

Website:<u>www.jriiejournal.com</u>

ISSN 2520-7504 (Online) Vol.9, Iss.2, 2025 (pp. 865 - 872)

Effect of Project Delays on Performance of Construction Projects in Rwanda, Gasabo District. A Case of Zaria Court Project by Real Contractors Ltd

Umurangamirwa Sandrine & Sam Bazimya University of Kigali <u>https://orcid.org/0009-0001-0456-8096</u> Email: <u>sandrineumurangamirwa@gmail.com</u>

Abstract: The general objective of this study is to investigate the effect of project delays on the performance of construction projects in Gasabo District, Rwanda, specifically focusing of Zaria Court Project by Real Contractors Ltd. Statistical Package for Social Sciences (SPSS) version 25 facilitated descriptive and regression analyses, ensuring the generation of meaningful interpretations of the research findings. The R value of 0.797 indicates a strong correlation between the predictor variables (Decision making, Scheduling and Supply chain) and the performance of Zaria Court Project by Real Contractors Ltd in Gasabo District, while the R squared value of 0.635 signifies that 63.5% of the variance in performance can be explained by the independent variables included in the model. The Durbin-Watson statistic of 1.983 indicates that there is no significant autocorrelation in the residuals, which strengthens the model's reliability. The significance of the model is confirmed with a p value of less than 0.05. The coefficients indicate that for each unit increase in supply chain, scheduling and decision-making, the performance of the project is expected to increase by 0.369, 0.187, and 0.409, respectively, when all other variables are held constant. The significance of each coefficient (p < 0.05) confirms that all independent variables included right effect on the performance of the project. The paper recommends that Real Contractors Ltd staff should attend risk management training, suppliers improve inventory systems, and teams adopt technology.

Keywords: Project Delays, Performance, Construction Projects, Supply Chain, Scheduling, Decision-Making

How to cite this work (APA):

Umurangamirwa, S. & Bazimya, S. (2025). Effect of Project Delays on Performance of Construction Projects in Rwanda, Gasabo District. A Case of Zaria Court Project by Real Contractors Ltd. *Journal of Research Innovation and Implications in Education*, *9*(2), 865 – 872. <u>https://doi.org/10.59765/uwf538</u>.

1. Introduction

Constructions projects in Rwanda faces notable challenges in adhering to project schedules, often resulting in delays. Contributing factors include inadequate planning, poor monitoring, and delayed identification of defects during the early stages of construction. Insufficient budgeting and unclear project requirements from project owners frequently lead to scope changes, causing disruptions. In Rwanda's construction industry, inefficiencies in consultancy services and poorly structured contracts also contribute to delays. In order to overcome these obstacles and increase project delivery while reducing time overruns in Rwanda's fast expanding construction industry, thorough project management methods are needed across the whole project lifecycle (Basomingera, 2021).

Construction projects in Gasabo District, Rwanda, face delays due to challenges in monitoring and evaluation practices. Inefficient planning during monitoring and evaluation disrupts project timelines, while limited staff skills in this area reduce the capacity to identify and mitigate delays. Additionally, the lack of proper integration of ICT tools affects the efficiency of project tracking and management. Strengthening monitoring and evaluation processes through better planning and advanced technological tools is vital for improving the performance and timely completion of construction projects in Gasabo District (Habarurema & Malgit, 2024).

The construction of the Regional Cybercrime Center in Gasabo District, Rwanda, has been significantly impacted by delays and associated cost overruns. These delays stem from various factors, including inexcusable, non-compensable, and compensable delays. Each of these has contributed to an increase in project costs and a disruption of the planned schedule. Factors such as delays in payment processing, changes to project scope, and issues with contractor performance have exacerbated the situation. To mitigate these delays and avoid further financial strain, it is essential for project owners to secure adequate and timely financial resources for project completion (Amanya & Njenga, 2022).

Today, Rwanda's construction sector provides over 144 billion Rwandan Francs to the GDP, promoting socioeconomic growth and creating key job opportunities. However, issues such as insufficient planning skills, poor communication, inefficient resource allocation, and restricted access to financing remain, hurting its overall efficiency and development potential (Rutagengwa & Kwena, 2024).

Notably, construction industry in Rwanda faces significant challenges with delays and cost overruns. Delays in the construction of the Regional Cybercrime Center in Gasabo District are significant, with inexcusable delays correlating strongly with cost overruns (0.773), alongside impacts from noncompensable and compensable delays. Between 2012 and 2015, 65.7% of public construction projects in City of Kigali experienced delays (Amanya & Njenga, 2022). Notable projects such as the Kigali Convention Center, initially scheduled for completion in 2011, were postponed until 2016. Similarly, the construction of Bugesera International Airport, originally set for 2016, has yet to begin. A statistical analysis of 15 commercial building projects between 2010 and 2020 revealed that none met their planned schedules, with 75% requiring more time and 15% canceled. Additionally, delays in Kigali projects were caused by time overruns (45%), cost overruns (33.4%), and disputes (21.6%) (Amanya & Njenga, 2022).

Similarly, delays in project schedules remain a critical problem, as 68% of public construction projects experience schedule disruptions. These delays are attributed to material shortages, changes in project scope, and ineffective coordination among project participants (Mukiza *et al.*, 2021). According to Ingabire (2021), quality concerns in the business stem from inadequate oversight, a lack of competent workers, and poor communication between contractors and subcontractors.

Despite several studies on project delays in different locations, no one has particularly looked into the effect of project delays on the performance of Zaria Court Project by Real Contractors Ltd, Gasabo District. This research gave critical insights on how to manage and mitigate delays in supply chain, scheduling and decision making and its effects on performance of Zaria Court Project by Real Contractors Ltd.

The general objective of the study is to investigate the effect of project delays on performance of construction projects in Gasabo District, Rwanda, specifically focusing on Zaria Court Project by Real Contractors Ltd.

Specifically, the study had the following objectives:

- 1. To assess the effect of supply chain on performance of Zaria Court Project by Real Contractors Ltd in Gasabo District
- 2. To determine the effect of scheduling on performance of Zaria Court Project by Real Contractors Ltd in Gasabo District
- 3. To analyze the effect of decision-making on the performance of Zaria Court Project by Real Contractors Ltd in Gasabo District

The following research null hypotheses were developed:

 H_{01} : There is no significant effect of supply chain on the performance of Zaria Court Project by Real Contractors Ltd in Gasabo District

 H_{02} : There is no significant effect of scheduling on the performance of Zaria Court Project by Real Contractors Ltd in Gasabo District

 H_{03} : There is no significant effect of decision-making on the performance of Zaria Court Project by Real Contractors Ltd in Gasabo District

2. Literature Review

2.1 Supply Chain Delays and Performance of Project

Ahmed *et al.* (2021) examined the synergic effects of reworking imperfect quality items integrated with multiperiod delay-in-payment and partial backordering in global supply chains. The study focused on reworking defective items at local repair workshops, which proved cost-effective and sustainable compared to returning them to the supplier. A synergic inventory model was developed to maximize profit through reworking, delayin-payment policies, and backordering strategies. Findings indicate that profit decreases when the supplier's permitted payment period equals or exceeds the cycle time but increases when the permitted period is shorter than the cycle time. The study employed a nonderivative approach for a closed-form solution, optimizing inventory cycle time and monitoring inventory performance phases. The model demonstrated improved inventory management and higher profitability through enhanced monitoring of reworked items, payment periods, and shortages. This approach highlighted the benefits of integrating rework processes and financing strategies in global supply chain management.

Riera et al. (2021) examined the delays and disruptions in cancer healthcare services caused by the COVID-19 pandemic through a systematic review of 62 studies. The review identified 38 categories of delays and disruptions impacting treatment, diagnosis, and general health services. Common disruptions included reduced cancer surgeries, delays in radiotherapy, and rescheduled or canceled outpatient visits. Provider- and system-related issues, such as decreased service availability, were the most frequent determinants of disruptions. Facilities experienced interruptions in up to 77.5% of cases, while supply chain disruptions and personnel shortages affected up to 79% and 60%, respectively. The studies lacked high methodological quality but highlighted the widespread reduction in routine cancer services due to the COVID-19 burden. The findings emphasized the need for strategies to mitigate delays and standardize measurement and reporting practices. Continuous updates to this review were deemed necessary as more studies became available.

Nanayakkara et al. (2021) examined the applicability of blockchain and smart contracts in addressing payment issues within construction supply chains. The study highlighted persistent challenges such as partial payments, non-payments, high financing costs, lengthy payment cycles, retention concerns, and payment security, which stem from the complex and dynamic nature of construction supply chains. Utilizing an expert forum and structured questionnaires with construction industry stakeholders, the study identified blockchain's distributed data storage capabilities and the selfexecuting nature of smart contracts as effective solutions for streamlining interorganizational processes. The findings revealed that blockchain and smart contracts can reduce payment disputes, enhance transparency, and ensure timely execution of financial agreements. The study emphasized the potential of these technologies to significantly mitigate financial issues in the construction industry, offering a secure and efficient mechanism for managing transactions in complex supply chain environments.

2.2 Scheduling Delays and Performance of Project

Mogoa and Muchelule (2023) investigated the influence of project schedule management on the performance of construction projects in Mombasa County, Kenya. Targeting 175 contractors categorized as NCA5 to NCA8, the study utilized a cross-sectional survey design and stratified random sampling to collect data through structured questionnaires. The findings revealed that sequencing project tasks ensures efficient resource utilization, while task dependencies are effectively considered during scheduling. Tools such as Gantt Charts were prominently used to document and visualize task dependencies, with a focus on the critical path to optimize resource allocation. Communication of project schedules was centralized and consistently relayed throughout the project lifecycle, promoting internal collaboration. The study concluded that systematic scheduling of resources, deployment of technological tools, and provision of financial and skilled human resources significantly enhance project outcomes, including timeliness, budget adherence, and quality. Recommendations emphasized equipping construction projects with knowledgeable personnel and sufficient technological and financial resources.

Giri (2023) investigated the factors causing delays in construction projects in Nepal, a common issue in developing countries. The study used a well-structured questionnaire administered to 100 participants, including contractors, consultants, and civil engineers. Statistical tests, such as reliability assessments and factor analyses, ensured the data's integrity. The findings revealed several key factors contributing to delays, including inadequate design, poor communication and coordination among stakeholders, insufficient planning and experience of contractors, delays in material delivery and testing, labor shortages, low qualifications, and external factors such as regulatory changes and unforeseen circumstances. The study emphasized the importance of understanding these factors to improve project performance and reduce delays, cost overruns, and disputes among stakeholders.

Tarig and Gardezi (2023) investigated the relationship between Delays and Conflicts (D&Cs) in construction projects, an area with limited exploration. The study reviewed existing literature to develop a global ranking of D&C causes and examine the hidden connections between them. Data were classified using Jenks optimization, which identified the top five causes of D&Cs: financial problems from the owner, change orders/variations, and lack of communication/poor relationships. These common causes were found to project performance, significantly affect and understanding their mutual relationship can enhance construction management strategies. The study also highlighted new avenues for future research to improve project success parameters, focusing on the interplay between delays and conflicts as key factors influencing construction outcomes.

2.3 Decision-making Delays and Performance of Project

Balta *et al.* (2021) assessed the delay risks in Tunnel Boring Machine (TBM) tunnel projects through a Bayesian Belief Network (BBN)-based decision support tool. The study developed a risk assessment method using the BBN model to predict delays and formulate strategies for managing these risks. A decision-support tool, BBN Tunnel, was created to evaluate delay risks and consider alternative risk mitigation strategies. The validity of the method and tool was tested through ten validation tests, and the tool's applicability was demonstrated in a real tunnel project. The findings indicated that BBN Tunnel effectively modeled interrelations between risk factors, constructed a risk network, predicted delays, and aided in the formulation of cost-effective risk mitigation strategies. This approach offers a structured method for managing uncertainty and delay risks in TBM tunnel projects.

Egwim et al. (2021) assessed the use of Ensemble Machine Learning Algorithms (EMLA) for predicting construction project delays. The study employed bagging, boosting, and stacking techniques to mitigate time overruns in construction projects. A review of delay factors informed quantitative data collection from experts, followed by data cleaning, feature selection, and hyperparameter optimization. Various models, including Decision Tree, Random Forest, and Naive Bayes variants, were trained to predict delays. The results showed that ensemble methods, particularly stacking, significantly improved predictive performance compared to single algorithm models, as demonstrated by higher accuracy, precision, recall, F1 score, and Area Under the Receiver Operating Characteristic Curve (ROC AUC). The findings highlight the effectiveness of ensemble learning techniques in predicting and mitigating delays in construction projects.

Parsamehr et al. (2023) assessed the challenges in conventional construction management and the solutions provided through Building Information Modeling (BIM). The study focused on key construction management areas: schedule, cost, quality, and safety. It examined how BIM can address data accessibility issues and enhance decisionmaking through predictive techniques. The review highlighted the role of BIM in improving communication, collaboration, and the development of automated prediction models. A BIM-based construction decision-making framework was proposed to assist organizations in implementing a decision support system for project management. The study also identified existing knowledge gaps and the potential for future research in applying BIM to improve construction management practices. The research emphasized the need for the construction industry to adapt modern technologies and management techniques, akin to other industries, to achieve efficient project delivery.

3. Methodology

This section outlines the research methodology, detailing the rationale, data collection methods, and the analysis of how project delays impact the performance of construction projects in Gasabo District, particularly focusing on Real Contractors Ltd.

3.1 Research Design

This study employed both descriptive and correlational research design. Quantitative data gathered using questionnaires, and descriptive techniques were utilized to interpret the data. These methods were aligned with the study's objectives, ensuring that the data collected were relevant and meaningful. The integration of these approaches allowed for a comprehensive understanding of the variables under study and their interconnections.

3.2 Population of the Study

The target population for this study consists of 180 individuals, categorized into key groups: 13 participants from the project management team of Zaria Court Project, including managers, engineers, and supervisors; 72 construction workers and skilled laborers; 28 Real Contractors Ltd staffs and 67 supply chain and material suppliers.

3.3 Sample Size of the Study

Census Inquiry Method was more feasible and practical because the population was small. The Census Inquiry Method is a data collection approach in which information is gathered from every unit or individual within a given population or target group.

3.4 Data Collection Methods and Instruments

Questionnaires were distributed among project managers, contractors, site supervisors, and relevant stakeholders of Zaria Court Project within Gasabo District to ensure a broad and detailed understanding of the factors influencing project outcomes.

Since this is a critical review of the literature that seeks global perspectives to provide a comparative framework for readers' analysis and evaluation, the researcher employed this documentary approach to gather secondary material.

3.5 Data Analysis

Statistical techniques assisted in identifying patterns, relationships, and trends within the data. These analytical methods enable the researcher to form meaningful interpretations, enriching the understanding of the impact of project delays on performance of Zaria Court Project in Gasabo District, with a particular focus on Real Contractors Ltd.

Inferential statistics, including correlation analysis were employed to explore the relationships between project delay factors: supply chain, scheduling and decisionmaking, and the performance of Real Contractors Ltd construction projects in Gasabo District. The adopted multiple regression model for analysis was as follows: $Y=\alpha+\beta_1X_1+\beta_2X_2+\beta_3X_3+\epsilon$

Where:

- Y = Y represents the performance of project
- X₁ corresponds to supply chain.
- X₂ reflects scheduling.
- X₃ indicates decision-making.
- α represents the constant term or y-intercept.

 β denotes the coefficients, indicating the impact of each delay factor on project performance

3.6 Ethical Considerations

The researcher sought approval from participants before their involvement in the study. This included obtaining consent from the management of the relevant organizations to ensure their members' participation, supported by an official authorization letter. The researcher protected the identities and responses of participants throughout the study. The data collected was kept secure and used exclusively for the purposes of this research. These ethical practices protected the rights of all participants, reinforcing the credibility and trustworthiness of the research findings.

4. Results and Discussion

This section presents a detailed analysis of the data collected to investigate the effect of project delays on the performance of construction projects in Gasabo District, Rwanda, focusing specifically on the Zaria Court Project by Real Contractors Ltd. Inferential statistical analyses aim to draw meaningful conclusions and associations relevant to the impact of project delays on construction performance.

4.1 Respondent Rate

The respondent rate section provides an overview of the questionnaire completion status among participants in the study. The data showcased in Table 4.1 below illustrates that a majority of respondents completed the questionnaires, indicating a high engagement level in the research process.

	Frequency	Percent				
Complete Questionnaire	169	93.89				
Incomplete Questionnaire	11	6.11				
Total Questionnaire	180	100.00				
	Source: Field data 2025					

Table 1: Response rate

Source: Field data, 2025

Table 1 presents the respondent rate, detailing the frequency and percentage of complete versus incomplete questionnaires. Out of 180 distributed questionnaires, 169 were adequately completed, representing 93.89% of the total responses. Conversely, 11 questionnaires were not completed, which accounts for 6.11%. This strong completion rate highlights the willingness of participants

to contribute valuable information concerning the impact of project delays on construction performance.

4.2 Correlation Analysis

This section presents the correlation statistics used to analyze the relationships among the various delays and the performance of the Zaria Court Project.

Table 2: Correlations						
		Supply chain	Scheduling	Decision making	Performance of proje ct	
	Pearson Correlation	1	.540**	.543**	.677**	
Supply chain	Sig. (2-tailed)		.000	.000	.000	
	N	169	169	169	169	
	Pearson Correlation	.540**	1	.509**	.596**	
Scheduling	Sig. (2-tailed)	.000		.000	.000	
	N	169	169	169	169	
Decision making	Pearson Correlation	.543**	.509**	1	.692**	
	Sig. (2-tailed)	.000	.000		.000	
	N	169	169	169	169	
Performance of p roject	Pearson Correlation	.677**	.596**	.692**	1	
	Sig. (2-tailed)	.000	.000	.000		
	Ν	169	169	169	169	
1 . · ·		$1/2 \cdot 1/2$				

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Field data, 2025

Table 2 presents the correlation analysis among supply chain, scheduling, decision-making and the performance of Zaria Court Project by Real Contractors Ltd in Gasabo District. The Pearson correlation coefficients highlight significant relationships between the independent variables and the dependent variable, which is the performance of the project.

Specifically, the correlation between supply chain and performance of the project is 0.677, indicating a

moderate positive relationship (p < 0.05). The findings regarding supply chain are consistent with the work of Ahmed *et al.* (2021), who emphasized that effective management of supply chain issues directly impacts project performance. This study on the Zaria Court Project indicates that addressing procurement, transport, delivery, and logistics delays significantly enhances overall project effectiveness.

Similarly, scheduling exhibit a correlation of 0.596 with performance of the project, indicating a moderate positive relationship (p < 0.05). The findings concerning scheduling resonate with the research of Mogoa and Muchelule (2023), who stressed the importance of systematic scheduling in project management. This study on the Zaria Court Project indicates that efficiently managing planning, milestone, approval, and monitoring delays directly correlates with improved timeliness and quality in project execution.

Decision making correlate highly with performance of the project at 0.692, indicating a moderate positive relationship (p < 0.05). The findings related to decision-

making align with the work of Parasmehr et al. (2023), who emphasized the need for clear decision-making protocols to facilitate successful project outcomes. This study on the Zaria Court Project indicates that minimizing approval, feedback, response, and coordination delays is vital for optimizing performance and achieving project goals.

The significance values for all these correlations are less than 0.05, confirming the statistical significance of the relationships between the independent variables and the dependent variable.

4.3 Regression Analysis

This section focuses on the regression analysis conducted to understand the relationships between the identified delays and the performance of the Zaria Court Project. Regression analysis allows for the evaluation of the extent to which supply chain, scheduling, and decision-making contribute to variations in project performance metrics.

Table 3: Model Summary								
Model R R Square		Adjusted R Square	Std. Error of the Estimate	Durbin-Watson				
1	.797ª	.635	.628	.32342	1.983			
De listere (Constant) De listere 11 a. Calad line Constants								

a. Predictors: (Constant), Decision making, Scheduling, Supply chainb. Dependent Variable: Performance of project

Source: Field data, 2025

Table 3 provides the model summary for the regression analysis. The R value of 0.797 indicates a strong correlation between the predictor variables (Decision making, Scheduling and Supply chain) and the performance of Zaria Court Project by Real Contractors Ltd in Gasabo District, while the R squared value of 0.635 signifies that 63.5% of the variance in performance can be explained by the independent variables included in the model. The Durbin-Watson statistic of 1.983 indicates that there is no significant autocorrelation in the residuals, which strengthens the model's reliability. The significance of the model is confirmed with a p value of less than 0.05.

In support of these results, Balta *et al.* (2021) highlighted the substantial association between independent variables and total project performance measures, showing that performance metrics are greatly improved by good risk management. According to this analysis of the Zaria Court Project, early interventions in delay management might maximize performance indicators even further. Moreover, it is backed by studies by Nanayakkara et al. (2021), which underlined how well strategic interventions help to control delays thus enhancing project results. Their analysis verified that a high R square value explains a significant amount of performance variation across independent factors. This research on the Zaria Court Project shows that knowledge of these links helps project managers concentrate on important factors affecting success. Furthermore, in line with Egwim et al. (2021), who highlighted the need of strong statistical models in project success prediction is the results. Their results imply that evaluating the effect of management strategies on project success depends on using dependable models.

	Table 4: ANOVA							
Model		Sum of Squares	df	Mean Square	F	Sig.		
	Regression	30.021	3	10.007	95.305	.000 ^b		
1	Residual	17.259	165	.105				
	Total	47.280	168					

a. Dependent Variable: Performance of project

b. Predictors: (Constant), Decision making, Scheduling, Supply chain

Source: Field data, 2025

Table 4 displays the ANOVA results, showing an F value of 95.305, which indicates a statistically significant model (p < 0.05). This finding supports that the

regression model significantly predicts the performance of the Zaria Court Project by Real Contractors Ltd in Gasabo District based on the independent variables (Decision making, Scheduling and Supply chain). The results line up with the efforts of Tariq and Gardezi (2023), who underlined that statistically significant regression models favorably predict project success, thus proving that the combined effect of independent factors greatly influences project results. According to this research on the Zaria Court Project, ANOVA analysis of these correlations validates their relevance. Moreover, it is backed by studies by Egwim *et al.* (2021), which show how important it is to use ANOVA to evaluate project performance in order to expose important management effectiveness concerns. Their studies underlined the link

between project results and management techniques, therefore supporting the need for careful assessments. According to this analysis of the Zaria Court Project, good performance outcomes depend on strategic control of delays. Furthermore, the results speak to Riera *et al.* (2021), which underline the need of good management strategies in raising project performance. Their studies support the need for thorough performance analysis and underline the important part suitable approaches play in reaching project goals.

	Table 5: Coefficients								
Model		Unstar	dardized	Standardized t		Sig.	Collinearity		
		Coef	ficients	Coefficients			Statistics		
		В	Std. Error	Beta			Tolerance	VIF	
	(Constant)	.165	.218		.757	.449			
1	Supply chain	.369	.063	.351	5.857	.000	.611	1.636	
	Scheduling	.187	.054	.204	3.463	.001	.642	1.558	
	Decision making	.409	.060	.398	6.817	.000	.639	1.564	

a. Dependent Variable: Performance of project

Source: Field data, 2025

Table 5 outlines the coefficients for the independent variables in the regression model. The adopted model for analysis was structured as follows:

 $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$

Where:

Y = Performance of Zaria Court Project by Real Contractors Ltd in Gasabo District

 $X_1 =$ Supply chain

 $X_2 =$ Scheduling

 $X_3 = Decision making$

 α = Constant (intercept)

 $\beta_1, \beta_2, \beta_3$ = Coefficients indicating the strength of each variable's influence on organizational performance ϵ = Error term

Hence,

Performance of Zaria Court Project by Real Contractors Ltd in Gasabo District = 0.165 + 0.369(Supply chain) + 0.187(Scheduling) + 0.409 (Decision making) + ϵ

The coefficients indicate that for each unit increase in supply chain, scheduling and decision-making, the performance of the project is expected to increase by 0.369, 0.187, and 0.409, respectively, when all other variables are held constant. The significance of each coefficient (p < 0.05) confirms that all independent variables have a statistically significant effect on the performance of the project.

The results match the conclusions reached by Giri (2023), who underlined the need of knowing regression coefficients to improve project performance while stressing the need of early decision-making in deciding project success. This research of the Zaria Court Project shows that performance is significantly influenced by addressing each delay variable. Moreover, Balta et al. (2021) supports it by talking about the crucial need of controlling delay factors in guaranteeing the effective running of building projects. Their studies revealed that better decision-making procedures provide positive coefficients that capture performance increases. This research on the Zaria Court Project shows that improved results need particular interventions aiming at supply

chain, scheduling, and decision-making delays. Furthermore, the results align with the study of Egwim *et al.* (2021), indicating that regression coefficients provide insightful analysis of the interactions between independent factors and project success indicators. This research underlines that optimal performance across important criteria like scope, quality, timeliness, and cost depends on efficient delay management.

Table 5 presents the results of the hypotheses testing concerning the effects of the independent variables on the performance of the Zaria Court Project. The results indicate that all null hypotheses are rejected since the p values for each variable are less than 0.05. This finding confirms that supply chain, scheduling, and decisionmaking each have a significant effect on the performance of the project. Therefore, it can be concluded that these types of delays directly influence the overall success and effectiveness of the Zaria Court Project.

5. Conclusion and Recommendations

5.1 Conclusion

The comprehensive analysis of the Zaria Court Project demonstrates that effective management of supply chain, scheduling and decision-making significantly influence its performance. The findings show that participants universally recognize the effect of these efforts as evidenced by high means across the measured variables. Specifically, dealing with supply chain delays have a notable effect on project delivery, confirming that timely supplier engagement and efficient logistics are crucial for success. Similarly, scheduling delays hinder progress, reinforcing the importance of continuous monitoring and adaptive resource allocation. Furthermore, decision-making delays impede project effectiveness, underscoring there is clear protocols and effective communication among stakeholders.

Collectively, these conclusions highlight Zaria Court Project demonstrates has strategies to manage delays and improve overall project performance.

5.2 Recommendations

The study recommended that,

- 1. Project managers enhance communication protocols to ensure timely supplier engagement.
- 2. Training for construction workers focuses on efficient work practices and adherence to schedules.
- 3. Real Contractors Ltd staff participate in regular risk management and project planning training sessions.

5.3 Area for Further Research

Future research to examine the effect of project management practices on performance of the Zaria Court Project and examine the effect of workforce training on performance of the Zaria Court Project.

References

- Ahmed, W., Moazzam, M., Sarkar, B., & Rehman, S. U. (2021). Synergic effect of reworking for imperfect quality items with the integration of multi-period delay-in-payment and partial backordering in global supply chains. *Engineering*, 7(2), 260-271.
- Amanya, F. S., & Njenga, G. (2022). Construction delays and project cost overrun: A case of the Regional Cybercrime Center in Gasabo District, Rwanda. Journal of Entrepreneurship & Project Management, 6(1), 34-52.
- Balta, G. K., Dikmen, I., & Birgonul, M. T. (2021). Bayesian network-based decision support for predicting and mitigating delay risk in TBM tunnel projects. *Automation in Construction*, 129, 103819.
- Basomingera, J. (2021). Factors contributing to project schedule delay in Rwanda: Case of Horizon Construction Ltd. *Global Scientific Journal*, 9(9).
- Egwim, C. N., Alaka, H., Toriola-Coker, L. O., Balogun, H., & Sunmola, F. (2021). Applied artificial intelligence for predicting construction projects delay. *Machine Learning with Applications*, 6, 100166.
- Giri, O. (2023). Perception-based assessment of the factors causing delays in construction projects. *Engineering*, 15, 431–445.
- Habarurema, M., & Malgit, A. (2024). Effect of monitoring and evaluation practices on performance of construction projects in Gasabo

District, Rwanda. International Journal of Economics, Project Management, and Development, 9(3).

- Ingabire, Y. (2021). Analysis of delay factors and success of commercial building projects in Rwanda: Case of Nitsal international construction, epitome architects Rwanda limited and EPC Africa companies (Doctoral dissertation, University of Rwanda).
- Memon, A. H., Memon, A. Q., Khahro, S. H., & Javed, Y. (2023). Investigation of project delays: Towards a sustainable construction industry. *Sustainability*, 15(2), 1457.
- Mogoa, A. M., & Muchelule, Y. (2023). Project schedule management on performance of construction projects in Mombasa County, Kenya. *The Strategic Journal of Business & Change Management, 10*(2), 582–603.
- Mukiza, E., Hanbin, J., & Li, H. (2021). An investigation into the causes of delays in public construction projects in Rwanda. *Advances in Civil Engineering*, 2021, 1-9.
- Nanayakkara, S., Perera, S., Senaratne, S., Weerasuriya,
 G. T., & Bandara, H. M. N. D. (2021).
 Blockchain and smart contracts: A solution for payment issues in construction supply chains. *Informatics*, 8(2), 36
- Parsamehr, M., Perera, U. S., Dodanwala, T. C., Perera, P., & Ruparathna, R. (2023). A review of construction management challenges and BIMbased solutions: perspectives from the schedule, cost, quality, and safety management. *Asian Journal of Civil Engineering*, 24(1), 353-389.
- Riera, R., Bagattini, Â. M., Pacheco, R. L., Pachito, D. V., Roitberg, F., & Ilbawi, A. (2021). Delays and disruptions in cancer health care due to COVID-19 pandemic: systematic review. *JCO* global oncology, 7(1), 311-323.
- Rutagengwa, R., & Kwena, R. (2024). Risk management and performance of the Busanza-Muyange construction project implemented by Nyarutarama Property Developer (NPD Ltd) in Kicukiro District. *Brainae Journal*, 8(5).
- Tariq, J., & Gardezi, S. S. S. (2023). Study the delays and conflicts for construction projects and their mutual relationship: A review. *Ain Shams Engineering Journal*, 14(1), 101815.