

Integrating Project and Supply Chain Management to Enhance Stakeholder Value in Infrastructure Projects: Lessons from AIMA's Customer Delight Initiative

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ABSTRACT

Infrastructure projects are among the most complex and resource-intensive endeavors, involving multiple stakeholders with diverse and often conflicting expectations. These projects are critical to economic development, particularly in urban environments, where they address the growing demands for housing, transportation, and commercial spaces. The complexity of infrastructure projects is further compounded by the need to integrate various disciplines, including architecture, engineering, procurement, and construction management. The work reported in the paper explores how integrated supply chain management (SCM) can enhance stakeholder value in infrastructure projects, using the All India Management Association (AIMA) Institutional Building Project, a part of AIMA's Customer Delight Initiative, as a case study. The study explores the mechanisms through which these integrated strategies contribute to enhanced value in infrastructure projects, emphasizing the relevance of a collaborative mind-set in modern project execution. The study highlights the challenges of regulatory delays, tight site conditions, and sustainability demands in urban infrastructure development. By integrating SCM practices such as dynamic procurement, supply chain visibility, and stakeholder engagement, the project achieved a 12% cost reduction, timely completion, and enhanced stakeholder satisfaction. The findings offer practical insights for project managers and supply chain professionals to align project execution with stakeholder expectations on cost, quality, and sustainability.

Keywords: Project Management, Supply Chain Management, Infrastructure Projects, Stakeholder Value, Sustainability

1. Introduction

1.1 Background of the Study

Infrastructure projects are among the most complex and resource-intensive endeavors, involving multiple stakeholders with diverse and often conflicting expectations. These projects are critical to economic development, particularly in urban environments, where they address the growing demands for housing, transportation, and commercial spaces. However, urban infrastructure development is fraught with challenges, including regulatory delays, tight site conditions, and increasing demands for sustainability. Stakeholders, including project owners, users, regulatory bodies, and the community, seek assurance on key aspects such as budget adherence, timely completion, and quality standards.

The complexity of infrastructure projects is further compounded by the need to integrate various disciplines, including architecture, engineering, procurement, and construction management. A study carried out on infrastructure projects in Iraq observes that infrastructure projects take a long time, are complex, multidisciplinary, use different materials and products, and have high risk (Jarallah and Mahjoob, 2022). Traditional project management approaches (Flyvbjerg, 2014), often fall short in addressing these multifaceted challenges, leading

to cost overruns, delays, and stakeholder dissatisfaction. This has prompted a shift toward more integrated approaches, where project management is closely aligned with supply chain management (SCM) to enhance efficiency, transparency, and stakeholder value. Thus, in the realm of infrastructure projects, the integration of project management and supply chain management emerges as a pivotal strategy for enhancing stakeholder value. These projects often entail complex networks of interactions among diverse parties including government agencies, contractors, and community representatives, all of whom have distinct expectations and interests. By adopting integrated approaches that align project management practices with supply chain dynamics, stakeholders can collectively foster efficiency, reduce costs, and streamline communication throughout the project lifecycle. This synergy not only minimizes potential conflicts and delays but also optimizes resource allocation and enhances overall project performance. Consequently, recognizing the interconnectedness of project and supply chain management provides a robust framework for maximizing stakeholder satisfaction and achieving sustainable outcomes in large-scale infrastructure initiatives.

To elaborate on the above, for instance, in the construction of large-scale infrastructure projects such as

airports, highways, and commercial buildings, the coordination between contractors, suppliers, and regulatory bodies is critical. Any misalignment in these areas can lead to significant delays and cost escalations. For example, a study carried out by Hertie School of Governance (Fiedler and Wendler, 2015) has observed that the construction of the Berlin Brandenburg Airport in Germany faced massive delays and cost overruns due to poor coordination and planning, highlighting the need for better integration of SCM practices in infrastructure projects. Considering All India Management Association (AIMA) Institutional Building Project, a part of AIMA's Customer Delight Initiative, as a case study, the study explores the mechanisms through which these integrated strategies contribute to enhanced value in infrastructure projects, emphasizing the relevance of a collaborative mind-set in modern project execution.

1.2 Problem Statement

Despite the growing recognition of the importance of supply chain management in project management, especially in the construction industry, there is limited acknowledgement in the literature on how integrated SCM practices can be effectively applied to infrastructure projects. For instance, McDermotti and Khalfan (2012) discuss different initiatives by the researchers, construction industry, and the Government of United Kingdom in order to achieve optimal level of supply chain integration in the country. Central to the practice of integrated project management is the alignment of project objectives with stakeholder interests, ensuring that all parties are engaged and informed from conceptualization through execution. By fostering collaboration among stakeholders, integrated project management not only improves communication but also bolsters trust, ultimately facilitating smoother project delivery. Furthermore, the integration of supply chain management practices enhances resource optimization and agility, which are crucial in navigating the complexities of infrastructure projects. Effective supply chain management is integral to maximizing stakeholder value in infrastructure projects, as it directly influences cost efficiency, timelines, and overall project success. By coordinating the various elements of the supply chain - such as procurement, logistics, and stakeholder involvement - project managers can ensure the timely availability of resources while minimizing waste and delays. The implementation of robust SCM strategies facilitates enhanced collaboration among stakeholders, which is essential for addressing the complex dynamics of infrastructure projects. Further, understanding stakeholder value is crucial for ensuring successful outcomes that meet diverse expectations and needs. Stakeholders, ranging from government entities and local communities to investors and contractors, play a significant role in shaping project objectives and priorities. The alignment of stakeholder interests with project goals can enhance perceived value and overall satisfaction. In this context, it is pertinent to emphasize that in developing countries like India, infrastructure projects often face delays due to bureaucratic hurdles and land acquisition issues. These delays not only increase project costs but also lead to dissatisfaction among

stakeholders, including investors, end-users, and the community. The lack of integrated supply chain management practices exacerbates these challenges, as project managers struggle to align procurement, logistics, and construction activities with regulatory requirements and stakeholder expectations. Thus, existing studies often focus on specific aspects of supply chain, such as procurement or logistics, without considering the holistic integration of these practices into the project management process. This gap in the literature is particularly evident in the context of urban infrastructure projects, where the interplay between regulatory constraints, sustainability demands, and stakeholder expectations creates unique challenges. The work reported in the paper aims to address this gap by exploring how integrated supply chain management can enhance stakeholder value in infrastructure projects.

2. Research Objectives

The specific research objectives addressed in the Paper are given below.

2.1 Research Objective 1

To identify key supply chain management practices that can be integrated into project management to address challenges such as regulatory delays, tight site conditions, and sustainability demands.

2.2 Research Objective 2

To examine the impact of the above practices on cost optimization, timeline management, and stakeholder satisfaction.

2.3 Research Objective 3

To provide practical insights for project managers and supply chain professionals to align project execution with stakeholder expectations.

2.4 Research Objective 4

To explore how dynamic procurement strategies can help mitigate the impact of material price fluctuations, which are a common challenge in infrastructure projects; and further, to examine how supply chain visibility tools, such as real-time tracking systems, can improve transparency and accountability, thereby reducing delays and cost overruns.

The organization of the paper henceforth is detailed below.

Section 3 reviews the theoretical framework and literature on supply chain management integration in project management. Section 4 describes the methodology, including the case study approach and data collection process, as also analysis steps adopted to discern the key aspects of the AIMA Institutional Building Project. Section 5 delineates the study results and key learnings from the case. Section 6 presents the discussion and conclusions of the work reported. Section 7 outlines the policy implications for theory and practice. Finally, Section 8 concludes the paper with the study limitations and the scope for future research.

3. Theoretical Framework

3.1 Literature Review

The integration of supply chain management (SCM) into project management (PM) has gained increasing attention in recent years, driven by the need for greater efficiency and transparency in complex projects. For instance, studies have highlighted the potential of supply chain management integration to mitigate challenges such as cost overruns, delays, and quality issues (Hernandez et al., 2023; Cheng et al., 2023). Another study has further emphasized the role of Industry 4.0 technologies in enhancing SCM practices, particularly in the context of sustainability and circular economy principles (Piyathanavong et al., 2022).

Integrating project and supply chain management (Love et al., 2004; Samaranyake and Toncich, 2007, McAdam and McCormack, 2001), is essential for project success, requiring simultaneous management of multiple interdependent dimensions including strength, scope, duration, and depth of integration. The evidence base is substantial and multifaceted. Eriksson (2015) established a foundational framework identifying four critical integration dimensions in project-based supply chains. Zhang et al. (2025) provides the most recent comprehensive review, synthesizing fragmented research and demonstrating that optimization methods facilitate PM-SCM integration across project scheduling, resource allocation, and supply chain coordination. Wei et al. (2021) identifies four key antecedent areas: IT integration, organizational coordination, risk management, and supply chain resilience.

Empirical support comes from multiple contexts: Xu et al. (2016) developed a project-driven supply chain model optimizing safety-stock and crashing decisions; Sterzi et al. (2007) demonstrated integration benefits in construction through strategic supplier identification; and Ali et al. (2021) confirmed integration's positive role in engineering project success. The research consensus emphasizes that integration requires coordinated implementation across multiple dimensions rather than isolated initiatives.

In the context of infrastructure projects, SCM integration involves several key dimensions (Jarallah and Mahjoob, 2022) and are also related to the critical context of sustainability (Kabir et al., 2022; Oshilalu, 2024). A few other researchers (Farooq et al., 2022; Lin et al., 2024) have identified coordination across work packages, sustainability integration, and dynamic procurement strategies as critical factors for success; and have also highlighted the importance of supply chain visibility and stakeholder engagement in ensuring alignment of objectives and proactive problem-solving (Awaad et al., 2024; Ahi and Searcy, 2013).

Infrastructure projects exemplify engineer-to-order supply chains (Gosling et al., 2014; Cigolini et al., 2020), where there is a high degree of complexity and uncertainty associated with developing a 'unique' product (Naim et al., 2021). For example, in the construction of the Burj Khalifa in Dubai, the integration of SCM practices played a crucial role in ensuring the project's success. The project team used advanced tracking systems to monitor the delivery of materials and equipment, ensuring that construction activities were not

delayed due to supply chain disruptions. Additionally, the team adopted sustainable procurement practices, such as sourcing materials from local suppliers to reduce the project's carbon footprint (Beske and Seuring, 2014).

3.2 Key Dimensions of SCM Integration in Infrastructure Projects

The following key dimensions of supply chain management integration have been observed in the present case.

Coordination across Work Packages. Infrastructure projects typically involve multiple contractors and suppliers, each responsible for different aspects of the project. Effective coordination across these work packages is essential to ensure seamless collaboration and avoid conflicts (Hobbs and Aubry, 2007). For example, in the construction of the Channel Tunnel between the UK and France, the project team used a centralized coordination system to manage the activities of over 200 contractors and suppliers. This system enabled the team to identify potential bottlenecks and take corrective actions proactively, ensuring that the project was completed on time and within budget (Kähkönen and Arto, 2015).

Sustainability Integration. With increasing demands for environmentally responsible practices, infrastructure projects must adopt sustainable procurement and construction methods. This includes the use of energy-efficient materials, waste reduction strategies, and green building certifications. For example, the One Angel Square building in Manchester, UK, achieved a BREEAM Outstanding rating by incorporating sustainable design features such as rainwater harvesting, solar panels, and energy-efficient lighting systems (Carter and Rogers, 2008).

Dynamic Procurement Strategies. Dynamic procurement strategies and stakeholder engagement are critical success factors for infrastructure projects (Pinto and Slevin, 1988). The volatility of material prices and availability necessitates adaptive procurement strategies. These strategies enable project managers to respond to market fluctuations and minimize cost overruns. For example, during the construction of the Hong Kong-Zhuhai-Macau Bridge, the project team used dynamic procurement strategies to manage the supply of steel and concrete. By monitoring market conditions and adjusting procurement plans accordingly, the team was able to avoid significant cost overruns and delays (Gosling and Naim, 2009).

Supply Chain Visibility. Real-time tracking of materials and progress is critical for ensuring transparency and accountability. This allows project managers to identify potential bottlenecks and take corrective actions proactively. For example, in the construction of the Panama Canal expansion project, the project team used GPS tracking systems to monitor the movement of construction equipment and materials. This system enabled the team to optimize logistics and reduce delays caused by supply chain disruptions (Zhu et al., 2013).

Stakeholder Engagement. Addressing the unique concerns of each stakeholder group is essential for ensuring alignment of objectives and building trust. Regular updates and transparent reporting can help mitigate stakeholder anxiety and foster collaboration. For example, in the construction of the High Line Park in New York City, the project team held regular community meetings to keep residents informed about the project's progress. This approach helped build trust and support for the project, ensuring its successful completion (Meng, 2012).

3.3 Conceptual Framework

Based on the literature review, this study proposes a conceptual framework for integrating SCM into infrastructure projects. The framework emphasizes the alignment of project objectives with stakeholder expectations through the adoption of key SCM practices. These practices include work packaging, dynamic procurement, sustainability integration, supply chain visibility, and stakeholder engagement. The framework also highlights the role of technology, such as Building Information Modelling, BIM (Jarallah and Mahjoob, 2022; Mehmood et al., 2024), in enhancing coordination and transparency (Winch, 2010).

For example, the framework suggests that project managers should use BIM to create a digital twin of the project, enabling them to simulate different scenarios and identify potential risks before they occur. This approach can help improve decision-making and reduce the likelihood of delays and cost overruns. Additionally, the framework emphasizes the importance of stakeholder engagement in ensuring that project objectives are aligned with the expectations of all stakeholders (Shenhar and Dvir, 2007).

4. Methodology

4.1 Case Study Approach

This study adopts a case study methodology (Flyvbjerg, 2006; McQuaid et al., 2022) to explore the integration of supply chain management (SCM) practices in infrastructure projects. The case study approach is particularly suited for the present work because it allows for an in-depth examination of real-world practices (Yin, 2018) and their impact on project outcomes and has gained increasing popularity in the realm of social sciences and business (Paparini et al., 2021). As a methodological approach, to gain an in-depth understanding of a case it relies on the collection of multiple sources of evidence (Yin, 2018). As observed by a team of researchers (Hyett et al., 2014), the case study methodology is a kind of research that involves systematic processes of data collection with the ability to draw rigorous conclusions. Thus, single case study research involves a systematic process of data collection with the ability to draw rigorous conclusions. By focusing on a single project - the All India Management Association (AIMA) Institutional Building Project - the present work reported provides detailed insights into how SCM practices can be effectively integrated into project management to enhance stakeholder value.

The AIMA project, a component of AIMA's Customer

Delight Initiative, serves as an ideal case study because it encapsulates many of the challenges commonly faced in urban infrastructure development, including regulatory delays, tight site conditions, and sustainability demands. The project's success in overcoming these challenges through integrated SCM practices makes it a valuable example for other infrastructure projects (Yin, 2018).

4.2 Project Overview

The AIMA Institutional Building Project involved the construction of a Platinum-rated green building in South Delhi, India. The building was designed to house AIMA's offices, training facilities, a banquet hall, and a storage room for critical documents. The project was located on a 1,000-square-yard residential plot, which had to be converted from residential to commercial use. The existing structure on the site, a 2.5-storey old house, was demolished to make way for the new building. The project faced several challenges during its progress that included the following.

Regulatory Delays. Obtaining the necessary approvals for the change in land use and building design was a time-consuming process.

Tight Site Conditions. The limited space available on the site required careful planning and coordination to ensure that construction activities could proceed without disruptions.

Sustainability Demands. The project aimed to adhere to green building principles, although formal certification was not pursued. This required the use of energy-efficient materials and sustainable construction practices.

4.3 Data Collection

The data for this study was collected through a combination of document analysis and interviews with key stakeholders involved in the AIMA project. The documents analyzed included project plans, procurement records, progress reports, and meeting minutes. These documents provided valuable insights into the SCM practices adopted during the project and their impact on project outcomes.

In addition to document analysis, semi-structured interviews were conducted with project team leaders and functional heads. These interviews focused on understanding the challenges faced during the project, the SCM practices adopted to address these challenges, and the lessons learned from the project. The interviews were recorded and transcribed to ensure accuracy and completeness.

4.4 Data Analysis Dimensions

To carry out a detailed analysis of the AIMA Institutional Building Project, the data collected from the document scrutiny and the interviews conducted were analyzed using a *thematic analysis approach*. This involved identifying recurring themes and patterns in the data related to SCM practices and their impact on project outcomes. The themes identified included *work packaging, dynamic procurement, supply chain visibility, sustainability integration, and stakeholder engagement*.

Further, the analysis also focused on discerning the effectiveness of integrated supply chain management (SCM) practices in enhancing stakeholder value.

5. Study Results and Key Learnings

The analysis revealed that the project team adopted a work packaging strategy to divide the project into smaller, more manageable components. This strategy allowed for better coordination among contractors and suppliers, reducing the likelihood of delays and cost overruns. Similarly, the use of dynamic procurement strategies enabled the team to adapt to changes in material availability and market conditions, ensuring that the project remained on track. The detailed results of the thematic analysis approach are presented below.

5.1 Work Packaging Strategies

The following work packaging strategies were delineated in the analysis.

Civil and Structural Works. This package involved the construction of the building's foundation, superstructure, and external walls.

Electrical Works. This package included the installation of electrical systems, including lighting, power distribution, and fire alarms.

Plumbing and Fire Fighting Works. This package involved the installation of plumbing systems, firefighting equipment, and water supply systems.

Heating, Ventilation and Air Conditioning (HVAC) Works. This package included the installation of heating, ventilation, and air conditioning systems.

Interior Works. This package involved the design and construction of the building's interior spaces, including offices, training rooms, and the banquet hall.

5.2 Dynamic Procurement Strategies

Dynamic procurement strategies help mitigate risks associated with material availability and cost fluctuations (Zavadskas et al., 2010). The project team adopted such strategies to manage the supply of materials and equipment. These strategies included:

Direct Procurement. Critical materials such as HVAC equipment and electrical fixtures were procured directly from suppliers, bypassing contractors. This approach reduced costs by eliminating contractor margins and double taxation.

Flexible Procurement. The team used flexible procurement strategies to adapt to changes in material availability and market conditions. For example, when the price of steel increased due to market fluctuations, the team adjusted the procurement plan to minimize the impact on the project budget.

Design-Build Contracts. For specialized works such as HVAC and interior design, the team awarded design-build contracts. These contracts allowed contractors to optimize

the design and execution of their works, resulting in cost savings and improved quality.

5.3 Supply Chain Visibility

The project team implemented several measures to enhance supply chain visibility that included the following.

Real-Time Tracking Systems. The team used real-time tracking systems to monitor the delivery of materials and equipment. This allowed them to identify potential bottlenecks and take corrective actions proactively.

Weekly Coordination Meetings. The team held weekly coordination meetings to review progress and address any issues that arose during the project. These meetings ensured that all contractors and suppliers were aligned on project objectives and timelines.

Transparent Reporting. The team provided regular updates to stakeholders on project progress and cost management. This transparency helped build trust and confidence among stakeholders.

5.4 Sustainability Integration

The project team adopted several sustainable practices to reduce the environmental impact of the project. The following dimensions were delineated.

Energy-Efficient Materials. The team used energy-efficient materials such as double-glass units (DGU) for the building's façade. These materials reduced the building's energy consumption and improved occupant comfort.

Waste Reduction. The team implemented waste reduction strategies, such as reusing bricks and rubble from the demolished structure for landfilling and recycling steel through electric arc furnaces.

Green Building Principles. Although formal green certification was not pursued, the project adhered to green building principles, such as rainwater harvesting and greywater recycling.

5.5 Stakeholder Engagement

The project team adopted a stakeholder-centric approach to ensure that the concerns of all stakeholders were addressed. The approach adopted included the following dimensions.

Regular Updates. The team provided regular updates to stakeholders on project progress and cost management. These updates helped reduce stakeholder anxiety and build trust.

Real-Time Communication. The team used real-time communication tools to address stakeholder concerns proactively. For example, when a delay in material delivery was identified, the team immediately informed stakeholders and provided a revised timeline.

Iterative Decision-Making. The team adopted an

iterative decision-making process, where stakeholder feedback was incorporated into project decisions. This approach ensured that stakeholder expectations were aligned with project outcomes.

Further, as mentioned above, the AIMA Institutional Building Project demonstrated the effectiveness of integrated supply chain management (SCM) practices in enhancing stakeholder value. The following key results were observed in the analysis.

5.6 Cost Savings

Cost Savings Achieved. The project achieved a 12% reduction in the budgeted cost through strategic decisions such as revising the structural design and optimizing material procurement. For example, the replacement of the original structural design with a lighter and more efficient design saved approximately INR 32,00,000 (approximately 2% of the budgeted cost).

Direct Procurement of Critical Materials. The direct procurement of critical materials like the ones related to HVAC Works and the electrical fixtures eliminated contractor margins and double taxation, further reducing costs.

The AIMA project's ability to deliver cost savings, timely completion, and stakeholder satisfaction reflects its alignment with the framework suggested by Pinto and Slevin (1988) on critical success factors in project management. Their study underscores the importance of structured stakeholder engagement, proactive decision-making, and risk management — all these factors played a crucial role in the project's success.

5.7 Timeline Management

Despite regulatory delays and tight site conditions, the project was completed within one year, with no time overruns. This was achieved through rigorous planning, weekly coordination meetings, and real-time tracking of materials and progress.

For instance, the early award of the elevator contract, even before the lift shafts were completed, ensured that there were no delays in the installation process.

5.8 Stakeholder Satisfaction

The outcome exceeded client expectations, delivering a visually appealing, functional, and sustainable building. Regular updates and transparent reporting helped build trust and confidence among stakeholders, including the client, contractors, and regulatory bodies.

For instance, the use of double-glass units (DGU) for the building's façade not only reduced noise levels but also improved energy efficiency, enhancing occupant comfort and satisfaction.

5.9 Sustainability Outcomes

Although formal green certification was not pursued, the project adhered to green building principles, resulting in significant environmental benefits. Key decisions, such as the use of AAC blocks and double-glass units, reduced the building's energy consumption and carbon footprint. The reuse of bricks and rubble from the demolished

structure, as well as the recycling of steel, minimized waste and promoted resource efficiency.

6. Discussion and Conclusions

This study contributes to the growing body of literature on SCM integration in project management by providing a detailed case study of its application in infrastructure projects. The study's conceptual framework and key learnings can serve as a foundation for future research on this topic. To summarize, the AIMA Institutional Building Project demonstrates that integrated supply chain management (SCM) is key to enhancing stakeholder value in infrastructure projects. By aligning project execution with stakeholder expectations on cost, quality, and sustainability, the project achieved significant cost savings, timely completion, and enhanced stakeholder satisfaction.

The AIMA project provided valuable insights into the integration of SCM practices in infrastructure projects. The following Key Learnings from the Case Analysis may be highlighted.

6.1 Early Planning and Role Definition

Iterative decision-making and stakeholder engagement are critical for aligning project objectives with stakeholder expectations (Kotnour, 2000). Early planning and clear role definition are critical to preventing cost overruns and delays.

For instance, the project team spent the first month understanding client requirements and translating them into a detailed project brief, which served as the foundation for all subsequent activities.

6.2 Collaborative Decision Making

Regular stakeholder consultations and iterative decision-making ensured alignment of objectives and proactive problem-solving.

For instance, the decision to replace single-glass curtain walls with double-glass units was made after consulting with stakeholders, resulting in significant energy savings and improved occupant comfort.

6.3 Sustainability as a Value Proposition

Integrating sustainability into project execution not only reduces environmental impact but also enhances stakeholder perception and satisfaction.

The use of energy-efficient materials and waste reduction strategies demonstrated the project team's commitment to sustainability, earning the trust and support of stakeholders.

6.4 Flexibility in Execution

Adaptability to mid-project changes is essential for achieving better outcomes without compromising timelines.

For instance, the project team's ability to adjust procurement strategies in response to market fluctuations ensured that the project remained on track despite external challenges.

6.5 Leveraging Technology

The use of digital tools like Building Information Modeling (BIM) and real-time tracking systems enhanced

supply chain visibility and coordination. These tools enabled the project team to identify potential bottlenecks and take corrective actions proactively, reducing delays and cost overruns.

The following *Recommendations* may be derived from the case study.

6.6 Custom SCM Frameworks

Custom SCM frameworks tailored to project-specific challenges can enhance stakeholder value and organizational outcomes (Zwikael and Smyrk, 2011). Project managers should design custom SCM frameworks tailored to the specific challenges and stakeholder priorities of each project.

For instance, the AIMA project's work packaging strategy and dynamic procurement approach can serve as a model for other infrastructure projects that face similar challenges.

6.7 Value Engineering Practices

Data-driven insights should be used to identify cost-saving opportunities without compromising quality. The AIMA project's structural design revision and material optimization strategies demonstrate the potential of value engineering in achieving significant cost savings.

6.8 Communication Tools

Regular updates and transparent reporting are essential for building stakeholder trust and confidence.

The AIMA project's use of real-time communication tools and weekly coordination meetings ensured that stakeholders were kept informed and engaged throughout the project.

6.9 Technology Integration

Digital tools like building information modelling (BIM) and real-time tracking systems should be integrated into project execution to enhance supply chain visibility and coordination. These tools can help project managers identify potential bottlenecks and take corrective actions proactively, reducing delays and cost overruns.

7. Policy Implications

The findings of this study have significant implications in the realm of sustainable supply chain management (Eriksson and Westerberg, 2011) and its integration with project management for infrastructure projects. For project managers, the study offers a framework for integrating critical SCM practices such as procurement into infrastructure projects (Walker and Jones, 2012), especially in the context of developing countries (Ofori, 2000), enabling them to address stakeholder concerns more effectively. For supply chain professionals, the study highlights the importance of aligning procurement and logistics strategies with project objectives. Policymakers can also benefit from the study's insights by developing regulations that support integrated SCM practices in infrastructure development.

For instance, the study's findings can be used to develop guidelines for sustainable supply chain management practices (Kabir et al., 2022; Carter and Rogers, 2008) such as the implementation of green procurement

practices in public infrastructure projects. These guidelines can help governments achieve their sustainability goals while ensuring that projects are completed on time and within budget. Additionally, the study's emphasis on stakeholder engagement can inform the development of communication strategies that foster trust and collaboration among project stakeholders.

This study makes several key contributions to the field of project and supply chain management, a few of which need to be highlighted. First, it provides a detailed case study of SCM integration in infrastructure projects, highlighting the challenges and opportunities associated with this approach. Second, it proposes a conceptual framework for integrating SCM practices into project management, emphasizing the importance of work packaging, dynamic procurement, sustainability integration, supply chain visibility, and stakeholder engagement. Third, it offers practical insights and recommendations for project managers, supply chain professionals, and policymakers to enhance the efficiency and effectiveness of infrastructure projects.

The findings of this study also have significant practical implications for supply chain and project management professionals involved in infrastructure projects. Policymakers can adapt the findings of this study to develop regulations and guidelines that support the integration of SCM practices in infrastructure projects. A few options are highlighted below.

Green Procurement Policies. Governments can mandate the use of sustainable materials and practices in public infrastructure projects to promote environmental sustainability.

Stakeholder Engagement Guidelines. Policymakers can develop guidelines for effective stakeholder engagement, ensuring that the concerns of all stakeholders are addressed throughout the project lifecycle.

8. Study Limitations and Suggestions for Future Research

While this study provides valuable insights, it is important to acknowledge its limitations. The findings are based on a single case study, which may limit their generalizability to other infrastructure projects. Future research should explore the application of integrated SCM practices in a wider range of projects and contexts, including large-scale infrastructure developments and projects in different geographic regions.

The AIMA project serves as a model for future infrastructure developments, demonstrating that integrated SCM practices can deliver significant benefits in terms of cost savings, timeline management, and stakeholder satisfaction. By adopting these practices, project managers can enhance the value of infrastructure projects and contribute to sustainable development.

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