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Property Office Management Digitalization for a Government – Owned and Controlled Corporation

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Abstract.

Introduction. In an era defined by rapid technological advancement, digital transformation has become essential for both public and private institutions striving for efficiency, transparency, and accountability. In the Philippine public sector, the need for effective asset and inventory management has become increasingly urgent as agencies align with the goals of the Philippine Development Plan 2023–2028. This capstone project introduces the development of a Property Office Management Digitalization for a Government Owned and Controlled Corporation (POMD) intended for the Property/Procurement/Building and Transport Maintenance Section (PPBTMS) of the Sugar Regulatory Administration (SRA), a government-owned and controlled corporation tasked with regulating the country's sugar industry.

Currently, the SRA relies on outdated manual systems for managing its fixed assets, including office equipment, laboratory instruments, and vehicles. These legacy methods often result in data inaccuracies, inefficient workflows, and audit challenges. The proposed web-based and mobile-accessible system offers a centralized platform to accurately record, update, and monitor property information in real-time, thereby addressing longstanding operational inefficiencies.

Through the integration of modern digital tools and best practices in asset management, the system aims to improve property lifecycle tracking, enhance compliance with government auditing standards, and support better decision-making. The project underscores the broader relevance of digitalization in public governance and contributes to the ongoing efforts to modernize government services through innovative, scalable, and sustainable technological solutions.

Product Descriptions. The POMD is a web-based and mobile-responsive application developed to support the asset and property management functions of the Property/Procurement/Building and Transport Maintenance Section (PPBTMS) of SRA. The system enables streamlined, real-time tracking and monitoring of fixed assets, including office equipment, laboratory tools, vehicles, and furniture. It features modules for asset registration, maintenance scheduling, depreciation tracking, and inventory reporting compliant with Commission on Audit (COA) requirements.

Designed with role-based access controls, user-friendly dashboards, and support for barcode and QR code integration, POMD reduces the administrative burden of manual inventory systems while improving accuracy, accountability, and efficiency. The implementation of this digital solution supports the Philippine government's digital transformation initiatives by enhancing transparency and operational performance in public resource management.

System Features. The Property Office Management Digitalization for a Government Owned and Controlled Corporation (POMD) application offers a suite of integrated features that address the key challenges faced by property personnel, particularly in inventory tracking, audit compliance, and operational oversight. Key functionalities include asset registration and cataloging, real-time tracking via QR code scanning, user role management, automated report generation, and maintenance reporting. Additionally, the system supports mobile device access, enabling on-site verification and field operations. By leveraging digital technologies to streamline core asset management processes, POMD enhances data accuracy, reduces administrative burden, and ensures alignment with the standards of the Commission on Audit (COA). The system supports the Philippine government's digital transformation agenda and presents a scalable solution for modernizing public resource management practices.

External Interface Requirements. This system features a user-friendly interface encompassing a secure login screen, centralized landing page with dashboard visualizations, and dedicated modules for key asset documentation processes such as the Inspection and Acceptance Report (IAR), Inventory Custodian Slip (ICS), Property Acknowledgment Receipt (PAR), Requisition and Issue Slip (RIS), and Waste Materials Report (WMR). Each module is tailored to address specific asset tracking and accountability requirements, ensuring accurate data entry, real-time updates, and archival capability for scanned documents. The system architecture integrates both hardware and software interfaces: a Linux-based server environment supports backend operations, while client access is enabled via major web browsers on various operating systems. Hardware connectivity is achieved through high-speed Ethernet and fiber-optic backbones, while communication interfaces such as routers, switches, and wireless access points support reliable network operations. To safeguard data integrity and system functionality, a Sophos firewall appliance is deployed for robust network security. Collectively, the POMD system enhances efficiency, transparency, and accountability in public asset management by leveraging digital solutions aligned with national modernization initiatives.

Other Nonfunctional Requirements. Non-functional requirements define the quality attributes of a system, encompassing how it performs rather than what it does. Key performance requirements address system responsiveness, throughput, latency, reliability, scalability, and resource efficiency, ensuring a seamless user experience and sustained operational integrity. The safety and security requirements establish protocols to prevent harm and protect data through access controls, authentication mechanisms, encryption, and compliance with relevant regulations such as the Data Privacy Act of 2012. Furthermore, the system is evaluated based on critical software quality attributes—reliability, performance, scalability, maintainability, usability, and portability—each assessed through relevant metrics to ensure consistent quality throughout the software lifecycle. Finally, comprehensive testing requirements are articulated to validate system completeness, traceability, risk management, and non-functional performance. Collectively, these non-functional specifications ensure that the POMD system is robust, secure, scalable, and capable of meeting institutional and user expectations.

Project Management. This study presents the hardware and software infrastructure recommendations essential for the successful implementation of the Property Office Management Digitalization (POMD) for a Government-Owned and Controlled Corporations (GOCCs). The proposed configuration ensures a robust, secure, and scalable platform to support real-time asset monitoring, inventory control, and property accountability both in-office and in the field. Key hardware components include enterprise-grade servers, standardized workstations, rugged mobile devices, and secure network

infrastructure, all optimized for cost-efficiency and sustainability. On the software side, the recommendation emphasizes open-source, low-maintenance solutions such as Linux-based server operating systems, MySQL for data management, and web technologies like Laravel, Django, or Node.js for backend services. Client-side applications and tools are selected to ensure compatibility, usability, and security across varying user roles. The integration of these technologies aligns with government digital transformation policies, reduces operational costs, enhances data accuracy, and improves audit compliance. These recommendations serve as a blueprint for resource-conscious, secure, and future-ready deployment of digital property management systems in the public sector.

Summary. This project presents the development and implementation of The Property Office Management Digitalization for a Government Owned and Controlled Corporation (POMD) for Sugar Regulatory Administration, aimed at replacing traditional manual processes with a streamlined digital platform. The system is designed to enhance transparency, accountability, and operational efficiency in property administration, in alignment with government regulations and Commission on Audit (COA) guidelines. Key functionalities include automated property issuance, transfer, inspection, disposal, and reporting, with centralized asset tracking and real-time inventory reporting. By minimizing human error and reducing reliance on paperwork, the system significantly improves data accuracy and supports faster, more informed decision-making. This project underscores the agency's commitment to digital governance and efficient public resource management, contributing to broader e-governance objectives within the public sector.

Recommendations. Following the successful pilot implementation of the Property Office Management Digitalization for a Government Owned and Controlled Corporation (POMD) system, this project recommends its formal adoption and scaling to enhance asset management efficiency, accountability, and regulatory compliance within government offices. Key recommendations include institutionalizing the system through official policy, conducting comprehensive user training and capacity building, and integrating POMD with existing government platforms to ensure scalability and seamless data exchange. Additionally, structured data migration of historical records and rigorous audit compliance reviews are advised to uphold standards set by the Commission on Audit (COA). Establishing a robust monitoring and evaluation framework will facilitate ongoing performance assessment and continuous improvement. Finally, the system’s potential for wider adoption across various government agencies is highlighted, emphasizing its role in advancing digital governance and operational excellence in the public sector.

Chapter I
INTRODUCTION

Background of the Study

Digital technology has been commonplace since the advent and adoption of personal computers and the Internet. However, the ability to adapt and maximize its full potential has been a challenge. Digital technology empowers growth and modernization. Keeping abreast with technology means businesses, private or public, are on track and par with present and future trends (UN75, 2023). Digitalization in business is a necessary endeavor for them to thrive in the modern digital landscape. In the public sector, government agencies across the globe are striving to enhance efficiency, accountability, and transparency in resource management. One of the critical components of this endeavor is the implementation of robust inventory systems to oversee and optimize the use of public assets. These systems are pivotal in ensuring that governments meet the growing demands of citizens

while adhering to principles of good governance. The ASEAN (Association of Southeast Asian Nations) region, with its dynamic economies and diverse governance systems, has shown varying levels of progress in inventory and asset tracking across its member states. As governments aim to modernize their operations, the importance of effective inventory management and asset tracking has grown significantly. These systems are critical for ensuring accountability, optimizing resource use, and supporting sustainable development goals (ADM, 2025).

In consonance with the present Administration's Philippine Development Plan 2023 – 2028, the Digital transformation of government will result in more efficient and faster service delivery to the people, more transparency, and fewer opportunities for corruption at various levels. Digitalization can also help the government build better data systems to create better programs and services for the masses (PDP, 2023).

The Sugar Regulatory Administration (SRA), created through Executive Order No. 18 s1986, being a government-owned and controlled corporation, oversees the orderly system of sugarcane production, establish and maintain sugar production balance and requirement, promote merchandising of sugar and its by-products and take relevant studies in the implementation of action programs for the sugarcane industry (EO18, 1986). At SRA, particularly in the Property/Procurement/Building and Transport Maintenance Section (PPBTMS), the current process of managing equipment, furniture, and other fixed assets relies heavily on manual documentation, spreadsheets, or outdated systems. These practices often lead to challenges such as inaccurate records, asset misplacement, delayed audits, and difficulties in tracking the lifecycle and location of property.

Property and fixed assets—such as office equipment, laboratory tools, vehicles, and IT infrastructure—are long-term investments essential to the organization’s daily functions. Unlike consumable inventory items, these assets require systematic monitoring due to depreciation, maintenance requirements, and institutional policies related to accountability and ownership.

Recognizing the limitations of the current system, this capstone project proposes the design and implementation of an inventory management system specifically tailored for the property and fixed assets of Sugar Regulatory Administration. The system aims to provide a centralized platform where all asset-related data can be accurately recorded, updated, and retrieved in real-time.

Technologies such as AI, machine learning, blockchain, and IoT have shown potential to revolutionize inventory and asset management, their application in the government context remains underexplored (IDR 2024). Research is needed to assess the feasibility, scalability, and ethical implications of deploying these technologies in government agencies. Furthermore, property and assets management come with its own challenges that can affect efficiency, financial performance and operation workflows (Schwertner, 2021). Among the challenges include: asset tracking and record accuracy; organizing and managing assets; technological integration; vendor and supplier coordination; and, lifecycle and replacement planning. Addressing these challenges is paramount to this project as it will answer pressing issues faced by personnel of PPBTMS in performing their daily tasks.

Digitalization is reimagining core business processes in the digital age. It leverages cutting-edge technologies such as cloud computing, artificial intelligence, IoT, and data analytics to streamline operations (Swanson, 2018). Developing a digital application as a support tool for the PPBTMS personnel will enhance employee efficiency and produce realistic and accurate periodic reports, thus resulting in improved service delivery to its clientele.

1.1. Purpose

The goal of this project is to develop an online, web – based information system, called POMD (Property Office Management Digitalization for GOCCs), that will digitalize, streamline and optimize the manual inventory processes by leveraging the latest technology that provides a comprehensive, accessible and user – friendly platform. Key goals include:

1.1.1. Automate the tracking and management of fixed assets to minimize human error, maintain accurate and up-to-date inventory records, and enhance the reliability of reporting, thereby supporting informed decision-making by management;

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1.1.2. Enable remote access to property data, allowing authorized users to view and manage inventory information from any location at any time, improving operational flexibility and responsiveness;

1.1.3. Streamline administrative processes associated with property management, freeing up personnel of the PPBTMS to focus on strategic initiatives and client services rather than manual data entry and record keeping;

1.1.4. Integrate advanced reporting and analytics tools to support employees and management in identifying usage patterns, forecasting resource needs, and optimizing inventory turnover for better resource allocation;

1.1.5. Design an intuitive and user-friendly interface to accommodate users with varying levels of technical expertise, promoting ease of use, quick adoption, and minimal training requirements;

1.1.6. Implement robust security protocols to safeguard sensitive inventory and asset data, ensuring confidentiality, integrity, and system resilience against unauthorized access or data breaches.

1.2. Technical Review of Related Systems

1.2.1. Automated Warehouse Management System

This study explores how implementing an automated warehouse management system (WMS) can improve inventory management and overall supply chain performance by reducing resource use and increasing efficiency and reliability. Conducted in the warehouse of a major telecommunications provider in Jordan, the study involved analyzing existing processes, customizing and testing software to streamline workflows, and redesigning the facility layout to include a production station for bundling, labeling, and repackaging. The system supported three key product lifecycle phases—receiving, processing, and distributing SIM and prepaid cards—while identifying and addressing process gaps. The findings offer a practical example for comparing automated and manual inventory systems and underscore the need for adaptable solutions to manage supply chain disruptions (Anas et al., 2018).

1.2.2. Effectiveness of Systems Applications and Products (SAP) Business One

The study evaluated the effectiveness of using an accounting system for inventory management at CPAC Monier Phils. Inc., focusing on its relationship with business productivity and inventory management features. It examined six productivity factors—collaboration, business insight, flexibility, usability, familiarity, and transactional efficiency—and five inventory features such as accuracy, timely reporting, and forecasting. Data were collected via surveys and reports, and analyzed using descriptive statistics, chi-square tests, and statistical tools. The findings concluded that the system is effective and recommended measures like system initialization, user training, reliable backups, strong internet, and customized reports for improved performance (Legazpi, 2019).

1.2.3. UBRPIS

This study used a quantitative descriptive research design to examine the processes involved in using the University of Baguio Requisition, Procurement, and Inventory System (UBRPIS), which automates inventory management. It assessed employee familiarity with the system, identified its limitations, and proposed improvements. While most respondents were familiar with the system's processes, many also reported issues, particularly with barcode placement and lack of non-consumable items. The study recommends investing in a more suitable inventory management system and conducting regular staff training to address these challenges (Odasco, 2023).

1.2.4. e-AIMSS

This capstone project developed an efficient electronic property inventory system for school assets, aiming to optimize resources and ensure fair access for all students. Using the ISSO framework and a waterfall model, the system underwent alpha and beta testing, with its effectiveness evaluated through a t-Test. Results showed that real-time monitoring improved custodianship and digitalization enhanced reliability, efficiency, and usability compared to manual methods. The study highlights the system's benefits for stakeholder engagement, communication, and transparency, and suggests its potential for wider use in e-government applications (Ahmad, 2023).

1.2.5. Web – based Inventory Management System

This software project developed a web-based inventory management system for a small business in Pagadian City, Zamboanga del Sur, to help the owner manage inventories more efficiently and conveniently. The business, which includes four branches and a mobile store, previously relied on a manual, paper-based system that caused data inaccuracies and process inefficiencies. The new system automated inventory tasks by enabling electronic data recording, processing, and report generation through a web platform. As a result, the project significantly improved the business's overall operations and addressed the key challenges of the manual system (Tanaman, 2023).

1.2.6. Inventory Management and Sustainability in Agri - Retail

The study by Gonzaga, Galan, and Mahinay (Gonzaga, 2022) investigated the role of inventory management in promoting sustainability among agri-products retailers in Panabo City. It found that effective inventory strategies significantly impact stock availability, spoilage reduction, financial efficiency, and business continuity. The research emphasized the value of modern inventory systems tailored to the unique challenges of the agricultural sector, such as perishability and demand fluctuations. These findings support the development of context-specific inventory models for managing fixed assets and perishable goods in similar settings.

Studies/Research	Report Generation	Interactivity	Security	Features
Automated Warehouse Management System	Limited flexibility	Interactivity is primarily confined to asset recording tasks, reflecting a simplistic approach.	Captures only a subset of data, leaving gaps in the backup and restore procedures.	Information is typically presented in a static format without analysis.
Systems Applications and Products Business One	Limited flexibility	Interactivity is primarily confined to asset recording tasks, reflecting a simplistic approach.	Captures only a subset of data, leaving gaps in the backup and restore procedures.	Information is typically presented in a static format without analysis.
UBRPIS	Limited flexibility	Interactivity is primarily confined to asset recording tasks, reflecting a simplistic approach.	Captures only a subset of data, leaving gaps in the backup and restore procedures.	Information is typically presented in a static format without analysis.

e-AIMSS	Limited flexibility	Interactivity is primarily confined to asset recording tasks, reflecting a simplistic approach.	Captures only a subset of data, leaving gaps in the backup and restore procedures.	Information is typically presented in a static format without analysis.
Web-Based IMS	Limited flexibility	Interactivity is primarily confined to asset recording tasks, reflecting a simplistic approach.	Captures only a subset of data, leaving gaps in the backup and restore procedures.	Information is typically presented in a static format without analysis.
Inventory Management and Sustainability in Agri-Retail	Limited flexibility	Interactivity is primarily confined to asset recording tasks, reflecting a simplistic approach.	Captures only a subset of data, leaving gaps in the backup and restore procedures.	Information is typically presented in a static format without analysis.
POMD Application	The intuitive interface allows users to interact with the system more naturally and flexibly.	A customizable dashboard feature within a software application allows users to personalize and configure the layout.	Full data backup and audit trail provide comprehensive coverage, ensuring all relevant data is backed up regularly and securely.	Advanced analytics and algorithms to analyze vast amounts of data, identify patterns, trends, correlations, and derive actionable insights

1.3. Project Scope

The scope of this Project is to develop Property Office Management Digitalization for Government Owned and Controlled Corporation (POMD for brevity), a web – based online information system that covers the property management function of PPBTMS. The system encompasses receipt of assets and supplies to inventory taking up to asset disposal. It does not cover the complete cycle of acquisition of goods, services, and infrastructure projects, as these are covered by separate laws, rules, and regulations. Building Maintenance is also excluded from the project primarily because there is an insufficient need to digitalize the process and procedures in this area.

1.3.1. Data Capture Forms. These data capture forms include Inspection and Acceptance Report (IAR), Requests and Issue Slip (RIS), Inventory Custodian Slip (ICS) and Property Acknowledgment Receipt (PAR)

1.3.2. Actual Inventory Taking. Manual recording of Property Tags and numbers during inventory taking.

1.3.3. Reports Preparation. Generating detailed reports on inventory data such as Reports on the Physical Count of Properties, Plant, and Equipment (RPCPPE) and Reports of Semi-Expendable Property Issued (RSPI).

1.3.4. Users. The primary users of the proposed system is the Property Custodian who performs encoding and printing of reports; and the Supply Officers who verifies inventory data and performs actual inventory taking;

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Chapter II
PRODUCT DESCRIPTION

2.1. Product Perspective and Key Features

The POMD is designed as a standalone but integrative web-based (or desktop-based, depending on the platform) application intended to streamline the recording, tracking, updating, and auditing of an organization's physical assets and property holdings. It serves as a centralized platform that replaces traditional manual tracking methods—such as spreadsheets or paper logs—offering improved data accuracy, accessibility, and operational efficiency.

2.2. Operating Environment

The operating environment refers to the integrated set of hardware, software, and supporting infrastructure that provides the necessary foundation for the execution, management, and functioning of application systems. It encompasses physical components such as servers, computers, networking equipment, and storage devices, as well as software elements including operating systems, middleware, system utilities, and databases. Together, these components create the technical ecosystem in which application software runs and interacts with users and other systems.

A stable and well-configured operating environment is crucial for ensuring that applications perform reliably, securely, and efficiently. It supports key system functions such as memory allocation, process scheduling, file management, and device control. Moreover, the operating environment also includes external dependencies like cloud services, APIs, firewalls, and security protocols that enable applications to scale and operate in distributed or networked environments.

In the context of system development—especially for POMD —understanding the operating environment is vital during the planning and deployment phases. This ensures compatibility between the application and the existing infrastructure and helps define requirements for hosting, maintenance, security, and system integration. Any mismatch or inadequacy in the operating environment can lead to performance bottlenecks, system errors, or security vulnerabilities, thereby affecting the overall effectiveness of the system being implemented.

2.3. Design and Implementation Constraints

The development of an property inventory management system can have several design and implementation constraints that need to be considered to achieve the desired results, such as effectiveness, scalable, and intuitive application systems.

2.4 Assumptions and Dependencies

Several key assumptions and dependencies must be considered to ensure the software's effectiveness and reliability. It is assumed that users will input consistent, reliable, and updated data; that they possess basic skills in using computers or mobile devices; that the network infrastructure will remain stable with minimal downtime; and that the system will be scalable to accommodate a growing volume of inventory records. Additionally, the project depends on the availability and maintenance of adequate hardware infrastructure (such as servers, storage, and network equipment), stable and supported software components including third-party libraries, frameworks, APIs, and database systems, as well as strong project management practices to ensure the system is delivered on time, within budget, and meets quality standards.

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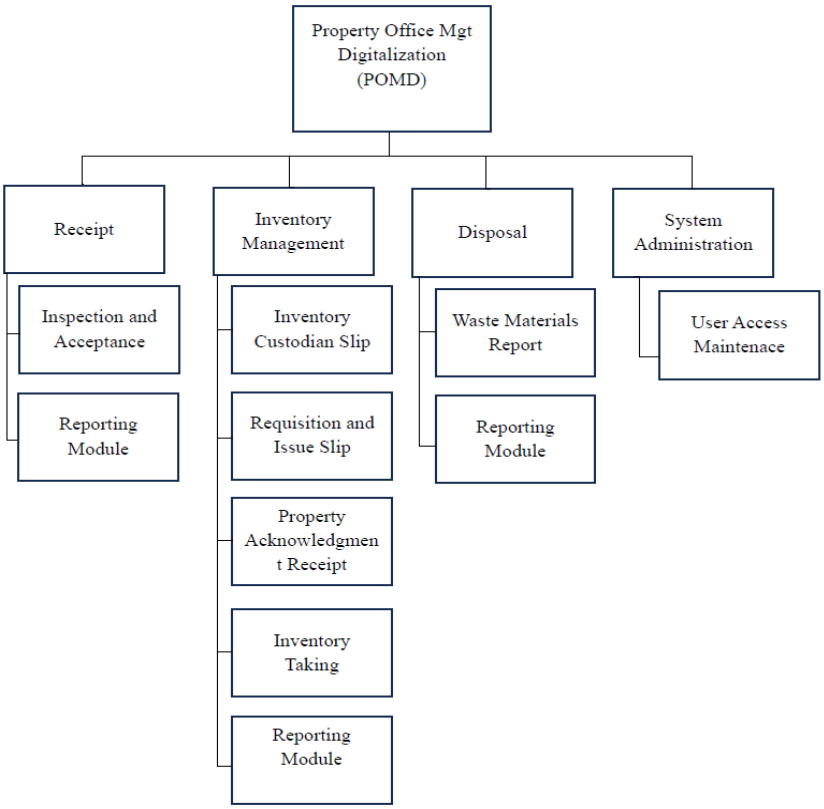
Chapter III
SYSTEM FEATURES

3.1. System Decomposition

Decomposing the system into subsystems will reduce the complexity of the software application project. Decomposition also breaks down critical aspects of system design, enabling the breakdown of complex systems into smaller, more manageable modules or components. Each module encapsulates a specific functionality, data, or behavior of the system, and modules are designed to interact with each other through well-defined interfaces (Geeks, 2024).

Figure 1
System Decomposition Diagram



The above figure shows a decomposed **POMD** application into several sub-modules, each with its own set of functionalities. The Receiving Module is where inventory data is first captured (inventory-in). The Management Module is designed to process the encoded inventory data for assignment to intended users. The Inventory Disposal module will take up inventory data that will be properly disposed of (inventory-out).

3.2. System Functionalities

The Property Office Management Digitalization (POMD) is a software application designed to automate the manual inventory transactions of PPBTMS. It features an interactive, intuitive, and portable interface that operates in a multi-user environment using the latest technology. Key functions include stock management across various SRA offices, supplier database management with detailed

supplier records, QR code integration for efficient property tagging and inventory tracking, and mobile access with role-based user management for convenient system access via mobile devices, tablets, or laptops.

3.2.1. Inspection and Acceptance Report (IAR)

The IAR module allows the Property Custodian to input and verify item details such as quantity, unit price, description, and amount, using supporting documents like the Sales Invoice and Delivery Receipt. Once completed, the IAR is forwarded to the end-user for the formal acceptance of goods or services.

3.2.2. Inventory Taking

This module facilitates the actual verification of assets to ensure their presence and condition, complying with Commission on Audit requirements. It involves checking data against the Property Acknowledgment Receipt records, including assets like buildings, vehicles, and equipment. To streamline the process, each property will have a QR-coded tag linked to its database record, allowing for online and offline inventory capabilities. The outcome is documented in the Report on Physical Count of Property/Plant/Equipment (RPCPPE).

3.2.3. Inventory Custodian Slip (ICS)

The ICS is prepared after the end-user accepts goods valued between P5,000 and below P50,000. The Property Custodian encodes the necessary data and prints four copies for payment, user acknowledgment, and record-keeping within the PPBTMS system.

3.2.4. Request and Issue Slip (RIS)

This form is used when end-users request consumable supplies such as office or laboratory items. Once received by the Property Custodian, these items are promptly released to the requesting party. Since consumables are charged to the MOOE, they are not included in the inventory records.

3.2.5. Property Acknowledgment Receipt (PAR)

The PAR is issued for goods with unit costs of P50,000 or more and is used to officially record the receipt of assets by end-users. When property custody changes—due to retirement, resignation, or transfer—the original PAR is canceled, and a new one is issued to the new recipient.

3.2.6. User Enrolment

This submodule handles the addition of new users into the system and allows for the updating of login credentials, such as password changes, ensuring user authentication and access control.

3.2.7. Maintain Database

Database maintenance includes essential tasks like backup, data integrity checks, performance tuning, storage, and security management. The system uses MySQL and requires a scheduled daily backup at 6 PM to a designated location for data protection.

3.2.8. Set User Access

This feature enables the web administrator to define access privileges for users based on their roles. Users can only interact with the modules relevant to their duties, ensuring data security and proper workflow segregation.

3.2.9. Reports

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Only authorized personnel, such as Supply Officers III and IV, can access the reporting module, which generates COA-compliant reports like the Physical Count of Property, Semi-Expendable Properties Issued, and Waste Materials. These reports undergo manual verification by the Supply Officer to ensure data accuracy.

3.2.10. Waste Materials

The Waste Materials Report (WMR) is used to officially document and dispose of obsolete or unusable items under a custodian's charge. The report includes item descriptions, quantities, and disposal methods (e.g., sale or destruction), formalizing asset write-offs.

3.2.11. Inventory Transfer Report

This module generates standardized, printable Inventory Transfer Reports to document the official transfer of property between custodians or departments. The report details item specifications, transfer dates, custodians, and includes required signatures, with access limited to authorized roles for audit purposes.

Chapter IV
EXTERNAL INTERFACE REQUIREMENTS

4.1. User Interfaces

The User Interface (UI) is the primary interaction point between users and the POMD system, designed to be intuitive and user-friendly through elements like buttons, icons, and menus. Accessing the system requires entering a specific IP address or URL in a browser, followed by authentication using a username and password. Successful login directs users to the landing page, while incorrect credentials prevent access.

4.1.1. Landing Page

The landing page serves as the main dashboard of the POMD system, displaying key data such as Comparative Annual Total PPE values and per-employee issued PPE totals. It includes a left-hand menu offering access to core system functions such as IAR, ICS, PAR, WMR, Gate Pass, and listings of inventory items and suppliers.

4.1.2. Inspection & Acceptance Report

The Inspection and Acceptance Report (IAR) records the verification of received items, confirming their quantity and quality. It is signed by both the inspection officer and the property officer. Additionally, the Inventory Custodian Slip (ICS), also discussed here, is used for items under ₱50,000 in value, establishing accountability for long-life, serviceable goods issued to end-users.

4.1.3. Inventory Custodian Slip

The ICS is used for tracking tangible items with over a one-year lifespan and under ₱50,000 in value. It ensures accountability through sequential numbering and includes item-specific details such as quantity, description, and estimated useful life. ICS records are maintained until items are disposed of due to wear or obsolescence.

4.1.4. Property Acknowledgement Receipt

The Property Acknowledgement Receipt (PAR) documents the issuance of property and equipment to end-users and supports digital archival by accepting scanned documents in formats like PDF or JPG, promoting record accuracy and ease of retrieval.

4.1.5. Requisition and Issue Slip UI

The RIS interface allows offices to request and issue items carried in stock, detailing critical information such as RIS number, preparation date, item descriptions, quantities, purposes, and the identities of personnel involved in the request, approval, receipt, and issuance processes.

4.1.6. Waste Materials Report

The Waste Materials Report (WMR) is used to document and dispose of obsolete or damaged assets previously recorded in the books. It is processed by the Supply/Property Custodian and endorsed by the Section Head to the Disposal Committee for proper handling and derecognition from the organization's accounting records.

4.1.7. Inventory Transfer Report

This module manages and records asset transfers between employees or departments. It captures detailed data on the items and personnel involved in the transfer, supports dynamic item entry, and includes approval fields, thus enhancing transparency and accountability during inventory movements.

4.1.8. Reports

The Reports module provides access to the Report on the Physical Count of Property, Plant, and Equipment (RPCPPE), categorized by account codes such as Land. Users can scroll through detailed data for each asset type, with full access provided through the dedicated RPCPPE module in the system.

4.2. Hardware Interface

The hardware interface in the POMD system is essential for enabling seamless communication between various hardware components and the computer system. It ensures smooth data, command, and signal transfers, allowing devices to operate together efficiently.

4.2.1. Server Computer

The server computer, or data server, is a key hardware element that facilitates communication with connected devices or networks. As noted in the hardware environment section, these servers are designed for high-speed data transfers and low latency, making them suitable for medium to enterprise-level applications.

4.3. Software Interface

The software interface defines how different software systems, applications, or components interact through shared methods, data formats, and protocols. It ensures seamless communication within and across systems. In the POMD setup, server computers use the Linux operating system, while workstations can operate on Windows or iOS, depending on hardware compatibility. Mobile access is supported on Windows, Android, or iOS devices. Since the application is web-based, it is compatible with major browsers like Chrome, Edge, Safari, and Firefox

4.4. Communication Interface

The communication interface enables data exchange between systems, devices, or components, serving as the medium through which information is transmitted and interpreted. It plays a vital role in ensuring interoperability and efficient communication within both simple and complex networks.

4.4.1. Routers, Modems, Switches and Network Interface

Ethernet is the primary communication medium among on-site workstation computers at SRA, with servers utilizing high-speed options like Gigabit or 10 Gigabit Ethernet for large data transfers. Fiber optic cables form the on-premise backbone, providing long-distance, high-bandwidth transmission with minimal signal loss. Unmanaged switches and multiple access points support connectivity between workstations, wireless devices, and server computers, ensuring seamless communication across the network.

4.4.2. Network Security Platform

To safeguard servers, workstations, and the local network, a Sophos firewall appliance is used. This integrated security solution protects against threats, intrusions, and unauthorized access, offering comprehensive network defense and ensuring secure communication across all connected devices.

Chapter V
OTHER NON – FUNCTIONAL REQUIREMENTS

Other non – functional requirements refer to the criteria that describe how a system operates, rather than the specific behaviors or functions it performs. These requirements outline the quality attributes of a system and are critical for ensuring that it meets user expectations and operates effectively within its environment.

5.1. Performance Requirements

This section describes the ability of a system, such as a computer, network, or software application, to perform its functions efficiently and effectively. It encompasses several key aspects, including:

- **5.1.1.** *Speed*: The POMD should respond and completes tasks or processes data efficiently.
- **5.1.2.** *Throughput*: The POMD defines how much work the system can handle in a given time period.
- **5.1.3.** *Latency*: The POMD application addresses the delay between an input or request and the corresponding output or response.
- **5.1.4.** *Reliability*: The POMD system's consistency in functioning without failures
- **5.1.5.** *Scalability*: The POMD system should be capable to handle increased load or demand without performance degradation.
- **5.1.6.** *Resource Usage*: The POMD application addresses efficiently the system uses resources such as CPU, memory, and bandwidth.

Enhanced system performance ensures that users experience quick, seamless, and reliable interactions with the system, which is critical for productivity, user satisfaction, and overall system functionality.

5.2. Safety and Security Requirements

This section outlines essential non-functional requirements aimed at ensuring the system operates safely and remains secure from threats. Safety focuses on preventing accidental harm to users and infrastructure, while security addresses protection against unauthorized access and data breaches—both are vital for the reliable and protected operation of the system.

5.2.1 Safety Requirements

Safety requirements ensure the system functions without endangering users or the environment by identifying hazards, implementing fail-safe mechanisms, defining operational limits, and establishing safe shutdown procedures in case of failure. It also includes preventive hardware

measures, such as installing UPS and AVR systems, to protect the servers from power surges and fluctuations during setup.

5.2.2. Security Requirements

Security requirements aim to maintain data integrity, confidentiality, and availability by enforcing access control using middleware, securing data transmission through HTTPS, and implementing strong authentication and authorization protocols in the Laravel framework. Additionally, the system includes threat detection methods like input validation and aligns with data protection laws, such as the Data Privacy Act of 2012.

5.3. Software Quality Attributes and Metrics

Software quality attributes and metrics are essential aspects of software engineering that help ensure the system meets user expectations and performs well under various conditions. Quality attributes define non-functional requirements of a system, while metrics are quantifiable measures used to assess these attributes. Below is a discussion on key software quality attributes and associated metrics:

- **5.3.1. Reliability** - Reliability refers to the ability of software to perform its required functions under specified conditions for a given period.
- **5.3.2. Performance** - Performance describes how quickly and efficiently a system responds to user actions or processes data
- **5.3.3. Scalability** - Scalability is the system's capacity to handle an increasing amount of work or its potential to be enlarged to accommodate growth
- **5.3.4. Maintainability** - Maintainability refers to the ease with which a system can be modified to fix defects, improve performance, or adapt to changes
- **5.3.5. Usability** - Usability is the degree to which the software is easy to learn, use, and provides a satisfactory user experience.
- **5.3.6. Portability** - Portability is the ease with which software can be transferred from one environment to another.

Each software quality attribute plays a crucial role in ensuring that a software system is reliable, efficient, secure, and user-friendly. Metrics associated with these attributes provide a structured way to measure and improve software quality throughout the development lifecycle. Proper attention to both attributes and metrics leads to more maintainable, robust, and satisfying software for users and stakeholders

5.4. Testing Requirements

Testing requirements is a critical phase in the software development life cycle that ensures all specified requirements are verifiable and complete. Here are the key tasks that should be performed during testing requirements stage:

- **5.4.1. Requirements Review**: To ensure requirements are clear, complete, consistent, and feasible for each module and sub – modules of the system;
- **5.4.2. Requirements Traceability**: To maintain a connection between requirements and test cases for coverage.
- **5.4.3. Validation of Non-Functional Requirements**: To verify that non-functional requirements (e.g., performance, usability, security) are clearly defined;
- **5.4.4. Risk Analysis**: To identify potential risks in meeting the requirements and mitigating them.

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5.4.5. Requirement Completeness Check: To confirm all aspects of the product are covered by the requirements

Chapter VI
PROJECT MANAGEMENT

6.1. Hardware Recommendation

Recommended Server Requirements

The recommended server setup for on-premises or hybrid deployment prioritizes reliability, performance, and scalability. It should be an enterprise-grade, rack-mounted or tower server with a powerful multi-core processor (e.g., Intel Xeon Silver or AMD EPYC), at least 16 GB ECC RAM, and a storage setup that includes a 1 TB SSD for the OS and a 2 TB HDD for data, preferably in RAID 1 or 5 for redundancy. Dual Gigabit Ethernet ports ensure stable networking, while a Linux server OS like Ubuntu LTS or CentOS is advised. For data protection, a NAS with cloud sync or external backups is recommended, along with an online UPS providing at least 30 minutes of power backup.

Recommended Workstation Requirements

The recommended workstation requirements for in-office users—such as property officers, administrative staff, and IT personnel—are tailored to ensure smooth daily operations. These include a modern Intel Core i5 or AMD Ryzen 5 processor, at least 8 GB of DDR4 RAM, and a 256 GB SSD for fast performance. A 21.5" Full HD monitor is suggested for clear viewing, and either Windows 10/11 Pro or Ubuntu Desktop may be used as the operating system. Reliable connectivity, whether through wired Ethernet or Wi-Fi, is also essential.

Recommended Mobile Device Requirements

The recommended mobile device requirements for field personnel or supply officers focus on ensuring reliable performance during property verification, asset tagging, and mobile data entry. Suggested devices include Android smartphones/tablets (Android 11+) or iOS devices (iOS 15+), with at least an octa-core processor, 4 GB RAM, and 64 GB storage. Key features include 4G LTE, Wi-Fi, Bluetooth connectivity, a 4000 mAh battery for extended use, and a 12 MP or better camera for scanning and documentation. Optional tools like a protective case, power bank, and Bluetooth barcode scanner are also advised.

Network Infrastructure

A secure and efficient network infrastructure is critical for smooth operations. It should feature a managed 24-port Gigabit switch for centralized control and scalability, along with an enterprise-grade router that includes firewall, VPN, and access control for secure connectivity. Dual-band enterprise-grade Wi-Fi access points with roaming support are recommended to maintain seamless wireless coverage. To support high-speed data transfer and future expansion, structured LAN cabling using CAT6 or higher, along with patch panels, should be implemented.

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6.2. Software Recommendation

Server – Side Software

The server-side software for the POMD application should run on a secure Linux environment like Ubuntu Server LTS or CentOS Stream. It will use Apache or NGINX as the web server and PostgreSQL or MySQL for database management. Backend services can be built with frameworks such as Laravel, Django, or Node.js. Security features include SSL/TLS encryption via Let's Encrypt, regular backups using tools like Duplicity or rsync, and protection against unauthorized access with UFW and Fail2Ban.

Client-Side Software (Workstations)

For desktop or laptop users, the system should run on Windows 10/11 Professional or Ubuntu Desktop for broad compatibility. Access should be through Google Chrome or Mozilla Firefox, with LibreOffice or Microsoft Office used for document processing. PDF files can be viewed using Adobe Acrobat Reader or built-in browser tools. Security should be handled by Windows Defender or an open-source antivirus, and remote support can be provided via AnyDesk or TeamViewer.

Mobile Device Software

For mobile access and field inventory tasks, devices should run Android 11+ or iOS 15+ and use responsive browsers like Chrome or Safari. Asset tag scanning can be done with apps like QR Droid, NeoReader, or the built-in camera. For file sharing, tools like Google Drive, OneDrive, or internal FTP apps are recommended.

Development and Maintenance Tools

The recommended software stack is composed of widely supported, secure, and cost-effective tools, most of which are open-source and require minimal licensing. These tools collectively support the operational and technical requirements of POMD, promote long-term sustainability, and align with the Philippine government’s push for digital transformation and efficient public resource management.

6.3. User Classes and Characteristics

User Classes

User roles in the system are defined as follows: the System Administrator manages system settings, user accounts, backups, and security; the Property Officer handles asset management, including data entry and inventory tracking; the Supply Officer oversees supply receipt, issuance, and record updates; End-Users or Accountable Officers view and confirm asset records; and IT Support Staff provide technical support, system updates, and troubleshooting.

User Characteristics

User characteristics differ by role and skill level: System Administrators have high technical skills and full access; Property Officers have moderate to high skills with admin or user-level access for asset management; Supply Officers have moderate skills for inventory tasks with similar access levels; End-Users or Accountable Officers have basic skills and view-only access to assigned assets; and IT Support Staff possess high technical skills with admin access limited to technical support and maintenance.

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6.4. Product Feasibility Assessment

This section presents an assessment of the feasibility of developing and implementing the POMD. The goal is to determine whether the proposed solution is viable in terms of technical capacity, cost, user adoption, and operational sustainability.

6.4.1. Technical Feasibility

The POMD system is technically viable due to the availability of mature web technologies, open-source platforms, and proven frameworks. It will use modern programming languages, be hosted on Linux servers, and accessible via browsers and mobile devices. The system is scalable, adaptable, and maintainable with existing infrastructure and trained IT support.

6.4.2. Economic Feasibility

The system is cost-effective, with low development and deployment costs compared to commercial software. Expenses include one-time development, minimal licensing, occasional hardware, and training. Long-term benefits include reduced paperwork, improved audits, and high ROI.

6.4.3. Operational Feasibility

The system fits well into daily operations of property and supply officers, enhancing efficiency, especially through mobile access. Staff are prepared for adoption with minimal training. It integrates with current workflows and supports audit and compliance requirements.

6.4.4. Legal and Regulatory Feasibility

POMD complies with national IT policies, COA guidelines, and the Data Privacy Act of 2012. It ensures secure, encrypted data handling and access through role-based permissions, making it legally safe for government use.

6.4.5. Schedule Feasibility

The system can be completed in 4 to 6 months, covering requirements gathering, development, testing, training, and rollout. The timeline is practical and aligns with available resources.

6.4.6. Overall Feasibility

The POMD project is feasible across all dimensions and contributes to government digitalization efforts. It is expected to improve transparency, efficiency, and accountability in managing assets and supplies.

6.5. Time Management Plan

The successful implementation of the **POMD** requires careful scheduling and time allocation across project phases. This time management plan outlines the proposed timeline, milestones, and resource commitments to ensure timely delivery.

6.5.1. Project Duration

The project will proceed through several phases over a structured timeline. It begins with a one-week Initiation and Planning phase, followed by two weeks each for Requirements Gathering and System Design. The Development phase will take six to eight weeks, then two weeks for Testing and Quality Assurance. Training and Documentation will also take two weeks, after which the system will be deployed in one week. The project concludes with a one to two-month Post-Deployment Support phase for updates and user assistance.

6.5.2. Time Management Strategies

Time management for the project will use Agile-inspired sprints with weekly progress meetings and built-in one-week buffer periods between key phases to manage risks. Continuous documentation will help reduce end-phase workload. With this structured approach and consistent stakeholder communication, the project aims to be completed within 4 to 6 months.

6.6. Communication, Coordination, and Team Composition Plan

To ensure the successful development and implementation of the POMD, a well-structured communication and coordination plan is essential. This plan outlines the communication channels, reporting structures, and roles of each project team member.

6.6.1. Team Composition

The project team consists of key roles including a Project Manager, IT Lead/Systems Analyst, Developers, QA/Testers, a Property Office Representative, and Trainers/Support Staff. Each member has defined responsibilities—from managing the project and ensuring technical alignment, to development, quality assurance, domain validation, training, and post-deployment support—to ensure successful project delivery.

6.6.2. Communication Plan

The communication plan outlines structured interactions such as a project kickoff meeting, weekly status updates, and milestone reviews to maintain alignment and transparency. Feedback mechanisms like user surveys and focus groups are used post-rollout, while technical issues are tracked via reports or ticketing systems. A final review wraps up the project, summarizing results, lessons learned, and project closure.

6.6.3. Coordination Strategy

The project will use a centralized dashboard for real-time task and status tracking, with defined escalation protocols for managing issues efficiently. Each team will have a single point of contact to streamline communication, and all key documents will be stored in a shared repository. Clear communication, structured team roles, and active stakeholder engagement will support timely and transparent project delivery.

Chapter VII
SUMMARY AND RECOMMENDATION

7.1. Summary

The Property Office Management Digitalization for a Government Owned and Controlled Corporation project is a digitalization initiative developed to streamline and modernize the asset and inventory management operations of the Property/Procurement/Building & Transport Maintenance Section of Sugar Regulatory Administration. This system replaces traditional manual processes with an integrated, user-friendly digital platform designed to enhance transparency, accountability, and efficiency in property administration.

Developed in alignment with government regulations and property accountability standards, the system automates key functions such as property issuance, transfer, inspection, disposal, and reporting. It provides centralized tracking of assets, generates real-time inventory reports, and ensures compliance with the Commission on Audit (COA) guidelines. By reducing paperwork and minimizing human error, the system improves the accuracy of records and expedites decision-making.

The project was conceived in response to the growing need for digital governance and improved public resource management. Its implementation demonstrates the government's commitment to operational excellence and digital innovation, supporting broader e-governance goals across public institutions.

7.2. Recommendation

The successful pilot of the Property Office Management Digitalization (POMD) system suggests it should be formally adopted and expanded to enhance efficiency, accountability, and compliance in government asset management. Several key recommendations are provided to support its institutionalization and effective use.

7.2.1. SRA Management

To standardize usage, the office should issue a formal memorandum or administrative policy mandating the use of POMD for all property and inventory-related tasks across departments.

7.2.2. End-Users, Property Custodians, and Supply Officers

Training must be provided to all relevant personnel through comprehensive onboarding, hands-on workshops, and periodic refresher courses to ensure consistent and effective use of the system.

7.2.3. Property, Budget, and Finance Supervisors

Integrating POMD with existing procurement, budget, and accounting systems will streamline operations and data flow. The system should also be designed for scalability to accommodate future upgrades or expanded use.

7.2.4. Internal Audit Personnel

A verified data migration process should be implemented to digitize and transfer historical records. Internal auditors must ensure that system outputs and functionalities comply with COA standards and reporting requirements.

7.2.5. Planning and Policy Department, including ICT Personnel

Given its potential for broader government use, the POMD could be proposed for adoption by other agencies or LGUs, supported through partnerships with oversight and IT service bodies for wider deployment.

Final Recommendation

Overall, adopting and maintaining the POMD system is vital for advancing operational efficiency, minimizing audit risks, and fostering digital governance. With appropriate training, policy backing, and integration efforts, the system can become a scalable public sector asset management solution.

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