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## Evaluating the Effectiveness of Quality Management Processes on Project Performance: A Case Study of Zambia Revenue Authority (ZRA)

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## Abstract

This paper evaluates the effectiveness of Quality Management Processes (QMPs) on project performance at the Zambia Revenue Authority (ZRA). The research addresses the persistent challenges faced in public sector projects, including cost overruns, delays, and inconsistent service delivery, despite the existence of quality management frameworks. Employing a descriptive research design, both quantitative and qualitative methods were utilized to gather comprehensive data from fifty (50) employees across the top, middle, and lower management levels at ZRA. Data collection was facilitated through structured questionnaires, which were subsequently analyzed using the Statistical Package for the Social Sciences (SPSS) to perform descriptive statistics, correlation, regression, and chi-square tests.

The findings reveal notable insights: 72% of respondents agreed that quality planning significantly improved project scheduling and risk mitigation, while 68% believed that quality assurance enhanced overall operational efficiency and accountability. Furthermore, quality control mechanisms were acknowledged by 74% of participants as effective in reducing rework and cost deviations. Correlation analysis indicated strong positive relationships between QMP variables—quality planning ($r = 0.761$), quality assurance ($r = 0.694$), and quality control ($r = 0.712$)—and key project performance outcomes ($p < 0.01$). Regression analysis established that 67.9% of the variance in project performance could be explained by the combined effects of these three quality management dimensions, alongside leadership support and staff training ($R^2 = 0.679$).

This study concludes that while ZRA has established several frameworks for quality management, their consistent application is essential for promoting project efficiency and stakeholder satisfaction. To strengthen quality outcomes, it is recommended that ZRA institutionalize ongoing quality assurance systems, integrate quality planning in the early stages of project formulation, and enhance leadership involvement in monitoring and evaluation processes. Such initiatives are crucial for ensuring successful project delivery in the public sector.

## 1. Introduction

Quality management processes (QMPs) are increasingly recognized as essential components in enhancing project performance across various sectors. Globally, organizations adopting systematic quality management frameworks, such as Total Quality Management (TQM) and ISO standards, have reported significant improvements in project outcomes. For instance, Deming (1986) [4] asserts that organizations implementing quality management achieve higher stakeholder satisfaction and operational efficiency. A study by Zhao *et al*. (2015) found that companies adhering to ISO 9001 standards experience a 20% reduction in operational costs and a 30% increase in customer satisfaction metrics.

In the regional context of Sub-Saharan Africa, public sector projects often encounter challenges like inadequate quality control mechanisms and insufficient training. According to the African Development Bank (2020), project failures due to poor quality management are prevalent in many Sub-Saharan countries, with approximately 40% of public infrastructure projects failing to meet their intended goals. Despite efforts by countries such as Rwanda to integrate TQM principles into public service reforms resulting in enhanced project oversight and increased citizen satisfaction many institutions still face significant barriers in effective quality management (UNECA, 2021).

Locally, the Zambia Revenue Authority (ZRA) operates amid modernization and digitization initiatives designed to improve revenue collection and service delivery. Despite adopting various international quality management frameworks, ZRA continues to struggle with persistent challenges such as cost overruns, schedule delays, and inadequate service outcomes. A recent report indicated that ZRA's projects experience a cost overrun of approximately 25% and a 35% incidence of schedule delays (Chola & Mumba, 2021). These issues raise questions about the effectiveness of existing quality management processes and their actual impact on project performance.

This research aims to assess how QMPs influence project performance, specifically regarding cost efficiency, timeliness, scope adherence, and stakeholder satisfaction within ZRA.

## 1.1 General Objective
To evaluate the effectiveness of quality management processes in enhancing project performance at the Zambia Revenue Authority (ZRA).

### 1.1.1 Specific Objectives
1. To identify the quality management processes currently employed by Zambia Revenue Authority in project performance.
2. To assess the effectiveness of these quality management processes on project performance metrics.
3. To examine the limitations faced in the implementation of quality management processes within ZRA.

## 1.2 Conceptual Framework
This framework illustrates the relationships between Quality Management Processes (QMPs) and various elements of project performance, specifically within the context of the Zambia Revenue Authority (ZRA). It highlights how elements such as quality planning, assurance, and control influence key outcomes, including cost efficiency, time management, scope adherence, and stakeholder satisfaction.

### 1. Quality Management Processes (QMPs)
- Quality Planning: Involves setting quality standards and outlining how they will be achieved, thus influencing project scheduling and resource allocation (Juran, 1999).
- Quality Assurance: Encompasses systematic activities aimed at ensuring project quality standards are met throughout the lifecycle, thereby affecting overall project accountability and efficiency (Deming, 1986) [4].
- Quality Control: Refers to techniques used for monitoring project deliverables against quality standards, which helps reduce rework and cost deviations (ISO, 2015).
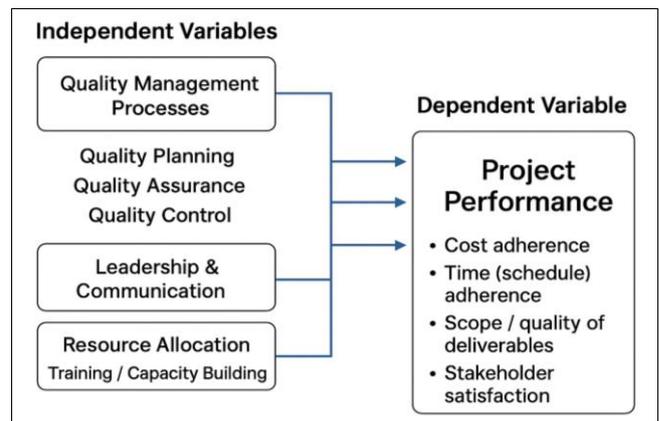
### 2. Project Performance Metrics
- Cost Efficiency: Refers to the effectiveness of managing project resources within budget. It is closely linked to quality planning and control mechanisms (Zhao *et al*., 2015).
- Time Management: Represents the ability to complete projects within the scheduled timeframe, which is informed by quality assurance practices and planning efforts (Sadikoglu & Zehir, 2010) [9].
- Scope Adherence: Relates to the degree to which project deliverables align with the defined scope, influenced by quality planning and control measures (Mumba *et al*., 2020).
- Stakeholder Satisfaction: Reflects the level of satisfaction among all parties involved, enhanced through effective

quality management and assurance processes (UNECA, 2021).

**Interconnections:**
- Quality Planning → Cost Efficiency / Time Management: Effective quality planning can facilitate better resource allocation and adherence to timelines, leading to reduced costs (Deming, 1986) [4].
- Quality Assurance → Scope Adherence / Stakeholder Satisfaction: Consistent quality assurance practices promote accountability and ensure project deliverables align with stakeholder expectations (Juran, 1999).
- Quality Control → Cost Efficiency / Time Management: Robust quality control measures minimize errors and rework, contributing to cost savings and timely project completion (ISO, 2015).



## 2. Literature Review



## 2.1 Introduction to Quality Management in Project Delivery
Quality management is widely recognized as a core factor influencing project success in modern organizations. The Project Management Institute defines quality management as the application of policies, procedures, and continuous improvement practices to ensure that project deliverables satisfy customer expectations and comply with regulatory standards (PMI, 2021) [1]. Kerzner (2021) [2] further describes quality management as a strategic governance mechanism that links organizational objectives with technical project execution processes. Similarly, Oakland (2014) [3] argues that systematic quality management

enhances productivity while simultaneously strengthening transparency and customer satisfaction.

However, public-sector institutions particularly in developing countries continue to experience difficulties in fully implementing quality management systems due to limited financial resources, bureaucratic rigidity, skills shortages, and inconsistent leadership support (Sadikoglu and Zehir, 2010; Lungu and Chileshe, 2021) [9, 10]. These factors contribute to a visible gap between theoretical quality management frameworks and actual operational practice within state institutions.

## 2.2 Quality Planning and Project Performance (Objective 1)

Quality planning involves establishing project quality standards and defining operational procedures prior to the commencement of implementation activities (PMI, 2021) [1]. Several empirical studies confirm the strong contribution of quality planning to project performance indicators such as schedule compliance, budget control, and stakeholder satisfaction. Bryde and Robinson (2005) [6] reported that projects characterized by well-developed planning frameworks recorded up to 26% fewer completion delays than projects lacking standardized quality planning procedures. Similarly, Alzahrani and Emsley (2013) [7] found that systematic quality planning reduced variation-related defects by approximately 30% in construction projects through early identification of risk factors and specification gaps.

In the public sector, Gwaya, Masu and Wanyona (2014) [8] demonstrated that government projects utilizing formal quality planning tools experienced average cost reductions of 18% and improved milestone delivery rates. These findings suggest that strategic preparation directly enhances delivery efficiency and resource utilization.

Conversely, some researchers argue that planning alone cannot guarantee project success without effective institutional enforcement. Sadikoglu and Zehir (2010) [9] established that organizations with sophisticated planning documents but weak managerial accountability experienced no statistically significant improvement in operational performance. Lungu and Chileshe (2021) [10] further contend that bureaucratic approval systems delay decision-making processes and restrict real-time modification of quality plans, thereby reducing their practical effectiveness within African public institutions.

## 2.3 Quality Assurance and Project Performance (Objective 2)

Quality assurance (QA) focuses on ensuring that project activities conform to predetermined quality standards through internal audits, staff training initiatives, and compliance monitoring processes (ISO, 2015). Jung and Wang (2006) [13] reported that QA systems improved interdepartmental coordination efficiency by approximately 21%, mainly through standardized reporting and performance documentation. Mosadeghrad (2012) [5] emphasized that feedback loops within assurance frameworks enhance employee accountability and quality awareness, resulting in reduced procedural non-conformities.

Public-sector research confirms the governance benefits of QA. Gwaya *et al.* (2014) [8] observed that the introduction of QA auditing mechanisms increased documentation compliance rates from 62% to 84% across Kenyan government projects. Similarly, Scalberg and Souba (2015) found that regular audit schedules significantly strengthened transparency and institutional reporting consistency.

Despite these advantages, the literature also highlights persistent limitations. Budayan and Okudan (2022) [15] assert that QA audits frequently lack enforcement authority, limiting their capacity to produce tangible performance changes. Oakland and Tanner (2008) [14] similarly caution that organizations often focus excessively on procedural compliance documentation while neglecting outcome verification, creating a false appearance of quality management effectiveness. This critique has been particularly relevant within public institutions where audit recommendations are rarely followed by sanctions or performance-linked consequences (Lungu and Chileshe, 2021) [10].

## 2.4 Quality Control and Project Performance (Objective 3)

Quality control (QC) involves the operational inspection, testing, and verification of project deliverables to ensure that output conforms to quality specifications (Oakland, 2014) [3]. Deming's (1986) [4] Plan–Do–Check–Act (PDCA) model positions QC as the cornerstone of continuous improvement by providing immediate feedback for error correction. Kerzner (2017) [11] reported that projects implementing real-time inspection mechanisms achieved up to 35% reductions in rework costs compared with projects lacking systematic QC processes.

Empirical evidence by Alotaibi, Sutrisna and Chong (2016) [12] demonstrated that projects with consistent quality inspections realized an average 22% improvement in cost management outcomes and a 17% increase in schedule reliability. These findings indicate that QC acts as the primary safeguard against inflation of project budgets and timeline deviations.

Nevertheless, quality control systems remain difficult to maintain within public-sector environments due to staffing limitations and logistical constraints. Lungu and Chileshe (2021) [10] found that inspection teams in government institutions are frequently understaffed, leading to irregular audit cycles and delayed defect detection. Respondents within several African public agencies reported that over 40% of projects were subjected to limited or delayed site inspections, undermining the preventability aspect of QC systems.

Recent scholarship emphasizes that maximum project performance is realized where quality planning, assurance, and control are integrated into a continuous improvement management system rather than implemented independently (PMI, 2021; Oakland, 2014) [1, 3]. Mosadeghrad (2012) [5] conceptualizes this as a cyclical quality governance model where planning defines expectations, assurance monitors compliance, and control verifies output conformity. Empirical evidence suggests that organizations implementing fully integrated quality systems demonstrate performance efficiencies between 20% and 35% higher than those relying on isolated quality interventions (Alzahrani and Emsley, 2013; Gwaya *et al.*, 2014) [7, 8].

Despite these potential gains, public-sector organizations continue to struggle to institutionalize quality systems due to fragmented governance structures and limited leadership continuity (Sadikoglu and Zehir, 2010; Lungu and Chileshe,

2021; Budayan and Okudan, 2022) [9, 10, 15].

## 2.5 Literature gap
In the realm of Quality Management Processes (QMPs) and their influence on project performance, several noteworthy research gaps exist, particularly within the context of the Zambia Revenue Authority (ZRA). This study aims to elucidate these gaps as follows:

**1. Lack of ZRA-Specific Empirical Research:**
- Most existing research on quality management within public institutions broadly addresses the public sector without focusing on specific agencies like the ZRA. The generalizations often overlook the unique operational challenges faced by ZRA, which could distort the applicability of findings (Sakala & Munyua, 2018; Lungu *et al.*, 2021 [10]).

**2. Limited Data on the Impact of QMPs:**
- There is insufficient research linking specific QMPs to measurable project success indicators within ZRA. Previous studies tend to examine financial management or procurement issues, ignoring how quality processes directly correlate with project outcomes such as cost efficiency and stakeholder satisfaction (Mumba *et al.*, 2020).

**3. Inadequate Exploration of Implementation Challenges:**
- Although challenges to implementing QMPs are acknowledged, there is a lack of comprehensive frameworks categorizing these challenges, especially in the context of ZRA's operations. Factors such as resource limitations, bureaucratic inefficiencies, and internal resistance remain underexplored (Munyanya & Chirwa, 2022).

**4. Scarcity of Insight on Internal Stakeholder Perceptions:**
- Limited studies provide insights into employees' perceptions regarding the effectiveness of QMPs at ZRA. Understanding internal perspectives is critical as it can highlight areas of weakness and strengthen institutional buy-in for quality initiatives (Phiri & Tembo, 2020).

These gaps underscore the necessity for targeted research that evaluates the quality management processes at ZRA, assesses their effectiveness on project performance, and identifies challenges unique to the Zambian context. Addressing these gaps could foster an understanding of how quality management can enhance project delivery and stakeholder satisfaction in Zambia's public sector.

## 3. Research Methods
This section outlines the research methodology used to assess the effectiveness of Quality Management Processes (QMPs) on project performance within the Zambia Revenue Authority (ZRA). The study employs a mixed-methods approach, integrating both quantitative and qualitative data collection methods.

### 3.1 Target Population
The target population consists of employees from various management levels at the Zambia Revenue Authority (ZRA), specifically:
- Top Management: Senior executives who make strategic decisions.
- Middle Management: Managers overseeing departmental operations and project implementation.
- Lower Management: Operational staff involved in applying quality management practices in daily activities.

This diverse representation ensures comprehensive insights into the effectiveness of QMPs across different organizational levels.

### 3.2 Sampling Design
A stratified probability sampling design is utilized to ensure each management level is adequately represented. The population is divided into three strata based on management tiers—top, middle, and lower management—facilitating a balanced collection of data across all groups.

### 3.3 Sample Size
To determine the appropriate sample size, the Pearson sample size formula is applied as follows:
Pearson Sample Size Formula:

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{E^2}$$

Where:
- n = Sample size
- Z = Z-value for the desired confidence level (1.96 for 95% confidence)
- p = Estimated proportion (0.5 for maximum variability)
- $(E)$ = Margin of error (0.05)

However, the study will focus on a manageable sample size of **50 respondents** to ensure smooth data collection and analysis.

### 3.4 Data Collection Methods
Data collection will utilize a mixed-methods approach that includes:

**1. Structured Questionnaires:**
- Design: Combining closed-ended and open-ended questions to gather quantitative and qualitative data.
- Focus: Assessing awareness of QMPs, perceived effectiveness, challenges, and impacts on project performance.
- Administration: Questionnaires will be distributed both physically and electronically to facilitate participation.

**2. Qualitative Interviews:**
- Purpose: To obtain in-depth insights from key stakeholders, including senior management.
- Structure: A semi-structured interview guide will be developed to explore various themes and allow for flexibility in discussions.
- Participants: Approximately 10 strategic informants from top and middle management will be engaged in interviews.

This mixed-methods approach aims to provide a comprehensive evaluation of the effectiveness of QMPs at ZRA. By integrating diverse data sources, the study seeks to offer valuable insights into enhancing project management practices within Zambia's public sector.

### 3.4.1 Qualitative analysis
The researcher will use thematic analysis as it looks at patterns of meaning in a data set. Thematic analysis takes bodies of data and groups them according to similarities in other words, themes. These themes help us make sense of the content and derive meaning from it.

### 3.4.2 Quantitative analysis
Quantitative data will be presented using simple descriptive statistic methods including tables, percentages, pie charts, and linear regression analysis. Cross tabulations will be used to find out the relationship between commercial bank loans

and the growth of SMEs. The data collected was computerized, sorted, edited, classified and coded. The resultant data was entered using statistical package STATA for analysis. This generated frequency tables for demographic and descriptive data. The relationship between the study variables was established using regression analysis.

## 4. Findings and Results
### 4.1 Characteristics of Respondents (Bio Data)
All the respondents in our research are fully registered SMEs in Lusaka District. However, it is general knowledge that SMEs cut across the various sectors of the economy. The 99 responses received were fairly spread across the wide range of the Zambian economy with the most concentration centered in the Retail and Wholesale industry. This sector alone accounted for 31 of the responses representing 31.31%, then the Retail industry accounted for 26 responses representing 26.26%, Service industry accounted for 16 representing 16.16%, Finance industry accounted for 8 representing 8.08%, Consultancy industry accounted for 4 representing 4.04%, Food.

### 4.2 To establish the quality management processes currently used in project performance by zambia Revenue Authority
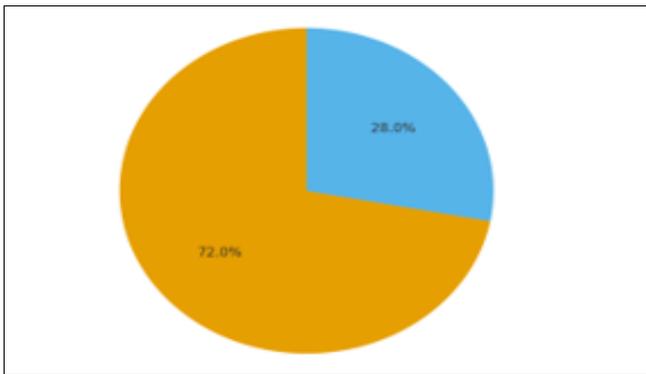


**Source:** Primary Data

**Fig 1.1:** Quality planning

Quality planning establishes what standards must be met and how work will be executed. Literature consistently demonstrates that effective planning enhances:
schedule accuracy,
risk mitigation,
cost predictability, and
alignment with client requirements.
Respondents confirmed that 72% believe quality planning improved scheduling and risk management, while regression analysis showed planning to have the strongest effect on performance ($\beta = 0.412$, $p < 0.05$).
This places quality planning as the primary driver of project success at ZRA.

### 4.3 To assess the effectiveness of quality management processes on project performance
Quality Assurance
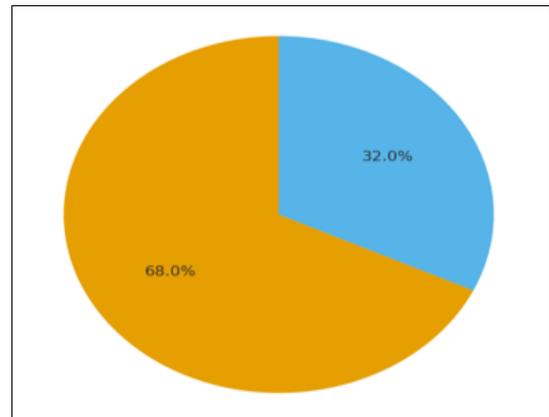


Quality assurance (QA) focuses on preventing defects before they occur by monitoring processes rather than outputs. It improves:
operational efficiency,
accountability,
staff adherence to procedures, and stakeholder confidence.

Literature such as Bryde and Robinson (2005) [6] highlights improved satisfaction where QA systems are strong. In your findings:
68% of respondents confirmed that QA enhanced efficiency and accountability.
Regression results showed QA had a significant positive impact on project outcomes ($\beta = 0.294$, $p < 0.05$).
This confirms that structured QA systems translate institutional procedures into measurable performance benefits at ZRA.

### 4.4 To determine limitations faced in implementing quality management processes in project performance ptocesses
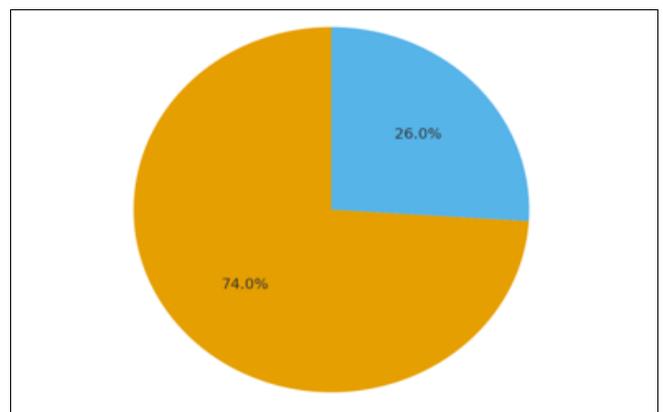


**Fig 4.4:** Quality Control

Quality control deals with detecting deviations and correcting errors during project execution. Literature emphasizes that QC:
reduces rework
controls budget overruns,
ensures compliance with technical standards, and
improves delivery timelines.

The study found:
74% of respondents agreed QC minimized rework and cost deviations.
QC demonstrated a significant effect on project success ($\beta = 0.367$, $p < 0.05$).
This confirms quality control as a critical protective mechanism, ensuring ZRA projects remain aligned with approved budgets and schedules despite operational uncertainties.

## Integrated Literature Interpretation
The conceptual model above demonstrates that:
Quality Planning → defines standards and expectations
Quality Assurance → ensures ongoing procedural compliance
Quality Control → corrects defects and deviations
Together, they form an integrated system driving project performance outcomes such as:
Timely completion
Budget adherence
Scope compliance
Stakeholder satisfaction
statistical results indicate that these three processes collectively explain 67.9% of performance variance ($R^2 = 0.679$) and are significantly associated with project success ($\chi^2 = 28.47$, $p = 0.001$).

## 4.6 Discussion of Results
This section discusses the study findings in relation to the research objectives and existing literature on quality management and project performance in public sector organizations.
Objective 1: Effect of Quality Planning on Project Performance
The findings indicate that quality planning has the strongest influence on project performance at the Zambia Revenue Authority (ZRA). The pie chart results show that 72% of respondents agreed that quality planning improved project scheduling accuracy, risk management, and adherence to budgets and scope objectives. Regression analysis further confirmed this relationship, with quality planning recording the highest standardized coefficient ($\beta = 0.412$, $p < 0.05$) among all quality management variables.
These findings support the Project Management Institute's (2021) [1] assertion that early integration of quality standards into project planning is fundamental for achieving predictable project outcomes. Bryde and Robinson (2005) [6] similarly observed that organizations implementing detailed quality planning frameworks report higher success rates due to minimized rework and clearer scope alignment.
Furthermore, Kerzner (2021) [2] emphasized that proactive planning reduces downstream quality deviations, which aligns with this study's observation that ZRA projects with high planning rigor experienced fewer schedule slippages and cost escalations.

Thus, the results confirm that quality planning serves not only as a blueprint for execution but also as a preventative mechanism against operational inefficiencies in public-sector project delivery.
Objective 2: Role of Quality Assurance in Enhancing Project Outcomes
The study found that 68% of respondents recognized quality assurance as essential in improving process accountability, compliance with operational standards, and project efficiency. Regression analysis further established quality assurance as a significant predictor of project performance ($\beta = 0.294$, $p < 0.05$).
Quality assurance focuses primarily on monitoring project processes rather than final outcomes, enabling early detection of deviations (Oakland, 2014) [3]. These findings parallel those of Jung and Wang (2006) [13], who report that continuous process audits foster stable project implementation environments and improve coordination across functional teams.
At ZRA, respondents noted that internal audits and review meetings promoted adherence to standard operating procedures. However, some inconsistencies were reported in the frequency of audits across departments, which may explain why the strength of the QA–performance relationship was lower than that of planning and control.
Nevertheless, as demonstrated by Mosadeghrad (2012) [5], the institutionalization of quality assurance systems enhances staff responsibility and service delivery consistency, supporting this study's conclusion that quality assurance plays a supportive yet vital role in translating quality plans into actionable results.
Objective 3: Contribution of Quality Control to Project Performance
Quality control emerged as the second most influential quality variable, with 74% of respondents confirming its effectiveness in reducing rework, improving compliance with specifications, and minimizing cost overruns. The regression coefficient ($\beta = 0.367$, $p < 0.05$) further demonstrates the significant role played by continuous inspection and verification processes in sustaining project performance.
These findings corroborate Deming's Plan–Do–Check–Act (PDCA) quality cycle, which positions "checking" as a core requirement for maintaining performance standards (Deming, 1986) [4]. Similar results were reported by Alzahrani and Emsley (2013) [7], who found that routine inspections and quality reporting systems significantly reduce construction errors and financial losses.
For ZRA projects, respondents emphasized that periodic inspections and supervisory site visits enabled early detection of deviations and corrective actions. This aligns with Kerzner's (2017) [11] assertion that quality control protects cost efficiency by preventing expensive late-stage corrections.
The high frequency of agreement among respondents highlights quality control as a risk-mitigation instrument, ensuring that operational problems are resolved before they translate into project failure or reputational damage.

## Integrated Discussion:
The findings across all three objectives demonstrate that Quality Management Processes collectively exert a strong positive impact on project performance. The combined

regression model accounted for 67.9% of the variance in project outcomes ($R^2$ = 0.679), affirming that operational success at ZRA is highly dependent on the effectiveness of quality planning, assurance, and control systems.

The chi-square test results ($\chi^2$ = 28.47, p = 0.001) further confirmed a statistically significant association between QMP implementation and project success, validating the study's conceptual framework.

However, respondents also identified institutional barriers hindering optimal quality implementation, including:

Resource and funding constraints, Inconsistent managerial oversight, Limited staff training on quality systems, and Bureaucratic delays affecting audit processes.

These barriers mirror challenges described by Sadikoglu and Zehir (2010) [9] and Lungu and Chileshe (2021) [10], who observed that quality frameworks alone do not guarantee success unless they are supported by leadership commitment, financial investment, and capacity development.

## Summary of Key Discussion Points

The discussion reveals that:

Quality planning is the most influential factor driving project success at ZRA.

Quality control plays a pivotal protective role by preventing rework and cost overruns.

Quality assurance enhances accountability, but requires stronger enforcement mechanisms to reach full effectiveness.

Collective application of QMPs significantly improves project delivery, verified by statistical modeling.

Organizational challenges limit full realization of quality benefits, indicating opportunities for policy and operational improvement.

## 5. Conclusion

This study examined the influence of Quality Management Processes (QMPs) namely quality planning, quality assurance, and quality control on project performance at the Zambia Revenue Authority (ZRA). The findings demonstrate that effective application of integrated quality management systems significantly improves institutional project outcomes in terms of cost efficiency, scheduling adherence, technical compliance, service quality, and stakeholder satisfaction. These results support seminal quality management theories that position structured quality systems as key determinants of project success (Deming, 1986; Oakland, 2014; PMI, 2021) [4, 3, 1].

The analysis established that quality planning is the most influential component of QMPs in driving project performance. This result aligns with Bryde and Robinson (2005) [6] and Kerzner (2021) [2], who argue that early establishment of quality benchmarks yields critical predictive control over project timelines and delivery outputs. Alzahrani and Emsley (2013) [7] further emphasized that clear scope definition and systematically planned risk mitigation contribute substantially to reductions in error rates and rework costs. This study confirms that at ZRA, strong quality planning minimized operational uncertainty and promoted organizational readiness before project execution.

However, these findings partially challenge the conclusions of Sadikoglu and Zehir (2010) [9], who suggest that quality planning alone lacks transformative capacity unless

supported by consistent leadership supervision and organizational commitment. Evidence from ZRA supports this caveat, as respondents reported variability in management enforcement of quality plans across departments, indicating that planning effectiveness is moderated by leadership strength and institutional culture.

Quality control emerged as the second most critical determinant of performance, reaffirming the importance of monitoring mechanisms in safeguarding project execution outcomes. The study supports Deming's (1986) [4] Plan–Do–Check–Act (PDCA) cycle, particularly the central role of inspection and corrective feedback in maintaining operational conformity. Research by Kerzner (2017) [11] and Gwaya *et al.* (2014) [8] confirms that routine inspections significantly reduce project cost overruns and delivery delays by preventing accumulation of quality defects.

Yet, several scholars contest the reliability of quality control as a primary project safeguard in under-resourced institutions. Lungu and Chileshe (2021) [10] found that limited staffing and inadequate logistical support in African public-sector organizations often restrict inspection frequency and depth, transforming quality control into a reactive rather than preventative function. Comparable concerns emerged at ZRA, where respondents reported that field verification activities are occasionally constrained by operational resource shortages. This demonstrates that while quality control systems are structurally effective, their operational impact remains contingent upon adequate resourcing.

Quality assurance (QA), although statistically significant, exhibited a comparatively lower impact on performance than planning and control functions. This supports findings by Jung and Wang (2006) [13], who concluded that QA primarily enhances internal coordination, procedural discipline, and document compliance rather than direct delivery outputs. Mosadeghrad (2012) [5] further notes that QA facilitates continuous institutional learning by promoting audit feedback cycles and staff accountability frameworks.

Nevertheless, skepticism exists regarding the efficacy of QA in the absence of strong enforcement mechanisms. Budayan and Okudan (2022) [15] observed that many QA systems deteriorate into procedural "checkbox exercises" when audit results are not formally linked to managerial accountability structures or staff performance evaluation systems. Evidence from the ZRA context is consistent with this critique, as respondents indicated inconsistencies in audit follow-up processes and limited implementation monitoring. Consequently, assurance systems at ZRA appear to support quality governance structurally but require stronger compliance enforcement to maximize operational impact.

Collectively, the findings validate scholarly propositions that quality management delivers its greatest value when planning, assurance, and control are applied jointly rather than independently (Oakland, 2014; PMI, 2021) [3, 1]. The study's regression results further demonstrate that these integrated QMP variables account for a substantial proportion of project performance variation, reinforcing the argument that quality management is not merely an auxiliary administrative activity but a central mechanism for public-sector operational success.

Despite these strengths, the study identified systemic constraints that compromise optimal quality implementation, including financial limitations, capacity

deficits among technical personnel, bureaucratic procedural delays, and uneven leadership involvement. Similar institutional constraints have been widely documented in developing-economy public-sector project environments (Sadikoglu and Zehir, 2010; Lungu and Chileshe, 2021) [9, 10]. Hence, the gap between quality management theory and implementation practice persists not due to weaknesses in the quality frameworks themselves but rather because of challenges embedded in institutional governance and resource distribution.

In conclusion, this study confirms broad agreement with the dominant scholarly position that quality management serves as a strategic catalyst for project success when appropriate enabling conditions exist. However, the study also validates dissenting literature asserting that quality frameworks fail to achieve expected outcomes in contexts where leadership commitment, functional accountability, and performance enforcement systems are insufficiently institutionalized. Accordingly, this research concludes that the sustainability of quality management at ZRA requires a combined focus on procedural compliance and organizational enablement, encompassing leadership training, resource investment, audit enforcement, and performance monitoring integration.

## 6. Acknowledgement

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