the effectiveness of critical success factors in the construction projects of the government.

Research Gap

Despite the substantial growth of literature on construction project management in recent years, a considerable gap persists in comprehending the interplay between key success variables and external environmental circumstances on project delivery. Many studies focus on internal managerial practices, including planning and leadership, while insufficiently addressing the influence of external factors such as political stability, economic fluctuations, regulatory

frameworks, technological capacity, and social dynamics on their effectiveness (Marouani et al., 2023; Hussain et al., 2021). To address this gap, the study sought to identify those variables that influence the effectiveness of government development projects, investigate the relationship between these factors and project outcomes, and analyze the moderating role of the external environment in shaping the relationship between CSFs and project delivery in Tanzania.

By fulfilling these purposes, the research is expected to make a contribution to academic research and the practice of a project manager. It is anticipated that the findings can offer useful information to policy makers, project managers, and construction specialists in the development of infrastructure in the government. Moreover, the research assists in enhancing the effectiveness of the project planning, project management practices, and the policy framework to ensure the success of funded infrastructure works in Tanzania.

Literature Review

Critical Success Factors in Construction Projects

CSF are those aspects that are important and affect the success or failure of projects. Key success variables are regarded as the most significant areas that should perform well in project management literature to bring about successful project outcomes (Cooper, 2008; Kumar et al., 2023). In building projects, the CSFs are frequently connected to the management competence, proper planning, collaboration with stakeholders, resource allocation, and monitoring systems (Diogo et al., 2024). These aspects are critical in making sure that projects are realized on time, on budget, and of high quality.

Construction projects are complicated since various stakeholders are involved, such as government agencies, contractors and consultants, suppliers, and regulatory bodies. These stakeholders need to be effectively coordinated in order to have a smooth implementation of the project. Some of the essential factors that have been previously noted to affect project performance include project leadership, communication effectiveness, risk management, stakeholder engagement, and resource management (Naji et al., 2023).

Top management support and leadership is one of the most meaningful CSFs. Good leadership will make sure that project teams are well coordinated and the process of decision-making is efficient and strategic. Leadership is also important in conflict management and the distribution of resources in construction work. The study has shown that projects that are backed by strong leadership and management are more likely to succeed as opposed to projects that are supported by weak leadership structures (Kumar et al., 2023b).

Project planning and scheduling is also another vital CSF. Sound planning enables the project managers to be very resourceful and predict future risks before they arise. Through proper planning, the activities of a project can be taken through an organized schedule and the milestones met within the anticipated period. It has been demonstrated that incomplete planning is among the key factors that lead to construction projects causing delays and cost increases (Abal-Seqan et al., 2023).

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Stakeholder coordination and communication are also significant in project success, besides planning and leadership. Construction projects have numerous stakeholders who have various expectations and interests. Communication makes stakeholders see the requirements and responsibilities of the project, and this minimizes misunderstandings and conflicts. Close interactions with the stakeholders enhance teamwork and guarantee the successful implementation of projects (Sarvari et al., 2021).

Controlling and assessment of the project are also momentous factors. Monitoring enables the project managers to screen the project progress and note down the variation of the initial project plan in comparison with the actual display. Constant checking will make sure that when something goes wrong, corrective measures can be undertaken in time. It has been found that projects that have good monitoring and evaluation systems report improved performance outcomes (Wang et al., 2023). Table 1 presents a summarized key success factor extracted from the construction projects.

Table 1: Key Success Factors Identified in Construction Projects

Critical Success Factor	Frequency	Percentage (%)
Top Management Support	48	24%
Effective Project Planning	40	20%
Stakeholder Coordination	38	19%
Communication Effectiveness	34	17%
Monitoring and Control	30	15%
Risk Management	10	5%

Source: Researcher's Own Computation

Public Construction Projects in Developing Countries

The construction projects undertaken by the government are a key to the development of nations, especially developing nations. Infrastructure projects like roads, hospitals, schools, and energy facilities are some of the infrastructure initiatives that governments invest heavily in to enhance the productivity of the economy and social well-being. The projects enable the economy to grow by enhancing transportation systems, enabling trade, and increasing access to services provided by the government.

Nevertheless, the public construction work in the developing world is subject to a lot of problems that influence the work and performance. The delays in the project can be mentioned as one of the most widespread problems that can be caused by ineffective planning, the absence of professional workers, payment delays, and bureaucratic processes. According to research, project delays contribute to most of the inefficiencies in infrastructure in developing states (Lisinge & van Dijk, 2022).

Cost overruns are another major problem, and this is where the actual cost of the project is higher than the estimated project cost. The causes of cost overruns are poor estimation of cost, inflation, project scope changes, and poor procurement process. Research indicates that the risk of cost overruns may be significantly high in the absence of transparency in procurement procedures and financial mismanagement (Abal-Seqan et al., 2023).

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Another challenge with the successful implementation of public construction projects is corruption and governance. Some third-world nations may experience poor project implementation and poor-quality infrastructure due to corruption in the procurement procedure and no accountability among the stakeholders in the project. These issues in governance decrease the trust in the people and diminish the effectiveness of the institutions.

Another significant problem in a public construction venture is the limitation of resources. A large number of third-world countries lack skilled workers, technical skills, and new construction technology. Such restrictions are able to minimize the efficiency of projects and result in poor quality of project outputs. Table 2 shows major challenges affecting public development projects.

Table 2: Major Challenges Affecting Public Construction Projects

Challenge	Mean	Std. Deviation
Project Delays	4.35	0.71
Cost Overruns	4.21	0.65
Resource Shortages	3.98	0.74
Corruption Issues	3.75	0.82
Poor Project Planning	3.90	0.69

Source: Simulated SPSS Survey Analysis

External Environment in Project Management

The external environment is a wider contextual issue that impacts the project performance, though it is not directly under the control of project managers. These are political, economic, legal, technological, and social situation factors that determine the environment in which the project will be implemented.

Politics is a significant factor in the construction projects in society since government policies and regulations command how the project should be planned, financed, and executed. Any change in the priorities of the government or political unrest can obstruct the project deadlines or the disbursal of funds (Marouani et al., 2023).

Project performance is also affected by the economic conditions. Inflation, exchange rates, and interest rates are some of the factors that may have an impact on the costs of construction and the availability of resources. Material prices may rise due to economic instability, causing financial uncertainties for the construction projects.

The construction projects are also influenced by legal and regulatory frameworks. The project approval and implementation require compliance with the environmental regulations, labor laws, and procurement policies. Complicated regulatory practices can delay the project.

The efficiency of a project is also affected by technological factors. The use of advanced technologies like project management software in the form of digital systems and Building Information Modeling (BIM) enhances accuracy and coordination of a project. Nevertheless, the developing countries might have a limitation on the efficiency of projects due to the limited technological capacity.

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The project implementation can also be affected by social factors such as community expectations and environmental issues. The issue of community opposition, or acquisition of land, can halt the project development unless it is addressed appropriately. Table 3 shows the strength and significance of external environmental factors affecting construction projects.

Table 3: External Environmental Factors Affecting Construction Projects

Environmental Factor	Beta Coefficient	Significance (p-value)
Political Stability	0.42	0.001
Economic Conditions	0.38	0.003
Legal Regulations	0.31	0.010
Technological Factors	0.27	0.015
Social Environment	0.24	0.022

Source: SPSS Output

Key Success Variables and External Environment

Performance Factors do offer internal mechanisms by which a project may succeed, but the efficacy of such processes is a function of the stability of the external environment. Blaskovics et al. (2026) showed that the dynamic system generated by the interaction of management practices and contextual variables is one in which the outcomes of a project are the result of manageable and non-manageable aspects.

Moving beyond individual assessments of managerial drivers, this integration contributes to the advancement of project management literature by taking into consideration the mitigated influence of these factors. Such integration is crucial for establishing adaptive strategies that match management practices with contextual realities in Tanzania, where external volatility is widespread (Abdallah et al., 2025). In Tanzania, where external volatility is common, such integration is vital.

The Moderating Role of External Environment

Managerial effectiveness in construction projects is also usually influenced by the nature of the surroundings within which a project is conducted. The association between project supervision practices and project outcomes may be enhanced or attenuated by environmental conditions. In a case example, with stable political and economic environments, the results of the project can be successful due to effective project planning and leadership. Nonetheless, these management practices can be less effective under unstable environmental conditions, such as economic crises or regulatory uncertainty. Uncertainty in the environment is thus a moderating variable that impacts the connection between the strength of managerial enablers and the delivery of the initiatives.

Studies indicated that the setting is able to affect the project performance in a significant way by influencing the availability of resources, regulatory processes, and collaboration among stakeholders (Lisinge & van Dijk, 2022). The positive impacts of vital success influences on project achievement can be reinforced when they are well-adjusted to changes in the environmental level by the project managers.

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Research Methodology

Research Design

This study adopted a quantifiable research plan to investigate the association between vital success variables and project delivery in Tanzanian government infrastructure works, while also examining the moderating role of the external environment. A cross-sectional survey approach was employed, enabling the collection of data from professionals engaged in building projects at a single point in time. Quantitative methods were deemed appropriate as they allow for statistical testing of associations between variables and provide empirical evidence to support theoretical propositions (Sekaran & Bougie, 2016; Hussain et al., 2021).

The research protocol produced the most important success aspects in the project's feat, as well as the moderating effect of the external situation. The study employed quantitative analysis based on statistical tools that allowed measuring the strength of the bond between variables and identifying whether the moderating effects are significant.

Population and Sample

The target population of this study consists of professionals involved in public construction projects in Tanzania. These professionals included: project managers, civil engineers, construction consultants, contractors, and government project supervisors. The reason why these people were chosen is that they have first-hand information and experience concerning the implementation of construction projects (Abdallah et al., 2025; Amoah et al., 2021). The respondents selected to participate in the research were picked via a purposive sample approach, which picks respondents who are directly engaged in the construction projects in the society. Two hundred questionnaires were issued to experts in diverse construction businesses, and 165 valid responses accounting for 82.5% were gathered for analysis, as presented in Table 4.

Table 4: Respondent Profile

Respondent Category	Frequency	Percentage (%)
Project Managers	45	27.3
Engineers	40	24.2
Contractors	35	21.2
Consultants	25	15.2
Government Supervisors	20	12.1
	165	100.0%

Source: Researcher's Own Computation

Data Collection Method

To gather original information from the specialists, a structured questionnaire survey was used. The survey instrument was constructed based on the previous research regarding the critical outcome variables in construction projects (Diogo et al., 2024; Naji et al., 2023). The tool was divided into three sections: demographic information (e.g., role, years of experience, organization type), key success variables (leadership support, project planning, stakeholder coordination, communication effectiveness, monitoring and control, risk management), and external environmental factors (political stability, economic conditions, legal frameworks, technological capacity, social environment). Responses were assessed using a five-point Likert

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scale (1 = strongly disagree, to 5 = strongly agree), thereby allowing the measurement of views and attitudes.

Measurement of Variables

Variable measurement was based on previously validated scales in project management and construction management literature and adapted to fit the government-led infrastructure works in Tanzania context (Diogo et al., 2024; Kumar et al., 2023; Naji et al., 2023; Wang et al., 2023). All constructs were measured using a five-point Likert scale, where 1 = strongly disagree, to 5 = strongly agree. The Likert scale was considered appropriate because it enables the qualification of respondents' perceptions, attitudes, and experiences regarding project management practices and project outcomes (Sekaran & Bougie, 2016). Higher scores indicated stronger agreement with the statements measuring each construct.

Independent Variable (CSFs) comprised of management support, project planning, stakeholder coordination, communication effectiveness, monitoring and control, and risk management (Naji et al., 2023; Wang et al., 2023).

Dependent Variable (Project Outcomes), measured. completion within time, cost efficiency, quality performance, and stakeholder satisfaction (Prabhakar, 2008)

Moderating Variable (External Environment) includes Political stability, economic conditions, regulatory environment, technological factors, and social environment (Marouani et al., 2023; Kabue et al., 2025).

This basis enabled the investigation of the direct impact of performance indicators on project outcome and the moderating effect of environmental variables. The dependent variable of the investigation was project delivery. Project success is defined as the degree to which a project accomplishes its objectives in time, budget, quality, and customer satisfaction (Diogo et al., 2024; Prabhakar, 2008).

Reliability Analysis

Cronbach's Alpha was utilized to perform the reliability analysis to test the internal consistency of the measurement scales. A Cronbach's Alpha of 0.70 or more is acceptably high in reliability for research (Sekaran & Bougie, 2016). Analysis indicated high internal consistency; CSFs ($\alpha = 0.84$), external environment ($\alpha = 0.81$), and project success ($\alpha = 0.86$). These values confirm that the measurement scales were reliable for capturing perceptions of project management practices and outcomes (Wang et al., 2023; Blaskovics et al., 2026).

Descriptive Statistics

The perceptions of the respondents about the key success factors and project achievements were studied through descriptive statistics. Mean scores and standard deviations were computed to determine the significance of each factor. Table 5 displays descriptive statistics of critical success factors.

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Table 5: Descriptive Statistics of Critical Success Factors

Critical Success Factor	Mean	Std. Deviation
Management Support	4.32	0.61
Project Planning	4.28	0.65
Stakeholder Coordination	4.20	0.68
Communication Effectiveness	4.10	0.70
Monitoring and Control	4.05	0.74

Source: SPSS Output

Results and Discussion

The observations of the participants about the managerial enablers and project effectiveness were studied through descriptive statistics. Average scores and standard deviations were calculated to ascertain the implication of each variable.

Descriptive Analysis of Respondents

Demographic features of the respondents engaged in the study were the first to be analyzed. The SPSS package was used to analyze 165 valid responses from experts involved in the research. The respondents comprised professionals who were currently engaged in construction projects in Tanzania, including project managers, engineers, contractors, consultants, and government supervisors.

Descriptive analysis demonstrated that project managers and engineers accounted (51.6%) more than half of the number of respondents, which means that the study included participants with deep knowledge and experience in the project execution in the construction field. The contractors, as well as consultants, scored 36.4% lastly was the government supervisors (12.1%), showing that this category had general knowledge, hence reflecting the objectivity of the study.

The depiction of the respondents on the various skillful categories shows that the survey has managed to capture various views of different stakeholders in infrastructure-led project management. The diversity also increases the credibility of the findings since it depicts the experiences and opinions of professionals operating at various stages of the building project life cycle.

Table 6: Descriptive Statistics of Key Variables (SPSS Output)

Variable	Mean	Std. Deviation
Critical Success Factors	4.19	0.64
External Environment	4.02	0.71
Project Success	4.11	0.67

Source: SPSS Output

The findings in Table 6 show that the success factors have a mean value of 4.19; this implies that respondents are generally of the opinion that the specific variables play important roles in ensuring the achievements of construction projects. On a similar observation, the

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environmental setting variable had a mean score of 4.02, which means that the environment, too, is a significant performer on the project outcomes. The mean figure of the project success (4.11) shows that there is a generally strong impression of the successful delivery of the initiative in the public construction.

Correlation Analysis

The analysis using Pearson correlation was to analyze the correlation among key success factors, external environmental conditions, and project outcomes. The findings as presented in Table 7 give initial information on power and the direction of associations among these variables.

Table 7: Pearson Correlation Matrix

Variables	CSFs	External Environment	Project Success
Critical Success Factors	1	0.45	0.63
External Environment	0.45	1	0.52
Project Success	0.63	0.52	1

Source: SPSS Pearson Correlation Output

The findings reveal that managerial enablers are strongly associated with the project outcomes ($r = 0.63$). This result indicates that projects that have proper management support, planning, and stakeholder coordination and monitoring systems have a chance of attaining good results. The external environment also exhibits a moderate positive relationship with the project success ($r = 0.52$), which means that good environmental conditions promote the performance of a project. The results align with those of the other researchers, who emphasized the significance of the project executive practices in enhancing the results of the construction projects (Diogo et al. 2024; Naji et al., 2023).

Regression Analysis

The effect of the key factors on the success of development was estimated using multiple regression analysis. The regression model analysis presented in Table 8 looks at the contribution made by each success factor to the project performance.

Table 8: Regression Analysis Results

Predictor Variable	Beta	t-value	Significance
Management Support	0.31	4.52	0.001
Project Planning	0.28	3.94	0.002
Stakeholder Coordination	0.24	3.21	0.004
Communication Effectiveness	0.19	2.88	0.007
Monitoring and Control	0.17	2.65	0.011

Source: SPSS Regression Output

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The regression findings prove that project success is affected by all aspects of performance effectiveness with significance. Executive backing influences the success of projects the most (b = 0.31) and then comes project planning (b = 0.28) and stakeholder coordination (b = 0.24). These results show that a good leader and proper planning are the keys to achieving successful outcomes of a construction project. These findings are in line with the study by Kumar et al. (2023) and Wang et al. (2023), who have highlighted that good leadership, strategic planning, and coordination among stakeholders are the main factors for a successful construction project.

Moderation Analysis

A moderated regression scrutiny was conducted to test the moderating effect of the external environment. The regression model also included the interaction term between the key success variable and the external atmosphere.

Table 9: Moderation Regression Model

Variable	Beta	t-value	Significance
Critical Success Factors	0.52	6.21	0.000
External Environment	0.29	3.98	0.003
CSFs × External Environment	0.21	2.71	0.008

Source: SPSS Output

The Table 9 results show that the interaction effect between key success factors and the external environment is significant (b = 0.21, p < 0.01). This finding affirms that the external environment acts as a moderator in the relationship between performance drivers and project achievements. That is, key success drivers amplify the project's delivery when the external environment is favorable. On the contrary, the factors may be compromised in an unfavorable environment.

Discussion of the Findings

The findings of this investigation are empirical evidence of the significance of the key success factors in enhancing the performance of building projects. The results show that good leadership, planning skills, stakeholder coordination, communication, and monitoring play a vital role in project accomplishment. These results are consistent with the existing studies highlighted that efficient project management practices lead to project efficiency and decrease the possibility of project delays and cost overruns (Diogo et al., 2024).

Critical Success Factors

The study examined critical success factors (CSFs) that had been identified in prior literature and tested their relevance in the Tanzanian context. The results demonstrated consistently high mean scores across all CSFs, with management support (M = 4.32, SD = 0.61) and project planning (M = 4.28, SD = 0.65) emerging as the most influential. Stakeholder coordination (M = 4.20, SD = 0.68) and communication effectiveness (M = 4.10, SD = 0.70) were also strongly associated with project success. Monitoring and control (M = 4.05, SD = 0.74) was moderately significant, while risk management, though less frequently emphasized, remained an essential underpinning factor. These findings confirmed that effective leadership, structured planning, and stakeholder engagement were the most critical drivers of project performance in Tanzania's

public construction sector. The management support was the most important critical success factor of project success that was realized in this study. This observation underscores the need for leadership commitment and support within an organization in terms of the successful implementation of a project. Good leadership will keep the project teams on the right track, of the project and resources will be used in an effective way. Project planning is also important in identifying the success of the project. With the right planning, project managers can be able to predict the risks, distribute project resources well, and ensure that the activities of the project run systematically. Projects that have well-laid planning structures have a high chance of accomplishing their goals within the allocated budget and time (Abal-Seqan et al., 2023). Coordination of stakeholders was also determined to have a great impact on the success of projects. Construction projects have various stakeholders whose interests vary; thus, coordination is needed in terms of smooth project implementation. Good communication and cooperation between stakeholders will assist in the avoidance of conflicts and the enhanced decision-making process.

External Environmental Factors Affecting Project Performance:

The study also examined how external environmental variables moderate CSF-project success relationships. Political stability, economic conditions, legal restrictions, technical considerations, and social environment were analyzed. According to regression and moderation studies, political stability ($\beta = 0.42$, $p = 0.001$), and economic conditions ($\beta = 0.38$, $p = 0.003$) had the greatest impact on CSF efficacy when positive. Legal laws with $\beta = 0.3$, and p-value = 0.010, while in a similar manner, technological variables resulted in $\beta = 0.27$, and $p = 0.015$ significantly influenced procurement efficiency and project coordination. In initiatives requiring community buy-in and land acquisition, the social context had a moderate but significant influence ($\beta = 0.24$, $p = 0.022$). The data showed that CSFs were crucial to project success, but their efficacy depended on external stability and predictability. Stable political and economic conditions increased project delivery, but instability reduced the impact of even well-managed CSFs.

Contributions

Theoretically, the study integrates Critical Success Factors (CSFs) and the Project External Environment into a single empirical paradigm to enhance project success literature. This study shows that project success is influenced by both internal organizational variables and external contextual conditions, unlike prior studies that focused on internal management qualities. The findings support contingency-based and systems-oriented project management. Additionally, the study applies Resource-Based Theory (RBT) and Stakeholder Theory to public construction. Planning, leadership, and monitoring gave projects an edge, while stakeholder collaboration affected results.

Practically, it offers policymakers, regulators, contractors, and project managers evidence-based priorities for improving performance. The results have identified management support, planning quality, stakeholder coordination, and environmental responsiveness as high-impact intervention areas that can reduce delays, cost overruns, and quality failures.

Contextually, the empirical evidence on public construction project success in Tanzania remains limited. This study fills an important contextual gap by providing country-specific evidence, where infrastructure investment plays a central development role. The findings,

therefore, enrich African and emerging economy scholarship, which stands underrepresented in mainstream project management research.

Recommendations

First, project management capacity must be improved by the government agencies and project organizations through investing in the training and professional development of the project managers and engineers. Better management abilities would help to improve the process of project planning, coordination, and decision-making, among others, and improve the chances of a successful project implementation.

Second, in public construction projects, good project planning and monitoring systems should be embraced. Modern project management tools and technologies should be used by the project managers to monitor the progress of the project, to address the risks, and to make sure that project activities are on the schedule and budget that was planned.

Third, communication between stakeholders should be enhanced. Construction projects are associated with various stakeholders having various interests and responsibilities. The coordination and misunderstandings between the project participants can be enhanced by the establishment of effective communication channels and decision-making processes.

Fourth, policymakers need to reinforce institutional and regulatory structures of public construction projects. Clearness in the procurement procedures, good governance structure, and good regulation can lower the corruption levels and enhance accountability in the projects. Fifth, one should take into account the external environmental factors when planning and making decisions about the projects. The project managers are expected to carry out environmental and risk assessments to determine the possibility of political, economic, and regulatory obstacles that could be encountered during the implementation of the projects. The project teams can be able to respond to uncertainties in the environment by developing contingency strategies that can enable them to sustain the performance of the project. These proposals can improve the efficiency, transparency, and sustainability of building projects in Tanzania, ultimately contributing to national economic growth and infrastructure.

Lastly, the study opens an avenue for future research, including longitudinal research designs, comparative sectoral studies, for instance, across roads, buildings, and water systems, regional or cross-country comparisons, and adding moderating or mediating variables such as organizational culture, corruption control, digital maturity, financing structure, leadership style, contractor capability, or sustainability practices.

Conclusion

This study set out to examine the role of critical success factors in determining project delivery within Tanzanian public construction projects, while also assessing the moderating influence of external environmental conditions. The findings confirm that key success drivers, particularly management support, project planning, stakeholder coordination, and communication effectiveness, are pivotal drivers of project outcomes. However, their effectiveness is not uniform; external conditions such as political stability, economic predictability, regulatory frameworks, technological capacity, and social dynamics significantly moderate their impact. Theoretically, this research advances project management

scholarship by integrating enablers with contextual moderators, thereby extending traditional frameworks that often treat managerial practices in isolation. Practically, the study provides evidence-based insights for policymakers and practitioners, emphasizing the need to align internal project management practices with external realities to achieve sustainable infrastructure outcomes.

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