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Time Management and Performance of Kigali Infrastructure Project Rwanda

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Abstract

This study examined how time management affects project performance, using the Kigali Infrastructure Project (KIP) in Rwanda as a case study. Specifically, it focused on the impact of task prioritization, resource allocation, and adherence to the schedule. The research was guided by the Theory of Constraints, Time-Driven Delivery-Based Costing Theory, and Resource-Based View Theory. To address these research aims, a descriptive mixed-methods design was used. The study targeted 162 KIP stakeholders, including funders, project staff, and employees. Using the Slovin formula, 115 participants were randomly selected, of whom 114 responded (99.1% response rate). Data were collected through questionnaires and semi-structured interviews and analyzed using descriptive statistics, Pearson's correlation, and multiple regression. Results showed that task prioritization (mean = 3.888; $r = 0.434$, $p < 0.01$) and resource allocation (mean = 3.961; $r = 0.425$, $p < 0.01$) had significant positive effects on KIP performance. Notably, while schedule adherence was positively correlated with performance ($r = 0.358$, $p < 0.01$), it did not have a statistically significant direct effect in the regression model ($\beta = 0.058$, $p = 0.548$). Overall, the model accounted for 25.9% of the variance in project performance ($R^2 = 0.259$, $F = 12.790$, $p < 0.001$). Therefore, task prioritization and resource allocation are proven drivers of KIP success, while schedule adherence supports positive outcomes. To improve infrastructure project performance in Rwanda, project managers should use structured planning tools, streamline resource deployment, and closely integrate scheduling with task and resource management for optimal results.

Keywords: *Time Management, Task Prioritization, Resource Allocation, Schedule Adherence, Project Performance, Kigali Infrastructure Project*

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1. INTRODUCTION AND BACKGROUND

Time overruns have long challenged project management in global construction and infrastructure. Effective time management means strategically coordinating tasks to optimize productivity within a set timeframe. It is essential to project success (Eon et al., 2021). Time management includes task prioritization, resource allocation, and keeping to the schedule. These are critical for meeting deliverables, controlling costs, and satisfying stakeholders.

Globally, poor time management in road infrastructure projects is a pervasive issue. Inability to adhere to project schedules delays social and economic progress and affects the broader community (Amandin & Kule, 2016). Inappropriate task prioritization, inadequate resource allocation, and ineffective scheduling contribute to construction delays, resulting in cost overruns, reputational damage, stakeholder dissatisfaction, and, in some cases, project failure. The Project Management Institute (PMI) estimates that organizations globally waste billions of dollars yearly due to poor project management practices, with time management inefficiencies accounting for a substantial share of these losses.

In Africa, road infrastructure projects face unique challenges, including insufficient project management practices tailored to local conditions, constrained financial resources, and a shortage of skilled personnel (Byaruhanga & Basheka, 2017). These issues, combined with delays in procurement processes and complex regulatory environments, make it especially difficult for contractors and stakeholders to manage time effectively. Consequently, many road projects across the continent experience prolonged execution times and repeated failures to meet scheduled deadlines (Kebede & Tiewei, 2021). Such persistent time management difficulties directly impact economic development and social progress, as infrastructure remains a key driver for growth and improved living standards in the region. In particular, Sub-Saharan Africa faces a pronounced infrastructure deficit, partly driven by recurring delays and inefficiencies in project delivery.

East Africa is no exception to these challenges. Despite regional initiatives to improve project management practices, inadequate time management remains a persistent barrier to project success. Road projects often encounter setbacks, including inadequate planning, limited resources, external dependencies, and contractor-related bottlenecks (Mahamid et al., 2012). These challenges delay project completion, erode stakeholder confidence, and hinder infrastructure development. Kenya, Uganda, Tanzania, and Rwanda have all reported high cost and time overruns in major infrastructure projects.

In Rwanda, road infrastructure projects continue to face delays despite government efforts and increased budgets. Vision 2050 and the National Strategy for Transformation (NST1) both highlight infrastructure as vital to reaching middle-income status. However, poor time management continues to hinder project success (Sibomana, 2018). Delays in transportation projects harm the economy and limit community access to services. Amandin and Kule (2016) and Mbonabihama (2022) reported cost overruns and schedule slippages in public infrastructure across Kigali and other cities, highlighting the ongoing challenges.

The Kigali Infrastructure Project (KIP) highlights local infrastructure challenges. Planned to build over 215 km of roads to support Kigali's growth, KIP has faced funding constraints, resulting in project delays (Ntirenganya, 2024). In response, the Mayor of Kigali recognized the Auditor General's budgetary concerns and the delay and pledged to complete them within five months. Progress varies: some sections, such as Kabeza to Airport and African Leadership University to Musave, are nearly complete, while others, such as the Rusororo-Gasogi corridor,

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require more time (Amandin & Kule, 2016). The City of Kigali plans to resume construction by late May 2024 and prioritize critical segments to speed progress (Ntirenganya, 2024).

1.1 Problem Statement

Despite the recognized importance of time management in project delivery, there remains a notable gap in empirical research specifically examining the relationship between time management practices and project performance within road construction projects in Rwanda.

Task prioritization within road construction projects is another significant challenge, with project stakeholders often struggling to effectively prioritize tasks (Mbonabihama, 2022). Without clear prioritization strategies in place, project teams may fail to focus on key milestones and objectives, leading to inefficiencies and delays throughout the project lifecycle. Competing priorities and shifting project requirements further complicate task prioritization efforts, hindering project performance and success.

Furthermore, adherence to project schedules remains a persistent issue, with project teams facing challenges in meeting established timelines and milestones. Factors such as unforeseen challenges, weather conditions, and resource constraints derail project timelines, making it difficult to deliver projects on time (Ntirenganya, 2024).

This study specifically investigates how task prioritization, resource allocation, and schedule adherence, three key time management dimensions, impact the performance of the Kigali Infrastructure Project (KIP). By focusing on these areas, the research aims to provide evidence-based insights for project managers, policymakers, and stakeholders in Rwanda's infrastructure sector.

1.2 Purpose of the Study

The aim of this study was to assess the effect of time management on project management with a case of Kigali Infrastructure Project, Rwanda.

1.3 Specific Objectives

(i) To examine the effect of task prioritization on the performance of Kigali Infrastructure Project

(ii) To evaluate the effect of resource allocation on the performance of Kigali Infrastructure Project

(iii) To determine the effect of schedule adherence on the performance of Kigali Infrastructure Project

1.4 Research Hypotheses

H_{01}: Task prioritization has no significant effect on the performance of the Kigali Infrastructure Project, Rwanda.

H_{02}: Resource allocation has no significant effect on the performance of the Kigali Infrastructure Project, Rwanda.

H_{03}: Schedule adherence has no significant effect on the performance of the Kigali Infrastructure Project, Rwanda.

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2. LITERATURE REVIEW

2.1 Theoretical Framework

This analysis draws upon three theoretical perspectives. The Theory of Constraints (TOC), developed by Goldratt, offers a framework for identifying and addressing system bottlenecks that impede project throughput (Balderstone, 2020). The Theory of Constraints offers insights applicable to time management and project performance. Firstly, TOC underscores the significance of identifying and addressing constraints, akin to recognizing critical paths in time management. This entails prioritizing resources and efforts towards alleviating bottlenecks to ensure efficient resource allocation and timely project completion (Landau, 2021). Secondly, TOC asserts that optimizing individual components may not enhance overall performance if it fails to alleviate constraints. Similarly, in project management, improving isolated tasks or processes may not boost project performance if they don't address critical constraints hindering progress. Specifically, in the context of Kigali Infrastructure Project, TOC explains why prioritizing resources toward critical constraints, such as workforce shortages or procurement delays, is necessary to enhance project efficiency. This connection shows that task prioritization and resource allocation in KIP should be directed toward resolving bottlenecks to achieve optimal results, rather than optimizing individual tasks independently.

Time-Driven Activity-Based Costing (TDABC) theory was developed by Robert S. Kaplan and Steven R. Anderson in 2004, with further elaboration in 2007 (Borges et al., 2024). It aimed to address the shortcomings of Conventional Activity-Based Costing (CABC) by simplifying the costing process, utilizing time as the primary cost driver, and providing more accurate information on resource utilization (Quesado & Silva, 2021). Building upon the identification and management of constraints through TOC, the Time-Driven Delivery-Based Costing (TDABC) Theory extends activity-based costing by directly linking time utilization to cost and performance outcomes (Choudhery et al., 2021). This framework facilitates the measurement of time consumption across project activities and enables managers to optimize scheduling and resource deployment. In the case of KIP, TDABC highlights the financial impact of schedule slippage and the cost-efficiency advantages of disciplined time management.

The Resource -Based View (RBV) presents a valuable framework. It begins by identifying an organization's unique internal resources pertinent to time management within a specific project, guiding the allocation of resources during time management. Resources that are both valuable and rare are strategically assigned to essential project components, aligning with RBV's premise that such resources can confer a competitive advantage, even within projects. The Resource-Based View (RBV) Theory asserts that an organization's competitive advantage stems from the strategic acquisition, deployment, and utilization of resources (Almarri & Gardiner, 2014). Within the KIP context, RBV supports the view that effective allocation of financial, human, and material resources is a key determinant of project performance. Organizations that align resource deployment with project objectives are more likely to deliver projects on time and to high quality.

2.2 Empirical Review

2.2.1 Task Prioritization and Project Performance

The study of Bryde and Wright (2017) investigated project management practices within the U.K. social housing sector, aiming to establish a comprehensive model of project priorities. Through a five-factor model encompassing project cost, time, quality, stakeholder focus, and

customer/project team orientation, the research integrates disparate perspectives on project performance measurement. Employing a correlational research design, the study explores the relationship between these project management criteria and the effectiveness of a performance management system (PMS). Findings suggest that PMS effectiveness serves as a precursor to practices emphasizing customer, project team, and stakeholder engagement. These insights underscore the importance of aligning project management strategies with organizational performance goals to enhance project outcomes in the social housing sector.

The empirical study of Yasiri (2020) investigated the impact of time management on the success of service organizations, particularly focusing on municipal departments in Dhi-Qar. Utilizing a descriptive approach, data was collected from employees directly involved in accounting and supervisory roles. The findings revealed a significant correlation between time management and goal achievement within the organization. Recommendations include improving time management systems, recognizing its importance in decision-making, and enhancing clarity in administrative procedures to maximize productivity and efficiency. The study underscores the critical role of effective time management in organizational success and recommends interventions to optimize time utilization for improved performance.

The empirical cross-sectional study of Chanie et al. (2020) assessed time management practices among primary hospital employees in North Gondar and identify associated factors. Data was collected using a structured questionnaire from 422 employees selected through simple random sampling. Results revealed a prevalence of time management practice at 56.4%. Factors significantly associated with time management practice included satisfaction with organizational policies, performance appraisals, compensation and benefits, and planning. The study concludes that interventions targeting these factors are crucial for improving time management practices among primary hospital employees in the region.

The empirical research of Abeysinghe and Jayathilaka (2022) identified influential factors for timely Completion of construction projects in Sri Lanka. Through a literature review and expert opinions, these factors were identified and incorporated into a questionnaire distributed to 163 Civil Engineers using random sampling. The Relative Importance Index (RII) ranked project delay factors, highlighting shortages of skilled subcontractors/suppliers and laborers, financial difficulties of contractors, delayed material deliveries and the Covid-19 pandemic as significant influencers. Contractor-related factors emerged as key contributors to project delays. The study's scientific value lies in aiding the Sri Lankan construction industry by identifying and mitigating factors affecting project completion, enabling stakeholders to proactively address issues and schedule construction work effectively.

2.2.2 Resource Allocation and Project Performance

This empirical study of Makokha and Ngugi (2022) investigated the impact of resource allocation on healthcare project implementation by Busia County Government, Kenya, employing a descriptive research approach with 95 respondents, including project managers and team members, surveyed through a questionnaire. The findings indicated a significant and positive influence of resource allocation on project implementation. Proper resource allocation, encompassing staffing, equipment, and financial resources, was shown to enhance project efficiency, problem identification, and adaptability. The study concluded that ensuring the right number of project team members and avoiding both overstaffing and understaffing are crucial for project implementation. The strong Pearson's r value of 0.616 with a significance value of

0.00 suggests a substantial relationship between resource allocation and project implementation. Furthermore, the regression analysis confirmed resource allocation's positive and significant impact, with a beta value of 0.007. This study underscores the importance of effective resource allocation in the Performance of healthcare projects by Busia County Government, Kenya.

The study of Rauzana *et al*. (2022) identified risk factors for project delays in construction projects with a case study of Central Aceh District, Indonesia. Through a questionnaire distributed to 47 contractor companies in Central Aceh District, primary data was collected, complemented by secondary data from relevant literature. Validity and reliability tests were conducted, followed by descriptive analysis. Results indicate eight risk factors with very high influence on project delays, including tool malfunction, cost estimation inaccuracies, and poor project planning. These findings offer crucial insights for contractor companies, enabling them to proactively manage risks and minimize project losses.

The study of Eric *et al*. (2022) investigated the impact of Project Planning Practices on Enhancing Project Performance in Rwanda, focusing on the Huguka Dukore Akazi Kanoze Project in Nyabihu District. Employing a descriptive-analytical research design, both quantitative and qualitative approaches were utilized to evaluate the relationship between project planning practices and project performance. With a total population of 123 individuals, including project staff members, staff from the Business Development and Employment Promotion unit in Nyabihu District, and employees, no sampling was necessary. Data collection involved documentation, questionnaires, and interviews, with analysis conducted using Statistical Package for Social Scientists (SPSS) 23. Results indicated a strong correlation between project scope planning, cost planning, human resource planning, and project performance, concluding a positive effect of project planning practices on project performance.

2.2.3 Schedule Adherence and Project Performance

The empirical study of Kebede and Tiewei (2021) conducted on efficiency of project delivery systems in Ethiopia's Construction Sector: A Legal Perspective," investigates the effectiveness of project delivery systems in public construction projects. Employing doctrinal and non-doctrinal legal research methods, the study explores Ethiopia's public work contract laws and assesses their impact on project completion efficiency. Findings reveal that while Design-Bid-Build (DBB) is the default mode of contracting, there's implied recognition of Design-Build (DB) and its variants. Through a survey questionnaire of 158 respondents and analysis using SPSS, the Relative Importance Index (RII) was generated for each contracting mode. Primary data from 40 road and 9 building projects corroborated survey results, indicating that time overrun is greater in DBB projects compared to DB projects. This underscores the need for revisiting project delivery systems to enhance construction project efficiency in Ethiopia.

The study of Meng et al. (2022) conducted on construction schedule management by proposing a scheme for a large-scale construction project monitoring system based on multisensor network information fusion. Recognizing the limitations of traditional schedule management methods, the research leverages the advantages of Building Information Modeling (BIM) technology to enhance visibility, simulation, and optimization in construction scheduling. Through the investigation of monitoring content and multisensor network composition, the study designs hardware and software modules along with fusion algorithms to facilitate data acquisition, transmission, and display functions. The proposed system is tailored for large-scale

construction projects, offering comprehensive monitoring capabilities to ensure smooth project implementation and achieve objectives effectively.

The study of Safapour *et al*. (2023) conducted on the predictive models for cost and schedule performance in hurricane-damaged transportation infrastructure reconstruction. Utilizing stepwise multiple linear regression and extreme bound analysis (EBA), the research identified robust predictors for both cost and schedule performance. Results showed that seven predictors for cost performance and nine for schedule performance collectively explained a significant proportion of variance in the models, with Adjusted R-Squared values of 92.4% and 99.2%, respectively. EBA highlighted four robust predictors for cost and seven for schedule performance. Notably, factors such as laborers' wages, inspection frequency, and proactive management of safety and environmental concerns emerged as critical predictors, offering valuable insights for decision-makers tasked with mitigating delays and cost overruns in post-disaster reconstruction efforts.

The research of Byusa (2019) evaluated the impact of scheduling on project success in public projects, focusing on Kicukiro District. Specific objectives include assessing scheduling practices, project performance levels, and the relationship between scheduling and project performance. Utilizing a descriptive research design, the study targeted a population of 133 individuals, employing stratified and simple random sampling techniques. Analysis involved correlation coefficient and analysis of variance methods, supported by Statistical Package for Social Science (SPSS) version 21 and STATA version 15. Findings reveal widespread use of scheduling practices, particularly in budgeting and time scheduling, with high levels of agreement on the facilitation of project budgets. The study underscores the influence of scheduling on project quality and timeliness, suggesting the importance of efficient scheduling practices for successful project outcomes.

2.3 RESEARCH GAP

Although existing literature offers significant insights into various aspects of project management, there remains a distinct gap in research that simultaneously integrates task prioritization, resource allocation, and schedule adherence within a single study, particularly concerning road infrastructure construction in Rwanda. This study seeks to address this gap by empirically investigating all three dimensions of time management and their collective impact on KIP performance, thereby providing original evidence to the project management literature in the East African context.

3. METHODOLOGY

This study used a descriptive design, combining quantitative and qualitative methods to enhance validity and reliability through data triangulation (Almalki, 2016). The target population was 162 from the Kigali Infrastructure Project: 3 funders, 15 staff, and 144 employees. Applying the Slovin formula with a 5% margin of error, a sample of 115 was selected by simple random sampling. Of these, 114 responded (99.1% response rate), supporting the data's representativeness and reliability. Data collection used two tools: structured questionnaires for all 114 (using a 5-point Likert scale to assess task prioritization, resource allocation, schedule adherence, and project performance) and semi-structured interview guides for 5 key informants to obtain contextual and experiential insights. Instrument validity was established through the supervisor's expert review, and reliability was confirmed using Cronbach's alpha (all constructs > 0.70).

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Quantitative data were analysed in SPSS. Descriptive statistics, including means and standard deviations, summarized respondents' perspectives on time management and project performance. Pearson's correlation tested study hypotheses and showed the strength and direction of relationships among variables. Multiple regression analysis assessed how the independent variables predicted project performance using the model $Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3$, where Y represents project performance and X_1, X_2, and X_3 represent task prioritization, resource allocation, and schedule adherence, respectively. Qualitative data from key informant interviews were analysed thematically to identify patterns and contextual explanations that supplemented the quantitative findings. These analyses together gave a comprehensive understanding of the link between time management and project performance in the studied context.

4. RESULTS

4.1 Socio-demographic Profile

The majority of respondents were young professionals below 35 years of age (75.4%), with a higher proportion of males (63.2%). Most participants had primary-level education (50.9%), followed by secondary (26.3%) and tertiary (21.1%) levels. Regarding project experience, 73.7% had spent fewer than five years on the project, indicating a relatively new workforce engaged in KIP activities.

4.2 Task Prioritization and Kigali Infrastructure Project Performance

Descriptive results indicated a positive perception of task prioritization, with an overall mean of 3.888. The highest-rated statement was 'Effective task prioritization optimizes resource utilization in KIP road construction' (mean = 4.00, SD = 0.892), reflecting strong consensus on the value of strategic prioritization. Other highly rated items included 'Clear task prioritization enhances efficiency' (mean = 3.98) and 'Task prioritization deficiencies lead to delays and inefficiencies' (mean = 3.95).

Table 1: Descriptive Results of Task Prioritization

Statement (Task Prioritization)	Mean	SD
Effective task prioritization optimizes resource utilization	4.00	0.892
Clear task prioritization enhances efficiency	3.98	0.787
Task prioritization deficiencies lead to delays	3.95	0.939
Task prioritization influences timely completion	3.88	1.049
Task prioritization strategies mitigate delays	3.70	1.072
Overall Mean	**3.888**	—

4.3 Resource Allocation and Kigali Infrastructure Project Performance

Resource allocation received an overall mean of 3.961, reflecting a generally favorable perception of its role in KIP performance. The highest-rated item was 'Suboptimal resource allocation hinders progress and quality' (mean = 4.101, SD = 0.841), followed by 'Effective resource allocation optimizes outcomes, and budget adherence' (mean = 4.070) and 'Efficient resource allocation minimizes delays and maximizes productivity' (mean = 4.031).

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Respondents consistently agreed that proper resource planning and deployment are essential for timely completion, cost control, and quality assurance.

Table 2: Descriptive Results of Resource Allocation

Statement (Resource Allocation)	Mean	SD
Suboptimal resource allocation hinders progress and quality	4.101	0.841
Effective resource allocation optimizes outcomes and budget adherence	4.070	0.909
Efficient resource allocation minimizes delays and maximizes productivity	4.031	0.857
Adequate resource allocation expedites completion of KIP road projects	3.950	0.850
Strategic resource allocation fosters innovation and sustainability	3.931	0.984
Overall Mean	**3.961**	—

4.4 Schedule Adherence and Kigali Infrastructure Performance

Schedule adherence received an overall mean of 3.975. The highest-rated item was 'Timely schedule adherence minimizes disruptions and enhances efficiency' (mean = 4.120, SD = 0.923), followed by 'Schedule adherence challenges impact overall performance levels' (mean = 4.110). Respondents also strongly agreed that schedule adherence fosters stakeholder trust (mean = 3.991) and that schedule deviations compromise productivity and satisfaction (mean = 3.971).

Table 3: Descriptive Results of Schedule Adherence

Statement (Schedule Adherence)	Mean	SD
Timely schedule adherence minimizes disruptions and enhances efficiency	4.120	0.923
Schedule adherence challenges impact overall performance levels	4.110	0.919
Schedule adherence deficiencies lead to delays and inefficiencies	4.031	0.877
Rigorous schedule adherence fosters stakeholder trust and confidence	3.991	0.917
Deviations from schedules compromise productivity and satisfaction	3.971	0.877
Overall Mean	**3.975**	**—**

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4.5 Kigali Infrastructure Project Performance

The overall performance of KIP was also rated positively (overall mean = 4.009), with 'aligned scope prevents delays' (mean = 4.131) and 'quality adherence underscores successful performance' (mean = 4.114) rated highest.

Table 4: Descriptive Results of Performance of Kigali Infrastructure Project

Statement (Performance of Project)	Mean	SD
Meeting KIP deliverables confirms efficient project performance and progress	3.970	.877
Sticking to KIP budget ensures effective project performance and resource management.	3.921	.923
Satisfied KIP stakeholders denote successful project performance and stakeholder engagement.	3.991	.916
Timely execution in KIP signifies high-performance project management and progress.	3.930	.971
Quality adherence underscores successful KIP project performance and outcomes.	4.114	.919
Aligned scope in KIP prevents delays, ensuring efficient project performance.	4.131	.926
Overall Mean	**4.009**	-

4.6 Inferential Statistics

The inferential statistics are based on correlation and regression analysis which were conducted in line with the objectives and hypotheses of the study.

Table 5: Correlation Analysis-Time Management and Kigali Infrastructure Project Performance (p<0.01))**

Variable	R	p-value	N
Task Prioritization	0.434**	.000	114
Resource Allocation	0.425**	.000	114
Schedule Adherence	0.358**	.000	114

Correlation analysis confirmed that task prioritization has a moderate and statistically significant positive relationship with KIP performance ($r = 0.434$, $p < 0.01$), leading to the rejection of H_{01}.

Correlation analysis confirmed a moderate, statistically significant positive relationship between resource allocation and KIP performance ($r = 0.425$, $p < 0.01$), leading to the rejection of H_{02}.

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Correlation analysis revealed a positive and statistically significant relationship ($r = 0.358$, $p < 0.01$) between schedule adherence and KIP performance, leading to the rejection of H_{03} at the bivariate level.

Table 6: Model Summary of Time Management and Kigali Infrastructure Project Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.509[a]	.259	.238	.765

a. Predictors: (Constant), adherence to schedule, resource allocation, task prioritization

The regression analysis in Table 6 reveals a moderate relationship between time management practices (task prioritization, resource allocation, and adherence to schedule) and the achievement of Kigali Infrastructure Project (KIP) performance ($R = 0.509$). The R Square value of 0.259 indicates that 25.9% of the variance in meeting KIP performance is explained by the combined effects of the three-time management practices. The adjusted R Square of 0.238 accounts for the number of predictors in the model, confirming the reliability of the model. The standard error of the estimate is 0.765, reflecting a reasonable level of prediction accuracy for the model. These results suggest that improvements in task prioritization, resource allocation, and adherence to schedule contribute meaningfully to the KIP performance.

Table 7: ANOVA of Time Management and Kigali Infrastructure Project Performance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	22.478	3	7.493	12.790	.000[b]
	Residual	64.443	110	.586		
	Total	86.921	113			

a. Dependent Variable: KIP performance
b. Predictors: (Constant), adherence to schedule, resource allocation, task prioritization

The ANOVA supported the overall significance of the model ($F = 12.790$, $p < 0.001$). Task prioritization ($\beta = 0.288$, $p = 0.003$) and resource allocation ($\beta = 0.275$, $p = 0.005$) were statistically significant predictors, whereas schedule adherence did not demonstrate a significant direct effect ($\beta = 0.057$, $p = 0.548$) when controlling for the other predictors.

Table 8: Regression Coefficients of Time Management and Kigali Infrastructure Project Performance *($R^2=0.259$; $F=12.790$; $p<0.001$)*

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.574	0.418	—	3.769	.000
Task Prioritization	0.276	0.092	0.288	3.008	.003
Resource Allocation	0.284	0.098	0.275	2.894	.005
Schedule Adherence	0.058	0.096	0.057	.603	.548

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The multiple regression analysis (Table 8) indicated that time management practices collectively accounted for 25.9% of the variance in KIP performance ($R^2 = 0.259$, Adjusted $R^2 = 0.238$).

5. DISCUSSION

The results show that task prioritization has a significant, positive impact on KIP performance. The descriptive mean is 3.888, and the correlation is moderate ($r = 0.434$, $p < 0.01$). This suggests that respondents see effective task prioritization as key to improving efficiency, optimizing resources, and reducing delays. These findings agree with Bryde and Wright (2017), who reported that performance management systems focusing on task prioritization improve outcomes in construction projects. Yasiri (2020) similarly found that time management, especially task prioritization, facilitates achieving goals in service industries. The regression coefficient ($\beta = 0.288$, $p = 0.003$) supports that task prioritization predicts KIP performance. This effect holds even after accounting for resource allocation and schedule adherence.

Resource allocation was also identified as a strong factor for KIP performance ($r = 0.425$, $p < 0.01$; $\beta = 0.275$, $p = 0.005$). Respondents noted that poor resource allocation slows project progress and reduces quality. By contrast, allocating financial, human, and material resources effectively improves outcomes and supports budget compliance. These results are consistent with Makokha and Ngugi (2022), who saw a strong positive link between resource allocation and project implementation in Kenya. Eric et al. (2022) observed similar patterns in Rwanda's Huguka Dukore Akazi Kanoze Project. The Resource-Based View Theory supports these results. It says organizations with advanced resource management achieve sustainable project advantages.

Schedule adherence showed a positive bivariate correlation with KIP performance ($r = 0.358$, $p < 0.01$). However, its direct effect was not significant in the regression analysis ($\beta = 0.057$, $p = 0.548$) after accounting for task prioritization and resource allocation. This suggests that schedule adherence is helpful but, on its own, does not improve project performance when tasks are well organized and resources are well deployed. Byusa (2019) found that scheduling practices impact project quality and timeliness. In contrast, Meng et al. (2022) identified advanced scheduling systems as core to project success. The difference may stem from the KIP context, where manual project management is more common than technology-based scheduling systems.

Time management practices account for approximately 26% of the variance in KIP performance, with task prioritization and resource allocation identified as the primary contributors. These findings are consistent with Safapour et al. (2023), who demonstrated that schedule performance is influenced by multiple interacting factors beyond scheduling alone. The present study contributes to the literature by offering empirical evidence from Rwanda's infrastructure sector and quantifying the impact of three distinct time management areas on overall project performance.

6. CONCLUSION

This study investigated the impact of time management, specifically task prioritization, resource allocation, and schedule adherence, on the performance of the Kigali Infrastructure Project (KIP) in Rwanda.

The study concludes that task prioritization significantly influences the performance of the Kigali Infrastructure Project. Descriptive results show strong agreement among respondents

that effective task prioritization enhances efficiency and optimizes resource use, while poor prioritization leads to delays and inefficiencies. Correlation analysis further confirms this relationship, revealing moderate and statistically significant associations with KIP performance. These findings demonstrate that prioritizing critical tasks is essential for timely delivery, cost control, and improved stakeholder outcomes.

Resource allocation is a key driver of KIP performance. Descriptively, respondents strongly perceived effective resource allocation as vital for timely completion, quality assurance, and cost efficiency. Correlation results support this perception, showing significant positive relationships with KIP performance. This confirms that proper planning and utilization of resources directly enhance project performance.

Regarding schedule adherence, respondents generally viewed adherence to timelines as important for minimizing disruptions and enhancing efficiency. Correlation results indicate positive and significant between schedule adherence and KIP performance. However, regression analysis shows that schedule adherence does not have a significant direct effect when task prioritization and resource allocation are considered. This suggests that while schedule adherence supports performance, effective task prioritization and resource allocation are the primary drivers of KIP project success.

The findings of this study have significant implications for infrastructure project management in Rwanda and similar East African contexts. The rejection of H_{01} and H_{02}, along with the partial rejection of H_{03}, collectively demonstrates that integrated time management strategies, particularly those that prioritize critical tasks and optimize resource allocation, are vital for achieving sustainable project outcomes. These results offer original empirical evidence to the regional project management literature and present actionable recommendations for both practitioners and policymakers.

7. RECOMMENDATIONS

Based on the study findings, the following recommendations are proposed. First, project managers and implementation teams at KIP should adopt structured task-planning tools, such as work breakdown structures, priority matrices, and project scheduling software, to ensure that critical activities are systematically identified, sequenced, and executed. This approach is expected to improve timely delivery, budget compliance, and stakeholder satisfaction.

Second, project owners, implementing agencies, and funding partners should strengthen resource allocation practices by employing rigorous planning, continuous monitoring, and efficient utilization of financial, human, and material resources. Resource allocation should remain dynamically aligned with project priorities to minimize delays, cost overruns, and inefficiencies.

Third, although schedule adherence has a direct effect, it should not be addressed in isolation. Project planners and supervisors are encouraged to integrate schedule management with task prioritization and resource planning, using flexible, adaptive scheduling approaches to address date uncertainties and external shocks.

Fourth, policymakers and government institutions should develop supportive policies, guidelines, and capacity-building programs to promote effective time management in public infrastructure projects. Academicians and researchers are encouraged to expand upon these

findings through longitudinal studies, experimental designs, and research across broader geographic contexts to strengthen causal inference and generalizability.

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