BUSINESS PROCESS REENGINEERING AND ERP SYSTEM PROPOSAL FOR PROCUREMENT AND INVENTORY MANAGEMENT USING ODOO IN THE FACILITIES DEPARTMENT OF YOGYAKARTA INTERNATIONAL AIRPORT

UNDERGRADUATE THESIS

Submitted to the International Undergraduate Program in Industrial Engineering in Partial Fulfilment of the Requirements for the Degree of Sarjana Teknik at the Faculty of Industrial Technology
Universitas Islam Indonesia

Name : Emad Abdulrahman Abdullah Hasan Mashrah
Student Number 21522379

UNDERGRADUATE PROGRAM IN INDUSTRIAL ENGINEERING
FACULTY OF INDUSTRIAL TECHNOLOGY
UNIVERSITAS ISLAM INDONESIA
YOGYAKARTA
2025

AUTHENTICITY STATEMENT

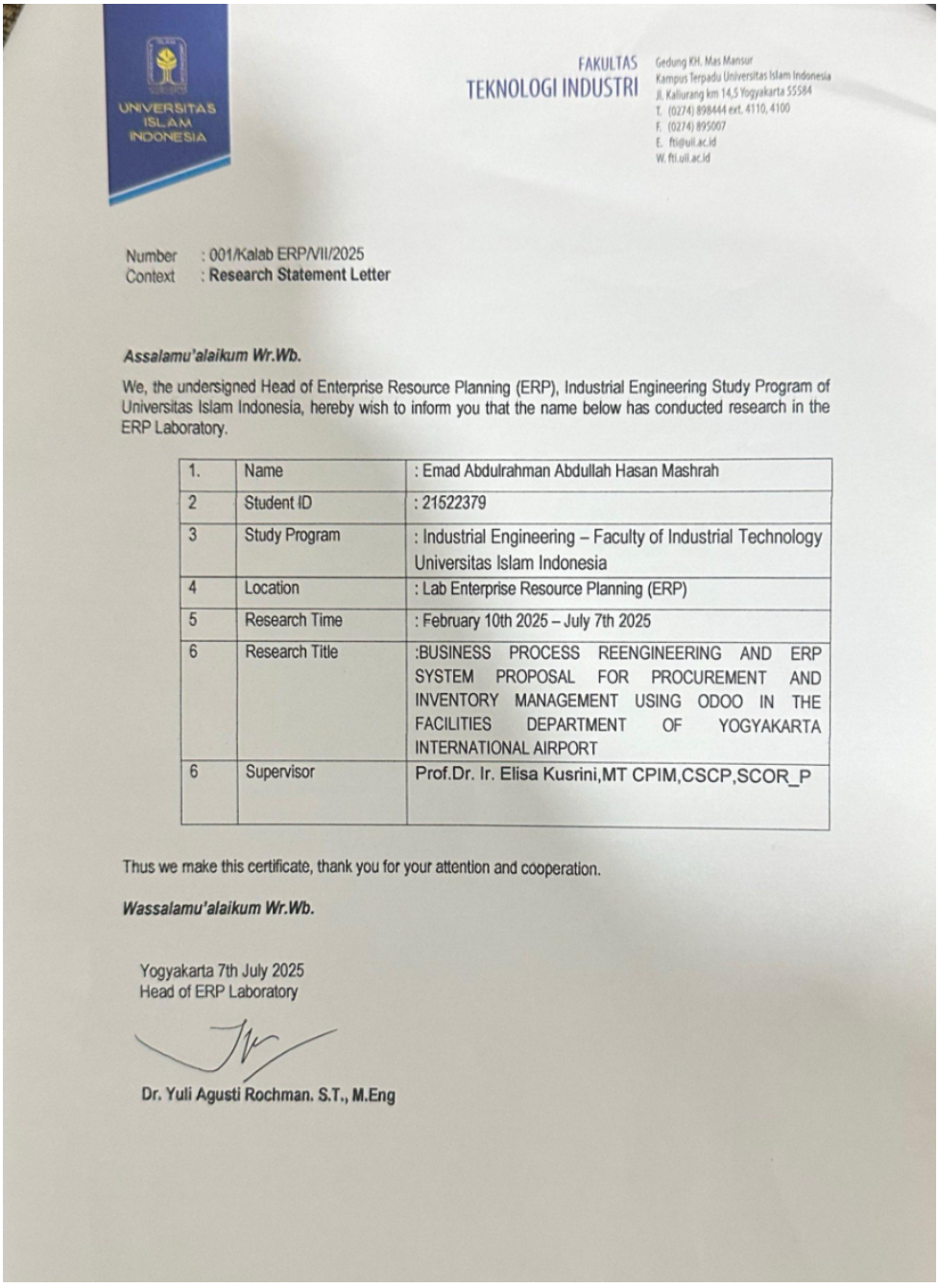
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Yogyakarta, July 5, 2025



Emad Abdulrahman Abdullah Hasan Mashrah
21522379

RESEARCH COMPLETION LETTER



UNIVERSITAS ISLAM INDONESIA

FAKULTAS TEKNOLOGI INDUSTRI

Gedung KH. Mas Mansur
Kampus Terpadu Universitas Islam Indonesia
Jl. Kaliurang km 14,5 Yogyakarta 55584
T. (0274) 898444 ext. 4110, 4100
F. (0274) 895007
E. fti@uii.ac.id
W. fti.uii.ac.id

Number : 001/Kalab ERP/VII/2025
Context : **Research Statement Letter**

Assalamu'alaikum Wr.Wb.

We, the undersigned Head of Enterprise Resource Planning (ERP), Industrial Engineering Study Program of Universitas Islam Indonesia, hereby wish to inform you that the name below has conducted research in the ERP Laboratory.

1.	Name	: Emad Abdulrahman Abdullah Hasan Mashrah
2	Student ID	: 21522379
3	Study Program	: Industrial Engineering – Faculty of Industrial Technology Universitas Islam Indonesia
4	Location	: Lab Enterprise Resource Planning (ERP)
5	Research Time	: February 10th 2025 – July 7th 2025
6	Research Title	:BUSINESS PROCESS REENGINEERING AND ERP SYSTEM PROPOSAL FOR PROCUREMENT AND INVENTORY MANAGEMENT USING ODOO IN THE FACILITIES DEPARTMENT OF YOGYAKARTA INTERNATIONAL AIRPORT
6	Supervisor	Prof.Dr. Ir. Elisa Kusrini,MT CPIM,CSCP,SCOR_P

Thus we make this certificate, thank you for your attention and cooperation.

Wassalamu'alaikum Wr.Wb.

Yogyakarta 7th July 2025
Head of ERP Laboratory

Dr. Yuli Agusti Rochman. S.T., M.Eng

SUPERVISOR APPROVAL SHEET

BUSINESS PROCESS REENGINEERING AND ERP SYSTEM PROPOSAL FOR PROCUREMENT AND INVENTORY MANAGEMENT USING ODOO IN THE FACILITIES DEPARTMENT OF YOGYAKARTA INTERNATIONAL AIRPORT

UNDERGRADUATE THESIS

Written by:

Name : Emad Abdulrahman Abdullah Mashrah

Student Number : 21522379

Yogyakarta, 5 July 2025

Supervisor,

Prof. Elisa Kusrini Ir. M.T.

EXAMINERS' APPROVAL PAGE

Business Process Reengineering And ERP System Proposal For Procurement and Inventory Management Using Odoo In The Facilities Department Of Yogyakarta International Airport

UNDERGRADUATE THESIS

Written by:
Name : Emad Abdulrahman Abdullah Hasan Mashrah
Student Number : 21522379

Has been defended before the board of examiners in partial fulfilment of the requirement for a Bachelor Degree in Teknik Industri at the Faculty of Industrial Technology Universitas Islam Indonesia

Yogyakarta, July 16, *2025*

Board of Examiners

Prof. Dr. Ir. Elisa Kusrini, M.T.	
Chairman	
Ir. Bambang Suratno, S.T., M.T., Ph.D	
Member I	
Dr. Yuli Agusti Rochman, S.T., M.Eng.	
Member II	

Acknowledged by,
Head of Undergraduate Program in Industrial Engineering
Faculty of Industrial Technology
Universitas Islam Indonesia

Ir. Muhammad Ridwan Andi Purnomo, S.T., M.Sc., Ph.D., IPM

DEDICATION PAGE

I dedicate this work to my dear parents, who were the light in my darkness and the support when my steps faltered. To those who instilled patience in me, bestowed immeasurable love, and made priceless sacrifices. Without them, these pages would never have been written, nor would this dream have touched reality. I dedicate it to my brothers and sisters, who were a shadow walking with me and a heart that consoled me without my asking. To my companions on the path, my companions of fatigue and long nights, those who shared my confusion and laughter, my falling and rising, and who left an indelible mark on my heart. To everyone who believed in me when I doubted, lifted me up when I was weak, and pushed me to continue when I stumbled. This research is written not only in my name, but in the name of everyone who was part of this journey.

MOTTO

We will be what we want one day, the journey has not begun, nor has the path ended

Mahmoud Darwish

PREFACE

Alhamdulillah, all praise and gratitude are due to Allah SWT for His countless blessings and guidance, enabling the author to complete this undergraduate thesis entitled **Business Process Reengineering and ERP System Proposal for Procurement and Inventory Management Using Odoo In The Facilities Department of Yogyakarta International Airport**. This thesis was prepared as one of the requirements for completing the Bachelor's Degree in Industrial Engineering at Universitas Islam Indonesia. The journey to complete this work was filled with challenges, learning experiences, and invaluable support from many people.

On this occasion, the author would like to express deep gratitude to:

1. My beloved parents, for their endless love, prayers, and encouragement throughout this journey.
2. Prof. Dr. Ir. Elisa Kusrini, M.T., as the thesis advisor, for her continuous guidance, constructive feedback, and encouragement.
3. Ir. Bambang Suratno, S.T., M.T., Ph.D., pre-defense examiner, for his valuable suggestions that helped improve the quality of this work.
4. Dr. Yuli Agusti Rochman, S.T., M.Eng., final defense examiner, for his insightful evaluation and recommendations.
5. Mrs. Devy Nurrahmah, S.Kom., academic staff of the International Program in Industrial Engineering, for her support and assistance.
6. All staff of the Facilities Department at Yogyakarta International Airport, for their cooperation and valuable data provided during this research.
7. All individuals who supported the author, both morally and technically, until the completion of this thesis.
8. The amazing lecturers of the International Program in Industrial Engineering, for their knowledge and guidance throughout the study period.
9. My international classmates (Bichara & Mahdi), who have been companions and motivators during the years of study.
10. The "Laki-Laki" group for being the heart of many unforgettable memories, laughter, and support.

The author realizes that this thesis is far from perfect and welcomes constructive suggestions and feedback for improvement. It is sincerely hoped that this thesis will contribute positively to academic knowledge and practical applications in ERP and supply chain management.

ABSTRACT

Manual procurement and inventory processes in large organizations have the tendency to be inefficient and inaccurate, thereby creating the problems associated with them. This study discusses how Odoo, an open-source ERP solution, can be implemented in the Yogyakarta International Airport (YIA) in terms of procurement and inventory systems, applying the Waterfall methodology. The study starts by highlighting the major operational issues in the Facilities Department of YIA, followed by the shortfalls of the existing manual operations that utilize Word, Excel, and WhatsApp to perform the given operational tasks. The study presents the Odoo ERP system that has the capacity to satisfy these operational needs. It outlines the steps of rolling out the procurement and inventory modules. Under the Waterfall methodology, the research identifies the following steps such as observations, interviews, gap analysis, BPMN model, and repeated improvement using the feedback given by users. The project, applied to YIA, led to the high efficiency of procurement, real-time tracking of inventory, and the automated periodical reporting of data, which greatly lessened the manual workups. The results highlighted the need for user training and customization as a success factor in ERP adoption. Based on the study, it can be concluded that the implementation of Odoo ERP can bring significant improvements to its operations at YIA and can even be used to help understand how to implement better efficiency, accuracy, and decision-making within comparable organization environments

Keywords: ERP, Inventory, Odoo, Procurement, Supply Chain, Waterfall

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CHAPTER 1
INTRODUCTION

1. Background

As mentioned by Agrawal and Narain (2018), effective supply chain management (SCM) is crucial for organizations that strive to be competitive in the current hyper-competitive, conditionally globalized market. According to them, leveraging technologies such as cloud computing and big data in the digital transformation of SCM brings in improvements in visibility, decision making, and efficiency (Agrawal, P., & Narain, R., 2018).

Supply chain management (SCM) stands as an essential business factor that enables products and service delivery alongside informational flow among suppliers and customers. An efficient supply chain system makes companies achieve cost reductions while improving product quality and customer satisfaction, as described by (Christopher M. 2021). Through effective SCM, organizations can optimize their inventory management, thus they can fulfill customer requirements while avoiding costly inventory imbalances. A company's competitiveness grows through SCM because it enables shorter delivery times alongside reduced lead times and enhanced operational flexibility. Business continuity and growth need an agile and responsive supply chain because worldwide markets continue integrating throughout the economy.

Integrated ERP-based information systems enhance business operations to yield cost-effective operations and better decision-making according to R. Al Aziz, F. Amalia, and A. Hendra Brata (Purwanto, H., 2019). Leaders can use the system to make decisions while lowering their operational costs. It produces better business relationships.

Business operations need Enterprise Resource Planning (ERP) systems as a necessary tool to optimize both workflow processes and supply chain management effectiveness. Firdaus, Puspitasari, and Lubis (2019) explain how ERP systems unite different business operations into one platform that improves data availability and enhances coordination in real time. Organization success in inventory management and logistics improvement stems from the integrated features, which reduce operational problems as well as mistakes. ERP systems improve supply chain response time to market changes through decision-making enhancement and automated task processes, and supply chain overview. The availability of up-to-date,

identical information to all stakeholders is possible through ERP systems, resulting in more accurate market predictions alongside cost reduction, and superior customer service. (Firdaus, S. K., Puspitasari, W., & Lubis, M. 2019)

The Yogyakarta International Airport stands in Kulon Progo district at 40 kilometers from Yogyakarta city center in Central Java province of Indonesia. The airport features vital operations by connecting domestic, national, and international flights while providing broad-based support for the local traveler and tourism industries. Through its capacity design, YIA serves as a facility to serve both increasing passenger traffic and expanding cargo activities across Central Java.

The establishment of YIA in 2020 transformed Adi Sucipto International Airport into the leading airport for the Yogyakarta region. The establishment of this airport delivered a modern design with one terminal divided into international and domestic areas, together with advanced features for optimized airport operations. The facility enjoys advanced technology that facilitates operations for airport-wide passenger and cargo processing as well as overall facilities administration. YIA works toward establishing its position as a regional transport hub, which will deliver enhanced connectivity and superior services intended for both visitors and business professionals.

YIA plays a strategic role in developing regional economic growth because it supports Yogyakarta tourism and operates as a pathway leading to various parts of Indonesia. Adaptability combined with operational efficiency needs to remain the priority at YIA since it operates as a fast-growing international transportation facility for expanding passenger volumes and increased flight requirements.

The Yogyakarta International Airport relies on its facilities department as a vital component to achieve smooth operational efficiency. The airport infrastructure maintains its condition through the dedicated department, which ensures periodic maintenance and repairs of every physical element from terminals to runways and baggage handling systems, and parking areas. The airport depends on proper facility maintenance since it helps ensure operational safety and shortens periods of inactivity and system disruptions, which impact passenger travel and cargo transit.

Procurement management stands as a primary duty of the facilities department. Acquisition of materials, together with tools and equipment for daily operations, represents another duty of this department. Procurement responsibilities for the facilities department

include providing timely delivery of necessities such as office supplies, cleaning materials, machinery spare parts, and construction materials, among others. Establishing efficient procurement operations maintains a constant supply, so operational disruptions from shortages and delays can be prevented along with their additional costs.

The facilities department maintains an essential function for inventory management in the organization. The monitoring and maintenance of vital resources inventory should include spare parts, together with machinery and repair tools necessary for maintenance operations. Real-time inventory tracking enables the maintenance of constant critical supply levels, thus preventing operational delays at the airport. Through supply usage monitoring, the department defends against supply excesses, which saves costs and optimizes resource allocation.

When it comes to operating Yogyakarta International Airport infrastructure properly, the Facilities Management Department stands as the vital operational unit. However, the department faces several operational challenges that hinder its efficiency. The main operational problem starts now procurement begins. Team members currently use a Word document for manual entry of necessary items before seeking manager approval, then transferring the list through WhatsApp to Angkasa Pura Support and suppliers. Although straightforward, this process runs through several stages, which remain manual. This manual approach requires extended time and contains various errors during processing, which results in delayed approvals and misunderstandings among participating groups. The lack of automation and a centralized procurement system not only slows down operations but also increases the likelihood of costly mistakes.

The inventory management system operating at the airport causes ongoing difficulties for users. Because of the current system, the department depends on a manual Excel spreadsheet tracking for its warehouse inventory. The traditional spreadsheet approach of stock management causes both time losses and an increased chance of mistakes. The team operates poorly when material counts are not captured in real-time because it leads to inaccurate inventory monitoring and keeps them unaware of stock deficiencies or excess stock. A lack of consistent methods during resource management creates unnecessary costs through increased delays, which result in higher expenses.

The reporting process at the department requires substantial improvements because the current method creates multiple issues. The workforce at the facility enters Excel manually each day to produce reports. Employees must spend significant time on daily report generation since

they need to perform extremely repetitive data entry procedures, which do not support strategic decision-making. The implementation of this manual process produces both speed concerns and reliability problems that result in problems maintaining data accuracy and recentness. The manual reporting process creates problems for the department by decreasing its ability to make timely data-driven decisions, thus affecting performance when responding to operational needs.

The research focuses on resolving supply chain operational problems at Yogyakarta International Airport. Since the author's internship there, one of the workers was interviewed, and a survey was conducted as well. The results indicated that manual handling in procurement takes more time and can sometimes lead to misunderstandings. Regarding inventory, they are unaware of the exact locations of some tools, resulting in random placement. Consequently, they do not have an accurate count of the tools, which can lead to shortages and necessitate new purchases, a process that also requires time. Therefore, the research proposes implementing an Enterprise Resource Planning (ERP) system that functions as a strategic tool to create automated processes while achieving operational and supply chain efficiency in the Facilities Management Department at Yogyakarta International Airport. The implementation of an ERP system will enhance airport procurement procedures while minimizing inventory errors through automated reporting, thus creating better resource management and financial benefits, and decision quality improvements. The research builds connections between supply chain management principles and ERP systems, which ultimately enhances operational performance to fulfill expanding airport operational targets.

1.1 Problem Formulation

Based on the background of the research that has been explained, we can formulate some research questions:

1. What is the current business process in the facility department of Yogyakarta International Airport?
2. How could the implementation of an ERP system in procurement and inventory modules improve YIA's Facilities Department supply chain operations?
3. What are the advantages of implementing Odoo ERP for procurement and inventory management in YIA's Facilities Department compared to the current system?

1.2 Research Objectives

The research objectives answer research questions. The following are the research objectives:

1. Identify the current business process.
2. Implementation of Odoo, based on an enterprise resource planning system with procurement and inventory module
3. Identifying the advantages of implementing an ERP system for the facilities department.

1.3 Benefits of Research

Benefits of this research are:

1. This research benefits YIA's Facilities Department by automating procurement and inventory management**,** reducing inefficiencies.
2. Other airport departments can use similar ERP solutions to improve resource planning and operational efficiency**.**

1.4 Research Limitations

The following are the limitations of the research:

1. The research is conducted at YIA's Facilities Department and may not fully represent challenges faced by other airport departments or industries
2. This study focuses on implementing and configuring Odoo ERP for procurement and inventory management. It does not involve developing a new system from scratch.
3. The study specifically examines procurement and inventory management modules**.**

1.5 Systematic Research

The research is structured into several chapters, and each chapter will be described as follows:

CHAPTER 1	**INTRODUCTION**
	This section describes the discussion in Chapter I consists of background, problem formulation, research objectives, benefits of research, and research limitations.
CHAPTER II	**LITERATURE REVIEW**
	This section contains the inductive and deductive literature.
CHAPTER III	**RESEARCH METHODOLOGY**

This section elaborates o n the methodology, object, subject, and research flow.

CHAPTER IV DATA PROCESSING AND RESEARCH RESULTS

This section shows the result of the research.

CHAPTER V DISCUSSION

This section describes the challenges, obstacles, benefits, and performance of the research.

CHAPTER VI CONCLUSIONS AND RECOMMENDATIONS

This section contains the conclusion and recommendations of the research based on the obtained results.

BIBLIOGRPHY

ATTACHMENT

APPENDIX

CHAPTER II
LITERATURE REVIEW

2.1 Literature Review

Literature review is a section to explain and to correlate previous and recent research related to this research. The purpose is to find the gap between studies that have been conducted and obtain recent knowledge to conduct similar research.

Operational success depends heavily on supply chain management (SCM) because its effectiveness controls the business efficiency of functional operations. Multiple investigations demonstrate that SCM obtains major enhancements with digital technology implementations, which include Enterprise Resource Planning (ERP) systems. The research conducted by Hendriksen (2023) demonstrates that artificial intelligence (AI) and machine learning push SCM efficiency through optimized logistics management and enhanced forecasting capabilities, and improved demand planning. The application of technology delivers tools to assist decision systems while reducing traditional mistakes and making supply chains more flexible, therefore fostering superior performance results.

Multiple experts have studied Cyber-Physical Systems in improving supply chain performance through literature analysis. The creators of CPS helped develop networks that advance supply chain interoperability alongside modularity and decentralized management, thereby producing increased responsiveness and flexibility for supply chains, according to Wassick and Perez (2024). ERP systems enable digital technology adoption, which automates traditional manual operations to boost operational efficiency through the elimination of duplicate work and reduced expenses, and real-time decision capability. The demonstrated evidence shows that Enterprise Resource Planning systems create opportunities to enhance Supply Chain Management, specifically in demanding environments that need operational efficiency for successful outcomes.

Companies depend on Enterprise Resource Planning (ERP) systems to combine their business functions, including purchase order management and inventory control, and product shipment. Real-time data sharing through ERP systems integration establishes a cross-department network essential for better resource decision-making processes. ERP systems function as a unified platform that cuts down supply chain inefficiencies while enabling diverse functional units to better work together, according to Li and Wu (2021)

According to Nuerk and Dařena (2025), ERP systems enable semantic interoperability to connect business processes comparatively between different departments and external business partners. Central control mechanisms within ERP systems improve information transparency and flow, which enhances the capability to operate complex multi-tier supply chains. The centralization of ERP system control and improved data visibility support superior operations and better choices for decision-making, as well as complete supply chain integration. Naval and maritime institutions require ERP systems to address integration problems while boosting their supply chain operational outcomes.

Manually conducted procurement tasks present the biggest challenges to supply chain management because they lead to various issues, including lengthy wait times and system errors, and operational inefficiencies. Several research investigations prove that ERP systems transform procurement operations through automated optimization, which leads to better data precision and deals with relationship development and human error reduction. ERP systems automate supplier performance tracking and order processing functions, along with inventory management tasks, and thereby minimize procurement expenses while accelerating order completion times according to Utami and Kharisma (2023).

Pagell and Wilhelm (2025) explain that ERP systems provide businesses with real-time procurement data that enables fast responses to supply chain disruptions from fluctuations in demand alongside changes in supplier performance. ERP systems reduce procurement-related costs and maintain supply chain resiliency by performing automatic procurement tasks that decrease both delays and mistakes in the process. The importance of ERP systems becomes evident because they tackle procurement issues and enhance supply chain operational efficiency.

Supply chain performance depends heavily on inventory management because companies must handle unnecessary stock levels or stock shortages effectively. Many academic studies have investigated how ERP systems provide automation functions for inventory management operations. ERO systems served as an automated inventory tracking solution that helps businesses optimize their stock levels to match anticipated market needs, thereby decreasing the occurrence of overstocking or stockouts, according to Zhao and Tu (2021)

The research by Li and Wu (2021) depicts how ERP systems unite inventory maintenance with procurement systems and logistics functions to achieve proper inventory replenishment. ERP systems establish real-time tracking of inventory, which helps companies make improved

forecasts, together with informed strategic decisions. These systems optimize inventory management, then they boost supply chain performance through better goods distribution while minimizing operational expenses. ERP system automation produces accurate and efficient inventory management operations, which lead to minimized operational expenses and superior service delivery.

Research on ERP systems addresses broad industries and large companies with a focus on general matters such as procurement operations and inventory management, and operational effectiveness in most cases. Studies have not yet examined the practical application of Odoo ERP and its use in managing facilities within an airport environment. Studies have shown that ERP systems benefit procurement and inventory control (Utami & Kharisma, 2023; Zhao & Tu, 2021), yet they do not cover the specific difficulties airports face with manual purchasing and inventory tracking, including Facility Department reporting problems at YIA. My investigation will fill the existing research gap through an evaluation of Odoo ERP solutions for optimizing operations within the specific airport facilities management environment.

2.2 Theoretical basis

The theoretical ground of this study revolves around some important notions appurtenant to the subject matter of supply chain optimization, as well as ERP implementation. Supply Chain Management (SCM) is a process that aims at enhancing operational performance by organizing and coordinating sourcing, purchasing, and logistics-related operations, and it can be optimized with the help of digital technologies, including artificial intelligence and machine learning (Hendriksen, 2023). Enterprise Resource Planning (ERP) systems are used to unite internal processes, so it is possible to share data in real-time and make better decisions across the departments (Li & Wu, 2021). Applied to procurement activities, ERP will automate supplier management, purchase requests, and approvals, which will minimize errors in this process and speed it up (Utami & Kharisma, 2023). ERP systems are also good in managing inventory as they can easily make tracking, forecasting, as well as optimizing the stock, preventing shortages and overstocks (Zhao & Tu, 2021). Business Process Reengineering (BPR), as a theory in fitting the organization processes with the ERP systems, focuses on radical redesign of the processes, which helps to enhance the performance (Hammer & Champy, 1993). In this study, the Waterfall approach is used as an ERP implementation technique that presents defined steps in the process of implementation, beginning with the gathering of requirements

to the deployment (Royce, 1970). Moreover, Fit-Gap Analysis is applied to determine the compatibility between the ERP and the current processes at the company and recognize the regions in the system requiring modifications or the change of the process (Bradford, 2015). The following theoretical concepts allow the proposal and the setup of Odoo ERP to manage the procurement and inventory in the Facilities Department of the Yogyakarta International Airport.

Available literature on ERP systems concentrates on large organizations and general procedures. Nevertheless, little is known regarding how Odoo ERP can be implemented in the airport facility departments, in particular, the sphere of procurement and inventory. The proposed work addresses this gap by offering a customized ERP solution to the Yogyakarta International Airport in regard to its facilities Department.

CHAPTER III
RESEARCH METHOD

3.1 Research Subject

Research was conducted at Yogyakarta International Airport (YIA), managed by PT. Angkasa Pura I, located in Kulon Progo Regency, Special Region of Yogyakarta, Indonesia. At YIA, the subject of research is the Facilities Department.

3.2 Research Object

The object of this research is the implementation of the Odoo ERP system in the Facilities Department of Yogyakarta International Airport (YIA). Specifically, the research focuses on how Odoo ERP can be used to address the following key challenges:

1. Procurement Process
2. Inventory Management
3. Reporting Process

3.3 Data Analysis Method

The research data analysis will integrate Gap Analysis alongside Business Process Modelling & Notation (BPMN). These analysis approaches were selected as they demonstrated successful detection of operational weaknesses and created practical solution guidelines for adapting Odoo ERP within YIA's Facilities Department.

3.4 Data Collection

The researcher will use primary methods like speaking with Facilities Department staff, observing procurement activities and inventory control, and reporting processes to gather data. Secondary sources will include procurement records from internal sites, along with background information on ERP systems.

3.5 Research Approach

This study follows Waterfall methodology, which is one type of sequential development software; every stage must be completed before proceeding with the others. It all starts with problem identification and ends with evaluation and feedback. The methodology is appropriate, since the deployment of Odoo ERP in YIA is a linear progression of the stages of development-

design of the system, configuration of the system, testing, and final analysis, and there are no steps of iteration initial stages.

3.6 Research Flow

The flow of the research is as follows:

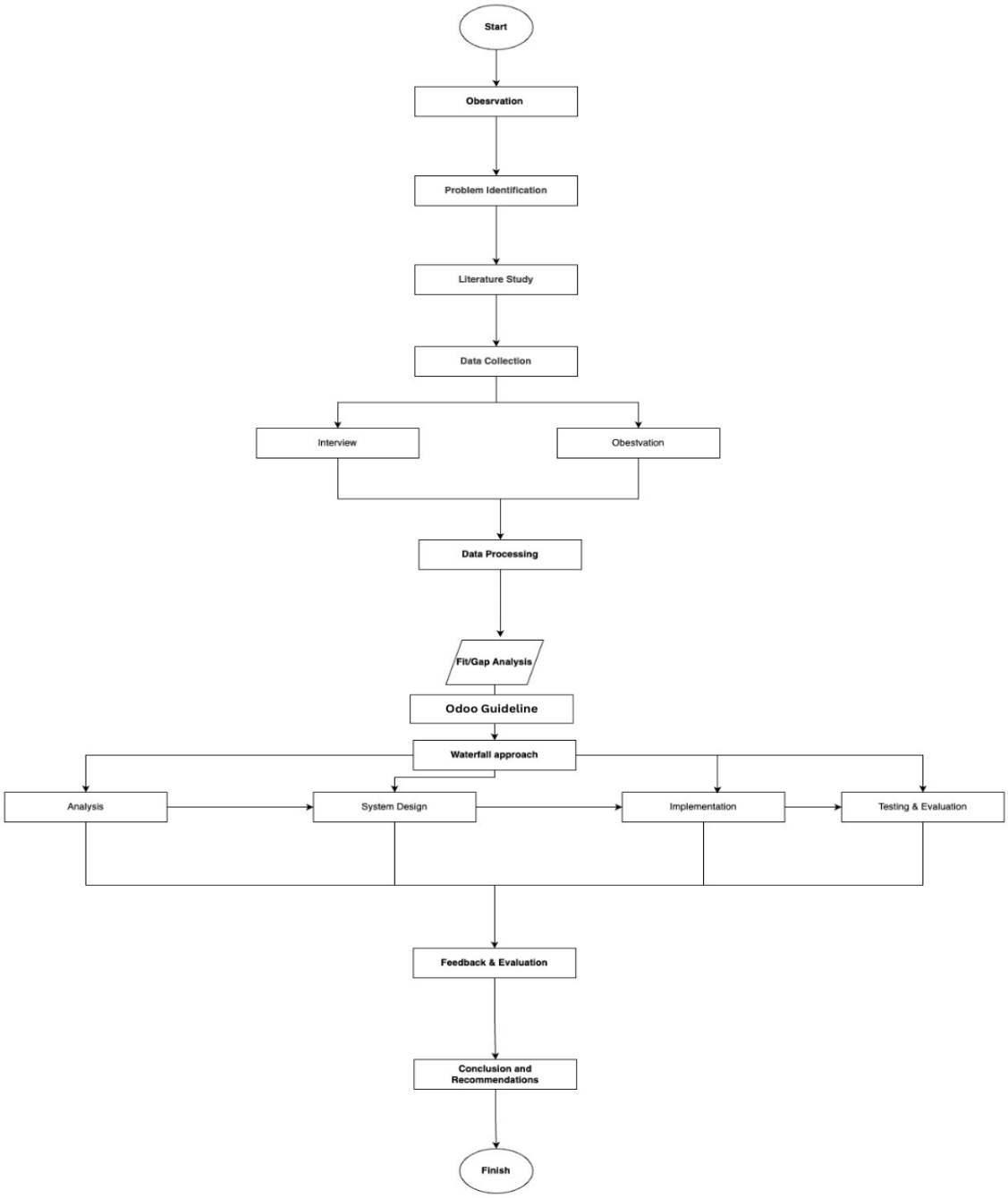


Figure 3.1Research Flow

The description of each flow in the flowchart:

1) Start

   This point where the research was started.

2) Observation

   The researcher spent two months at YIA observing the Facilities Department's work processes throughout their internship period. The researcher observed how employees managed procurement together with inventory tracking and reporting activities before noting down successful and less-than-successful aspects. The observation period allowed the researcher to understand how operations function regularly and locate the aspects that need improvement.

3) Problem Identification

   From the observations, the researcher identified the problems in the department. These include manual procurement, manual inventory management, and manual reporting.

4) Literature study

   Literature review is a section to explain and to correlate previous and recent research related to this research. The purpose is to find the gap between studies that have been conducted and obtain recent knowledge to conduct similar research.

5) Data collection

   In the study, primary data is being used as the base of information. These data consist of first-hand data collected by a combination of direct observations and through interviews at Yogyakarta International Airport (YIA), where the operational environment forms the data source. It was aimed to have a detailed comprehension of the current procurement and inventory system in the Facilities Department.

6) Data processing

   This study's data processing includes the development of a blueprint paper that outlines the implemented improvements. The analysis begins by contrasting the current state with the desired state of the business process before and after adoption. This section elucidates the business processes operating within the Odoo ERP system, accompanied by a business process analysis illustrated using the Business Process Model & Notation (BPMN) diagram.

7) Waterfall Approach

The approach taken in this research is the Waterfall model to inform the system development and implementation process. A linear and sequential model that is mostly applied in software and system development is the Waterfall model, where one always has to finish one stage before another commences.

a. System Analysis

During this stage, the issues and the needs were transformed into functional and technical needs. This will involve determining system roles, information flows, needed features, and system behavior.

b. System Desing

In this case, the TO-BE (the future state) of business processes was charted out. BPMN diagrams have been drawn to illustrate the automation of processes in Odoo, such as purchase requisitions, stock updates, and vendors. There was also the conceptualization of the screen designs and field requirements.

c. Implementation

During this step, the designed system was put into practice with Odoo ERP. There was a distribution of the configuration of procurement and inventory modules, creation of user and custom workflows to match the operational requirements of YIA.

d. Testing & Evaluation

The introduced system was applied directly to the employees of the Facilities Department of Yogyakarta International Airport (YIA). This was carried out on real employees who interacted with the Odoo ERP system, and not theoretical dummy data or internal petty simulations, but on real employees conducting their usual procurement and inventory functions and with the new interface.

8) Feedback & Evaluation

At the end of the testing stage, informal discussions and follow-up interviews were used to directly get feedbacks from the employees. The aim was to know their experiences with the new system, to determine whether there were some technical or operational difficulties, and to evaluate how well the system was performing compared to the old manual way of doing things.

9) Conclusion and suggestions

Summarizing the study's outcomes and suggesting future steps or recommendations based on the findings.

10) Finish

The stage where the researcher completed his research

CHAPTER IV
DATA COLLECTING AND PROCESSING

4.1 Company Profile

Yogyakarta International Airport is an international airport located at the Temon district of Kulon Progo Regency, in Yogyakarta, Indonesia. The airport is situated around 45 km (28 mi) from the city of Yogyakarta, which serves the Yogyakarta Special Region, as well as nearby Central Javan cities such as Purworejo, Kebumen, Cilacap, and Magelang. It is the largest and one of the three airports in the Yogyakarta Special Region, the other being Adi sucipto Airport, which is located closer to the Yogyakarta city center, and Gading Airfield in Wonosari, Gunung Kidul Regency. The airport serves flights to and from several cities and towns in Indonesia and some international destinations such as Malaysia and Singapore. Figure 4.1 is an overview of the current organizational structure of YIA:

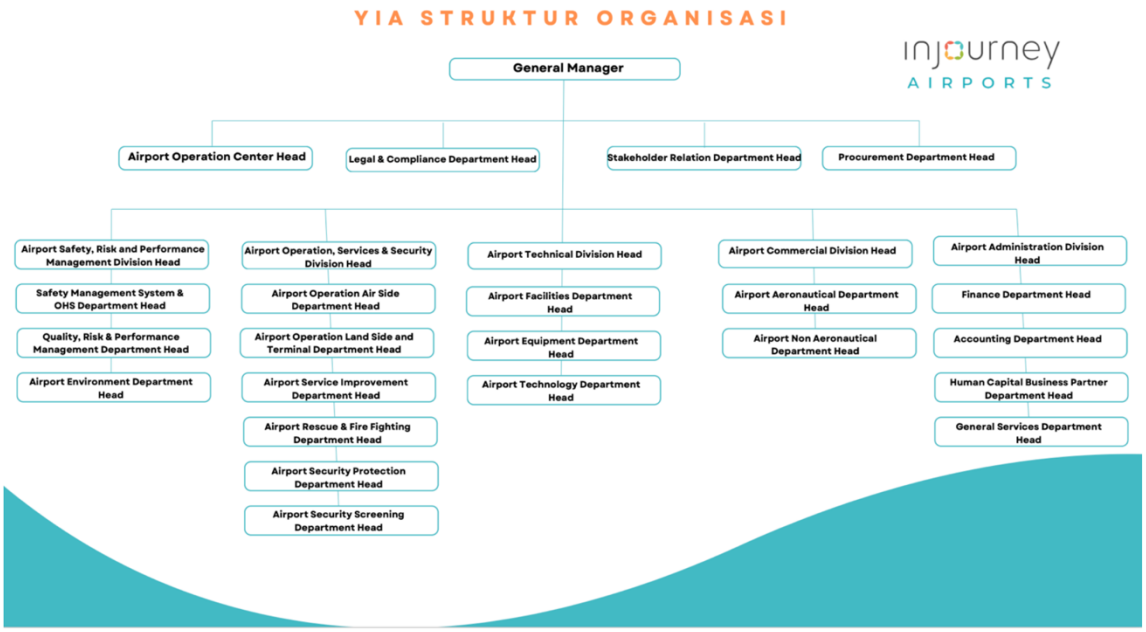


Figure 4.1 Organizational Structure

Within Yogyakarta International Airport (YIA), the General Manager oversees an organizational structure composed of numerous departments and divisions focused on essential functions between operations and safety and technical services and commercial activities, and administration. The main departments of YIA consist of Airport Operations, Services & Security, as well as Airport Technical Division, alongside Airport Commercial Division, which operate under specific department directors. The framework enables competent administration

of airport operations alongside safety and customer services, which strengthens YIA as a leading contemporary aviation hub.

4.2 Specificity of Case Study

Such research benefits from spending substantial time on the job, as it uses a case study method to address operational questions “how” and “why.” This part provides examples of the difficulties found in the Facilities Department at YIA and provides a recommendation through the preparation of blueprints that describe existing business processes and propose fixes using relevant modules in Odoo ERP.

The Facilities Department receives orders for goods and materials, tracks the airport’s supply, and cooperates with different groups within the airport. Even after automation, businesses still have to do things like fill out procurement requests, track what is in stock, and create detailed reports by hand. They are supported by using Microsoft Word, Excel spreadsheets, and communicating on WhatsApp. As a consequence, the department deals with delays, unreliable data, and problems getting immediate information about operations.

Since records are still often kept manually, some tasks are inefficient, and not all the data is clear to all. People working for the company have pointed out some challenges in communicating between departments, asking for multiple copies of the same procurement request, and following up on stock quantities. As a result, the overall performance decreases, and there is a higher chance of data mistakes. To gain better insight, the researcher talked with staff from the Facilities Department and looked at procurement materials and inventory logs inside the company.

Optimizing business processes using integrated digital systems is the main reason organizations implement ERP systems, Nugraha notes (2017). Though Odoo and ERP systems provide many regular modules, some workflows may still need custom settings to match the organization’s needs. As a result, a fit/gap analysis needs to be carried out to understand which of the current processes are suitable for Odoo and which are not.

When the needs were identified and the “gap” was clear, the researcher customized the Odoo ERP system using the proposed process improvements. The focus was on how to best set up YIA’s processes to use the functions of the Odoo modules. Adjustments were made during the configuration phase as required by what was observed and discussed during the trials.

Experts reviewed the implementation in terms of the department's true needs, so that future improvements and changes could be made.

4.2.1 Data Collection

Before using the new ERP system, the researcher talked directly with members of Yogyakarta International Airport's (YIA) Facilities Department to determine their needs and existing processes. The goal of these interviews was to show what activities the department really does and find challenges faced by the procurement and inventory team. To make sure there was no misunderstanding, interviews were done with participants while the internship was ongoing. The following questions and answers are presented here.

Table 4.1Interview Question

NO	Questions
1.	How do you initiate a procurement request?
2.	What information is included in a procurement request?
3.	Who approves the procurement request and how long does approval usually take?
4.	How do you communicate with suppliers?
5.	What are the common errors or obstacles in procurement requests?
6.	How often does miscommunication with suppliers occur due to manual processes?
7.	Are there frequent cases of duplicate or incorrect deliveries?
8.	How do you track inventory levels?
9.	How often do you conduct manual/physical stock counts?
10.	How long does it take to prepare related reports?

The above questions came from interviews carried out by the researcher with staff working in the Facilities Department at YIA. After analyzing what the operations team requires, it was determined that the Procurement Module and Inventory Module in Odoo fit their business activities best.

4.2.2 Gap Analysis

Gap analysis is used to report and provide an assessment of an organization's performance. Gap analysis is also defined as one of the important steps in the planning stage and the work evaluation stage. In general, this method is most often used to carry out internal management in an organization. The word Gap means a difference (disparity) between one thing and another. In short, gap analysis is a technique used to find out the performance of a system that is running in parallel on a standard system. Basically, the performance of a company or institution can be seen from the condition of the operational system framework and the strategy of its institution (Aziza & Rahayu, 2019). The following are the steps that must be taken in making a gap analysis (Rismawati, 2019):

a. Ranking Requirements, to ensure that business processes can be considered during the implementation of a new system, identifying areas that are important for the organization to increase value, so that it can improve business processes.

b. Customization Level, which is the extent to which the new system can meet the needs of the user.

c. Gap Resolution is identifying alternatives and providing solutions to resolve the existing gap.

This gap analysis subchapter will compare the As-Is and To-Be analyses using Odoo Software. This analysis uses fit/gap information to assess the following gaps:

- Fit (F), Business processes are said to be fit when the comparison between current business processes (As-Is) and future business processes (To-Be) does not require significant changes or can be said to be appropriate.

- Partial Fit (P), The business process is said to be a partial fit when the future business process (ToBe) has been executed on the current business process (As-Is). But in use, it still requires changes in some parts to match
- Gap (G), Business processes are said to be gaps when future business processes (To-Be) are executed on current business processes (As-Is)

Using the findings from our interviews and document research, we conducted a gap analysis to check how the difficulties experienced by YIA's Facilities Department relate to what the Odoo ERP system can do. This analysis examines how the Procurement Module and Inventory Module are used in the department to support daily work. Results from the analysis are displayed in Table 4.2 below.

Table 4.2 Results of Gap Analysis

NO	Module	Sub-Process	Current Condition	Future Condition	Fit	P	G
1	Procurement	Procurement Request	Requests submitted via Word and sent through WhatsApp; approvals handled manually by GM.	Requests submitted and tracked digitally using the Purchase Request feature in Odoo.	✓		
2	Procurement	Vendor Information	Vendor data stored manually and often incomplete or inconsistent.	Vendor data centrally managed in Odoo Vendor Master.		✓	
3	Inventory	Stock Tracking	Inventory recorded manually in physical logbooks with no real-time updates.	Stock levels updated automatically in real time using Odoo Inventory.	✓		
4	Inventory	Stock Opname	Weekly physical stock checks are done manually using paper forms.	Stock counts scheduled and digitally recorded in Odoo.	✓		
5	Inventory	Inventory Reporting	Reports compiled manually using	Reports automatically generated from	✓		

			Excel and logbooks, prone to delay and errors.	real-time inventory data in Odoo.			

Table 4.3 gives an overview of the main outcomes from the Fit/Gap analysis of both the Procurement and Inventory sections in the Odoo ERP at YIA.

Table 4.3 Summary of Gap Analysis

Module	Fit	Partial Fit	Gap	Total
Procurement	1	1	0	2
Inventory	3	0	0	3
Total	4	1	0	5

Using Fit/Gap analysis, the comparison between manual workflows and Odoo ERP led to the evaluation of five business processes in the Procurement and Inventory modules. Our assessment confirmed that four processes are Fit, which means they are handled perfectly by Odoo as is. A process labeled Partial Fit can be implemented with very little customization needed. All tested functions were found in Odoo's standard features, so no processes were classified as Gaps. The findings confirm that Odoo ERP helps YIA's Facilities Department to meet its operation needs, mainly in procurement and inventory management. To put it into action, standard procedures will be used to align the system and make sure users are prepared, without the need for any special development.

4.2.3 Odoo Guideline

The following section offers a short guide on how one can use the adopted Odoo ERP system and the features that can be exercised: the procurement and inventory modules adopted by the Facilities Department of Yogyakarta International Airport. This is supposed to help the users in doing major functions such as purchasing and stock control.

1. Login Instructions
   A. Open a web browser
   B. Enter your username and password.
   C. Click "Log In" to access the dashboard.
2. Procurement Module
   A. Creating a Request for Quotation (RFQ)

B. Go to the Purchase module.
C. Click Request for Quotation > Create.
D. Choose a vendor, select products, enter quantity, and planned date.
E. Save the document and submit for approval if required.
F. Once approved, click Confirm Order.

3. Inventory Module

Receiving Products:

A. Navigate to the Inventory module.
B. Click on Receipts, then find the related purchase.
C. Validate the receipt to confirm that items have arrived.
D. The system automatically updates the inventory levels.

Viewing and Tracking Stock:

- Go to Products > Products to view current and forecasted stock.
- Users can monitor on-hand quantity and stock locations.

Setting Reordering Rules (Low Stock Alerts):

A. Open the product you want to manage.
B. Under Reordering Rules, set:
   - Minimum Quantity
   - Maximum Quantity
   - Warehouse Location
C. Save. Odoo will trigger a low stock alert when the quantity drops below the set minimum.

4.3 Blueprint and Feedback

A blueprint includes various profiles that explain what is needed for successful project implementation, what materials and services are produced each year by the industry (Cervo, H., Ferrasse, J.). Descales and G. Van Eetvelde. 2020. A blueprint is made through several stages of working together. Carry out major actions, for instance, studying the organization's operations, to conform to YIA Facilities department standards, assessing, planning for, and evaluating, and gathering the materials for the project feedback. Moreover, the first draft is arranged by using the chapter blueprints in order to implement the suggested module and check its performance by asking the user.

4.3.1 Analysis of Process Business

In this section, discussions about business processes center on comparing current conditions with those proposed through improvement activities. The current condition describes how procurement and inventory activities were managed in the Facilities Department of Yogyakarta International Airport (YIA) before adopting Odoo ERP. The majority of these practices depend on using tools like Microsoft Word, Excel, and WhatsApp. The improvement condition shows what the system will do after it is put in place, using the tools that Odoo provides. This comparison provides the basis for spotting ways to improve how the department completes its work.

4.3.2 Blueprint Purchasing

Odoo ERP's Purchase Module contains three vital elements: master data, procurement transactions, and configuration. The integration of these components leads to a well-structured acquisition process.

- Master data: consists of important information, including item names, provider contacts, and the units in which each item is measured, meant for the Facilities Department at Yogyakarta International Airport (YIA).
- Procurement transactions: To acquire goods, procurement covers all the activities starting from creating the internal request, right up to verifying with the vendor and receiving the goods.

While production-oriented companies work to produce goods, the Facilities Department at YIA aims to get materials, items, and spares to supporting airport operations. The beginning of the procurement process is triggered by what is happening inside a company.

The present method served as the reference (as-is), and using it, we proposed and developed a new, ERP-centered process (to-be). The flowchart below represents the way procurement was handled at Facilities Department YIA before the Odoo system was used.

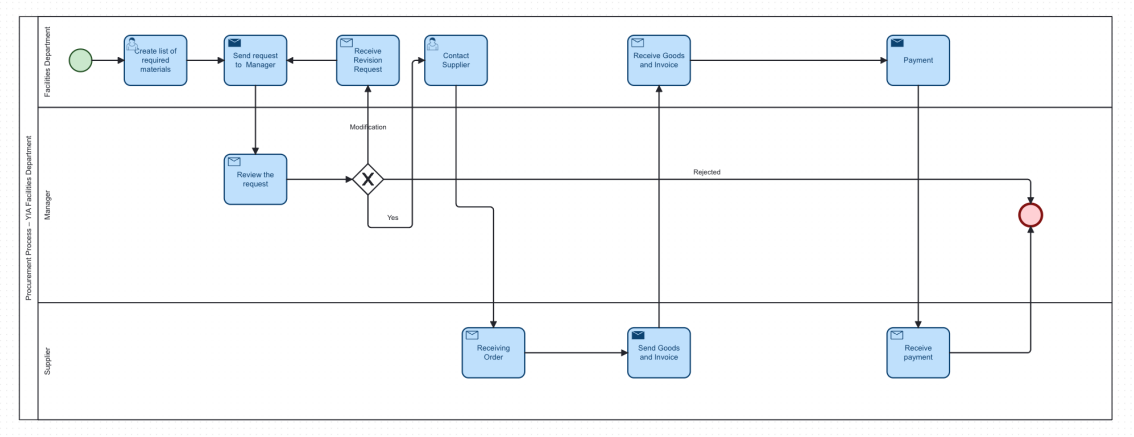


Figure 4.2 Current BPMN of Purchasing

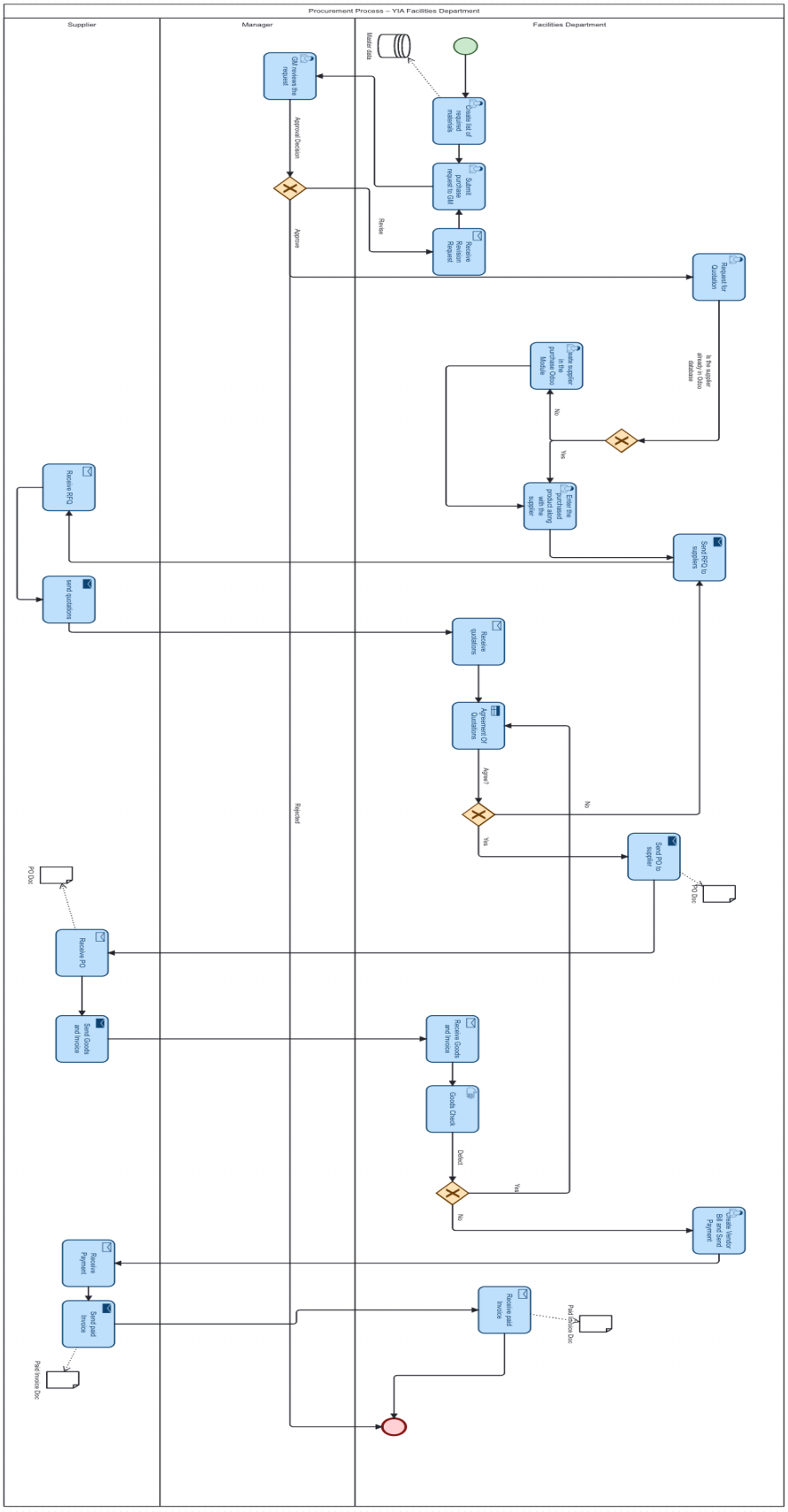
As illustrated in Figure 4.2, the Facilities Department's current (As-Is) procurement process at the Yogyakarta International Airport (YIA) is shown on the flowchart. At the start of the process, the department lists all the necessary things and asks the manager to approve them. After that, the manager evaluates the request and can approve it, reject it, or request changes from the writer.

Once approval is given, the department talks to providers and embarks on ordering. After placing the order, the supplier sends over the products and bills the customer. After delivery, employees of the department check it and manually enter the new products into the company's inventory records using spreadsheets. In the end, the payment goes through and is confirmed.

Most of the work is done manually, using WhatsApp and other ways to share documents that are not linked to a main system. This means there are delays, less visibility into progress, and a chance for data mistakes—all of which make it tough to manage and scale up.

The following illustration is the To-Be BPMN, which depicts the optimized business process now that the Odoo ERP system is in place.

Figure 4.3 To Be BPMN of Purchasing



4.3.2.1 Master data

When deploying Odoo ERP in Yogyakarta International Airport (YIA), master data is important in making the procurement process and inventory process identical, trackable, and effective. The actual data that will support the operation of a procurement transaction, communication with suppliers, and stock tracking activity will be called Master data.

The master data elements that were set up in the system to aid the work of the Facilities Department were the following:

- Vendor Information

  The data of registered suppliers was keyed into the system to centralize the data and ease communication. Every vendor record has the most vital information, like the name of the company, contact, and ID numbers. This will make transactions in the future traceable and standardized across the processes.

- Material Identification

  The department was using customary names, as well as unique references, connected to the materials normally purchased and tracked by the Facilities Department. This helps to ensure transparency in procurement requests, stock updates, and reporting activities, thereby lowering the ambiguity in the day-to-day operations.

- Unit of Measure (UoM)

  There was a correlation of each material with a suitable unit of measurement, also based on the order and the manner of management of the items on-site. UoM standardization assists in consistency among the purchase requests, delivery, and stock listing.

This was, in a way, carried out instead of cumulatively putting all the things in the system, as it concentrated on the important materials in relation to the testing and execution. The selective arrangement is supportive of usability, progressive use of the system adoption, and it has the flexibility of growing data entry that we may need later.

4.3.2.2 Procurement Transactions

The procurement transaction mechanism within the Odoo ERP system aims at automating and simplifying the working process within the company through the internal request for materials and communication with vendors, to the entry of the received goods. In Yogyakarta International Airport (YIA), it was modified to reflect the true requirements of

the Facilities Department and remove the formerly manual processes in favor of combined digital actions.

The filling process starts with the Facilities staff members making a Purchase Request (PR) when the level of items in the stock is below the intended minimum level. The PR then undergoes an auto-purported process of approval process with the department manager or General Manager (GM) based on the level of authorization.

When approved, a Request for Quotation (RFQ) document will then be created in Odoo and will go directly to the vendor. Quotations that are received by the vendors are then considered in the system, and upon acceptance to purchase products, they are converted to a Purchase Order (PO). This electronic transformation abolishes the communication on WhatsApp and manual document management and guarantees transparency and consistency.

When goods are received, the warehouse employees will record the received goods using of Goods Receipt feature in the system. The amounts are automatically matched with the ordered amount, and shortages (as well as overages) are pointed out. Inventory of the stock is also updated in real time. And lastly, the bill of vendor bill is recorded in the Odoo accounting connector, which makes the financial records in sync

4.3.3 Blueprint Inventory

Inventory Module in Odoo ERP is crucial in enhancing the accuracy, visibility, and efficiency of stock handling processes. In the case of the Facilities Department of the Yogyakarta International Airport (YIA), inventory control has been accomplished in the past manually, causing bottlenecks in the operations. With the Odoo Inventory Module, there is an opportunity to track the movement of goods in a digital form, automatically calculate the level of stocks, and further interconnect the processes with the procurement process.

Prior to implementing Odoo ERP, the Facilities Department of YIA applied a fully manual inventory management system. Shelves had to be checked, and the stock was recorded using spreadsheets. When goods came in, the piece count was to be entered manually by the staff, often in paper logs or Excel. They also did not have a system of real-time tracking, and it was common to have an ugly mismatch in inventories.

Changes or updates of inventories were largely manual; thus, the process was susceptible to slow performance and data incompleteness. Moreover, no automated alerts could be used to inform the staff of what actions would be necessary to perform when the stock levels were low,

so the process of replenishing the supplies was solely owned on periodic revision and the memory of employees. The inventory was done once per week on printed cards and afterwards adjusted manually. Reports regarding the inventory activities used a manual method of compiling these reports, thus making reporting cumbersome and unreliable.

This manual technique brought in some difficulties:

- Sluggish stock deliveries resulted in delays in reordering.
- Data loss risk is transmitted on paper.
- Different reports due to compilation by hand.
- Lack of real-time visibility to the level of stock, which affected the timing of procurement.

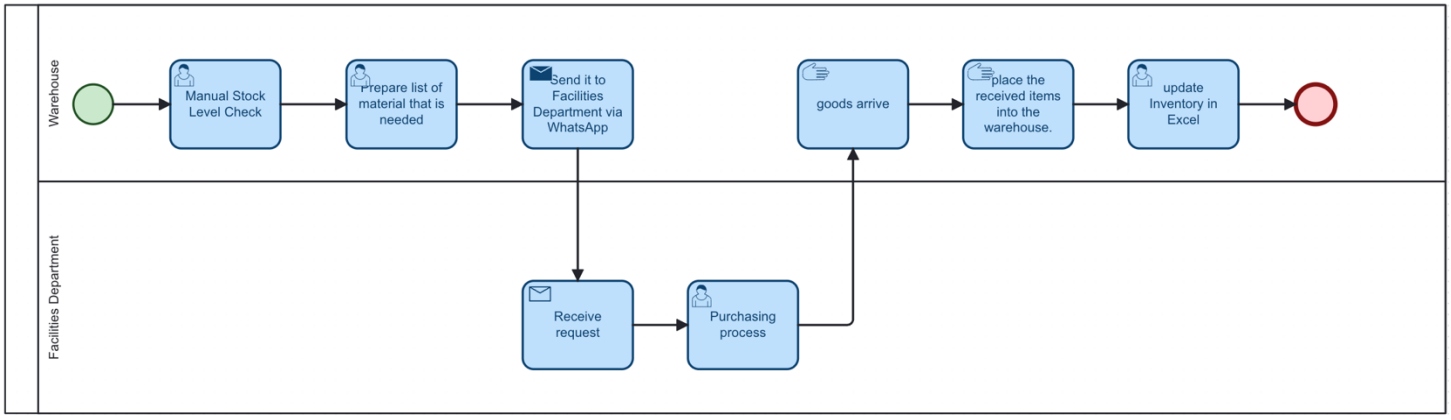


Figure 4.4 Current BPMN of Inventory

Using the Odoo ERP Inventory Module, the process of inventory management at YIA got much easier and automated. It is possible to adjust the stock level in real-time and automatically receive alerts in case the stock level falls below a certain minimum stipulated level. Upon the arrival of the goods, the personnel can scan the barcodes (or enter a manual entry) to record in Odoo the items they have received. The system automatically synchronizes the stock counts within the central database, so there is no point in manually updating a spreadsheet. The inventory records are made synchronized between departments, where the data becomes accessible and consistent. Odoo has incorporated the stock opname process, and such activities can be scheduled easily and carried out in the system. In case any differences in the booked and physically available stocks are identified, the personnel may make corrections to the system, and real-time changes will be visible. Moreover, inventory reports can now be drawn

automatically and with correct information any time, and this saves on errors and stress on administrative work.

With the new system, there are improvements such as:

- Triggers to be alerted of products being out of stock and tracing of stocks being replenished.
- Extermination of paper forms and spreadsheets.
- Inventory of real-time viewing of moves and levels.
- Proper and fast reporting.

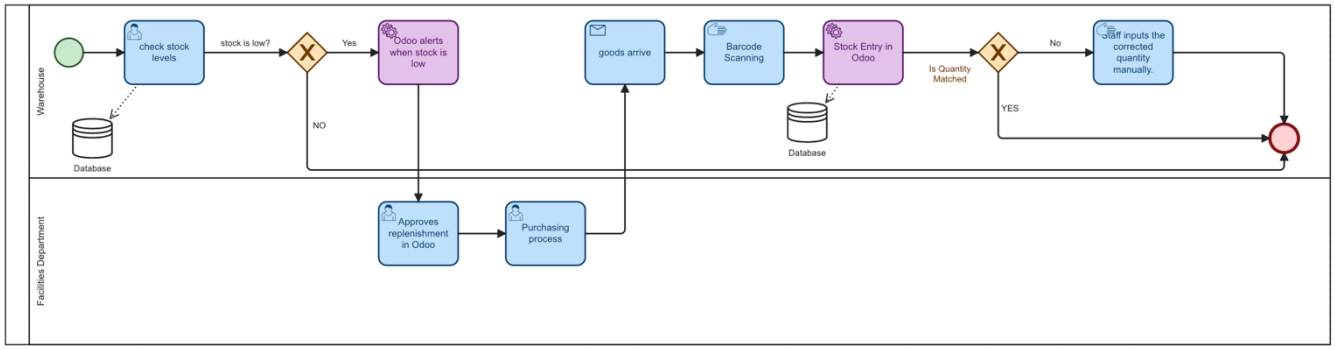


Figure 4.5 To Be BPMN Of Inventory

4.3.3.1 Master Data for Inventory

To facilitate effective inventory activities at the Yogyakarta International Airport (YIA), some of the critical master data have been set in the Odoo ERP system. These are master data entries to document movements of stocks, including receiving goods, up to updating the stocks, which are traceable, structured, and reliable.

4.3.3.2 Inventory Transactions

The Facilities Department at YIA used to use manual systems to handle inventory, carry out transactions like Excel files and logbooks, hence data errors, slow stock visibility, and unnecessary reports. The idea was to simplify these processes by implementing Odoo ERP because they were becoming less accurate and less real-time in their inventory management.

4.4 Configuration

A set of configurations was carried out in order to make sure that the Odoo ERP implementation at Yogyakarta International Airport (YIA) operates properly and streamlines the tasks to

support the operations of the Facilities Department. Such settings comprise general system-wide settings as well as module-specific settings (Purchasing and Inventory processes).

4.4.1 General Configuration

This research is based on the use of Odoo version 17.2 Enterprise Edition, which is available through the Odoo official cloud platform. The general configuration phase entails the installation of the main database, the choice of language and currency settings, and the installation of the relevant modules to help in the procurement and inventory activities. Configuration steps details are as follows:

1. Odoo Database

   The process of configuration required setting a new Odoo database called YIA Facilities System. In this configuration, they logged on using a registered email account, and then, as the country of origin, chose Indonesia to set the local values, in this case, currency and time zone (GMT+7). To be consistent among the users and in documentation, the English language was selected as the system language. The database will serve as the single source of maintaining procurement and inventory activities at the Facilities Department in the Yogyakarta International Airport.

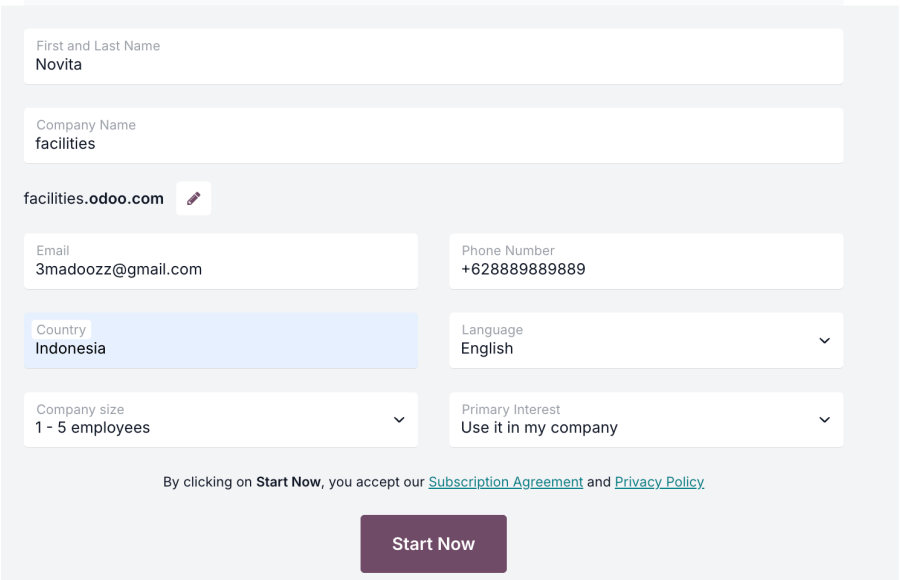


Figure 4.6 Register to ERP Odoo System

2. Modules In Odoo system

Odoo is an open-source ERP tool that has a huge set of customizable modules according to the operational requirements of various organizations. Purchase and Inventory modules in this implementation were chosen in favor of the most important work of the Facilities Department at Yogyakarta International Airport (YIA). The modules have been selected depending upon the prevailing problem areas in the department of handling the procurement processes, managing stock levels, as well as the availability of materials at the right time. Through these modules, the system will work to facilitate efficiency in procurement requests, enhance inventory visibility, and lower inaccuracies due to manual work.

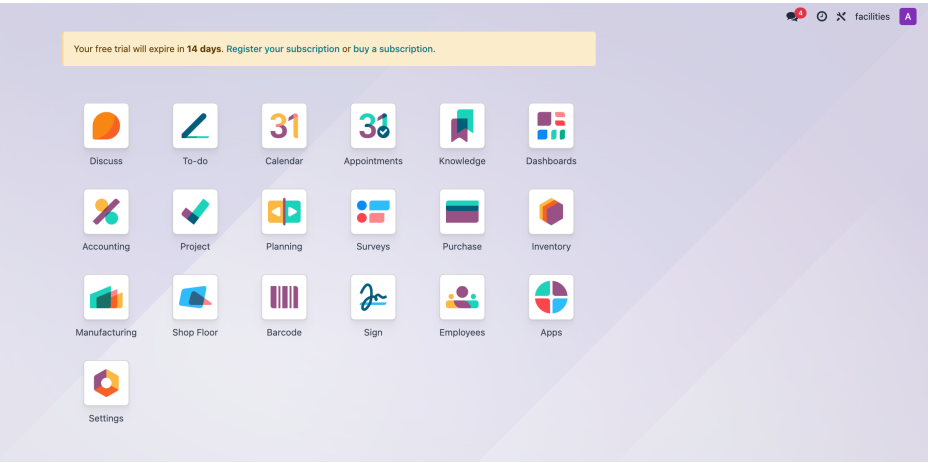


Figure 4.7 Modules in the Odoo system

4.4.2 Purchase Module Configuration

The purchase module of Odoo ERP will be set to automate the procurement processes at the Facilities Department of Yogyakarta International Airport (YIA). This module allows the data about suppliers, purchase requests, and order processing to be digitalized and instead of the earlier manual system through the use of Word documents, spreadsheets, and WhatsApp communication. Such a configuration makes it more efficient, transparent, and trackable with regards to the procurement workflow. The next part provides some most important settings inside the module, which help to improve operations at YIA, illustrated by screenshots.

1. Vendor Management Setup

This screen is an access to the database of registered vendors utilized by the Facilities Department. In every vendor profile, the name of the company, contact numbers, tax ID, and payment terms are listed. A centralized arrangement is also maintained since there is consistency with procurement, and orders can be placed quickly.

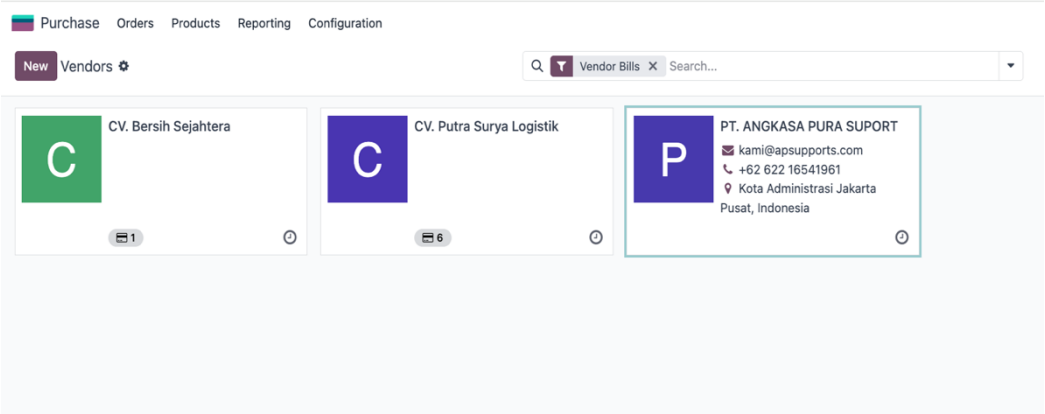


Figure 4.8 Vendors Information

2. Request for Quotation (RFQ)

In Odoo, it is possible to send a Request for Quotation (RFQ) to a number of vendors. Customers are allowed to define what they need, the number of items, and delivery periods, among other necessities. This substitutes informal communication, and all the procurement is accounted for and traceable.

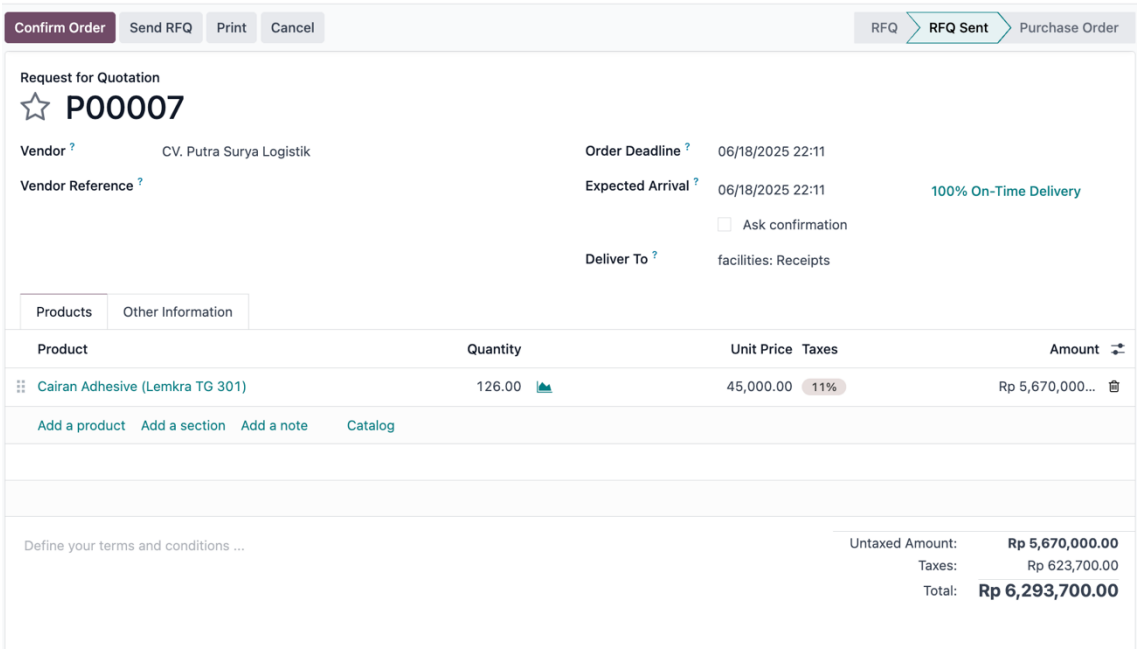


Figure 4.9 Request of Quotation

3. Purchase Order (PO) Creation

RFQs can be transformed into formal Purchase Orders (POs) after their responses have been reviewed and validated. This screen displays the final PO that contains confirmed pricing and delivery conditions. This aids in documentation to be uniform and hastens the ordering system.

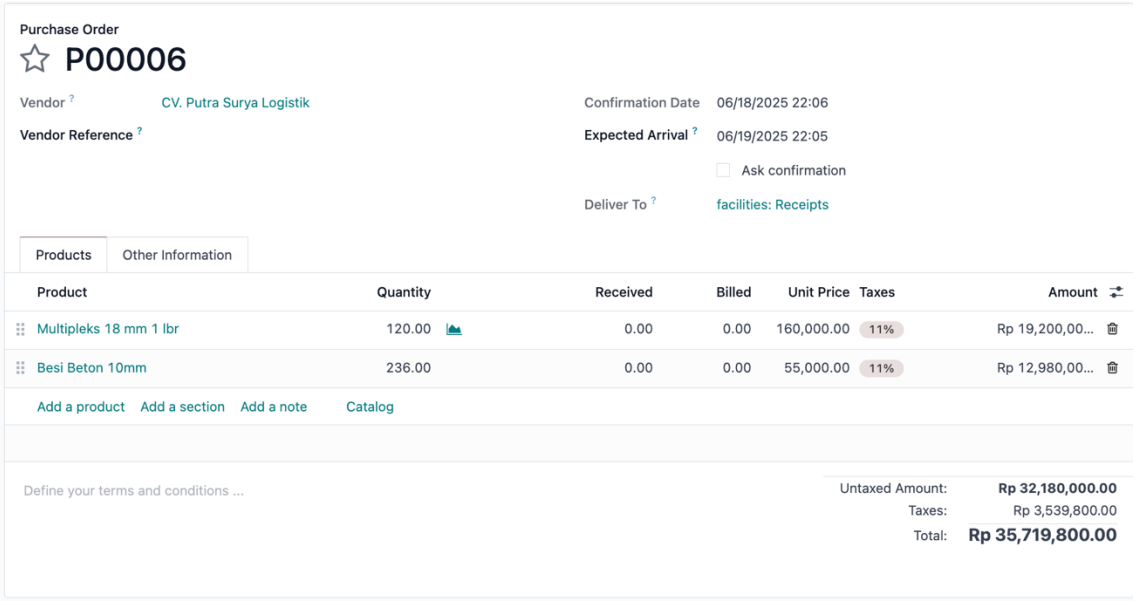


Figure 4.10 Purchase Order (PO) Creation

4. Product Master Data

This section carries the record of purchased items with names of items, descriptions, units of measurement, and prices. Due to a clear definition of products within the system, the department is capable of working out the traceability of stock movement easily, as well as the accuracy of purchase requests and stock inventory updates.

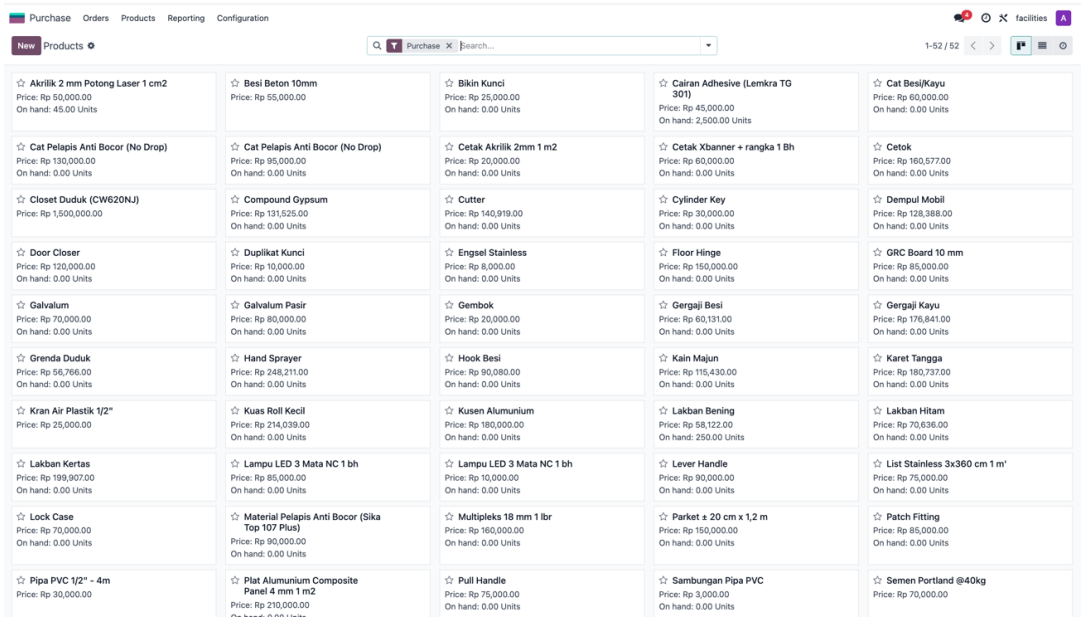


Figure 4.11 Product Master Data

4.4.3 Inventory Module Configuration

The Inventory Module in Odoo helps the Facilities Department at Yogyakarta International Airport (YIA) monitor and manage material stock in real-time. This module automates stock updates, supports warehouse operations, and enables accurate reporting, reducing reliance on manual tracking through spreadsheets or WhatsApp messages. The setup focuses on streamlining stock movements, ensuring item availability, and improving transparency in material handling.

1. Product Master Data

This section includes detailed information about items used by the department



Figure 4.12 Inventory Module

2. Warehouse & Location Setup

The system defines YIA's Facilities Department warehouse along with storage locations or zones

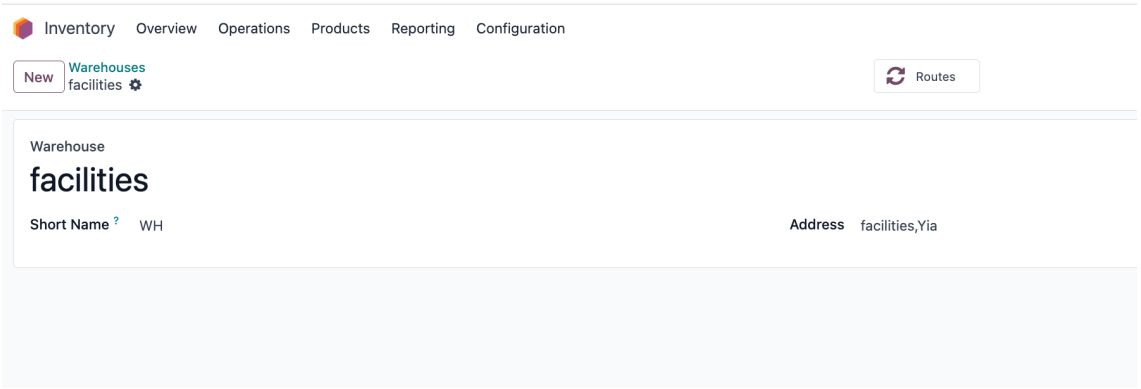


Figure 4.13 Warehouse & Location Setup

3. Stock On Hand

This attribute shows the immediate number of each product that is presently available on stock. It can assist the team in not over-ordering or stockout by simply giving it the up-to-date inventory of each product.

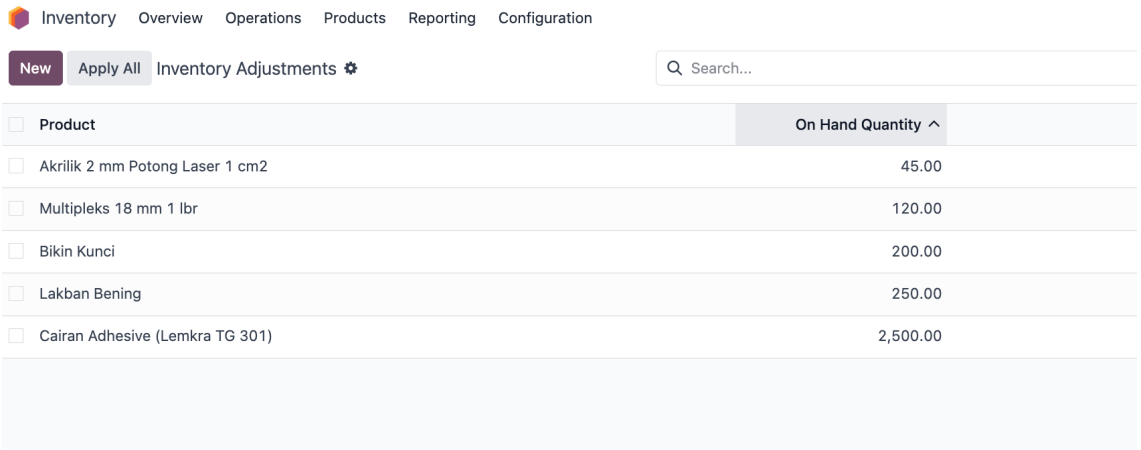


Figure 4.14 Stock Availability

4. Inventory Overview Dashboard

Odoo Inventory Overview Dashboard gives a general overview of all the activities concerning inventory. It provides a visual representation of important areas, including Receipts, Delivery Orders, and Manufacturing status.

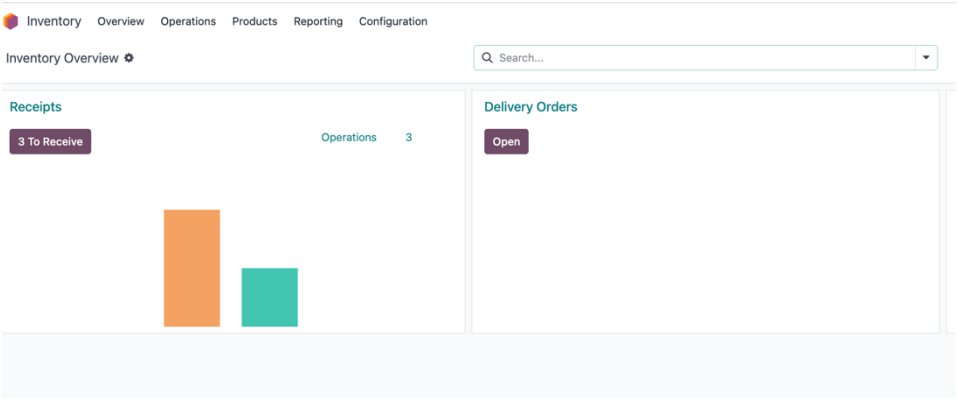


Figure 4.15 Inventory Overview Dashboard

CHAPTER V
DISCUSSION

5.1 System Testing

After the installation of the Odoo ERP system, a trial testing period of use was organized in the Facilities Department of Yogyakarta International Airport (YIA). The rationale of such testing was to model real-life procurement and inventory operations under a controlled environment but not based on real transactions or actual operational data.

The participants included three employees of the Facilities Department whose primary task was regularly work with the procurement, inventory monitoring, and corresponding reporting. These people took part in the test of the system during a short test period in order to understand the new digital path of work and to determine whether the Odoo modules configured in accordance with their needs responded to their functionality.

Tests were done on the following modules:

A. Procurement Module: To raise purchase requests, issue RFQs to vendors, convert to Purchase Orders, and post vendor bills.

B. Inventory Module: Receiving goods, real-time updating of stock level, stock opname in digital form, and issuance of inventory reports.

The testing phase was aimed at making sure that the set features of the device worked according to the requirements of the operations, and that the system was reliable and easy to operate in a real working environment.

5.2 Testing Results

5.2.1 Comparison Between the TO-BE Process Diagram and the Odoo ERP Implementation of Procurement

This section compares the TO-BE diagrams with the Odoo system to ensure all procurement and inventory steps are correctly implemented for the Facilities Department at YIA.

Table 5.1 Comparison Between TO-BE Process Diagram and Odoo ERP Implementation of Procurement

Process Step	Exists in Diagram	Implemented in Odoo	Explanation
Create list of required materials	Yes	Yes	Listed in procurement process
Submit purchase request to GM	Yes	Yes	Part of the approval flow
GM reviews and approves request	Yes	Yes	Handled by GM in workflow
Create supplier in Odoo	Yes	Yes	Supplier added if not available
Send RFQ to suppliers	Yes	Yes	Odoo sends RFQs
Receive quotations	Yes	Yes	Suppliers respond to RFQs
Agreement of quotations	Yes	Yes	Step before issuing PO
Send PO to supplier	Yes	Yes	Odoo generates and sends PO
Receive goods and invoice	Yes	Yes	Goods receipt tracked in system
Goods check	Yes	Yes	Checked before stock update
Create vendor bill and send payment	Yes	Yes	Vendor bill generated in Odoo
Receive paid invoice	Yes	Yes	Invoice marked paid in Odoo
Check stock levels	Yes	Yes	Stock levels monitored regularly
Odoo alerts low stock	Yes	Yes	Odoo triggers alert when low
Approve replenishment in Odoo	Yes	Yes	Approval done in system
Barcode scanning	Yes	Yes	Odoo supports barcode input
Stock entry in Odoo	Yes	Yes	Stock update recorded
Verify quantity and correct if needed	Yes	Yes	Manual correction allowed in Odoo

5.2.2 Comparison Between TO-BE Process Diagram and Odoo ERP Implementation of Inventory

This section shows how each step in the proposed inventory process (TO-BE diagram) is implemented in the Odoo ERP system. It confirms that the system supports key warehouse operations like stock checking, alerts, and goods receipt.

Table 5.2 Comparison Between the TO-BE Process Diagram and the Odoo ERP Implementation of Inventory

Process Step	Exists in Diagram	Implemented in Odoo	Explanation
Check stock levels	Yes	Yes	Inventory checked via product view or reports
Odoo alerts when stock is low	Yes	Yes	Alerts configured via reordering rules
Approve replenishment in Odoo	Yes	Yes	Manual or auto approval in Purchase module
Purchasing process	Yes	Yes	Integrated with procurement module
Goods arrive	Yes	Yes	Tracked via Inventory > Receipts
Barcode scanning	Yes	Yes	Barcode feature used (if activated)
Stock entry in Odoo	Yes	Yes	Product quantities confirmed upon receipt
Is quantity matched?	Yes	Yes	Odoo flags mismatches automatically
Staff inputs corrected quantity manually	Yes	Yes	Corrections made during validation

The trial of the system carried out in the Facilities Department of Yogyakarta International Airport (YIA) yielded plenty of suggestions, as it showed both the advantages and the shortcomings of the adopted Odoo ERP package. The testing allowed real staff to have a touch of the new digital tools in an unrealistic but near-actual condition and get to discover what the system can do for the staff and assess the system relative to their routine workflows.

The test was also carried out in several sessions during which it was subjected to some of the basic functions such as the submission of procurement requests, vendor communications processes, inventory management, and auto-reports. During the trial, the staff was urged to employ the system as it would be applied in the reality working conditions (although using test data), and their activities, observations, and responses were recorded.

On the whole, the response of the three members of the staff who took part in the testing was quite positive, especially regarding the effectiveness and comprehensibility of the system in question. Nevertheless, a number of use-related concerns and issues were also mentioned, which demonstrate that, despite the Odoo ERP system having a great potential, there exist certain areas that need to be further modified, supported, or trained for users.

A real-time visibility of inventory data was another significant advantage. In the past, stock levels were maintained manually on Excel spreadsheets or paper logs, which in many instances resulted in inaccurate or stale data. By using Odoo, the warehouse workers were able to be able to view the updated quantities as the simulation post goods receipt took place. This provided better visibility to allow them to make faster and more informed decisions regarding refills or rearranging the materials.

On the reporting part, the system enabled staff to produce inventory and procurement reports that were structured by clicking a few times on the automated features of the system. Commentators referred to how much easier it was not to have to manually produce a daily or weekly summary- a routine activity that had been prone to errors in the past.

The vendor, as well as the product master information, was shared centrally, which was also a good area. In the past, the information about suppliers was distributed among different documents and messages, being inconsistent and prone to delays. The Odoo system enabled the storage of supplier data in a single format, which could be easily accessed during the planning of the procurement.

Throughout the system trial, the three members provided several experiences that concurred with the advantages of the system, along with the areas of improvement in this systems. As one user put it, it was much more convenient to make requests online than before when it was to use WhatsApp and Word documentation. They liked that the system kept things centralized and where they could trace them, they also complained of being unable to modify a request once they were ready to go, because they were not sure how to make such changes and needed some guidance. One other participant mentioned that he was especially useful because this information on inventory is updated in real time through the system, which he further added, is a big improvement compared to using handwritten logs or spreadsheets. Nevertheless, they acknowledged that the learning process of how to navigate the system was a little bit confusing the first time, especially, and it took them a number of tries to remember where certain features are located. One of the third users was impressed with the speed of generation

of the report, thus, how much time was saved compared to the submission of data manually. Nevertheless, they also complained that the format of the created reports did not fully coincide with what they were used to in the department, i.e., they also had to make several modifications even after exporting. All in all, their experiences showed that although the system led to some significant changes in efficiency, accuracy, and transparency, it still needed an adaptation period, improved user orientation, and a certain level of customization to become a natural part of the operations of the department.

5.1 Discussion

The results of operational use and testing of the Odoo ERP system in the Facilities Department of the Yogyakarta International Airport (YIA) have shown some valuable lessons about the viability, efficiency, and flexibility of digital enterprise systems within a semi-manual workflow. The output of the test is in close correlation with the preliminary goals of the research, which were to achieve efficiency in the procurement, inventory management, and reporting by the transformation of the fragmented and manual work processes into more consolidated and computerized ones.

It was among the most visible facts in the trial to observe that the time of the processing and the complexity of the processes concerning procurement and inventory were extensively simplified. Earlier, even the very easy things like making a procurement request had to undergo multiple manual procedures, including the preparation of the document itself, physical or digital communication via WhatsApp. The Odoo system managed to make those steps smoother, limiting the use of informal communication and introducing more transparency to every workflow. Also, the real-time inventory tracking solution helped to eliminate one of the major operational issues of the department, the real-time availability of stock information. This aspect in itself enhanced precision and decision making, and the chances of being out of stock or ordering more than necessary, which used to cause inefficiency and backlogs before.

In spite of the obvious technical progress, significant human and procedural issues were revealed during the trial as well. User feedback proved that success should not only be function-oriented, but it should also be usable and adaptive to system success. Although the system worked well in its essence, some users faced problems at the beginning, in orientation and understanding the system logic, and even doing irrelevant actions like editing the made request. This emphasizes the need to train and support the users, especially in institutions where they

are in the process of changing their system to be digital. Even though a software has been designed very well, there are chances it will become friction by not guiding the user through its usage or the interface not matching their mental models of how to use the workflow.

The other important argument of discussion is connected with systems customization and its adjustment to local work lines. Such as the reporting feature was technically competent and responsibly sound, although it was not quite the standard format of the department. This underlines the point that successful ERP implementation is not just an implementation of a tool but than one which would require customization of that tool to the very requirements of the operational culture and preferences of the people using the tool. Luckily, Odoo ERP can be customized in such a way, and the possibilities to introduce the template customization to the next iteration of this system might fill this gap. The selection of the Waterfall methodology also fitted the scope and the nature of this project. This is considered since it made it possible to distinctly analyze, design, implement, test, and evaluate due to the linear and developing process. All these phases were implemented in succession, and this made sure that the system settings were not hastily implemented, but rather, they were based on needs identified through observations of the users. Nevertheless, there is a disadvantage of the Waterfall approach, which is its rigidity; as the feedback of the users was not provided until the implementation, some issues related to usability were not learnt until a late stage of the process. A combination of both iterative user feedback and a more agile approach may be more suited in the context of future similar projects where the experience design for the user needs to be more adjustable on a more dynamic basis, e.g., Agile or a reduced pilot-testing loop.

Finally, the trial of the system proved that even in a default setup, the Odoo ERP is a powerful solution to support the procurement and inventory processes in the case of airport facilities. Based on the results, it can be assumed that the research aim has been successfully fulfilled, and the implementation may serve as a solid background for the upcoming digital transformation of the department. Meanwhile, the interview also serves as a reminder that people, process, and technology need to go hand in hand to realize the success behind ERP when it comes to reaping the full potential of it in the long term, and that the same requires constant support, feedback, and customization.

CHAPTER VI
CLOSING

6.1 Conclusion

The following is the conclusion based on the findings and the results

1. The study was carried out to tackle some of these principal operational inefficiencies in the Facilities Department of the Yogyakarta International Airport (YIA), which relates to its procurement, inventory management, and reporting procedures. By observation, interviews, and gap analysis, it was possible to find out that the inability of the department to increase the automation of its workflows and use Word documents, Excel spreadsheets, and informal forms of communication, which use such channels as WhatsApp, resulted in delays and miscommunication, as well as discrepancies in data tracking.
2. The research presented a digital system that is supposed to substitute these manual procedures in the form of the Odoo ERP system with its procurement and inventory modules. It was built with the assistance of Waterfall methodology, and the alterations in the processes were displayed in Business Process Model and Notation (BPMN) models, which assisted in the determination of the passage between AS-IS and TO-BE states.
3. The outcome of the trial test showed that the system greatly enhanced operational efficiency. Requests to procure any items would be processed more quickly and transparently; goods available in the warehouse would be viewed in real-time, which would shrink the number of mistakes and estimations; and reports would be created automatically, sparing several hours of manual work. Nevertheless, the testing job also showed certain difficulties, especially concerning the familiarity of users with the interface, restrictions on editing, and the necessity to customize the report form. These observations highlight that effective implementation of ERP involves more than the use of technology, and that consideration should be turned toward training and sustaining users as well as aligning operations.

Overall, the use of Odoo ERP fulfilled the purpose of the research as the invoice and inventory management, transparency, and better decision-making improved. The system will offer a strong basis on which the digital change in the department will be introduced, against the future options of expanding it or increasing its capacity.

6.2 Suggestions

It is suggested that, based on the findings of this research, the following recommendations can be given:

1. New user training and support

   Carry out some intensive training programs so that employees get used to the features of the system, particularly in editing of forms submitted, traversing the modules, as well as using the reports. Appoint a contact person to assist the users.

2. Tailor the results of the system and make them ready to be used

   Edit the report templates on Odoo to align them in tandem with the current formats in the department and make them clearer. Make sure that there is a stable internet connection so that there is no interruption in the system, and it is a good practice to have offline backup procedures in mind that can be used during an emergency.

3. Discover opportunities for ERP

   Expansion and other development approaches on how the further Odoo modules can be used in the future may be studied, including maintenance or asset tracking. Also, it might be worth looking deeper into another kind of development process, such as Rapid Application Development (RAD), or using a combination of hybrid Agile or Waterfall process, since it is associated with more flexibility in ERP implementation.

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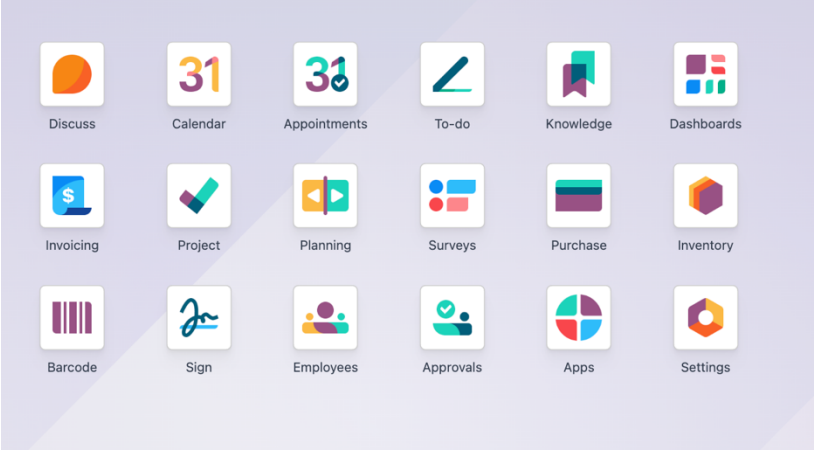
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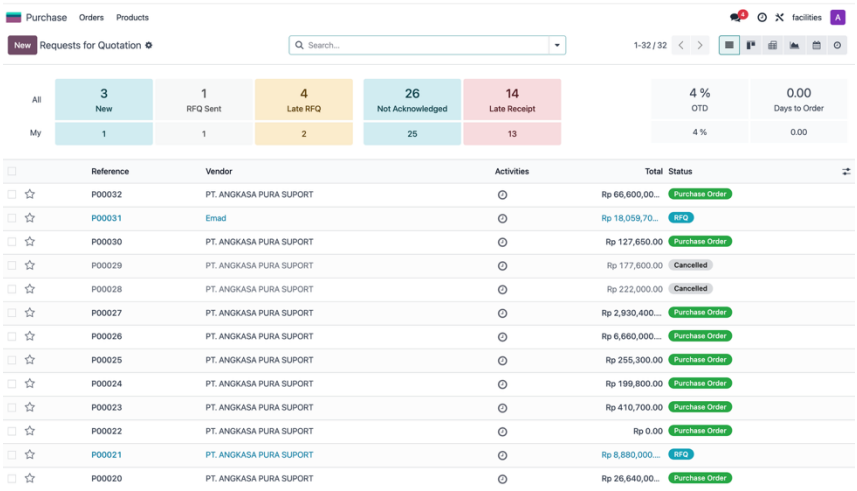
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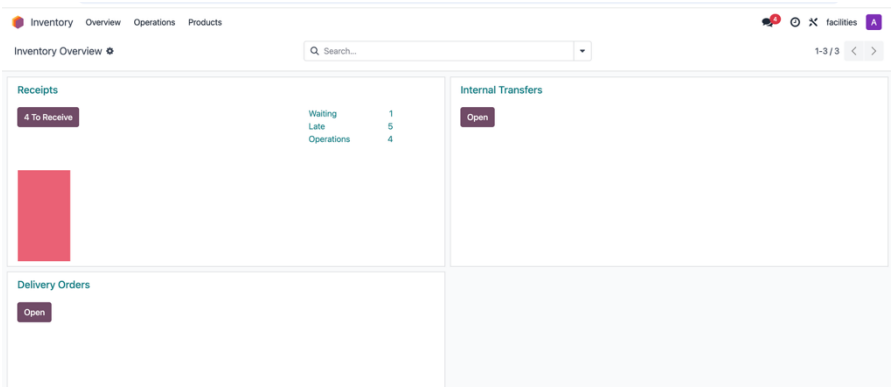
APPENDIX



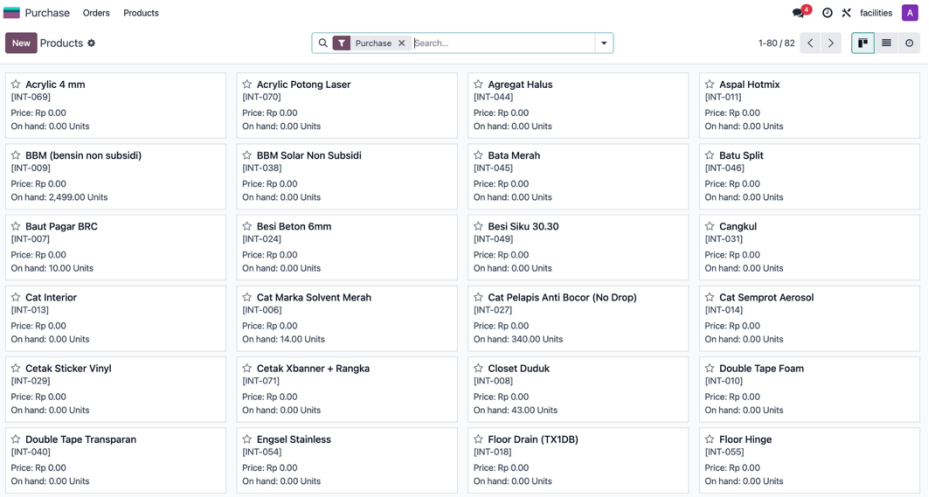
Odoo Interface



Purchase History



Inventory History



Product database

Deco Addict
77 Santa Barbara Rd
Pleasant Hill CA 94523
United States

Invoice INV/2023/00003

Invoice Date
07/08/2020

Due Date
08/07/2020

Description	Quantity	Unit Price	Taxes	Amount
[FURN_8999] Three-Seat Sofa Three Seater Sofa with Lounger in Steel Grey Colour	5.00	1,500.00	15%	$ 7,500.00
[FURN_8220] Four Person Desk Four person modern office workstation	5.00	2,350.00	15%	$ 11,750.00

Payment terms: 30 Days

Payment Communication: **INV/2023/00003**

Untaxed Amount	$ 19,250.00
Tax 15%	$ 2,887.50
Total	**$ 22,137.50**

Invoice

Priority	Order Reference	Vendor	Activities	Total	Status
Normal	P00032	PT. ANGKASA PURA SUPORT		Rp66,600,000.00	Purchase Order
Normal	P00031	Emad		Rp18,059,700.00	RFQ
Normal	P00030	PT. ANGKASA PURA SUPORT		Rp127,650.00	Purchase Order
Normal	P00029	PT. ANGKASA PURA SUPORT		Rp177,600.00	Cancelled
Normal	P00028	PT. ANGKASA PURA SUPORT		Rp222,000.00	Cancelled
Normal	P00027	PT. ANGKASA PURA SUPORT		Rp2,930,400.00	Purchase Order
Normal	P00026	PT. ANGKASA PURA SUPORT		Rp6,660,000.00	Purchase Order
Normal	P00025	PT. ANGKASA PURA SUPORT		Rp255,300.00	Purchase Order
Normal	P00024	PT. ANGKASA PURA SUPORT		Rp199,800.00	Purchase Order
Normal	P00023	PT. ANGKASA PURA SUPORT		Rp410,700.00	Purchase Order
Normal	P00022	PT. ANGKASA PURA SUPORT		Rp0.00	Purchase Order
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Normal	P00019	facilities		Rp152,828,685.00	RFQ
Normal	P00018	PT. ANGKASA PURA SUPORT		Rp16,650,000.00	Purchase Order
Normal	P00017	PT. MEGAH ANUGERAH ENERGI		Rp7,492,500.00	Purchase Order
Normal	P00016	PT. ANGKASA PURA SUPORT		Rp17,715,600.00	Purchase Order
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Normal	P00013	PT. MEGAH ANUGERAH ENERGI		Rp18,648,000.00	Purchase Order
Normal	P00012	PT. ANGKASA PURA SUPORT		Rp17,871,000.00	Purchase Order
Normal	P00011	facilities		Rp16,983,000.00	Purchase Order
Normal	P00010	Emad		Rp166,500,000.00	Purchase Order
Normal	P00009	facilities		Rp2,652,900.00	Purchase Order

Reporting