

PROJECT PROPOSAL

PROJECT TITLE : FNBN Engineering Store Inventory Management System

PROJECT MANAGER : Muhammad Syazwan bin Nazri

EXECUTIVE SUMMARY

The Store Inventory Management System (SIMS) is designed to streamline and digitize the management of spare parts within an industrial or maintenance environment. The system addresses key operational challenges such as inefficient inventory tracking, manual procurement processes, and lack of real-time visibility across departments. This project involves four primary user roles, Admin, Storekeeper, Procurement Officer, and Maintenance Technician, each with specific functions that ensure smooth coordination between inventory management, procurement, and maintenance operations. The Admin oversees system configuration, manages user access through role-based authentication, and maintains master data including parts, suppliers, and assets. The Storekeeper manages daily warehouse operations such as receiving, issuing, and tracking spare parts, supported by barcode-based validation and real-time stock monitoring. The Procurement Officer handles the purchasing cycle, including generating requisitions, managing suppliers, and tracking purchase orders. Meanwhile, the Maintenance Technician interacts with the system to request and issue spare parts for maintenance tasks, ensuring traceability and accountability. The SIMS also integrates key functionalities such as automated low-stock alerts, cycle counting, real-time dashboards, and comprehensive audit logs, all of which enhance data accuracy and operational transparency. Additionally, the system produces analytical reports on stock levels, valuation, and usage trends, empowering management to make data-driven decisions. By implementing this solution, organizations can expect to reduce downtime caused by part shortages, eliminate redundant manual work, and improve procurement efficiency, ultimately leading to better maintenance planning, cost control, and overall productivity.

PROBLEM STATEMENT

In many industrial and maintenance environments, managing spare parts inventory remains a major operational challenge. Traditional manual systems, often relying on spreadsheets or paper-based records, lead to inaccurate stock information, delayed procurement processes, and inefficient coordination between departments. As a result, organizations face frequent issues such as stockouts, overstocking, loss of traceability, and extended equipment downtime due to unavailability of critical spare parts.

Furthermore, the absence of an integrated system to link inventory, procurement, and maintenance operations causes data duplication, poor visibility, and limited accountability in spare parts usage and replenishment. Storekeepers struggle to maintain up-to-date records, procurement officers lack timely insights into low-stock alerts, and maintenance technicians face delays in obtaining required parts for repairs.

Without real-time tracking and automation, management also encounters difficulties in generating accurate reports and monitoring stock valuation, supplier performance, and usage trends. These inefficiencies not only increase operational costs but also impact the reliability of maintenance activities and overall productivity.

Therefore, there is a critical need for a centralized Store Inventory Management System that can integrate all aspects of spare parts handling, from storage and tracking to procurement and reporting, ensuring accuracy, traceability, and efficiency in the entire workflow.

GOAL

The goal of this project is to develop a centralized Store Inventory Management System (SIMS) that streamlines the processes of inventory control, procurement, and maintenance support. The system aims to improve operational efficiency, ensure real-time visibility of spare parts availability, and enhance coordination between different roles involved in maintenance and supply chain management.

OBJECTIVES

1. To design a digital platform that automates spare parts tracking, receiving, and issuing processes using barcode technology for improved accuracy.
2. To implement a role-based access control (RBAC) system that defines specific user permissions for Admins, Storekeepers, Procurement Officers, and Maintenance Technicians.
3. To integrate procurement functionalities such as purchase requisition, order management, and supplier records for better purchasing control.
4. To enable real-time stock monitoring and alert notifications for low-stock or critical spare parts to prevent shortages and unplanned downtime.
5. To generate analytical and traceability reports that support management decision-making and auditing processes.
6. To improve collaboration and communication between departments involved in maintenance and material management through a unified digital interface.

OUTCOMES

1. A fully functional Store Inventory Management System that supports CRUD operations for parts, suppliers, assets, and storage locations.
2. Improved inventory accuracy through automated barcode validation and real-time stock updates.
3. Reduced procurement delays through system-generated requisitions, purchase order tracking, and supplier management.
4. Enhanced accountability and transparency in spare parts usage via audit trail logs and role-based user actions.
5. Comprehensive reporting and dashboard insights that provide key performance indicators (KPIs) for stock valuation, movement, and consumption trends.
6. Optimized maintenance efficiency and cost savings through better planning, reduced stockouts, and data-driven decision-making.

NEEDS, APPROACH, BENEFITS, COMPETITOR (NABC)

Elements	Description
Needs	<ul style="list-style-type: none">● Centralized Inventory Control – Many organizations lack a unified platform to manage spare parts, leading to redundant records, lost items, and inefficient stock control.● Real-Time Stock Visibility – Maintenance and procurement teams need up-to-date information on stock levels to prevent delays and unexpected shortages.● Automated Procurement Workflow – Manual processes in purchase requisitions and order tracking are time-consuming and prone to errors.● Traceability and Accountability – A digital system is required to track user activities, part movement, and stock adjustments for transparency and audit purposes.● Data-Driven Decision Making – Management requires accurate analytical reports on spare part usage, valuation, and supplier performance for informed planning.
Approach	<ul style="list-style-type: none">● System Development Using Modern Tools – The SIMS will be developed using a combination of Flutter (for the front-end mobile interface) and Firebase (for the back-end database and authentication).● Role-Based Access Control (RBAC) – Each actor (Admin, Storekeeper, Procurement Officer, Technician) will have access only to relevant modules and functions.● Integration of Barcode Scanning – Barcode generation and validation will be implemented for part identification, receiving, and issuing.● Procurement and Inventory Linkage – Automated alerts for low stock will trigger purchase requisition workflows for timely replenishment.● Data Visualization and Reporting – The system will include dashboards and reports to display KPIs such as stock levels, movement trends, and audit logs.
Benefits	<ul style="list-style-type: none">● Improved Efficiency – Automation of stock management and procurement processes reduces manual workload and operational delays.● Accurate and Real-Time Data – Users gain instant visibility into inventory levels, part status, and pending requests.● Reduced Costs and Downtime – Optimized stock control prevents overstocking and shortages, leading to cost savings and continuous operation.● Enhanced Accountability – Audit trails and user-based actions ensure transparency and traceability in all inventory transactions.

	<ul style="list-style-type: none"> • Better Decision Making – Analytical dashboards support performance monitoring, budget planning, and procurement forecasting. • Cross-Department Collaboration – The unified system improves communication between maintenance, storekeeping, and procurement teams.
Competitor	<ul style="list-style-type: none"> • SAP MM (Material Management Module) – A comprehensive enterprise-level solution offering advanced inventory and procurement features but costly and complex for small organizations. • Oracle NetSuite Inventory Management – Cloud-based system with strong analytics but requires high implementation costs and technical expertise. • Odoo Inventory Management – Open-source ERP module providing inventory and procurement integration but lacks deep customization for maintenance operations. • Fishbowl Inventory – Focused on warehouse management for SMEs; provides good stock control but limited in procurement workflow automation. • Zoho Inventory – Affordable and cloud-based but primarily suited for sales inventory rather than maintenance and spare parts management.

TEAM MEMBERS AND ROLES

Bil	Name	Roles	Description
1	Muhammad Syazwan bin Nazri	Project Manager & System Analyst	Requirement analysis, documentation, testing, and project coordination
2	Ammar Ibrahim bin Mohamed	Backend Developer & Database Engineer	Backend logic, Firebase integration, data management, and security
3	Irfan Danial Leong Bin Muhammad Shariff Leong	Frontend Developer & UI/UX Designer	UI design, Flutter development, barcode integration, and user experience optimization

USE CASE DIAGRAM

