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The Design of Project Procurement Management to Improve Company Performance Project (Study Case: Warehouse Manufacture)

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Abstract
The Indonesian construction industry continues to face significant challenges related to project delays, especially in warehouse manufacturing projects. These delays often result in increased costs, reduced quality, and weakened stakeholder trust. This research aims to analyze the primary causes of delays in the warehouse construction project of PT. WMA and to design a procurement management framework that improves project performance. By conducting qualitative methods such as group discussions, the study identifies key contributing factors, including poor planning, weak interdepartmental coordination, supplier delays, and insufficient procurement monitoring. Root cause analysis was conducted using the Current Reality Tree (CRT), revealing that the lack of effective procurement management was the central issue. The study proposes a comprehensive procurement management framework based on the PMBOK 6th Edition, emphasizing the importance of planning, executing, and controlling procurement processes. Implementation of this framework is expected to reduce project delays and enhance the overall performance of construction projects. The findings not only contribute to academic knowledge but also provide practical recommendations for improving procurement practices in Indonesia's construction sector.

***Keywords**: Project Delays, Procurement Management, PMBOK, Construction, Warehouse, PT. WMA, Supply Chain*
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INTRODUCTION

The construction industry plays a vital role in Indonesia's economic development, contributing significantly to infrastructure improvement and job creation (Rahman et al., 2025; Kautsar, 2024). Based on data from aki.co.id (2024), construction in Indonesia is projected to grow by around 4.5% due to the positive response from the Ministry of Public Works and Housing (PUPR), with funding of approximately 423.4 trillion IDR. However, the industry is frequently plagued by project delays, which can lead to substantial financial losses, diminished work quality, and strained relationships among stakeholders (Rauzana, 2022; Abdurrahman, 2022). Delays are often attributed to various factors, including inefficient project management, resource shortages, unforeseen regulatory changes, and fluctuating material costs (Rauzana, 2022; Rahman, 2025).

The construction industry plays a vital role in Indonesia's economic development, contributing significantly to infrastructure improvement and job creation. According to aki.co.id (2024), construction in Indonesia is projected to grow by around 4.5% due to the positive response from the Ministry of Public Works and Housing (PUPR), resulting in funding of approximately 423.4 trillion IDR. However, the industry is frequently plagued by project delays, which can lead to substantial financial losses, diminished work quality, and strained relationships among stakeholders. Delayed projects are often attributed to various factors, including inefficient project management, resource shortages, unforeseen regulatory changes, and fluctuating material costs. Poor project planning is one of the main causes of such outcomes. Studies have shown that inadequate planning and scheduling are significant contributors to cost overruns and delays in construction projects (Daoud et al., 2023; Koirala, 2024). Additionally, factors such as scope changes, poor communication, and lack of skilled labor have been identified as critical risks leading to project failures (Enrica, 2021; Daoud et al., 2023).

Poor supply chain management also contributes to delays and cost overruns in the construction industry. Generally, Construction Supply Chain Management (CSCM) involves coordinating activities within a construction firm and among the members of its supply chain (Croxton et al., 2001). A supply chain is defined as "A system of

people, technology, activities, information, and resources that must exist in order to have a product delivered from the supplier to the customer" (Dainty et al., 2001). Recent studies have highlighted that inefficient supply chain management practices, such as inadequate procurement strategies and poor coordination among stakeholders, significantly contribute to project delays and cost escalations (Jayarathna & Perera, 2021; McKinsey & Company, 2020). Furthermore, disruptions in the supply chain, including material shortages and transportation delays, have been identified as critical factors leading to project inefficiencies and budget overruns (Patabendige & Perera, 2024; Caliber.global, 2025).

A delayed project in the construction industry refers to one that is not completed according to the predetermined schedule (Demissew & Abiy, 2023). These delays can stem from multiple factors such as poor management, resource shortages, design changes, or adverse weather conditions. According to a study by Hadi and Rizki (2022), inadequate planning and supervision are often the primary causes of delays. Additionally, Santoso (2021) noted that a shortage of skilled labor also contributes to this issue.

Within the scope of project management, time and performance share a strong relationship. Changes in these areas have a significant impact on overall project performance (Rashid, 2019). Delay is one of the most critical factors influencing construction projects because it is directly linked to increased project costs. Timely completion is valuable for all stakeholders—consultants, contractors, and clients alike (El-Razek, 2008; Al-Kharashi & Skitmore, 2009; Rashid et al., 2013).

In recent years, the occurrence of delayed projects has become increasingly prominent, drawing attention from both industry professionals and policymakers. According to recent studies, nearly 30% of construction projects in Indonesia experience significant delays, emphasizing the urgent need to understand their underlying causes and to develop effective mitigation strategies.

Considering the various consequences of project delays, it is crucial for stakeholders in the construction industry to understand the root causes and implement practical mitigation measures. Further research in this field will provide valuable insights to improve project management practices and reduce the risk of future delays. This thesis aims to investigate factors contributing to project delays and their impacts within an Indonesian construction company, analyze their implications, and propose recommendations to enhance project delivery efficiency. By focusing on real-world case studies, this research will provide valuable insight into improving project management practices within the sector. The findings are expected to contribute not only to academic discourse but also to practical applications that help mitigate delay risks in future construction projects in Indonesia.

The objectives of this research are as follows: to identify the main factors causing delays in projects at PT. WMA; to provide business solutions that can be implemented by PT. WMA to minimize these delays; and to recommend measures for future projects to avoid similar issues.

The scope and limitations of the study are as follows: the research is limited to delay-related problems occurring at PT. WMA, particularly within warehouse manufacturing projects. To examine the primary factors contributing to these delays and assess their impacts on construction companies, this study seeks to provide valuable insights into effective strategies. It aims to identify root causes such as inefficient project management, resource constraints, external factors, and design changes; explore their consequences, including financial losses, quality compromises, and reputational damage; and propose practical recommendations to enhance project management practices, optimize resource allocation, and minimize future delay risks.

METHOD

This research used qualitative methods to answer the research question. The qualitative method employed in this study was group discussions with PT WMA stakeholders and individuals who were heavily involved in warehouse manufacturing. These group discussions collected detailed information about project delays in the warehouse manufacture and explored factors that had previously been

overlooked in the projects. Therefore, they provided collective insights to be analyzed based on the minutes of the group discussion meetings.

Since the research questions and objectives focused on identifying the main factors and impacts of project delays, a qualitative research approach was appropriate for identifying relationships between variables, determining causal factors in an objective and measurable manner, and analyzing data to discover significant patterns.

The steps that this research followed were:

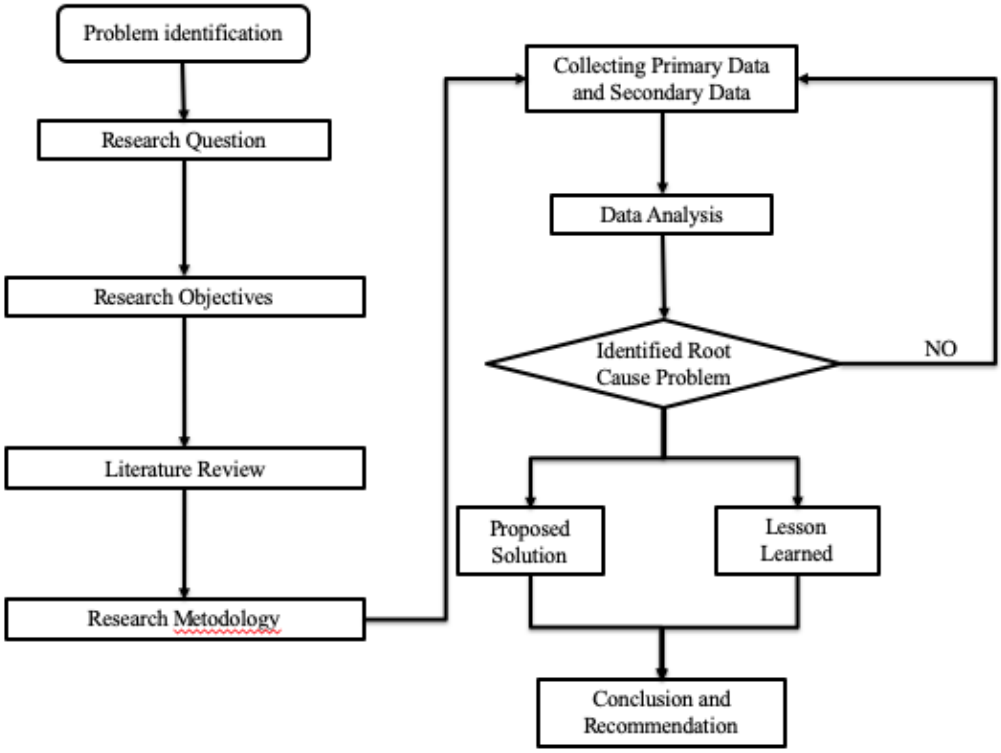

Figure 1. Research Design

Source: Researcher data processing, 2025

This research conducted group discussion with the participant from PT. WMA, Project manager, site manager, and head of operation as primary data. Primary data sources are data sources that directly provide data to data collectors while secondary data is a data source that does not directly provide data.

RESULTS AND DISCUSSION

Group Discussion

After conducting group discussion with sources who were directly involved in the construction project of a manufacturing warehouse at PT. WMA. The author first refers to the variables that can cause delays in a construction project, then the next stage the author brings these variables into group discussion with sources, and in the group discussion session the resource person gives a statement on the variables brought by the author that not all of them affect the delay in the project that occurs in the construction of a manufacturing warehouse at PT. WMA. The resource person provided several factors that affect the delay in the PT. WMA, as follows:

Table 1. Data Variable based on group discussion

Question	
Code	Variable
Project Management	
X1.1	The warehouse project does not have detailed and realistic initial plan.
X1.2	The project schedule can't be executed according to the initial plan.
X1.3	The project team does not have a good risk management skills.
X1.4	Project monitoring and evaluation aren't conducted periodically.
Policy	
X2.2	Decision-making in the project is done quickly but not effectively.
Organizational Behaviour	
X3.3	The leadership style applied does not supports project completion.
X3.5	Coordination between departments is not going well in the project.
Supply Chain Management	
X4.1	The project supplier can't meet the material needs on time.
X4.2	The logistics system doesn't supports the smooth running of the project.
X4.4	Supply chain disruptions often cause project delays.
X4.5	The coordination between the company and the supplier isn't going well.

Source: Results of research data processing, 2025

This data was obtained from Group discussion/In-Depth Interview conducted with sources directly related to delayed project that occurred in the construction of warehouse manufacture by PT. WMA.

Root Cause Analysis

Root cause analysis in this research is done by conduction group discussion with PT. WMA that heavily involved in warehouse manufacture and also by conducting the statistical analysis. Meetings that conduct with PT. WMA is discussing the root cause of project delay in warehouse manufacture project from all category, and the main root cause of the project delay. The meetings also discuss the relation from every variable.

1. Current Reality Tree

Current reality tree is use for identifying and analysing root cause problem of the project delay in warehouse manufacture project. First, author list 11 possible root cause of the project delay in warehouse manufacture. Here is the description for each root cause :

Table 2. Current Reality Tree Indicator and Description

No	Indicator	Description
1	The project schedule can't be executed according to the initial plan.	PT. WMA's project often missed deadlines due to poor planning and material delays.
2	Decision-making in the project is done quickly but not effectively	Decisions were made quickly without proper analysis, causing technical and timeline issues.
3	The logistics system doesn't supports the smooth running of the project.	Logistics were not integrated, leading to late deliveries to the project site.
4	Coordination between departments is not going well in the project.	Lack of communication between departments led to procurement and budget mismatches.
5	The leadership style applied does not supports project completion.	Authoritarian leadership reduced team motivation and hindered collaboration.
6	The project supplier can't meet the material needs on time.	Vendors failed to deliver materials on time, disrupting project progress.
7	The warehouse project does not have detailed and realistic initial plan.	The project lacked a detailed and realistic plan, causing budget and timeline adjustments.

No	Indicator	Description
8	The coordination between the company and the supplier isn't going well.	Poor communication with suppliers led to delivery mismatches and inefficiencies.
9	The project team does not have a good risk management skills.	The team failed to anticipate risks, making the project vulnerable to delays.
10	Project monitoring and evaluation aren't conducted periodically.	Procurement performance was not tracked regularly, making it difficult to resolve supply problems early.
11	Supply chain disruptions often cause project delays.	Frequent supply chain issues caused major delays, especially for imported materials.

Source: Researcher analysis, 2025

From the meetings with the participant that expert in the warehouse manufacture by PT. WMA, the agree that about all the root cause problem of the project delay. The first root cause are the project schedule can't be executed according to the initial plan. In PT. WMA's warehouse development project, the implementation often deviated from the initial timeline. For example, the construction phase of the main structure, originally planned for two months, was delayed by three weeks due to late material procurement. This indicates a lack of accuracy in scheduling and poor anticipation of field constraints.

Second root cause of the project delay is decision-making in the project is done quickly but not effectively. Project management at PT. WMA tends to make decisions hastily without thorough analysis of data or long-term risks. For instance, the selection of the racking system vendor was based solely on the lowest bid, ignoring technical capability. This led to installation delays and necessary revisions to meet specifications.

Third root cause of the project delay is the logistics system doesn't support the smooth running of the project. The internal logistics system at PT. WMA is not fully integrated with the project needs, resulting in delays in material distribution from the central warehouse to the project site. Construction materials like cement and steel arrived late due to the absence of a real-time tracking system for deliveries.

Fourth root cause of the project delay is coordination between departments is not going well in the project. Coordination among all departments engineering, procurement, and logistic has been not going well. Poor communication led to several misalignments, such as procurement of materials before receiving budget approval from the finance team, which disrupted the workflow.

Fifth root cause of the project delay is the leadership style applied does not support project completion. The leadership approach of the project manager is authoritarian and excludes team input from decision-making. At PT. WMA, this has resulted in low team morale and poor collaboration among divisions—both of which are essential for timely project delivery.

Sixth root cause of the project delay is the project supplier can't meet the material needs on time. Some suppliers collaborating with PT. WMA were unable to deliver materials on time. For example, the delivery of "Tiang Pancang" equipment from a local vendor was delayed by two weeks, postponing the installation process and affecting the overall schedule.

Seventh root cause of the project delay is the warehouse project does not have detailed and realistic initial plan. The initial planning of PT. WMA's warehouse project lacked sufficient detail, particularly in budget and timeline estimation. As a result, several phases had to be revised mid-project, leading to cost overruns and extended deadlines.

Eight root cause of the project delay is the coordination between the company and the supplier isn't going well. The coordination between PT. WMA and its suppliers is inadequate. Due to limited communication and a lack of regular progress updates, suppliers often deliver items that no longer match the updated needs of the project, resulting in delays and inefficiencies.

Ninth root cause of the project delay is the project team does not have good risk management skills. The project team at PT. WMA lacks strong risk management capabilities. Potential issues such

as extreme weather, logistics delays, or price fluctuations were not properly anticipated, leaving the team unprepared when these problems occurred.

Tenth root cause of the project delay is project monitoring and evaluation aren't conducted periodically. Monitoring and evaluation are not carried out regularly in the project. As a result, deviations from the original plan go unnoticed. For instance, a delay in foundation work was only discovered after two weeks, which could have been mitigated if weekly evaluations were in place.

Eleventh root cause of the project delay is supply chain disruptions often cause project delays. Supply chain issues are one of the main causes of project delays at PT. WMA. For example, sudden changes in import regulations led to a shortage of lightweight steel for the roofing structure, causing significant delays in the construction timeline.

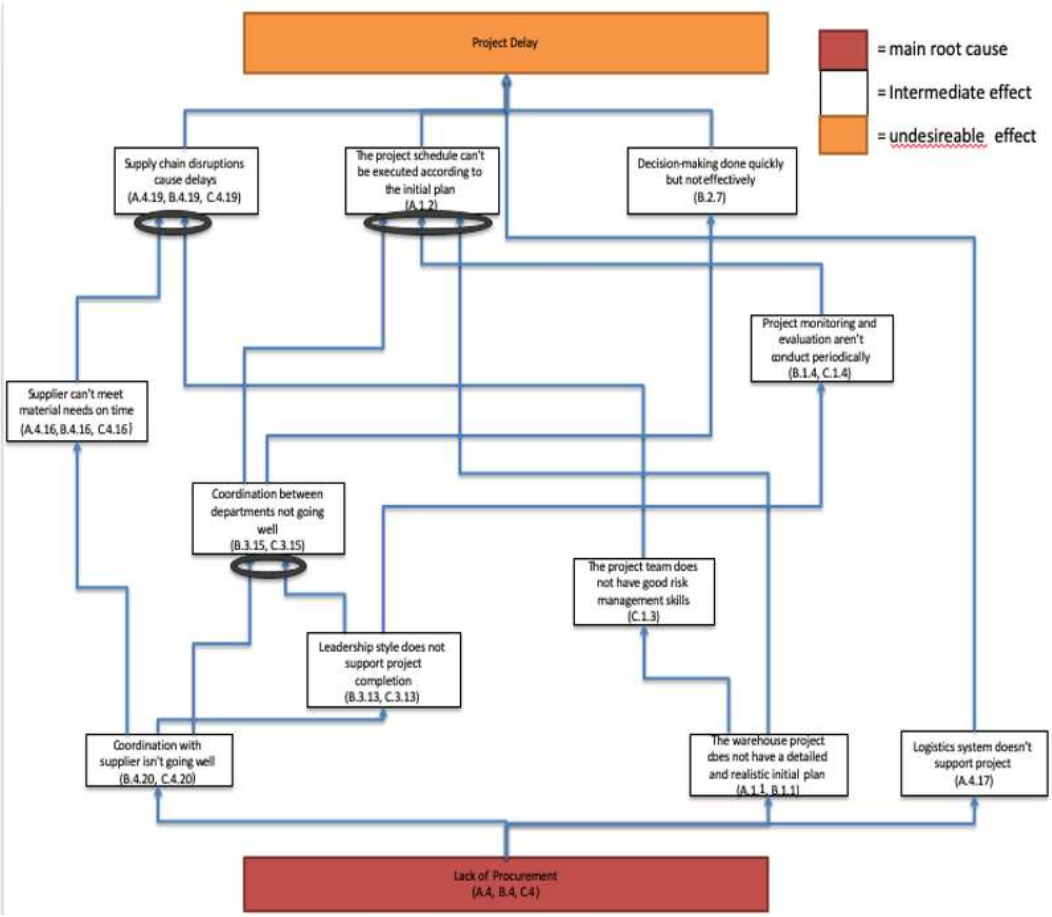

Figure 2. Current Reality Tree of the Root Cause

Source: Researcher analysis, 2025

The diagram above presents the Current Reality Tree (CRT), which illustrates the chain of causes leading to delays in the warehouse construction project at PT. WMA. Based on the analysis, the most fundamental issue identified is the lack of effective procurement management. This core problem triggers a series of interconnected issues that ultimately disrupt the entire project flow. One of the direct consequences of poor procurement is the lack of coordination with suppliers, resulting in delays in material deliveries. Additionally, the logistics system is not well-integrated, making the distribution of materials on-site inefficient. These challenges contribute to supply chain disruptions, which significantly impact project execution.

Internally, the effects of procurement issues are also evident. Poor coordination between departments, an unsupportive leadership style, and the project team's limited risk management capabilities all weaken the decision-making process. As a result, decisions are made quickly but often

lack effectiveness. Furthermore, the project suffers from the absence of a detailed and realistic initial plan, and monitoring and evaluation are not carried out regularly. These shortcomings collectively lead to a critical problem: the project schedule cannot be executed as planned, which directly causes project delays.

By analyzing this CRT, it becomes clear that addressing procurement-related problems has the potential to resolve many other issues in the project. Therefore, improving procurement processes should be a strategic priority to minimize delays and enhance overall project performance.

Proposed Solution

1. Procurement Management Framework

Procurement management is a critical element in ensuring the success of construction projects, particularly those of medium to large scale, such as the warehouse development undertaken by PT. WMA. In practice, procurement is not merely about acquiring goods and services; it represents a comprehensive strategy to manage the business relationships between the project owner and external parties (vendors or suppliers), ensuring that project requirements are met on time, within budget, and at the expected quality.

Here are the project procurement process:

1. Plan Procurement Management: The process of documenting project procurement decisions, specifying approach, and identifying potential sellers.
2. Conduct Procurement: The process of obtaining seller responses, selecting a seller, and awarding a contract
3. Control Procurement: The process of managing procurement realtionships, monitoring contract performance, makin changes and corrections as appropriate, and closing out contracts.

2. Plan Procurement Management

Plan Procurement Management is the process of documenting project procurement decisions, specifying the approach and identifying potential sellers. The key benefit of this process is that it determines whether to acquire goods and services from outside the project and, if so, what to acquire as well as how and when to acquire it. Goods and services may be procured from other parts of the performing organization or from external sources.

Table 3. Plan Procurement Management Business Solution

No	Component	Content / Description	Adjustment Based on Identified Issues	Output
1	Goods/ Services to be Procured	A list of all items and services that will be sourced externally (e.g., steel structure, foundation materials, etc.).	Create a detailed and realistic list of procurement needs to avoid poor initial planning and scheduling mismatches.	Procurement Statement of Work
2	Procurement Method	Methods such as open tender, limited tender, or direct appointment.	Use limited bidding with prequalified vendors to minimize risks of late delivery and ensure better vendor performance.	Selected Procurement Method
3	Contract Type	Contract models such as Lump Sum, Unit Price, Cost Reimbursable, or Time & Material.	Use Lump Sum for fixed scopes (e.g., structural steel), Time & Material for flexible tasks to accommodate project uncertainties.	Contract Type Document

No	Component	Content / Description	Adjustment Based on Identified Issues	Output
4	Vendor Evaluation Criteria	Criteria such as delivery time, technical capacity, price, quality, reputation, and responsiveness.	Include delivery accuracy, quality assurance, logistics capability, and supplier responsiveness for more reliable vendor selection.	Vendor Evaluation Criteria Document
5	Procurement Schedule	The timeline of procurement activities aligned with the main construction project timeline.	Align schedule with project master plan using planning software like Microsoft Project to improve accuracy and avoid slippage.	Procurement Schedule
6	Procurement Risk Identification	List of potential risks in procurement activities such as delays, budget overruns, and vendor failures.	Identify risks like material delivery failure, coordination issues, or scope misalignment; record in procurement risk register.	Procurement Risk Register
7	Risk Mitigation Strategy	Planned responses such as penalty clauses, secondary vendors, and early procurement for long-lead items.	Set buffer stocks for critical items and apply SLA with penalties to ensure vendor commitment and reduce disruptions.	Procurement Risk Response Plan
8	Required Procurement Resources	Internal personnel or teams responsible for procurement planning and execution.	Assign cross-functional team members from procurement, technical, and finance to strengthen coordination and accountability.	Procurement Roles & Responsibilities Matrix
9	Templates and Reference Documents	Standardized formats such as RFP, RFQ, vendor scoring sheets, and approved vendor list.	Use standardized RFP/RFQ formats and contract templates to streamline the process and ensure consistency across procurement activities.	Organizational Process Assets

Source: Developed by researchers based on PMBOK 6th Edition, 2025

The Plan Procurement Management process in the PT. WMA warehouse construction project is designed to address the root causes of delays experienced in past procurement activities. The first step involves clearly identifying all goods and services to be procured from external vendors. This includes detailed and realistic documentation of material requirements, which helps prevent misalignment between procurement and project execution.

To reduce risks of late delivery and poor vendor performance, PT. WMA should adopt a limited bidding approach with prequalified vendors and select the most suitable contract type based on the scope of work. For example, Lump Sum contracts can be used for fixed-scope items like steel structures, while Time & Material contracts are better suited for tasks that require flexibility.

Vendor evaluation should be based not only on cost but also on delivery capability, quality assurance, and track record. Procurement scheduling must be integrated into the overall project schedule and managed using digital planning tools like Microsoft Project to maintain accuracy and visibility.

Risk management is also embedded in the planning process through a dedicated Procurement Risk Register that identifies potential supply chain disruptions, vendor reliability issues, and coordination problems. PT. WMA is advised to prepare mitigation strategies such as maintaining buffer stock for critical items and enforcing penalty clauses through Service Level Agreements (SLAs).

Additionally, establishing a well-structured procurement team with clear roles and responsibilities enhances internal coordination and accountability. Finally, using standardized procurement templates and maintaining a reliable vendor database ensures consistency, reduces administrative errors, and speeds up the procurement cycle.

This structured and strategic approach enables PT. WMA to transition from reactive procurement to a proactive and performance-based procurement system that supports timely, cost-effective, and high-quality project delivery.

3. Conduct Procurement

Conduct Procurements is the process of obtaining seller responses, selecting a seller, and awarding a contract. The key benefit of this process is that it selects a qualified seller and implements the legal agreement for delivery. The end results of the process are the established agreements including formal contracts. This process is performed periodically throughout the project as needed.

Table 4. Conduct Procurement Business Solution

No	Component	Description	Adjustment Based on Identified Issues	Output
1	Invitation to Bid	The process of sending RFPs to selected vendors with attached proposal requirements (RFP, RFQ, ITB, etc.).	Send RFPs to verified vendors with a track record of timely delivery and responsiveness.	List of invited vendors, submitted proposals
2	Bidder Conference	Clarification meeting with vendors regarding scope and technical documents.	Host clarification meetings to avoid misunderstandings like past technical issues (e.g., racking system problems).	Minutes of meeting, list of attended vendors
3	Proposal Submission	Vendors submit technical proposals and delivery schedules.	Require vendors to submit both technical and delivery schedules for evaluation.	Proposal register, list of submitted proposals
4	Proposal Evaluation	Technical and delivery schedule analysis, scoring, and ranking.	Use a weighted system (e.g., 70% technical, 30% commercial) to avoid ineffective decision-making.	Vendor score results, proposal evaluation report, shortlist
5	Vendor Shortlisting & Selection	Select vendors based on evaluation and create shortlists.	Focus on delivery commitment, penalty clauses, and prior inspection to avoid contract failures.	Selection result, vendor shortlist, vendor notification
6	Contract Negotiation	Discussion and negotiation on technical, legal, and delivery aspects.	Finalize contract terms, penalty clauses, and delivery schedules.	Draft contract, negotiation record
7	Award Decision	Final selection of the vendor based on evaluation result.	Finalize with the best-performing vendor based on evaluation, with clearly defined criteria.	Letter of Award, vendor confirmation memo
8	Contract Finalization	Completion of legal contract documents, agreement on scope, duration, and responsibilities.	Define terms and delivery responsibilities.	Signed contract, legal documents
9	Contract Handover	Delivery of signed contract, procurement schedule, and vendor evaluation.	Handover documents to project team, update risk registers and vendor assignments.	Handover documents, risk log, vendor master list, implementation memo

Source: Developed by researchers based on PMBOK 6th Edition, 2025

The table outlines a structured procurement execution framework that focuses on the pre-award phase of vendor selection and contract finalization, which is crucial for ensuring successful project delivery. Each row represents a key step in the procurement process—from initial vendor invitations to contract finalization—paired with detailed descriptions, issue-based adjustments, and expected outputs.

The Invitation to Bid stage begins by sending RFPs (Request for Proposal) to vendors with a proven track record of timely delivery. This minimizes risks related to unreliable suppliers. The Bidder Conference phase includes clarification meetings to prevent misinterpretation of technical details or logistic challenges. During the Proposal Submission phase, vendors are required to provide both technical and delivery plans, ensuring the procurement team can evaluate feasibility and capability.

In the Proposal Evaluation step, proposals are analyzed using a weighted scoring system (e.g., 70% technical, 30% commercial) to maintain objectivity and avoid biased decision-making. This leads into Vendor Shortlisting & Selection, where the focus is on selecting vendors that not only score high but also demonstrate strong delivery commitment and reliability.

The Contract Negotiation phase solidifies terms related to timelines, penalties, and responsibilities, aimed at reducing future disputes or performance failures. This is followed by the Award Decision, where the best-performing vendor is officially selected and notified through a Letter of Award.

For the the final stages is Contract Finalization and Contract Handover this process are to ensure legal documentation is complete, roles are clearly defined, and risk logs and task assignments are documented. These steps ensure that all procurement actions are traceable and aligned with project timelines.

This structured approach enhances transparency, reduces procurement-related risks, and supports timely, informed vendor decisions, particularly relevant for complex projects such as warehouse construction at PT. WMA.

4. Control Procurement

Control Procurements is the process of managing procurement relationships; monitoring contract performance, and making changes and corrections as appropriate; and closing out contracts. The key benefit of this process is that it ensures that both the supplier and PT. WMA performance meet the project's requirements according to the terms of the legal agreement. This process is performed throughout the project as needed.

Table 5. Control Procurement Business Solution

No	Component	Description	Adjustment Based on Identified Issues	Output
1	Procurement Process & Vendor	Monitoring vendor delivery schedules, logistics coordination, and warehouse availability	Use a digital dashboard with weekly updates to monitor vendor delivery performance – addresses issues of material delay and logistics inefficiency.	Dashboard, delivery report, vendor progress report
2	Work Performance Information	Vendor delivery data, warehouse logistics schedule	Track actual vs planned delivery data and site progress related to procured items.	Data analysis, baseline vs actual report
3	Review Procurement & Payment	Vendor inspection, approval validation	Approve payments only after site inspection and progress validation to ensure compliance with contract milestones.	Payment data, inspection validation
4	Inspection & Quality Audit	Inspection of vendor materials before delivery	Conduct factory or on-site inspections prior to delivery to prevent quality issues.	Inspection form, vendor inspection report, QC report
5	Contract Change Control	Scope changes, delivery time revision, contract clause adjustment	Manage scope or timeline changes through formal change orders and proper approval channels.	Change documentation (change order),

No	Component	Description	Adjustment Based on Identified Issues	Output
				approval document
6	Claims Administration	Vendor delivery disruption, logistics failure	Log vendor claims and resolve them formally, especially those caused by external disruptions or coordination failures.	Claim log, vendor response, resolution documentation
7	Communication & Stakeholder Report	Weekly meetings, procurement-logistics-finance coordination	Hold weekly meetings with vendors and internal departments (procurement, logistics, finance) to avoid miscommunication and project misalignment.	Meeting notes, stakeholder report list
8	Vendor Risk & Issue Management	Vendor issue data, logistics risk, coordination risks	Continuously update risk log and mitigation actions to respond to newly identified issues.	Risk log, vendor mitigation report
9	Procurement Close-Out	Vendor performance documentation, final evaluation	Complete formal contract closure, including delivery acceptance, legal documentation, and final vendor evaluation.	Contract close-out report, vendor evaluation

Source: Developed by researchers based on PMBOK 6th Edition, 2025

The table above outlines a structured procurement monitoring and control system tailored to address key challenges faced in project implementation, particularly within the warehouse manufacturing context at PT. WMA. Each component in the procurement management process—ranging from vendor performance tracking to procurement close-out—has been adjusted based on issues identified during the project, such as material delays, coordination breakdowns, and quality inconsistencies.

To ensure vendor reliability, a digital dashboard is utilized for real-time monitoring of delivery performance, helping detect delays early and manage logistics risks. The analysis of work performance information compares actual delivery progress against planned schedules, providing clear visibility on procurement bottlenecks. Payment approval is conditioned on site inspections and milestone validations, which enforces discipline and ensures vendor compliance with contractual obligations.

Inspections and quality audits are conducted both at vendor sites and on delivery locations to prevent substandard materials from entering the project workflow. Contract change control procedures are formalized to manage scope or delivery changes with documented approval pathways, reducing scope creep and disputes. Vendor-related claims are logged and resolved through a structured claims administration mechanism, ensuring accountability and timely resolution of issues.

Regular communication and coordination meetings among stakeholders, including procurement, logistics, and finance teams, are held to avoid misalignment and ensure smooth project execution. Vendor risk and issue management practices involve continuously updating risk logs and taking proactive mitigation measures to address any emerging threats. Finally, the procurement close-out phase ensures that all contractual obligations are met, documentation is completed, and vendor evaluations are conducted to inform future engagements.

This integrated and proactive procurement approach not only increases transparency but also enhances decision-making, reduces risks, and supports timely project delivery—offering a valuable framework for overcoming project delays and inefficiencies observed at PT. WMA.

CONCLUSION

This research succeeded in identifying the main factors causing the delay in the warehouse project at PT. WMA, which is a lack of effectiveness in procurement management. Based on the root cause analysis using the Current Reality Tree (CRT), the main problems stem from indetailed procurement planning, weak coordination with suppliers, and lack of ongoing monitoring. As a solution, this study proposes the implementation of a Procurement Management Framework based on PMBOK 6 which includes three main stages: planning, implementation, and control. By implementing this framework, PT. WMA is expected to improve the timeliness, quality, and overall performance of the project. Based on the findings of the research, it is suggested that PT. WMA immediately adopted a pre-designed procurement management framework, starting with the preparation of a more detailed and realistic procurement plan. In addition, it is necessary to form an integrated procurement team with clear roles and responsibilities, as well as utilize digital monitoring tools to monitor supplier performance in real-time. Training related to risk management and interdepartmental coordination also needs to be improved. For further research, it is recommended to test the implementation of this framework on real projects and evaluate its impact on time and cost efficiency.

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