

**Influence of Supplier Relationship on Performance of Affordable Housing Project: A
Case of Nairobi County, Kenya**

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Accepted, June 25th, 2025

Abstract

Affordable housing projects faced significant challenges worldwide, including cost overruns of up to 183%, affecting nine out of ten residential housing projects. In Nairobi County, Kenya, numerous affordable housing projects were stalled or remained incomplete, worsening housing shortages. This study aimed to examine the influence of supplier relationships on project performance. The research was guided by the stakeholder theory and employed a descriptive survey research design to analyze the perspectives of project managers, procurement staff, contractors, and housing officials. Data were collected through structured questionnaires. Quantitative and qualitative data were analyzed using descriptive statistics and regression analyses. The study found that the performance of affordable housing projects in Nairobi County is positively influenced by strong supplier relationships ($r = 0.634$, $p < 0.01$). Supplier relationships significantly impacted project performance, with strong partnerships leading to timely deliveries and cost efficiency. However, challenges in collaboration for innovation and communication for dispute resolution were noted, indicating areas for improvement. The study recommends that project managers and procurement officers focus on strengthening supplier relationships by establishing clear Key Performance Indicators and improving communication channels.

Keywords: *Supplier Relationship, Performance, Affordable Housing Projects*

INTRODUCTION

Affordable housing projects have evolved significantly over the years across the globe, reflecting changes in economic, social, and political landscapes. In Singapore, the government has historically played a central role in providing affordable housing through the Housing and Development Board (HDB). Established in 1960, the HDB has been instrumental in transforming the housing landscape by offering high-quality, subsidized public housing to the majority of Singapore's population. The success of Singapore's approach lies in its comprehensive strategy, which includes land acquisition, financing, and community planning (Tan, 2023).

In South Africa, affordable housing has been a key focus since the end of apartheid. The government implemented the Reconstruction and Development Programme (RDP) in the 1990s to address the housing shortage for low-income families. Over the years, the approach has shifted towards a more holistic strategy, including integrated development and sustainable urban planning. However, challenges remain, such as land availability and socio-economic disparities, which continue to impact the performance of affordable housing

projects in the country (Mafukidze & Hoosen, 2021).

In Kenya, affordable housing is a key pillar of the government's Big Four Agenda. The State Department for Housing and Urban Development has been working on projects to increase access to affordable housing for Kenyans. Initiatives such as the Affordable Housing Programme (AHP) aim to deliver housing units for low and middle-income families. Despite these efforts, challenges such as financing, land acquisition, and regulatory hurdles affect the performance of affordable housing projects in the country (Mwangi, 2023).

The Kenya National Bureau of Statistics (2023) reported a decrease in housing unit construction, which was ascribed to increased construction material and finance prices. According to Hass Consult (2023), the average selling price of land in the Nairobi region increased by 1.4% in the second quarter of 2023, compared to 0.3% in the first quarter of 2023. In addition, Hass Consult (2023) reported that the mean selling prices of residential dwellings witnessed a 2.0% growth, diverging from the 6.8% surge documented in the year 2022. According to the Center for Affordable Housing Finance (2022), the housing demand currently stands at 250,000 units annually against a supply of 50,000 units which translates to only 20 per cent of the housing demand being met. In order to address the housing deficit in Kenya, the government of Kenya came up with various affordable housing projects among them being the Pangani Housing Project which was launched in June, 2020. Despite efforts, informal settlements persist due to affordability issues in the formal market as a result of expensive building resources some occasioned by poor vendor management practices. Over the past 30 years, existing housing policies in Kenya proved inadequate, leading to the launch of the AHP in 2017, addressing housing affordability across socio-economic strata (Kieti, Rukwaro, and Olima, 2020).

Statement of the Problem

A problem with housing affordability still exists in many wealthy countries as well as in emerging ones like Kenya. Urban land prices are rising, there is an increase in the people living in cities, and building and financing expenses are high. Kenya has declared an affordable housing programme as one of its three main agenda items, with the goal of constructing 500,000 affordable homes for all Kenyans by 2022. Despite their significance for economic growth, government housing projects encounter difficulties throughout construction (Mahamid, 2021). Measuring the success of housing projects in terms of accomplishing many goals is essential. These goals include delivering projects within budget, finishing them on time, and maintaining quality over the project's whole lifespan. Furthermore, according to Othieno (2019), the time, safety, quality, and cost of execution are taken into account when evaluating residential housing projects. However, Kim (2019) points out that the majority of government housing projects worldwide are beset by poor quality, delivery delays, and cost overruns. For instance, Mahamid (2021) reports that cost overruns occur in 76% of residential construction projects, with an average of 34.58% and time overruns in 88% of cases. Monitoring and assessment are two strategies for enhancing how well project schedules, costs, and quality are implemented, according to Hazhar (2020).

According to UN-Habitat (2019), Kenya is facing a severe housing shortage and subpar housing conditions. This has created a void that must be filled by identifying some of the problems causing Kenya's severe lack of reasonably priced housing. It is noteworthy that since Kenya gained its independence, efforts to bridge the developmental gap have been made to construct homes through public initiatives. Nonetheless, the bulk of home building projects were abandoned, which makes this sector a fascinating one to research. Kenya now has a 200,000 unit annual housing need and a 50,000 unit annual production rate, according to the World Bank (2020). This indicates that, despite the government's numerous attempts to build inexpensive homes for Kenya's underprivileged citizens, implementation success rates

are extremely low. This calls for research on the causes of these low implementation rates, with inadequate project management being suggested as a major contributing factor.

The performance of affordable housing projects in Nairobi County has been dismal over the years, raising concerns about the effectiveness and sustainability of these initiatives. Despite significant investments and government support, the delivery of affordable housing units has fallen short of expectations, leading to a persistent housing deficit in the county. Potential causes for this poor performance include inefficient procurement practices, inadequate funding, bureaucratic delays, and challenges related to land acquisition and zoning regulations (Njoroge, 2024). Furthermore, questions remain regarding the long-term impact of these projects on low-income families and the broader community. It is unclear whether the current approaches to affordable housing address the root causes of housing insecurity and contribute to equitable and inclusive urban development. Identifying and addressing these issues is crucial to ensure the success and sustainability of affordable housing projects in Nairobi County (Mwangi, 2023).

Affordable housing projects face significant obstacles both locally and globally. Cost overruns of up to 183% impact nine out of ten residential housing projects, while many projects in Nairobi County have either halted or remain unfinished, contributing to housing shortages (Ronoh, 2020; Kihoro, 2017). Rising construction costs and project delays exacerbate the lack of housing units, potentially harming the economy and reducing access to quality homes (Kaniaru, 2018). Though monitoring and assessment are used in most government housing projects, poor procurement practices are still observed (Elizabeth, 2020). Ismail and Nyang'au (2020) highlight that improved resource management can significantly affect public housing projects in Isiolo County. However, vendor management procedures were not thoroughly explored in their study. Similarly, Kimani and Karugu (2020) found that innovative construction methods and financing strategies impact the delivery of affordable housing in Nairobi, yet their study was primarily qualitative. In contrast, the present research adopted a quantitative approach to examine the impact of vendor management practices on the performance of affordable housing projects in Nairobi County, Kenya.

Objective of the Study

This study sought to assess the influence of supplier relationship on the performance of affordable housing project; a case of Nairobi County Kenya.

LITERATURE REVIEW

Empirical Review

The study by Li and Zhang (2022) investigated the complex dynamics of supplier relationships, emphasising the critical importance of collaboration, communication, and trust in project success. According to the study, organisations that cultivate well-managed and collaborative relationships with their suppliers enhance project performance metrics such as cost efficiency, timely delivery, and stakeholder satisfaction. This demonstrates the importance of excellent supplier relationship management in improving overall project outcomes. Furthermore, Garcia and Chen's (2023) work adds to the developing landscape by investigating the impact of digital technologies on supplier relationships and project performance. Their findings reveal that organizations embracing advanced digital solutions for communication, collaboration, and performance monitoring with suppliers tend to achieve superior project outcomes. Li and Zhang's study was conducted in a different geographical setting from Nairobi County, possibly limiting its generalizability to different contexts with unique socio-economic and cultural dynamics.

Emon, Khan, and Siam (2024) examined the impact of Supplier Relationship Management (SRM) on supply chain performance, particularly cost efficiency, within Bangladesh's

manufacturing and service sectors. Using a quantitative approach, they analyzed data from 1220 participants through regression and correlation analysis. The study found that Supplier Collaboration and Long-Term Supplier Relationships had a significant positive effect on cost efficiency, explaining 64.2% of its variance. These findings highlight the critical role of supplier relationships in optimizing supply chain operations. However, the study was limited by its cross-sectional design and focus on specific SRM practices. The authors suggested future research should explore additional dimensions and use longitudinal approaches. Practically, fostering strong supplier relationships can enhance project performance by improving efficiency, reducing costs, and ensuring resource availability.

Dza, Acquah, and Atsu (2024) explored the mediating role of supply chain resilience in the relationship between supplier relationship management (SRM) and operational performance in Ghana's food and beverage industry. Using a quantitative approach and structural equation modeling, the study analyzed data from 179 firms. Findings revealed that SRM significantly enhanced operational performance by improving collaboration, supplier evaluation, and long-term partnerships. Moreover, supply chain resilience strengthened this relationship by mitigating disruptions and ensuring business continuity.

Kisinga, Mchopa, and Mwagike (2024) investigated the impact of Supplier Relationship Management (SRM) on the business performance of small-scale grape processing firms in Dodoma, Tanzania, with logistics capabilities as a moderating factor. Using a cross-sectional survey design, data were collected from 202 firms through structured questionnaires and analyzed using descriptive and structural equation modeling. The study found that buyer-supplier relationships, supplier development, and supplier selection had a significant positive effect on business performance, while knowledge transfer had no impact. Additionally, logistics capabilities moderated the SRM-business performance relationship. The study recommended that firms strengthen supplier partnerships and logistics infrastructure to enhance performance. Policymakers were urged to develop supportive policies for small-scale processors. However, the study's generalizability is limited due to its focus on a single sector in Tanzania.

Issah, Aidoo-Acquah, and Eric (2024) examined the impact of Supplier Relationship Management (SRM) on supply performance, with employee commitment as a moderating factor. The study employed a quantitative research approach, using regression analysis to assess the relationship between SRM practices and supply performance. Findings indicated that strong supplier relationships significantly improved supply performance, particularly in terms of efficiency and cost-effectiveness. Additionally, employee commitment played a crucial role in strengthening these relationships by fostering collaboration and trust between firms and suppliers. The study highlighted the importance of structured SRM strategies, including supplier collaboration, evaluation, and long-term partnerships, in optimizing supply chain operations. It recommended that organizations invest in employee engagement programs to enhance commitment, as this would further improve supplier relationships and overall supply performance in competitive market environments.

Theoretical Framework

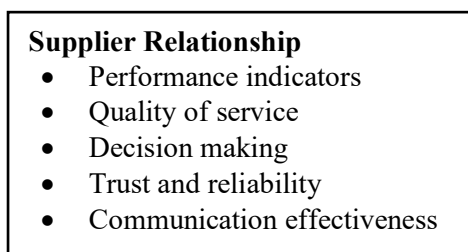
Stakeholder theory, which helps comprehend organisational functioning in connection to the numerous factors in which it is enmeshed, will serve as the foundation for this study (Miles, 2017). The development of stakeholder theory classifies stakeholders and makes it easier to identify the connections and interconnections between certain stakeholders. Freeman (1984) described stakeholders as people or groups who are impacted by the accomplishment of business objectives. Furthermore, a stakeholder's financial or human capital is at risk, implying that they are certain to lose/gain anything as a result of a company's actions. As a result, the theory argues for understanding the impacts of various enterprises' stakeholders

and how organizations respond to those effects in order to improve sustainability (Tapaninaho & Kujala, 2019). Organizations, rather than individual stakeholders, respond to various impacts emerging from all stakeholders (Fobbe & Hilletoft, 2021).

Stakeholder theory played a crucial role in explaining supplier relationships and information sharing in vendor management, particularly in the context of affordable housing projects. The theory emphasizes the importance of considering and prioritizing the interests of various stakeholders involved in a project, including suppliers, as a fundamental aspect of decision-making and strategy. In the realm of affordable housing, stakeholders typically include government agencies, community members, project managers, and suppliers.

Conceptual framework

Independent Variable



Dependent Variables

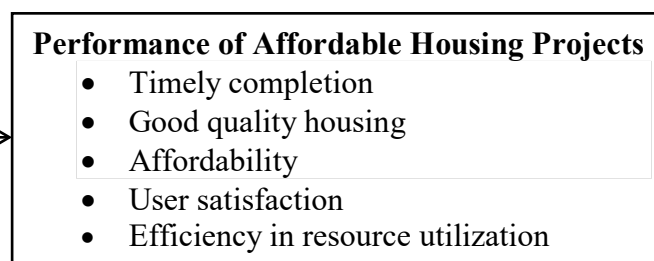


Figure 1: Conceptual Framework

METHODOLOGY

Research Design

This research employed a descriptive survey design to characterize social phenomena and explore how specific behaviors or occurrences took place. This design was chosen for its precision and accuracy. The descriptive study enabled hypothesis testing and examined the relationships between variables. It also facilitated data collection and analysis using both quantitative and qualitative techniques, as stated by Keman (2020).

Target Population

The focus of analysis in this study was 28 project managers and contractors overseeing the Pangani and Starehe Affordable Housing Projects, 20 general staff and 30 procurement staff. It also included 40 personnel from the Nairobi County Ministry of Infrastructure, Ministry of Lands, Public Works, Housing, and Urban Development, as well as 20 staff from the State Department of Housing and Urban Development.

Sample Size

This study employed census sampling, selecting all 138 targeted respondents. A census enabled a complete enumeration of the population, eliminating sampling bias and uncertainty. Groves et al. (2019) emphasized that census sampling ensures every individual in the population has an equal chance of inclusion, removing the need to generalize findings from a sample to the entire population.

Data Collection

The study utilized a structured questionnaire for data collection.

Data Analysis

Data analysis involved both quantitative and qualitative techniques to ensure comprehensive insights. Quantitative data from structured questionnaires were analyzed using descriptive and inferential statistics. Descriptive analysis, included means, frequencies, and percentages. Inferential analysis utilized regression and correlation tests to examine relationships between vendor management practices and affordable housing project performance. Statistical analysis was conducted using SPSS version 26. Qualitative data from interviews were

analyzed thematically, where responses were categorized into emerging themes and patterns. A Simple linear regression model was used. The following model was employed in the investigation:

$$Y = \beta_0 + \beta X + e$$

Where: Y = Performance of affordable housing projects

β_0 = represents the constant.

β =Coefficient

X= supplier relationship

e = error term

Ethical Considerations

Ethical considerations were upheld throughout the study to ensure compliance with research integrity standards. Ethical approval was obtained from the Mount Kenya University (MKU) Ethics Review Committee (ERC) to validate the study's adherence to ethical guidelines. Additionally, a research permit was secured from the National Commission for Science, Technology, and Innovation (NACOSTI) to authorize data collection within Nairobi County. Participants were informed about the study's purpose, and their voluntary participation was emphasized through an informed consent process. Confidentiality and anonymity of respondents were maintained. Furthermore, the study adhered to principles of non-maleficence, ensuring no harm to participants, and upheld objectivity and transparency throughout the research process.

FINDINGS AND DISCUSSIONS

Response rate

Out of the 138 questionnaires distributed, 124 were returned, representing a high initial response rate. However, two questionnaires were incomplete and, therefore, excluded from the analysis, leaving 122 fully completed questionnaires for data analysis. This translates to an effective response rate of 88.4%, which is considered highly satisfactory for survey research. The high response rate suggests strong engagement from the targeted respondents, likely due to the relevance of the study to their roles in the Pangani and Starehe Affordable Housing Projects. It also enhances the reliability and generalizability of the findings, ensuring that the data collected is representative of the target population.

Performance of affordable housing projects

This section examines the Performance of affordable housing projects which was the dependent variable of the study, assessed through six constructs measured on a Likert scale. Descriptive statistics, including means, percentages, and standard deviations (SDs), were calculated to provide a comprehensive overview of respondents' perceptions regarding project performance.

Table 1: Performance of affordable housing projects

Statements	1	2	3	4	5	Mean	SD
There is timely completion of construction phases and overall project timeline	6%	10%	13%	45%	26%	4.51	0.564
There is compliance with the allocated budget for the affordable housing project. Effective cost management and avoidance of cost overruns.	24%	40%	15%	11%	10%	2.32	0.993
There are high satisfaction levels among key stakeholders, including residents, local communities, and project investors.	18%	21%	19%	30%	12%	3.23	0.858
There is affordability of the houses in	24%	32%	15%	19%	10%	2.94	1.018

terms of pricing and financing options for potential residents							
There are minimal disruptions in the water supply	15%	33%	10%	23%	19%	3.11	0.918
There is efficient use of resources, including materials, labor, and equipment for the affordable housing projects	4%	8%	14%	45%	29%	4.38	0.528
Composite mean and composite SD						3.415	0.813

The analysis of affordable housing project performance revealed varying levels of success across key performance indicators. Timely completion of construction phases received a high mean score of 4.51 (SD = 0.564), indicating that most respondents agreed that project timelines were largely adhered to. Similarly, efficient resource utilization scored a strong mean of 4.38 (SD = 0.528), suggesting that materials, labor, and equipment were effectively managed to optimize project outcomes. These findings highlight the effectiveness of project management strategies in ensuring smooth execution of affordable housing projects.

Conversely, budget compliance and cost management emerged as a significant challenge, with a low mean score of 2.32 (SD = 0.993), indicating widespread concerns about cost overruns. Likewise, affordability of houses had a moderate mean of 2.94 (SD = 1.018), reflecting mixed perceptions about pricing and financing options for potential homeowners. Additionally, stakeholder satisfaction, with a mean of 3.23 (SD = 0.858), suggested that while some stakeholders were content, a notable proportion remained neutral or dissatisfied. These findings point to financial constraints and affordability challenges as critical areas requiring policy interventions and improved cost control mechanisms.

The study also assessed water supply reliability, which recorded a mean score of 3.11 (SD = 0.918), suggesting moderate success but room for improvement. The composite mean score of 3.415 (SD = 0.813) indicates that, overall, performance outcomes were fairly balanced, with strengths in project execution but weaknesses in budget management and affordability.

These findings align with recent studies on affordable housing projects in Kenya. For instance, Ngari (2023) identified that cost overruns significantly impact the performance of housing projects, echoing the challenges in budget compliance observed in this study. Similarly, Gachanja (2020) emphasized the importance of strategic location planning and resource utilization in enhancing project outcomes, which corresponds with the high ratings for timely completion and efficient resource use found in this analysis.

Supplier relationship and Performance of affordable housing projects

This section highlights the descriptive and qualitative findings related to supplier relationship and its impact on the Performance of affordable housing projects. The constructs were on a 5 point likert scale from 1 strongly disagree to 5 strongly agree.

Table 2: Supplier relationship and Performance of projects

Statements	1	2	3	4	5	Mean	SD
There is establishment and monitoring of key performance indicators (KPIs) for supplier performance	6%	14%	10%	46%	24%	4.40	0.571
There is consistency in delivering high-quality products or services.	7%	14%	12%	41%	26%	4.18	0.636
There are joint efforts in finding innovative solutions and process improvements	16%	23%	13%	30%	18%	3.59	0.917
There is trustworthiness of suppliers in	9%	16%	12%	37%	26%	3.88	0.836

meeting commitments and delivering on time.

There are open channels for feedback, inquiries, and dispute resolution

Composite mean and composite SD

The findings indicate that supplier relationship plays a crucial role in the performance of affordable housing projects. A majority of respondents (70%) agreed or strongly agreed that key performance indicators (KPIs) were established and monitored for supplier performance, yielding a high mean score of 4.40 (SD = 0.571). This suggests that the structured evaluation of supplier contributions ensures accountability and enhances efficiency in the delivery of materials and services. Similarly, 67% of respondents affirmed that suppliers consistently delivered high-quality products and services, with a mean of 4.18 (SD = 0.636). This highlights the importance of maintaining reliable supplier networks to uphold construction standards and project timelines.

The study also revealed that collaboration between suppliers and project managers contributed to innovative solutions and process improvements. However, only 48% of respondents agreed with this assertion, while 39% either disagreed or remained neutral, leading to a moderate mean score of 3.59 (SD = 0.917). This indicates that while some joint innovation efforts exist, there is room for improvement in fostering strategic supplier partnerships. Trustworthiness in supplier commitments was relatively well-rated, with 63% of respondents affirming that suppliers met deadlines and honored agreements, resulting in a mean of 3.88 (SD = 0.836). This underscores the significance of reliability in supplier relationships for the seamless execution of housing projects.

Despite the overall positive perceptions of supplier relationships, the study found that communication channels for feedback, inquiries, and dispute resolution were not as strong. Only 41% of respondents agreed that such channels were open and effective, while 42% either disagreed or were neutral, leading to the lowest mean score of 3.19 (SD = 0.997). This suggests a need for better communication frameworks between project teams and suppliers to enhance responsiveness and problem resolution. The composite mean of 3.85 (SD = 0.791) indicates that supplier relationships generally contribute positively to project performance, but improvements in collaboration and communication could further optimize outcomes.

The qualitative findings from interviews with Pangani and Starehe Housing Management Officials revealed that effective supplier relationship management significantly influenced project timelines and cost efficiency in Nairobi County's Affordable Housing Projects (AHP). Respondents emphasized that establishing long-term partnerships with reliable suppliers enabled timely delivery of construction materials, reducing delays in project execution. One official noted that "working with prequalified suppliers who understand project specifications and deadlines has minimized disruptions and improved workflow efficiency." Additionally, robust contract management and performance monitoring of suppliers ensured that procurement processes were streamlined, preventing shortages or cost escalations due to last-minute sourcing. These measures contributed to keeping the projects on track while maintaining adherence to budget allocations.

Cost efficiency was another major area impacted by supplier relationship management. Interviewees highlighted that strategic supplier negotiations and bulk procurement arrangements led to cost savings, allowing better allocation of financial resources across different project phases. One respondent stated that "collaborative relationships with suppliers have allowed for favorable pricing agreements and discounts, reducing overall procurement costs." Moreover, enhanced trust and transparency in supplier interactions minimized instances of contract disputes and financial inefficiencies. However, some

officials acknowledged that occasional inconsistencies in supplier reliability posed challenges, emphasizing the need for continuous performance evaluation and improved communication to mitigate potential risks. Overall, the findings underscore that strong supplier relationship management is instrumental in optimizing both project timelines and cost efficiency in Nairobi County's AHP.

Regression Results

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	. Error of the Estimate
1	.634 ^a	.514	.389	.23142

a. Predictors: (Constant), Supplier relationship

Source: Author (2024)

The regression results show that the model has a moderately strong positive relationship between the independent variables (supplier relationship) and project performance, with an R value of 0.634. The R² value of 0.514 indicates that 51.4% of the variance in project performance is explained by supplier relationship.

Table 4: Analysis of Variance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	106.15	1	106.15	123.298	.000 ^b
	Residual	103.311	120	.861		
	Total	209.461	121			

a. Dependent Variable: Performance of projects

b. Predictors: (Constant), Supplier relationship

The F-statistic is 123.298, and the p-value (Sig.) is .000, which is less than 0.05. This means the regression model is statistically significant, indicating that the independent variable significantly predicts the dependent variable.

Table 5: Regression Coefficients

Un-standardized Coefficients			Standardized Coefficients	t	Sig.
Model	B	Std. Error	Beta		
(Constant)	.604	0.469		1.228	0.000
Supplier relationship	.583	0.451	.495	1.311	0.000

Dependent variable: Performance of projects

Source: Research Findings (2024)

The regression results show the unstandardized and standardized coefficients, indicating the influence of independent variable on the performance of affordable housing projects. The supplier relationship (B = 0.583) appear to have substantial effects on project performance. Supplier relationship is statistically significant, with p-values of 0.000, suggesting that it significantly contribute to the performance of affordable housing projects.

Conclusion

The study concludes that the performance of affordable housing projects in Nairobi County showed mixed results, with positive outcomes in timely completion and resource utilization, but challenges in budget compliance and affordability. The overall performance score reflected successful execution despite financial constraints, highlighting the need for better cost control in future projects.

Supplier relationships significantly impacted project performance, with strong partnerships leading to timely deliveries and cost efficiency. However, challenges in collaboration for innovation and communication for dispute resolution were noted, indicating areas for improvement.

Recommendations

The study recommends that project managers and procurement officers focus on strengthening supplier relationships by establishing clear Key Performance Indicators (KPIs) and improving communication channels. This would help improve supplier reliability, reduce delays, and enhance overall project performance.

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