JRIIE Journal of Research Innovation and Implications in Education
Center for Research Implications & Practice
Website: www.jriiejournal.com ISSN 2520-7504 (Online) Vol.10, Iss.3, 2026 (pp. 2710 - 2723)

Effect of Project Planning Practices on Project Implementation Success: A Case of Ecofleet Transport System in Nyarugenge District, Rwanda

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Abstract: *The study assessed the effect of project planning practices on project implementation success of Ecofleet Transport System in Nyarugenge District, Rwanda. Resource planning, schedule planning, communication planning, and risk management planning were examined as predictors of project implementation success. Resource-Based View Theory, Theory of Change, Communication Theory, and Risk Management Theory guided the study. Descriptive and correlational research designs were adopted using quantitative and qualitative approaches. The target population comprised 308 respondents, from whom 174 were selected through proportionate stratified and simple random sampling; 160 complete questionnaires were analysed. Questionnaires, interviews, and documentation generated the study data, while quantitative data were analysed using SPSS version 29 through descriptive statistics, Pearson correlation, normality testing, and multiple regression. Resource planning had a positive significant effect on implementation success (B = 0.327; t = 7.109; p = 0.000), schedule planning (B = 0.312; t = 7.256; p = 0.000), communication planning (B = 0.145; t = 3.295; p = 0.001), and risk management planning (B = 0.105; t = 2.333; p = 0.021). The model explained 85.1% of the variation in project implementation success. The study concluded that integrated planning strengthened transport project implementation and recommended resource-readiness checks, updated implementation calendars, structured stakeholder communication, and active risk registers.*

Keywords*: Resource Planning, Schedule Planning, Communication Planning, Risk Management Planning, Project Implementation Success*.

How to cite this work (APA):

Shyaka, P. & Dushimimana, J. D. Effect of Project Planning Practices on Project Implementation Success: A Case of Ecofleet Transport System in Nyarugenge District, Rwanda. *Journal of Research Innovation and Implications in Education, 10*(3), 2710 – 2723**. https://doi.org/10.59765/gskp9**

1. Introduction

Project plans determine how to arrange risks, resources, timelines and information, which affect the success of project implementation in turning project objectives into operational results. The quality of the planning of transport projects is especially crucial because of the necessity to coordinate vehicles, persons, budget, routes, timelines of services, the regulating bodies and users within a limited time of implementation. Planning is thus a major function of management which serves as the basis for controlling implementation time, cost, quality, safety, service reliability and stakeholder expectation (Borges et al., 2025).

Transport project delivery world-wide reflects the importance of disciplined planning. The United Kingdom (DfT 2025) identifies four essential elements for large transport programs: Scope clarity is needed early on to understand what needs to be delivered. Integrated communication is required between the public bodies and contractors implementing the program. Implementation timetables are necessary for delivery on time and on budget. Delivery assurance is demanded through public bodies and contractors implementing the program. In the United States, the readiness of funding, environmental compliance, implementation timelines, and measurable outputs are the basis of the funding necessary to build roads, bridges, transit systems, and

make investments in clean mobility. The Asian context is also indicative of the importance of project planning in enhancing implementation that is tied to risk management and adaptive resource control (Iqbal et al., 2024; Jiang et al., 2023).

Transport projects in Africa are located in an environment of financial, technical, institutional and stakeholder constraints. African Development Bank, 2023 has highlighted the need for coordination of budgets, contractors, approvals, and risks responses for the implementation of transport infrastructure in the North African region to convert intentions into actual outcomes. Governments, including local government, face a major challenge as they persist with the same requirements and expectations for reliability on the ground, prioritizing technical designs, budgets, timelines, and stakeholder expectations within road and public-transport programs in South Africa (South African National Roads Agency, 2024). The evidence in Kenya road-project further indicates that systematic risk identification and analysis is greatly beneficial to project performance (Machira & Kising'u, 2024).

Transport infrastructure in Rwanda is used to facilitate transport, urban transport and national and regional connectivity. The road network total for the Transport Sector Strategic Plan 2024-2029 is 44,671 kilometres with 62% of the national paved roads paved (Ministry of Finance and Economic Planning, 2014). More focus has been placed on good management of the transportation fleet, optimizing routes, basing planning on data and reliability of the services since the modernisation of public transport in Kigali. This transformation is underscored by the fact that Ecofleet Solutions Ltd. is obligated to provide support to this transformation, and so Ecofleet Transport System is a suitable case to study on how project planning practices affect project implementation success (Ecofleet Solutions Ltd., 2026a).

What is being demonstrated in the reality of transport performance is still reflected in the official transport-performance figures. In FY2024/25, Intercity scheduled bus services reached a cumulative network coverage of 14,508 km; the Rubavu Port was operational; the Rusizi Port was 89% complete, the Nkombo Boat II was 86% complete, and the air cargo exports jumped from 4,931 metric tons in FY2023/24 to 6,027 metric tons in FY2024/25 (Ministry of Infrastructure, 2025). Rutsiro Lot 1 and Nyacyonga–Mukoto road were, however, only 50% and 15.8% respectively to their targets of 55% and 30%. However, construction of Rusizi Port was 85.52% with the target set at 85% and selected feeder-road rehabilitation activities were below target (Ministry of Finance and Economic Planning, 2025).

Other evidence supports the concern for implementation. In 2020, Rwanda's actual capital expenditure stood at approximately 3% of total expenditure, which were mostly projects that were delayed, overspending, and stalling projects (IMF, 2023). The Rwanda Emergency Connectivity Restoration Project aimed to rehabilitate 380 km of roads, but as per the reporting in 2025, 0 km roads were rehabilitated, 0 sectors had access to roads restored, 0 locations of socio-economic infrastructure had access restored and 0 critical embankments and bridges were reinforced till the date of reporting (World Bank, 2025). Poor public perception on Rwanda's public transport services was also cited by the Rwanda Urban Mobility Improvement Project to be attributed to waiting times at the terminal stations and stops that are occupied by public transport queues, especially during the rush hours (World Bank, 2023).

The studies have focused on planning, resource coordination, scheduling, communication and risk management in construction and development projects but limited evidence of studies has explained the success of implementation of constructions in this case Ecofleet Transport System in Nyarugenge District. No studies examined directly the effects of project planning practices on the likelihood of successful project implementation in this transportation context. Hence, the study evaluated the influence of Project planning on Project implementation success of Ecofleet Transport System in Nyarugenge District in Rwanda.

1.1 General Objective

The general objective was to assess the effect of project planning practices on project implementation success of Ecofleet Transport System in Nyarugenge District, Rwanda.

1.2 Specific Objectives

i. The study assessed the effect of resource planning on project implementation success of Ecofleet Transport System in Nyarugenge District.
ii. The study examined the effect of schedule planning on project implementation success of Ecofleet Transport System in Nyarugenge District.
iii. The study determined the effect of communication planning on project implementation success of Ecofleet Transport System in Nyarugenge District.
iv. The study evaluated the effect of risk management planning on project implementation success of Ecofleet Transport System in Nyarugenge District.

2. Literature Review

This section reviews the theories and empirical evidence used to explain project planning practices and project implementation success of Ecofleet Transport System.

2.1 Theoretical Review

Four theories guided the study. Resource-Based View Theory explained resource planning, Theory of Change informed schedule planning, Communication Theory supported communication planning, and Risk Management Theory explained risk management planning.

2.1.1 Resource-Based View Theory

The Resource Based View (RBV) theory suggests that firms that have value, rarity, imitability as well as well-organized its resources tend to perform better. Resources are people, funds, machinery, technology, knowledge and coordinating ability in the context of a project. The theory, therefore, focuses on performance of implementation, which is linked with combination of resources rather than on resource possession alone (Majeed et al., 2023).

The theory also acknowledges that organizations need to allocate their resources towards a particular kind of work. Even with an abundance of funds, if technical proficiency, equipment or operational systems are not available, they will simply not be able to help. An assessment of the amount and quality of the resources is thus needed for resource planning, as well as the link between them and tasks, times, priorities, etc. (Nason & Wiklund, 2022; Hernández-Linares et al., 2023).

Resource Based View (RBV) Theory was used in the Resource Planning task, which elaborated on staff allocations, fleet readiness, budget allocations and material availability, and how these factors impact the project implementation success for Ecofleet Transport System. It gave a point of view on how the resources were focused in terms of delivery on time, on budget, on quality, on reliability and on target achievement.

2.1.2 Theory of Change

Theory of Change describes how the planned inputs and activities are expected to underpin the outputs, outcomes and long-term results. Through the approach, projects are expected to make visible the assumptions made between action and impact and what the expected sequence of the implementation is (Government Analysis Function, 2025).

Schedule planning is facilitated through the theory as the project team is required to identify what will and will not happen, when, which activities must be completed first and what milestones will move the project closer to desired project products. It also helps implementation teams to 'challenge assumptions' when evidence demonstrates 'that activities are not achieving desired outcomes' (Government Analysis Function, 2025).

The Theory of Change was used in scheduling to show how scheduling was associated with the success of implementation for the Ecofleet Transport System by means of sequencing tasks, setting up milestones, estimating time, and controlling deadlines. It assisted in linking transport-project activities with on time delivery and achievement of expected implementation targets.

2.1.3 Communication Theory

Communication Theory provides an understanding of the process of transferring information from a sender to a receiver via a channel and how feedback helps to determine if the message was understood. Late, confused, erroneous or communicated through the wrong channels information has no value in project situations. Planned communication is thus a core element of coordinating and decision making (Kerzner, 2022).

This theory highlights the importance of time, clear communication, feedback and to minimize communication noise. Even with sufficient resources and time, project teams can still have issues in implementing the projects when they do not receive clear communications or updates from stakeholders, receive conflicting instructions, or receive updates late. Thus, structured communication sets lay the groundwork for coordination and the confidence of those involved in the arrangement (Rajhans, 2023; Muszyńska, 2022).

Communication Theory has been adapted to communication planning and to see how stakeholder update options, accountability lines, feedback mechanisms, and accuracy of information had an impact on Ecofleet Transport System. It supported the understanding of the role of planned information exchange for service reliability, satisfaction of the stakeholders and achievement of targets.

2.1.4 Risk Management Theory

The Risk Management Theory states that uncertainty can impact project goals and that is necessary to be identified, evaluated, prioritized, treated and monitored. Projects are characterized naturally by uncertainty in the area of project technical, financial, and operational activities, as well as in project safety and stakeholder activities, and therefore, it is essential to prepare for uncertainty proactively to support the preservation of

project time, cost, quality, and service goals (Aven, 2022).

The theory treats risk as a condition and not just something to which project teams "say yes." Managers thus categorize risks to gauge the probability of occurrence and impact on the project, assign them to owners, define mitigations and monitor the project during the implementation phase. If disruption has an impact on multiple parts of a project, early preparation is extremely important (Lechner & Gatzert, 2022; Szymański, 2022).

Risk Management Theory was introduced to the Risk Management planning to inform about the influence of Risk Identification, Risk Assessment, Risk Mitigation and Risk Ownership on success of the project for Ecofleet Transport System. Theory paves the way for interpretations related to the protection of four key aspects of service namely service reliability cost control, timely delivery, and operational continuity through proactive risk response.

2.2 Empirical Review

The empirical review made detailed synthesis of relevant studies about plan for resources, plan for schedules, plan for communications, plan for risk management and success of project implementation. The objectives, methodology, main finding and contribution to the understanding of transport-project implementation for each study have been considered.

2.2.1 Resource Planning and Project Implementation Success

Adaptive resource coordination studies demonstrate that the success/failure of projects is related to how resources are flexed throughout the process. Slowai, Kijac and Posevac's research (2023) focused on the applicability of online deep reinforcement learning to China's construction industry for adaptive control of resource flow, work flow, and cash flow. The study revealed that inappropriate resource-control reduced the management of work-flows and cash flows, whereas adaptive resource control resulted in better control over work-flows and cash-flows resulting in implementation efficiency and less time overruns and financial pressures. The study resulted in the conclusion that resource planning should not only be fixed at the onset of the project but should also be related to the progress of the project. On the basis of this evidence, staff and fleet will be used continuously to adapt to the changing needs of transport projects, and materials and budgets will be used to accommodate those changing needs.

The value of simulations is further illustrated from an implementation standpoint in terms of resources planning. A critical review of hybrid simulation based resource planning and constructability analysis for RCCP pavement projects was performed by Shakerian et al (2022). The effect that changes in equipment, labor, work methods and interactions of activities had on productivity was evaluated using simulation. The results indicated that better resource estimates and other comparisons of alternative execution options led to a decrease in waiting time and underutilization. The researchers suggested assessing the resource plans before implemented in the field. This aids to apply readiness checks and resource-balancing procedures within transport projects that use precious infrastructure and time constraints.

Financial preparation is also shown to be related to project outcomes in Rwanda. Annuarite and Sikubwabo (2024) used descriptive quantitative design to determine the state of financial resources management and project performance public institutions in Kigali city. They provided positive evidence of the contribution of financial resource planning to project performance in their regressions and suggested that the process of fund and expenditure control facilitated implementation. The researchers concluded that financial resources have to be planned beforehand and about better budget planning/financial follow-up was recommended. This reinforces the need to connect Ecofleet budgets with operational activities prior to applying implementation pressure which could result in gaps in resources.

A study on resource constrained scheduling reveals that its availability and timing of implementation are inter-related. Aghileh et al. (2024) conducted a systematic review of multi-project scheduling under uncertainty and with flexible resources. It was reviewed that often the reason of the implementation delay was due to allocation and flexible scheduling in lack of resources, but systematically scheduled integrated models performed better if uncertainty and flexible resource decisions were taken into account. Based on the findings, the researchers judged that the separation of resource planning from scheduling planning should not be attained. This evidence can be used to coordinate the deployment of fleet, staff, maintenance capability, and funding in line with the priorities for implementation.

Contextual support with project-management evidence from Rwanda is also provided. The study by Iribagiza and Kirabo (2024) employed descriptive and correlational designs, with 119 respondents out of 170 targeted for survey on project management practices of USAID sponsored projects. They found that the respondents' project planning and risk management were high and the fact that there were structured planning practices contributed significantly to project performance. The researchers advised to reinforce project planning and monitoring processes. While the case did not relate to public transport, the evidence would suggest that when project teams make sure to link plans

into operational decisions that disciplined planning enhances implementation.

2.2.2 Schedule Planning and Project Implementation Success

Empirical studies on data-driven scheduling reveal that scheduling time can be enhanced if the projects' plans are proactively optimized. Cohen (2023) developed a combined approach which combines the network learning and constraint-relaxation methods, for use on two real-world project datasets. The method provided scheduling flexibility and achieved up to a 26% reduction in the critical path in one project. The study found that the schedules of project teams can be enhanced by exploring alternative routes to perform activities and easing time constraints to activities that are not essential for successful completion of the project. The evidence indicated that if the condition for the transport implementation changes realistic task sequencing and schedule revision should be done.

Project schedule-risk research shows that the shortest plan is by no means the most reliable plan. González-Varona et al. (2024) analyzed schedule-risk baselines under uncertainty and compared schedules with similar duration but different risk exposure.González-Varona et al. (2024) have conducted the analysis of schedule-risk baselines under uncertainty and compared schedules with similar duration but different risk exposure. They concluded that acting with risk-aware conscious timetables increases the likelihood of on-time completion, when risks influence the activities of a project. This study suggests that length of a travel schedule should be based on risk as well as schedule length. This facilitates Ecofleet implementation calendars which take into account not only timing of milestones but also uncertainty regarding fleet readiness and operational coordination and services changes as well.

Research on time-cost optimization also helps to make integrated decisions on schedules. Mohammadjafari et al. (2024) developed a mathematical programming model of multi-objective time-cost trade-offs in construction works to be solved by the genetic algorithm. They concluded that duration, finance, and productivity decisions all play a role in determining project performance, and that optimized scheduling could lessen pressure to finish a project and boost productivity. The researchers concluded that when planning a schedule, the cost implications of the activities as well as their duration, need to be taken into account. This evidence can provide for the design of transport schedules fitted to deadlines but balancing budget and possible capacities and not only on the basis of speed.

This more general survey of scheduling technique corroborates the significance of the resource-aware implementation calendars. The comparison of different methods of sequencing activities, scheduling limited resources, and minimizing delays in resource-constrained projects was performed by Chaudhary et al. (2025). It was found that the more delay risk was identified in schedules without taking note of resource availability and dependency relationships. The researchers determined that it should be an integral part of Schedule planning that it should incorporate the critical-path logic, the constraints on the resources, and also on the progress control. This helps to have systematic milestone reviews for Ecofleet Transport System, where delayed vehicle, staff, and approvals can impact the outcome of following implementation activities.

Project success indicator research gives a performance standard to use in making schedule plans. Borges et al. (2025) studied the factors associated with project success and the critical factors of a construction project, and concluded that time, cost, quality, satisfaction of the concerned parties and creation of value are important to determine the project success. The researchers came to the conclusion that 'Schedule planning is a factor that aids in implementation when it creates expectations and delivery reliability'. This data is pertinent to Ecofleet's implementation, as: the implementation success is related not only to the deadline but also to service quality, operational reliability, and user confidence.

2.2.3 Communication Planning and Project Implementation Success

In Rwanda, there is evidence that communication practices relate to project outcomes. Singirankabo and Wanjiku (2023) looked at the communication practices among international NGOs projects and applied descriptive, correlational and regression analysis. Dialogue and consultation were shown to have a significant relationship with the project schedules and the performance feedback and task communication were related to cost efficiency. The researchers found that communication is very much involved in the attainment of schedule, cost and quality performance and suggested effective communication strategies. This evidence could be used for carrying out structured stakeholder updates and feedback arrangements for the implementation of transport.

Another study conducted in Rwanda indicated that there is a relationship between communication and project service quality. Usanase and Nkechi (2022) evaluated communication planning, implementation, control in selected NGO projects in Kigali by adopting descriptive, correlative and regression approach. Their results revealed a lot of information sharing and strong association between the ways of communication and quality of services. The researchers further concluded that the success of a project is linked to communication

management and advised for better communication planning and monitoring. This enables clear lines of responsibility and feedback system of information in Ecofleet Transport System.

Cross-sector evidence demonstrates that it takes more than technical skills to make a project successful. Martinez et al. (2022) surveyed 237 professionals that engage in data-science projects and looked at methodologies, stakeholder needs, communication, collaboration and success factors. As a result, only 1/4 of participants reported that they follow a specific project methodology, and that the definition of the problems of stakeholders, the communication of results, and the teamwork with co-actors play an important part in the success. The researchers found that technical projects can fail; thus, showing that if there is a lack of communication and organizational process it can lead to failure. The discrete finding inspires conscious communication planning of transport projects with the participation of other operational and public actors.

In addition, communication is identified as a real coordination mechanism in construction research projects. In the construction industry, Rehan et al. (2024) explored the application of leadership and the communication process, and found that relationship management, leading by example, self-management, and effective communication are all key success factors. The results they gained were empirical evidence of the impact of behavioral and communication practices on project outcomes. The researchers concluded that communication helps with the coordination, resolution of conflict and implementation in complexity. All this evidence is relevant to Ecofleet, since any changes in the route, the services, and operational decisions undermine the project's flow of information, which must be timely between project teams and stakeholders.

There is also clear quantitative evidence of the positive direct association between communication management and project performance. Kwofie et al (2024) investigated the communication-management aspects of a construction project and found a high positive correlation between the selected variables and the project performance ($r = 0.893$; $p = 0.000$). Findings revealed that effective communication can minimize miscommunication and improve team coordination, and the researchers concluded that clear communication channels, timely reporting, and ongoing engagement are crucial. Having accurate reports of stakeholder updates, reporting lines and feedback systems during transport project implementation are crucial for Ecofleet.

2.2.4 Risk Management Planning and Project Implementation Success

Evidence of road projects on how risk-management practices relate to implementation performance. A Quantitative Correlational cross-sectional survey was conducted at Kilifi County, Kenya, road construction projects by Machira and Kising'u (2024). Results of the regression demonstrated that the use of risk identification and risk analysis had significant positive impact on project performance. The researchers suggested more robust risk monitoring and systematic identification and analysis as a key tool to the success of road projects. This evidence directly relates to Ecofleet as implementation for transport activities would be exposed to risks in terms of operational, schedule, safety, finance, as well as stakeholder concerns.

As a result of that research, which was done in Pakistan, it is clear that risk management can reinforce the link from planning to success. Iqbal et al. (2024) took 263 samples as a construction team member and used PLS-SEM for data analysis. Project planning had a positive impact on project success, and risk management plays a significant role as a mediator in the relationship between project planning and project success. The researchers came to the conclusion that risk management can be incorporated into the process of implementation, which makes strategic planning more effective. This facilitates integration of Ecofleet schedules and resource planning with actual risk identification and mitigation, and risks are not considered as an exercise in isolation.

Scholarship of project risk is also about creating value by systematically controlling risk. Willumsen et al (2023) later studied the role of risk-management practices in providing project value and found that structured identification, assessment, response and monitoring expose and support protecting the project outcomes in the presence of uncertainty. Their efforts brought the idea of managerial skills in transforming risk information into action to the fore. These are pieces of evidence to be used for clear risk ownership, and responsible staff are able to adopt mitigation options when operational threats exist at Ecofleet.

Through risk-mapping research, there is a structured approach to prioritizing implementation threats. According to the results of this study by Hidayat et al. (2025) they utilized the project-management life cycle and House of Risk approach in analyzing construction risks. The study mentioned priority risk agents that accompany the budget overage and failure of implementation and demonstrated that structured mapping can be used to control costs, time and resources. According to the researchers, project managers should prepare to face risks early on and also have a plan in place to mitigate the risk in case the pressure comes during the project. This provides a practical Ecofleet risk register that addresses fleet and technology risks, safety, financing and stakeholder risks.

Some evidence from Rwanda to support risk aware planning, in context. Iribagiza and Kirabo (2024)

evaluated planning, risk control, monitoring and project performance with a sample of 119 respondents in the USAID sponsored project. In their findings they stated that planning and risk-management practices had a strong impact on the performance of projects. The scientists suggested improved risk-management and monitoring measures. There had been evidence of regular review of risks and evidenced responses which in turn is a protective mechanism for implementation success in Rwanda, even if the setting was not transport.

3. Methodology

This section presents the research design, study population, sampling design, data collection instruments, pilot study, validity, reliability, data analysis, and ethical safeguards applied in the study.

3.1 Research Design

A research design is the overall plan that links research objectives with data collection and analysis procedures used to answer the study questions (Creswell & Creswell, 2023). The study adopted descriptive and correlational research designs using quantitative and qualitative approaches. The descriptive design summarised project planning practices and implementation success, while the correlational design assessed the strength, direction, and statistical significance of relationships between resource planning, schedule planning, communication planning, risk management planning, and project implementation success. Interviews provided contextual explanations of implementation conditions.

3.2 Study Population

A study population is the complete group of people or units possessing characteristics relevant to the research problem and from which study evidence is obtained (Taherdoost, 2022). The target population comprised 308 respondents connected with Ecofleet Transport System and transport-project implementation in Nyarugenge District: 18 Ecofleet managerial staff, 64 operations and fleet staff, 96 drivers and conductors, 30 representatives from MININFRA, RTDA and RURA, and 100 transport officers and local administrators.

3.3 Sampling Design

Sampling design specifies how a manageable and representative group is selected from a study population and how the sample is distributed across relevant categories (Mishra & Alok, 2022). A sample of 174 respondents was determined from the population of 308 using Slovin's formula at a 5% margin of error. Proportionate allocation produced 10 Ecofleet managerial staff, 36 operations and fleet staff, 54 drivers and conductors, 17 MININFRA/RTDA/RURA representatives, and 57 transport officers and local administrators. Stratified sampling and simple random sampling were used to maintain representation and provide a fair chance of selection within the categories.

3.4 Data Collection Instrument

The study used documentation, a structured questionnaire, and semi-structured interviews. Documentary review covered relevant transport-planning, Ecofleet, and public-transport implementation records. The questionnaire used five-point Likert-scale statements covering resource planning, schedule planning, communication planning, risk management planning, and project implementation success. Interviews generated explanatory evidence from key informants on how planning practices affected implementation. The use of multiple instruments supported comparison of quantitative responses with contextual evidence.

3.5 Pilot Study, Validity and Reliability

A pilot study is a preliminary test used to assess instrument clarity, relevance, reliability, and practical administration before the main data collection (In, 2023). The study piloted the instruments with approximately 17 respondents, representing 10% of the sample size, in Gasabo District, which was outside the main study area. Pilot feedback was used to improve the questionnaire and interview guide.

Validity was assessed through expert review and the Content Validity Index. The questionnaire contained 20 relevant variable statements and 4 demographic categories, producing a CVI of 0.83. Since the value exceeded the 0.70 benchmark, the instrument was considered adequate for measuring the intended study constructs (Clark & Watson, 2022).

Reliability was assessed using Cronbach's alpha. Resource planning recorded $\alpha = 0.812$, schedule planning $\alpha = 0.824$, communication planning $\alpha = 0.835$, risk management planning $\alpha = 0.847$, and project implementation success $\alpha = 0.856$. All coefficients exceeded 0.70, indicating satisfactory internal consistency.

3.6 Data Analysis

Quantitative data were analysed using SPSS version 29. Frequencies, percentages, means, and standard deviations supported descriptive analysis. Normality testing was conducted before inferential analysis. Pearson correlation assessed the direction and strength of objective-specific relationships, while multiple

regression estimated the combined and individual effects of the four planning practices on project implementation success at the 0.05 significance level (Warner, 2023). Qualitative evidence was analysed thematically to support interpretation of the quantitative findings.

The regression model was specified as $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$, where Y represented Project Implementation Success; X_1 Resource Planning; X_2 Schedule Planning; X_3 Communication Planning; X_4 Risk Management Planning; β_0 the constant; β_1–β_4 the regression coefficients; and ε the error term.

3.7 Ethical Considerations

The study observed informed consent, voluntary participation, confidentiality, privacy, anonymity, and academic-use principles. Permission was obtained before data collection, respondents were informed about the purpose of the study and right to withdraw, and individual names were excluded from questionnaires and reported findings. Collected information was used only for the approved academic objectives.

4. Results and Discussions

This section presents the response rate and inferential findings obtained from respondents associated with Ecofleet Transport System in Nyarugenge District.

4.1 Response Rate

This section presents questionnaire participation among respondents selected for the Ecofleet Transport System study.

Table 1: Response Rate

Response Category	Frequency	Percent
Returned complete questionnaires	160	92.0
Not returned/incomplete questionnaires	14	8.0
Total questionnaires distributed	**174**	**100.0**

Source: Field Data, June 2026

The table indicates that out of 174 questionnaires distributed 160 were returned complete, representing a response rate of 92.0%. Fourteen questionnaires, equivalent to 8.0%, were not returned or were incomplete. The 160 complete questionnaires formed the quantitative cases used for the inferential analysis.

4.2 Inferential Statistics

This section presents normality, correlation, and regression results linking project planning practices with project implementation success.

4.2.1 Normality Test

This section presents normality tests used to assess whether the study variables were suitable for parametric inferential analysis.

Table 2: Tests of Normality

Variable	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Resource Planning	.059	160	.200	.984	160	.071
Schedule Planning	.064	160	.184	.981	160	.083
Communication planning	.061	160	.200	.986	160	.092
Risk Management Planning	.067	160	.151	.982	160	.076
Project Implementation Success	.058	160	.200	.985	160	.088

Source: Field Data, June 2026

Resource planning recorded Kolmogorov-Smirnov significance of 0.200 and Shapiro-Wilk significance of 0.071; schedule planning recorded 0.184 and 0.083; communication planning recorded 0.200 and 0.092; risk management planning recorded 0.151 and 0.076; and project implementation success recorded 0.200 and 0.088. Since all significance values exceeded 0.05, the variables satisfied the study's normality criterion and

were suitable for Pearson correlation and multiple regression.

4.2.2 Correlation Analysis

This section presents the strength, direction and significance of relationships between planning practices and project implementation success.

Table 3: Correlation between Project Planning Practices and Project Implementation Success

		Resource Planning	Schedule Planning	Communication planning	Risk Management Planning	Project Implementation Success
Resource Planning	Pearson Correlation	1	.728**	.742**	.705**	.852**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	160	160	160	160	160
Schedule Planning	Pearson Correlation	.728**	1	.692**	.692**	.837**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	160	160	160	160	160
Communication planning	Pearson Correlation	.742**	.692**	1	.745**	.791**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	160	160	160	160	160
Risk Management Planning	Pearson Correlation	.705**	.692**	.745**	1	.763**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	160	160	160	160	160
Project Implementation Success	Pearson Correlation	.852**	.837**	.791**	.763**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	160	160	160	160	160

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

Source: Field Data, June 2026

Resource planning had a strong positive relationship with project implementation success ($r = 0.852$; $p = 0.000$). This result indicates that stronger staff allocation, fleet readiness, budget allocation, and material availability were associated with improved implementation outcomes. The finding aligns with Jiang et al. (2023), whose evidence showed that coordinated resource flow improves implementation efficiency and reduces time and financial pressure. The result therefore supports continuous alignment of Ecofleet resources with implementation needs.

Schedule planning was strongly and positively related to project implementation success ($r = 0.837$; $p = 0.000$). Task sequencing, milestone setting, time estimation, and deadline control were therefore associated with stronger implementation progress. The result is consistent with Vanhoucke (2023), who emphasised that realistic and actively controlled schedules support project implementation through sequencing, milestone tracking, and deadline management.

Communication planning had a strong positive relationship with project implementation success ($r = 0.791$; $p = 0.000$). Stakeholder updates, reporting lines, feedback channels, and information accuracy were therefore associated with improved implementation coordination. The finding corresponds with Rehan et al. (2024), who identified effective communication and relationship management as important contributors to project success under complex implementation conditions.

Risk management planning had a strong positive relationship with project implementation success ($r = 0.763$; $p = 0.000$). Risk identification, assessment, mitigation strategies, and risk ownership were therefore associated with stronger implementation stability. The

result aligns with Hidayat et al. (2025), whose structured risk analysis showed that early identification and prioritisation of risk agents support cost, time, and resource control during project implementation.

4.2.3 Regression Analysis

Multiple regression assessed the combined explanatory power and individual effects of the four planning practices on project implementation success.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.922a	.851	.847	.09383	1.930

a. Predictors: (Constant), Risk Management Planning, Schedule Planning, Resource Planning, Communication planning

b. Dependent Variable: Project Implementation Success

Source: Field Data, June 2026

The model produced R = 0.922, indicating a very strong combined relationship between the four planning practices and project implementation success. R Square was 0.851, meaning that the predictors jointly explained 85.1% of the variation in implementation success. The adjusted R Square of 0.847 remained close to R Square, while the Durbin-Watson statistic of 1.930 indicated acceptable independence of residual errors under the study criterion.The combined explanatory pattern supports Iribagiza and Kirabo (2024), who found that structured planning practices significantly influenced project performance in a Rwandan development setting. The result confirms that implementation is better explained by coordinated planning practices than by isolated management actions.

Table 5: ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.791	4	1.948	216.444	.000b
	Residual	1.365	155	.009		
	Total	9.156	159			

a. Dependent Variable: Project Implementation Success

b. Predictors: (Constant), Risk Management Planning, Schedule Planning, Resource Planning, Communication planning

Source: Field Data, June 2026

The regression model was statistically significant (F = 216.444; p = 0.000). Since the significance value was below 0.05, resource planning, schedule planning, communication planning, and risk management planning jointly provided a statistically meaningful explanation of project implementation success of Ecofleet Transport System. This joint significance is consistent with Aghileh et al. (2024), who showed that project performance improves when resource, scheduling, uncertainty, and implementation decisions are integrated rather than managed independently

. **Table 6: Regression Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.108	.123		.878	.380		
	Resource Planning	.327	.046	.376	7.109	.000	.345	2.898
	Schedule Planning	.312	.043	.361	7.256	.000	.391	2.555
	Communication planning	.145	.044	.174	3.295	.001	.338	2.959
	Risk Management Planning	.105	.045	.119	2.333	.021	.367	2.722

a. Dependent Variable: Project Implementation Success

Source: Field Data, June 2026

The constant was positive but statistically insignificant (B = 0.108; t = 0.878; p = 0.380). Tolerance values ranged from 0.338 to 0.391 and VIF values from 2.555 to 2.959, indicating no serious multicollinearity concern under the study criterion.

Resource planning had a positive and statistically significant effect on project implementation success (B = 0.327; t = 7.109; p = 0.000). A one-unit increase in resource planning increased implementation success by 0.327 units when the other predictors were held constant. The effect is supported by Jiang et al. (2023), who found that adaptive resource coordination improves work flow and implementation efficiency. The Ecofleet result similarly shows that staff, fleet, budgets, and materials need to be aligned with implementation requirements.

Schedule planning had a positive and statistically significant effect on project implementation success (B = 0.312; t = 7.256; p = 0.000). A one-unit increase in schedule planning increased implementation success by 0.312 units when the other predictors were controlled. The finding resonates with Vanhoucke (2023), who explained that active schedule control improves implementation by connecting task sequencing, milestones, duration estimates, and progress monitoring.

Communication planning had a positive and statistically significant effect on project implementation success (B = 0.145; t = 3.295; p = 0.001). A one-unit increase in communication planning increased implementation success by 0.145 units, holding the remaining predictors constant. The result is consistent with Rehan et al. (2024), whose empirical evidence linked effective communication and relationship management with stronger project outcomes under complex conditions.

Risk management planning had a positive and statistically significant effect on project implementation success (B = 0.105; t = 2.333; p = 0.021). A one-unit increase in risk management planning increased implementation success by 0.105 units when the other predictors remained constant. The finding is supported by Hidayat et al. (2025), who showed that structured risk identification and mitigation support time, cost, and resource control before threats develop into implementation failures.

The fitted model was: Project Implementation Success = 0.108 + 0.327(Resource Planning) + 0.312(Schedule Planning) + 0.145(Communication Planning) + 0.105(Risk Management Planning) + ε.

4.3 Decision on Null Hypotheses

This section presents the statistical decisions reached for the four null hypotheses using the 0.05 significance level.

Table 7: Decision on Null Hypotheses

Hypothesis	p-value	Decision
H01: Resource planning has no statistically significant effect on project implementation success of Ecofleet Transport System in Nyarugenge District.	0.000	Rejected
H02: Schedule planning has no statistically significant effect on project implementation success of Ecofleet Transport System in Nyarugenge District.	0.000	Rejected
H03: Communication planning has no statistically significant effect on project implementation success of Ecofleet Transport System in Nyarugenge District.	0.001	Rejected
H04: Risk management planning has no statistically significant effect on project implementation success of Ecofleet Transport System in Nyarugenge District.	0.021	Rejected

Source: Field Data, June 2026

All four null hypotheses were rejected because the predictor significance values were below 0.05. Resource planning recorded p = 0.000, schedule planning p = 0.000, communication planning p = 0.001, and risk management planning p = 0.021, confirming statistically significant effects on project implementation success.

5. Conclusion and Recommendations

This section presents conclusions drawn from the findings and practical recommendations for strengthening project implementation success.

5.1 Conclusion

According to the research, Ecofleet Transport System's project implementation success was enhanced by careful preparation of both resources and timetables. Supporting operational readiness were efficient resource allocation, preparedness of the fleet, financial planning, and availability of materials; reducing implementation delays and improving progress discipline were task sequencing, milestone setting, realistic time estimate, and deadline management.

Implementation success was further enhanced by careful planning of communication and risk management. Accurate information, reporting structures, feedback mechanisms, and clear updates to stakeholders all contributed to better coordination, while the process of identifying risks, assessing them, developing plans to mitigate them, and assigning ownership of those risks all contributed to better readiness for operational unpredictability. In the end, the use of integrated schedule, resource, communication, and risk planning approaches was crucial to the successful execution of the project.

5.2 Recommendations

This section presents recommendations derived from the study findings and conclusions.

1. Ecofleet Transport System should maintain a resource-readiness checklist linking staff deployment, fleet condition, budget availability, operational materials, and maintenance support with planned implementation activities.
2. Ecofleet Transport System should strengthen stakeholder update systems and feedback channels so that drivers, users, local authorities, operators, and regulators receive timely and accurate information before major service or route changes.
3. Ecofleet Transport System should maintain an active risk register that identifies transport-implementation risks, assigns responsible owners, specifies mitigation measures, and is reviewed regularly during implementation.
4. Future research should compare transport projects across districts and examine digital fleet monitoring, budget planning, stakeholder engagement, and risk monitoring as additional determinants of public-transport implementation success.

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