The influence of quality management practices on performance of force account construction projects in Meru District Council, Arusha

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ABSTRACT

This study examined the influence of quality management practices and the performance of construction projects implemented through force account (FA) in Meru district. The study was grounded in Total Quality Management (TQM) theory. Cross-sectional research design with quantitative approach was used. Data were collected through questionnaires administered to 150 respondents from 243 target population across Meru district council. Quantitative data were analyzed through descriptive analysis such as mean and standard deviation while inferential statistics was analyzed through multiple linear regression analysis using SPSS version 25 software. The study found that quality planning yielded a positive and significant influence on the performance of construction projects implemented through force account in Meru District Council with (Beta= 0.216, P<0.001), quality assurance had a positive and significant influence on the performance of construction projects implemented through force account in Meru District Council with (Beta= 0.272, P<0.001), and technical supervision yielded a positive and significant influence on the performance of construction projects implemented through force account in Meru District Council with (Beta= 0.294, P<0.001). The study concluded that quality management practices positively influence the performance of construction projects implemented through force account in Meru District Council. The study recommends that there should an effective quality planning, quality assurance and technical supervision in all construction projects implemented through force account order to ensure good performance

Keywords: Construction Projects, Force Account, Quality Management Practices, Performance

I. INTRODUCTION

Worldwide, governments have employed diverse project delivery approaches to improve the efficiency, accountability, and quality of public infrastructure projects. Among these approaches is force account, whereby a government entity undertakes construction works using its own personnel and equipment. The World Bank recognizes force account as a procurement method that may be appropriate under specific circumstances and also emphasizes the potential use of local knowledge, materials, labour, and community participation in project implementation. Despite its potential advantages, effective implementation of force-account projects requires adequate technical capacity, appropriate management systems, and effective quality control. Deming (1986) emphasized the importance of systematic management and quality improvement in achieving consistent organizational performance, while Juran and Godfrey (1999) emphasized quality planning, quality control, and quality improvement as essential components of quality management. Similarly, Oakland (2014) emphasized the importance of systematic quality management, including planning, assurance, control, and continuous improvement, in organizational and operational performance

In Sub-Saharan Africa, force account has increasingly been used as an alternative approach for implementing public infrastructure projects, particularly within local government and public works programmes. Evidence from Uganda shows that force account approach has been used in roads construction and maintenance as an alternative to conventional contracting arrangements, with stakeholder perspectives highlighting the importance of institutional and managerial capacity for effective implementation Kalinzi et al. (2025). In Kenya, Waweru et al., (2025) examined the use and performance of force account in road construction projects in Nairobi City County and found that, although force-account projects demonstrated advantages in cost and time efficiency, challenges related to inadequate supervision, managerial inefficiencies, and financial compliance persist. The study further reported that supervision and quality control were important considerations in determining project outcomes. These findings suggest that the effectiveness of force account depends not only on its potential to reduce costs and accelerate implementation but also on the availability of adequate technical supervision, managerial capacity, and quality-control mechanisms.

In Tanzania, force account has been established through the Public Procurement Act (2016) and is widely used by Local Government Authorities (LGAs) to implement public infrastructure projects such as classrooms, health

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facilities, and roads. The approach is intended to improve cost efficiency and facilitate timely project implementation (World Bank, 2017). However, consecutively Controller and Auditor General (CAG) reports have identified weaknesses in the planning, design, supervision, materials management, and quality control on projects implemented through force account, resulting in various construction defects and low-quality finishes (CAG, 2022/2023). Similarly, Matto (2023) identified inadequate planning and design, weak supervision, and limited technical capacity as major shortcomings affecting force-account projects in Tanzania. Macharia et al. (2023) further found that staff competence and management support significantly influence the effectiveness of force-account implementation in LGAs.

Despite the existing challenges, there remains limited empirical research that systematically examines the influence of quality management practices on the performance of force account construction projects in Tanzania local governments. Most prior studies have focused either on cost efficiency or general project outcomes, without concentrating on how specific quality management dimensions such as quality planning, quality assurance and technical supervision directly affect project performance (Macharia, et al., 2023; Matto 2021; Mugarula, 2023). This knowledge gap hinders evidence-based interventions aimed at improving the effectiveness of force account projects. Therefore, this study addressed this gap by investigating the influence of quality management practices on performance of construction projects implemented through force account in Tanzanian local governments, using Meru district council as a case study.

1.1 Research Objectives

i. To examine the influence of quality planning on performance of force account construction projects in Meru district council
ii. To determine the influence quality assurance on performance of force account construction projects in Meru district council
iii. To examine the influence of technical supervision on performance of force account construction projects in Meru district council

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Total Quality Management (TQM) theory

This study is grounded in Total Quality Management (TQM) theory, which emphasizes systematic quality planning, continuous improvement, process control, and meeting stakeholder needs to achieve quality outputs (Deming, 1986; Juran & Godfrey, 1999; Oakland, 2014). TQM views quality as a continuous organizational responsibility that should be integrated into planning, implementation, monitoring, and control processes. The theory is particularly relevant to force-account projects because Local Government Authorities (LGAs) assume direct responsibility for planning, resource management, implementation, supervision, and delivery of construction works. Evidence from Tanzania shows that staff competence and management support influence the effectiveness of force-account implementation (Macharia et al., 2023), while Mugarula (2023) identified challenges related to cost, time, and quality in force-account construction projects.

The TQM theory explains how quality planning, quality assurance and control, and technical supervision influence performance of projects implemented through force account method. Quality planning involves establishing appropriate designs, specifications, schedules, and resource requirements before implementation (Juran & Godfrey, 1999; Oakland, 2014). Quality assurance and control involve systematic inspection and verification to ensure that materials and construction activities comply with required standards. Technical supervision ensures that activities are properly guided, monitored, and corrected throughout implementation. Together, these practices can minimize errors, defects, rework, resource wastage, and delays, thereby improving project performance.

This study conceptualizes project performance as a multidimensional construct encompassing cost adherence, time adherence, and quality of outputs, and posits that the effective implementation of TQM practices planning, quality assurance and supervision positively influence these performance outcomes. The theory highlights that force account acts as the operational context, where the government's dual role intensifies the need for robust quality management. When TQM principles are applied effectively, force account projects are more likely to be completed on time, within budget, and at high quality, fulfilling both organizational objectives and stakeholder expectations.

2.2 Empirical Review

2.2.1 The influence of quality planning on performance of force account construction projects

Waweru et al. (2025) highlights that in Kenya, force account projects which lack comprehensive planning experienced significant interruptions and inefficiencies, suggesting that the dual role of the government as client and contractor brought planning challenges. Tanzanian audit findings further substantiate these concerns, with the Controller and Auditor General reporting construction defects arising from inadequate project supervision and insufficient technical support, as well as numerous incomplete development projects across Local Government Authorities (Controller and

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Auditor General [CAG], 2024). The findings indicate that while the importance of planning is acknowledged, there is limited empirical evidence on how structured, TQM-based planning directly influences the three core dimensions of project performance cost, time, and quality in projects implemented through force account in Tanzania.

Matto (2023) examined the challenges in implementation of force account projects in Tanzania and identified inadequate planning and designing of projects as one of the major latent shortcomings affecting force account construction projects. The study also identified inadequate contract supervision, lack of qualified personnel, inadequate equipment and tools, inappropriate adherence to procurement procedures, and weaknesses in recording project costs as important challenges. These findings suggest that quality problems in force account projects may originate before physical construction begins, particularly where project requirements, designs, materials, human resources and implementation procedures are not adequately planned.

2.2.2 The influence quality assurance on performance of force account construction projects

Mugarula (2023) demonstrates that Tanzanian LGAs executing force account projects often deliver facilities with substandard finishes due to insufficient quality controls. CAG reports (2022/2023) provide further evidence that lack of systematic quality assurance contributes to structural deficiencies and budget escalation. Together, these studies underscore the criticality of quality assurance & controls, but they largely examine its isolated effects. There remains a knowledge gap on how quality assurance & controls interacts with other total quality management dimensions such as planning, supervision, and documentation to influence overall project performance of projects implemented through force account in Tanzania local government.

Mwaiseje et al. (2024) demonstrate that inadequate quality management, weak supervision and ineffective monitoring and control mechanisms can undermine the quality attainment of force-account construction projects in Tanzanian Local Government Authorities. Their findings establish that risk management, relationship management, dispute management, and monitoring and control are significant factors influencing the quality of force-account construction projects. This suggests that inadequate quality assurance and control mechanisms can contribute to poor workmanship, non-compliance with established construction standards and reduced infrastructure quality. Therefore, systematic quality assurance and effective control mechanisms are essential for ensuring that force-account projects achieve the required construction standards and deliver sustainable infrastructure outcomes.

2.2.3 The influence of technical supervision on performance of force account construction

Matto (2021) examined the latent shortcomings of force-account construction projects in Tanzania, focusing on projects in the education sector. Using an explanatory sequential mixed-method design, the study analyzed performance audit reports and qualitative interview data. The findings identified inadequate supervision and lack of qualified personnel to execute and supervise works among the major shortcomings affecting projects implemented through force account method. These findings highlight the importance of effective technical supervision and competent personnel in ensuring that construction activities comply with required standards and are properly implemented

Macharia et al. (2023) further, assert that poor supervision is a main factor of project delays and wastage of materials in Tanzanian LGAs, as internal teams often lack the experience to self-correct errors. Similarly, Mwaiseje et al. (2024) found that inadequate supervision in Kenyan force account projects led to low-quality outputs and project extensions, emphasizing the need for constant oversight. Tanzanian audit reports support these findings, highlighting incomplete works and structural weaknesses due to insufficient on-site supervision (CAG, 2023). Despite these insights, research remains fragmented, largely focusing on supervision as a standalone factor

III. METHODOLOGY

3.1 Research Design

This study employed a quantitative research approach using a cross-sectional descriptive design. The approach is suitable for examining relationships between quality management practices and performance of project at a single point in time (Creswell & Creswell, 2018). A cross-sectional design allows the collection of structured data from a large number of respondents to statistically assess the influence of planning, quality assurance and supervision on cost, time, and quality on performance of projects implemented through force account method.

3.2 Study Area

The study was conducted in Meru district council, Tanzania, which has actively implemented force account projects in sectors such as education, health, and roads. The district was selected due to its high prevalence of local government construction projects and the availability of records on force account project implementation, making it an ideal case for examining the influence of quality management practices on performance of projects implemented through force account.

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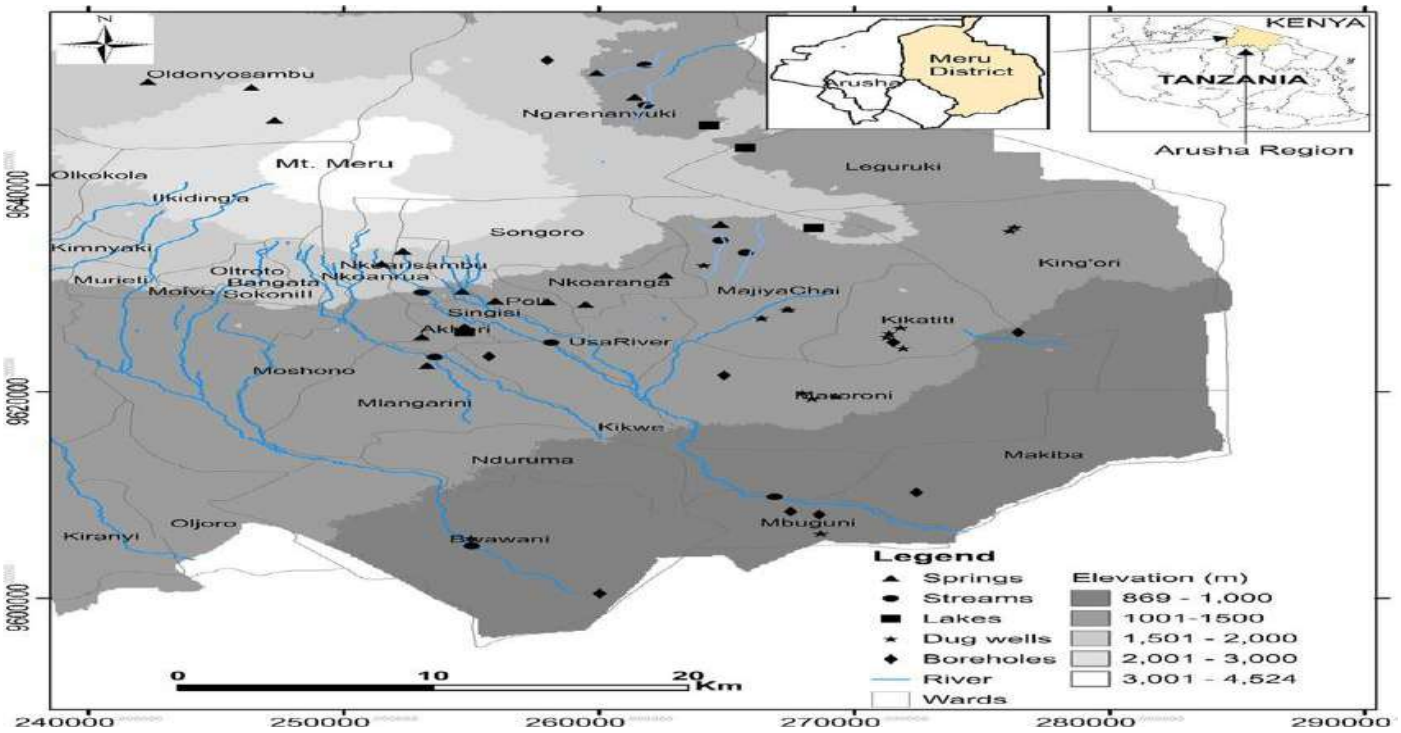

Figure 1

A map of Meru district Council

3.3 Population and sampling

The target population for the study consisted of respondents who are knowledgeable about the implementation force account projects, including district top management, district engineers, accountants, local contractors, local government officials, planning officers, procurement officers, and internal auditors from the districts. According to Meru District Council records, the total number for this target population is approximately 243 individuals.

The study employed snowball sampling techniques due to the absence of a publicly accessible registry of community members involved in force account project in Meru district. Though other methods like simple random sampling were considered, they were not feasible given the decentralized and dynamic participation of community in projects implemented through force account. To ensure no selection bias, respondents were selected from different construction sites implemented through force account to ensure diversity and representation in age, experience, and socioeconomic backgrounds. To ensure relevance, the sampling process included community members and local artisans who had been actively engaged in projects constructed through force account method for at least two projects consecutively. The sample also ensured demographic diversity, representing different groups in the district.

The researcher assumed a 95% confidence level, which is equivalent to a standardized normal deviation value of 1.96 and an acceptable margin of error of 5% (standard value of 0.05. Yamane's formula (1967) was used to determine the sample size for this study. Based on the study sampling frame, the sample size was computed at precision level of 5% (e = 0.05) as shown in equation below:

$$\frac{N}{1 + N(e)^2}$$

Where:

n = sample size

N = total population

e = margin of error (commonly 0.05 for 95% confidence level)

Given:

N = 243

e=0.05

$n \approx \frac{243}{(1+243(0.05)2)}$ = n=150

Therefore, the minimum sample size for this study was 150 respondents

3.4 Data Collection Method

The study used a close-ended questionnaire with a five-point Likert scale to collect data from 150 respondents. The five-point Likert scale was selected because it provides a structured approach for measuring respondents' attitudes,

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perceptions, and opinions. Respondents were asked to indicate their level of agreement with statements related to the research objectives, ranging from 1 = Strongly Disagree to 5 = Strongly Agree. This format facilitates standardized responses and quantitative analysis by enabling researchers to determine the extent of respondents' agreement or disagreement with the statements (Joshi et al., 2015).

3.5 Variables measurement:

Independent variables measurement: The measurement of independent variables is grounded in the TQM theoretical framework, The independent variable is Quality Management Practices, measured through three dimensions based on TQM theory: Quality Planning, Quality Assurance & Control and Technical Supervision. Each dimension is measured using Likert-scale indicators (1 = Strongly Disagree, 5 = Strongly Agree). More specifically, quality planning has the following indicators, existence of clear project plans, adequate resource allocation, well-prepared schedules and timelines and feasibility assessment before project start, on other hand, quality assurance & control has the following indicators, regular inspections and testing of materials, compliance with technical standards, monitoring of workmanship and corrective actions implemented promptly. The indicators for technical supervision were, continuous on-site supervision, timely guidance and correction of errors, supervision of internal staff and monitoring adherence to project designs

Dependent Variable: The dependent variable for this study which is performance of construction projects implemented through force account was measured across three indicators which is cost performance, time performance, and quality performance. Each dimension is also measured using Likert-scale indicators. The cost performance was measured with the following indicators, adherence to budget, minimization of wastage, efficient use of materials and resources and avoidance of unnecessary expenses using 5-point Likert scale, time performance was measured with completion within planned schedule, timely delivery of project phases, minimal project delays and effective handling of unforeseen interruptions 5-point Likert scale, the quality performance was measured with compliance with technical standards, structural durability, finishing and workmanship quality and satisfaction of project beneficiaries.

3.6 Data Analysis

The Statistical Package for Social Sciences (SPSS) Version 26 was utilized for data analysis to analyzes both descriptive statistics and inferential statistics. The descriptive statistics analyzed were mean and standard deviation. The study also used multiple linear regression analysis to estimate the relationship between independent and dependent variables. Therefore, the model specification was as follows;

$$Ya = \beta^0 + \beta^1 X^1 + \beta^2 X^2 + \beta^3 X^3 + \ldots + \beta_n X_n + \varepsilon \quad \ldots\ldots (1)$$

And,

$$PPFA = \beta^0 + \beta^1 QP + \beta^2 QA + \beta^3 TS + \varepsilon \quad \ldots\ldots (2)$$

Whereby,

$PPFA$ = performance of projects implemented through force account,

β_0 is the constant, $_1$

QP= quality planning

QA = quality assurance

TS= technical supervision

IV. FINDINGS & DISCUSSION

4.1 Demographic characteristics

The results in table 1 shows that 56.7% of respondents were male whereas 43.3% were female. On the other hand, 24.7% of respondents were in the age range of 18-30 years, 32% were between 31-40 years, 23.3% were between 41-50 years and 20% were between 51-60 years. Further, 15.3% of respondents had a primary school level of education, 24.7% had a certificate, 26% had a diploma, 20.7% had a bachelor's degree, and 6% had a postgraduate level of education. Furthermore, 32.7% of respondents had more than 5 years of working experience, 32% had 1-5 years of working experience, 27.3% had 1-3 years of experience and 8% had less than 1 year of working experience. Moreover, 25.3% of respondents were local contractors, 18.7% were accountants, 14.7% were procurement officers, 14.7% were planning officers, 13.3% were engineers, 9.3% were internal officers and 4% were district top officers

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Table 1
Sample Description

Variables	Category	Frequencies	Percentages
Gender	Male	85	56.7
	Female	65	43.3
	Total	**150**	**100.00**
Age group	18-30	37	24.7
	31-40	48	32.0
	41-50	35	23.3
	51-60	30	20.0
	Total	**150**	**100.00**
Education Level	Primary education	23	15.3
	Certificate	37	24.7
	Diploma	39	26.0
	Bachelor degree	31	20.7
	Postgraduates	20	13.3
	Total	**150**	**100.00**
Occupations	District top officers	06	4.0
	Procurement officers	22	14.7
	Accountants	28	18.7
	Planning officers	22	14.7
	Internal auditors	14	9.3
	Engineers	20	13.3
	Local contractors	38	25.3
	Total	**150**	**100.00**

4.2 Descriptive Analysis

4.2.1 Influence of quality planning on performance of projects implemented through force account

The table 2 shows the descriptive analysis findings on the influence of quality planning on performance of projects implemented through force account in Meru district

Table 2
Influence of quality planning

SN	Statements	Mean	Std. Dev.
1	The project had a clearly defined quality plan before implementation	3.62	0.83
2	Quality objectives were well communicated to all stakeholders	3.98	0.99
3	Standards and specifications for materials and workmanship were documented and followed	3.54	1.06
4	Quality planning was regularly reviewed and updated throughout the project	3.69	0.84
5	Stakeholder involvement was considered in the quality planning process	3.72	0.78

Table 2 presents descriptive statistics on the influence of quality planning in project implementation. The findings show that respondents generally perceived quality planning positively, as reflected by mean scores ranging from 3.54 to 3.98. Communication of quality objectives to stakeholders recorded the highest mean score of 3.98 (SD = 0.99), implying that quality objectives were relatively well communicated to project stakeholders. Stakeholder involvement in quality planning followed with a mean score of 3.72 (SD = 0.78), indicating that stakeholder participation was generally considered during the quality planning process. Similarly, regular review and updating of quality plans recorded a mean of 3.69 (SD = 0.84), while having clearly defined quality plans before project implementation recorded a mean of 3.62 (SD = 0.83), suggesting that quality planning was established before implementation and, to some extent, maintained throughout the project lifecycle. Documentation and adherence to standards and specifications for materials and workmanship recorded the lowest mean score of 3.54 (SD = 1.06). This suggests that, although respondents generally acknowledged the existence of quality standards, their consistent documentation and enforcement during project implementation may have been comparatively weaker. The relatively higher standard deviation for this statement further indicates differences in respondents' experiences regarding the application of quality specifications.

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4.2.2 Influence of quality assurance on performance of projects implemented through force account

The table 3 shows the descriptive analysis findings on the influence of quality assurance on performance of projects implemented through force account in Meru district

Table 3

Influence quality assurance

SN	Statements	Mean	Std. Dev.
1	Quality assurance procedures were clearly defined before project implementation	3.58	0.84
2	Regular inspections and audits were conducted during the project	3.85	0.88
3	Materials used in the project consistently met required standards	3.72	1.03
4	Corrective actions were taken promptly when quality issues were identified	3.65	0.89
5	Documentation of quality assurance activities was thorough and accessible.	3.76	0.76
6	Stakeholders were involved in quality assurance processes	3.89	0.87

The descriptive statistics findings on quality assurance in table 3 indicated that respondents generally expressed positive perceptions toward all six statements. The mean values ranged from 3.58 to 3.89, indicating that the majority of respondents agreed or strongly agreed that quality assurance plays an essential role in performance of project implemented through force account. The highest mean value (3.89) was recorded for the statement Stakeholders were involved in quality assurance processes, reflecting diverse community groups, suggesting that inclusivity and involvement of members in quality assurance are well emphasized. This was followed by regular inspections and audits were conducted indicated positive perceptions (mean = 3.85) and documentation of quality assurance activities was thorough and accessible had (mean = 3.76), implying that good documentation and accessibility of quality assurance activities. In addition, materials used in the project consistently met required standards had a (mean = 3.72) and corrective actions were taken promptly when quality issues were identified had (mean = 3.65) which indicate that corrective actions were taken promptly to ensure project performance

4.2.3 Influence of technical supervision on performance of projects implemented through force account

The table 4 shows the descriptive analysis findings on the influence of quality assurance on performance of projects implemented through force account in Meru district

Table 4

Influence of Technical Supervision

SN	Statements	Mean	Std. Dev.
1	Supervisors provided clear guidance and instructions during project implementation.	3.62	0.83
2	Regular site visits and inspections were conducted by technical supervisors	3.67	0.86
3	Supervisors ensured compliance with technical specifications and standards.	3.79	0.87
4	Supervisors monitored the use of materials to prevent wastage or misuse.	3.66	0.74
5	Supervisors addressed technical challenges promptly and effectively	3.50	0.97
6	Supervisors maintained proper documentation of supervision activities	3.74	1.07

Table 4 presents the descriptive statistics on technical supervision on the performance of projects implemented through force account in Meru district. Results showed that respondents generally expressed positive perceptions toward all six statements. The mean values ranged from 3.50 to 3.79, indicating that the majority of respondents agreed or strongly agreed that technical supervision plays an essential role in performance of project implemented through force account. The highest mean value (3.79) was recorded for the statement '' supervisors ensured compliance with technical specifications and standards'', suggesting that compliance with technical specifications is well emphasized. This was followed by supervisors maintained proper documentation of supervision activities indicated positive perceptions of the with (mean = 3.74) and regular site visits and inspections were conducted by technical supervisors (mean = 3.67), implying that regular site visits and inspections are strong. In addition, supervisors monitored the use of materials to prevent wastage or misuse (mean = 3.66) and supervisors provided clear guidance and instructions during project implementation (mean = 3.62) which indicate that supervisors provided clear guidance and instructions.

4.2.4 Performance of projects implemented through force account

The table 5 shows the descriptive analysis findings for performance of projects implemented through force account in Meru district

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Table 5

Performance of projects implemented through force account

SN	Statements	Mean	Std. Dev.
1	Projects implemented through FA is of high quality	3.79	1.200
2	Projects implemented through force account meets specified standards	3.71	1.239
3	Projects implemented attained stakeholders' satisfaction	2.99	1.402
4	Delivery of projects implemented through force account are usually within budget	3.68	1.368

Table 5 presents descriptive statistics on the performance of projects implemented through the force account approach. The findings indicate different perceptions of project performance, with mean scores ranging from 3.79 to 2.99. The statement that projects implemented through force account are of high quality recorded the highest mean score of 3.79 (SD = 1.200), suggesting that respondents agreed that force account projects produced quality outputs. Similarly, the statement that projects implemented through force account met specified standards recorded a mean score of 3.71 (SD = 1.239), indicating that respondents perceived the projects as complying with established standards and specifications. Furthermore, the delivery of projects within budget recorded a mean score of 3.68 (SD = 1.368), suggesting that force account projects were perceived to demonstrate reasonable budget performance. However, the relatively high standard deviation of 1.368 indicates considerable variation in respondents' opinions regarding the ability of force account projects to remain within their approved budgets.

On the other hand, stakeholder satisfaction recorded the lowest mean score of 2.99 (SD = 1.402), indicating relatively low stakeholder satisfaction compared with the other project performance indicators. This finding suggests that although force account projects were generally perceived to produce quality outputs and meet specified standards, these achievements did not necessarily translate into satisfactory experiences among project stakeholders. The relatively high standard deviation of 1.402 further indicates considerable differences in respondents' perceptions of stakeholder satisfaction. This may suggest the existence of gaps between project outputs and stakeholders' expectations regarding project implementation and delivery.

4.3 Inferential Statistics

To ensure the regression model robustness and eradicate any potential skewness, kurtosis, and potential nonlinearity in the continuous variables, the independent variables (quality planning, quality assurance and technical supervision) were transformed using the natural logarithm. Likewise, the dependent variable (performance of projects implemented through FA) was log-transformed to form a log-log specification. This approach reduces the chances of undue influence of outliers and reduces the chances of creating excessively large or misleading unstandardized coefficients (B), which can arise from variables measured on vastly different scales. By this transformation, diagnostic checks including tests for normality and homoscedasticity established that the model's fit improved substantially. This led to more robust and interpretable findings regarding the influence of quality management practices on performance of projects implemented through force account in Tanzania local government.

Model fitness: The multiple linear regression model exhibits strong fitness, with an R2 of 0.330 indicting that 33% of variation in performance of projects implemented through FA explained by the predictors. The adjusted R 2 of 0.317 confirms the model's robustness by accounting for the number of predictors, reducing overfitting. The F-statistic ($F=109.130$, $p < 0.001$) revealed the overall significance of the model.

Table 6

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.575[a]	.330	.317	2.39247	.330	109.130	3	295	.000

Predictors: (Constant), quality planning, quality assurance, technical supervision

Dependent Variable: Performance of construction projects implemented through FA

Model assumptions: The Durbin-Watson (DW) statistic of (2.07) which is approximately threshold (2) imply that no significant autocorrelation in the residuals, implying the independence assumption. Connectedly, the non-significant Shapiro-Wilk test ($p = 0.25$) indicates that regression model's residuals for a pair of observations are normally distributed, (Durbin, 1950). The multicollinearity assessment was performed using Variance Inflation Factor (VIF) and Tolerance values, which are standard diagnostic measures. A Variance Inflation Factor (VIF) value below 10 and Tolerance values above 0.1 are normally considered acceptable thresholds for multicollinearity Miles, J. (2005). The results revealed that, all predictor variables demonstrated VIF values ranging from 1.006 to 1.116, which is below the

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critical threshold of 10, demonstrating no severe multicollinearity. Similarly, the tolerance values ranged between 0.896 and 0.994, above the standard threshold of 0.1. This tolerance value also indicates that the predictor variables do not exhibit high intercorrelation, certifying the stability and reliability of the regression model.

Table 7

Coefficients of Regression

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.422	1.901		.748	.000
	Quality planning	0.216	0.070	0.219	3.066	.003
	Quality assurance	0.272	0.059	0.313	4.611	.000
	Technical supervision	0.294	0.062	0.339	4.734	.000

Dependent Variable: Performance of projects implemented through FA

b. Predictors: (Constant), quality planning, quality assurance & control, technical supervision

Regression coefficients in Table 7 indicates that all variables were significant predictors (p<0.05) of the model. This informs that a unit increase in quality planning explains a 0.216 increase in performance of construction projects implemented through FA method. And increase in one unit of quality assurance suggests a 0.272 unit increase in the performance of construction projects implemented through the FA method and also a unit increase in technical supervision explains a 0.294 increase in the performance of construction projects implemented through the FA method.

4.4 Discussion

Quality Planning: The regression coefficient for quality planning (β = 0.219, p = .003) confirms that structured planning is an important factors influencing success of construction projects implemented through force account. Quality planning is the cornerstone of successful project execution, particularly in force account projects where public institutions rely on internal resources such as labor, equipment, and materials to carry out construction and maintenance works. Unlike traditional contracting, force account demands a higher level of internal coordination and foresight, making quality planning not just beneficial but essential. It involves setting clear quality objectives, identifying standards, allocating resources, and establishing procedures to monitor and control quality throughout the project lifecycle.

Matto (2021), support this finding as he posits that, many force account projects in Tanzania fail to achieve the intended performance because they suffer from inadequate planning which leads to delays, cost overruns, and substandard work. This is often due to limited technical capacity, poor documentation, and lack of stakeholder engagement during the planning phase. Total Quality Management theory is in consistence with this finding as it put emphasize that quality must be built into the process from the beginning not inspected at the end. Therefore, quality planning should be proactive, participatory, and data-driven. In addition, Waweru et al. (2025) highlights that in Kenya, force account projects which lack comprehensive planning experienced significant interruptions and inefficiencies. This aligns with TQM's principle of customer focus, which advocates for understanding and meeting stakeholder expectations as a measure of quality success. As highlighted by Vlăsceanu et al., (2007) planning that incorporates quality assurance services from the beginning improves institutional effectiveness. This suggests that quality planning is a performance multiplier when embedded early and executed rigorously.

Quality assurance: Quality assurance demonstrates a stronger influence on performance of construction project implemented through FA (β = 0.313, p < 0.001). The strong statistical significance in your model suggests that when assurance and control are embedded into daily operations, they foster accountability and consistency. This aligns with TQM framework expectation which emphasize building quality into processes rather than inspecting it at the end (Deming, 1986). Assurance ensures that project activities conform to predefined standards, while control mechanisms detect deviations and enable timely corrective actions. Hou et al. (2024) provide compelling evidence from higher education systems in Asia, showing that evolving quality assurance frameworks are critical for maintaining standards across diverse and complex environments. Their study emphasizes that assurance is not static it must adapt to digital transformation, cross-border regulations, and stakeholder demands.

Likewise, Mugarula (2023) demonstrates that Tanzanian LGAs executing force account projects often deliver facilities with substandard finishes due to insufficient quality controls. TQM theory advocates for continuous improvement through the PDCA (Plan-Do-Check-Act) cycle, where the "Check" and "Act" phases are vital for learning and adaptation. Similarly, Mwaiseje et al. (2024) emphasize the importance of procurement contract administration, monitoring, and control in attaining quality in force-account construction projects in Tanzania. Their findings highlight the need for systematic supervision and effective control mechanisms to ensure compliance with established quality requirements. This supports the argument that quality control should be systematic and evidence-based. Within TQM,

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control is not primarily about punishment but rather about optimizing processes, identifying the root causes of defects, and preventing their recurrence.

Technical supervision: The regression findings reveal that technical supervision has the strongest influence on performance of construction projects implemented through FA ($\beta = 0.339$, $p < 0.001$) which is consistent with theoretical expectations between this variable and performance of projects implemented through force account method. This statistically significant result underscores the vital role of supervision in projects implemented through force account where public institutions execute construction works using internal labor, equipment, and materials. Unlike contractor-based models, force account relies heavily on internal capacity, making technical supervision a frontline mechanism for ensuring quality, efficiency, and accountability

This finding is in line with the study conducted by Matto (2021) which observed that many force account projects in Tanzania suffer from weak planning and documentation, placing unnecessary pressure on supervisors to resolve issues reactively. This reactive culture contradicts the TQM framework, which promotes proactive, integrated quality management across all phases of the project. To enhance the impact of technical supervision, local governments must adopt a more strategic approach rooted in TQM. This includes training supervisors in quality management, empowering them with autonomy, and integrating supervision into a broader system of continuous improvement Mwaiseje et al. (2024) also argue that supervision should not be isolated from planning and assurance but should function as part of an integrated quality framework.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study concludes that quality management practices significantly influence the performance of construction projects implemented through the force account method. Effective quality planning, quality assurance and control, and continuous technical supervision are essential for ensuring that project activities are properly coordinated, resources are adequately utilized, construction standards are maintained, and emerging problems are identified and corrected in a timely manner. This finding affirms that without robust quality planning, quality assurance & controls and technical supervision, the intended benefits of force account such as timely delivery, cost saving and timely completion will not be achieved. This finding further implies that quality management practices should be integrated throughout the entire project cycle, from planning and preparation to implementation and completion, rather than being treated as an activity conducted only after construction problems occur.

5.2 Recommendations

The district and local government authorities should strengthen quality management practices for the projects implemented through force account throughout the project cycle by requiring comprehensive quality plans before project implementation including clear designs, specifications, work schedules, resource requirements, and quality standards. There should be a systematic quality assurance and control mechanisms through regular site inspections, material testing, documentation, and immediate corrective action. In addition, LGAs should ensure that qualified technical personnel provide continuous on-site supervision, guide internal workers, verify compliance with approved designs, and address defects before they result in rework delays, or additional costs. Strengthening technical capacity through regular training and ensuring adequate availability of equipment, materials, and supervisory resources is also recommended to improve the effective implementation and performance of construction projects implemented through force account method.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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