

ODOO ERP DESIGN TO ENHANCE EFFICIENCY IN PROCUREMENT, INVENTORY, AND MANUFACTURING FOR AN AGRIFOOD-TECH SME

ERMA SITI NUR ROBI'AH



**DEPARTMENT OF AGROINDUSTRIAL TECHNOLOGY
FACULTY OF AGRICULTURAL ENGINEERING AND TECHNOLOGY
IPB UNIVERSITY
BOGOR
2025**

- Hak Cipta Dilindungi Undang-undang
1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
 2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.



@Hak cipta milik IPB University

Hak Cipta Dilindungi Undang-undang

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.

DECLARATION OF ORIGINALITY AND COPYRIGHT TRANSFER

Hereby I declare that the thesis titled "Odoo ERP Design to Enhance Efficiency in Procurement, Inventory, and Manufacturing for an Agrifood-Tech SME" is my own work, prepared under the guidance of my advisors Prof. Dr. Eng. Taufik Djatna, STP, Msi. and Dr. Indah Yuliasih, S.TP., M.Si. This thesis has not been submitted to any other institution in any form. All information taken or cited from the works of others, whether published or unpublished, has been clearly mentioned in the text and included in the References.

I also declare that all copyright for this written work is assigned to the IPB University.

Bogor, July 2025

Erma Siti Nur Robi'Ah
F3401211041

- Hak Cipta Dilindungi Undang-undang
1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
 2. Dilarang menggunakan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.



ABSTRACT

ERMA SITI NUR ROBI'AH. Odoo ERP Design to Enhance Efficiency in Procurement, Inventory, and Manufacturing for an Agri-Food Tech SME. Supervised by TAUFIK DJATNA and INDAH YULIASIH.

Digital transformation is a key strategy to enhance operational efficiency, particularly for agri-food tech startups. However, some business lines still encounter challenges as their procurement, warehousing, and production processes remain manual and lack integration. This study aims to design and implement an Odoo-based ERP system focused on three main modules: Purchase, Inventory, and Manufacturing. The system is developed using a Software Engineering approach, combined with Design Thinking and Scrum, to support iterative and user-centered development. The project successfully produced an integrated cross-departmental ERP module, featuring automation for purchase requests, stock recording, and production scheduling. The implementation results showed an average increase in operational efficiency of 85.7%, and all user needs were met with an average satisfaction level of 94%, based on the User Acceptance Test. The implementation of this system enables the company to streamline business processes, improve information accuracy, and support faster, data-driven, and integrated decision-making.

Keywords: efficiency, enterprise resource planning, integration, odoo, operational

ABSTRAK

ERMA SITI NUR ROBI'AH. Perancangan Sistem ERP Berbasis Odoo untuk Peningkatan Efisiensi Pengadaan, Pergudangan, dan Produksi pada UKM Agri-Food Tech. Dibimbing oleh TAUFIK DJATNA dan INDAH YULIASIH.

Transformasi digital merupakan strategi kunci untuk meningkatkan efisiensi operasional, khususnya bagi startup di bidang agri-food tech. Namun, beberapa lini bisnis masih menghadapi tantangan karena proses pengadaan, pergudangan, dan produksi yang dijalankan secara manual dan belum terintegrasi. Penelitian ini bertujuan untuk merancang dan mengimplementasikan sistem ERP berbasis Odoo yang berfokus pada tiga modul utama: Purchase, Inventory, dan Manufacturing. Sistem dikembangkan menggunakan pendekatan Software Engineering, dipadukan dengan Design Thinking dan Scrum, untuk mendukung pengembangan iteratif dan berpusat pada pengguna. Proyek berhasil menghasilkan modul ERP terintegrasi antardivisi, dengan fitur otomatisasi permintaan pembelian, pencatatan stok, dan penjadwalan produksi. Hasil implementasi menunjukkan peningkatan efisiensi operasional rata-rata sebesar 85,7%, dan seluruh kebutuhan pengguna terpenuhi dengan tingkat kepuasan rata-rata 94% berdasarkan User Acceptance Test. Penerapan sistem ini memungkinkan perusahaan untuk merampingkan proses bisnis, meningkatkan akurasi informasi, serta mendukung pengambilan keputusan yang lebih cepat, berbasis data, dan terintegrasi.

Kata kunci: efisiensi, enterprise resource planning, integrasi, odoo, operasional



Hak Cipta Dilindungi Undang-undang

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.

© Copyrighted by IPB, 2025
Copyright is protected by Law

It is prohibited to quote parts or the whole of this paper without including or mentioning its source. Citation is only for the purposes of education, research, writing scientific papers, report compiling, writing criticism, or problem reviews, and the quotation did not harm IPB's behalf.

It is prohibited to publish and copy parts or the whole of this paper in any form without IPB's permission.

ODOO ERP DESIGN TO ENHANCE EFFICIENCY IN PROCUREMENT, INVENTORY, AND MANUFACTURING FOR AN AGRIFOOD-TECH SME

ERMA SITI NUR ROBI'AH

Undergraduate Final Report
As one of the requirements for obtaining a degree of
Bachelor of Engineering with Honours
at
Department of Agroindustrial Technology

**DEPARTMENT OF AGROINDUSTRIAL TECHNOLOGY
FACULTY OF AGRICULTURAL ENGINEERING AND TECHNOLOGY
IPB UNIVERSITY
BOGOR
2025**



@Hak cipta milik IPB University

Hak Cipta Dilindungi Undang-undang

1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
 - a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
 - b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.

Examiner's Committee:

- 1 Dr. Ir. Agung Terminanto, MBA., IPM.
- 2 Dr. Muhammad Syukur Sarfat, M.Si.



Report Title : Odoo ERP Design to Enhance Efficiency in Procurement,
Inventory, and Manufacturing for an Agrifood-Tech SME

Name : Erma Siti Nur Robi'Ah

Student ID : F3401211041

@Hak cipta milik IPB University

Approved by

Supervisor 1:

Prof. Dr. Eng. Taufik Djatna, M.Si.

Supervisor 2:

Dr. Indah Yuliasih, S.T.P., M.Si.

Acknowledged by

Head of Department:

Prof. Dr. Ono Suparno, S.TP, M.T.

NIP. 197212031997021001

Date of Exam:

July 4th, 2025

Date Approval:

PREFACE

Praise and gratitude to Allah, the Almighty, for His abundant mercy and compassion, allowing the author to complete this main agro-industrial design project, which has been carried out from February to June 2025. The main agro-industrial design project titled "Odoo ERP Design to Enhance Efficiency in Procurement, Inventory, and Manufacturing for an Agrifood-Tech SME" is one of the requirements for completing the undergraduate program in the Department of Agricultural Industrial Technology, Faculty of Agricultural Engineering and Technology.

The author would like to thank all parties who have contributed to the writing and preparation of this main agro-industrial design project, namely:

1. Prof. Dr. Eng. Taufik Djatna, M.Si and Dr. Indah Yuliasih, S.T.P., M.Si as the supervising lecturers who have guided and provided advice during the main agro-industrial design project process.
2. Prof. Dr. Ono Suparno, MT as the Head of the Agricultural Industrial Technology Department.
3. All lecturers, educational staff, administrative staff, and UPT in the Agricultural Industrial Technology Department.
4. All staff and employees of the partner company who have assisted the author in collecting data and providing feedback for the author's final project for the undergraduate program.
5. All members of the Capstone Project group, namely Arizal Muhammad Fadilah and Shakira Maharani.
6. All guidance friends, namely Anggun Wahyudi, Faqih Bahrul Ilmi, and Syahda Mahdiyah.
7. Fellow students in the Agroindustrial Technology Department, Class of 58.

Bogor, July 2025

Erma Siti Nur Robi'Ah



TABLE OF CONTENTS

LIST OF TABLES	ix
LIST OF FIGURES	ix
LIST OF APPENDICES	x
INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement	2
1.3 Project Objective	2
1.4 Project Benefits	2
1.5 Project Scope	3
LITERATUR REVIEW	4
2.1 Enterprise Resource Planning (ERP)	4
2.2 Odoo ERP System	4
2.3 Purchasing Module	4
2.4 Inventory Module	5
2.5 Manufacturing Module	5
2.6 Microservices	6
III METHOD	7
3.1 Engineering Design Stages	7
3.2 Data Collection	9
3.3 Time and Place	10
3.4 Tools and Materials	10
3.5 Data Analysis	11
IV RESULT AND DISCUSSION	13
4.1 Problem Findings	13
4.2 System Development Model	15
4.3 Prototype Development	25
4.4 System Performance Evaluation	37
4.5 Analysis of Managerial Implication	40
4.6 System Limitations and Strategic Recommendations	41
V CONCLUSION AND RECOMMENDATION	43
5.1 Conclusion	43
5.2 Recommendation	43
REFERENCES	44
APPENDICES	47
BIOGRAPHY	73

Hak Cipta Dilindungi Undang-undang
1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.

Hak Cipta Dilindungi Undang-undang
1. Dilarang mengutip sebagian atau seluruh karya tulis ini tanpa mencantumkan dan menyebutkan sumber :
a. Pengutipan hanya untuk kepentingan pendidikan, penelitian, penulisan karya ilmiah, penyusunan laporan, penulisan kritik atau tinjauan suatu masalah
b. Pengutipan tidak merugikan kepentingan yang wajar IPB University.
2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin IPB University.

LIST OF TABLES

1	Data types and data collection techniques	9
2	The main hardware	10
3	The main software	10
4	User requirement	15
5	Validation of user requirements after prototyping	38
6	User acceptance test result	39
7	Results of operational efficiency improvement testing	40

LIST OF FIGURES

1	Stages of engineering design in Odoo ERP development	7
2	Existing BPMN for the operational division	13
3	Existing conditions of the company's operational division	14
4	Procurement, warehouse, and production division	15
5	Use case diagram of the Purchase module	17
6	Use case diagram of the Inventory module	18
7	Use case diagram of the Manufacturing module	19
8	ERD of the Purchase module	20
9	ERD of the Inventory module	21
10	ERD of the Manufacturing module	21
11	Physical architecture system	22
12	Proposed BPMN of the Purchase module	23
13	Proposed BPMN of the Inventory module	24
14	Proposed BPMN of the Manufacturing module	25
15	Purchase module integration with inventory	26
16	Purchase module integration with accounting	26
17	Vendor evaluation feature	27
18	Internal transfer features between warehouses	28
19	Reordering rules for raw materials and products	28
20	Lot/serial number management expired alert notifications	29
21	Integration of Manufacturing module with Inventory module	30
22	Purchase module dashboard	32
23	Inventory module dashboard	33
24	Manufacturing module dashboard	34
25	Microservice for PO approval	35
26	Microservice for goods receipt at the warehouse	36
27	Microservice for confirm manufacturing order	37



LIST OF APPENDICES

1	Functional and Non-Functional Requirements (Purchase Module)	46
2	Functional and Non-Functional Requirements (Inventory Module)	49
3	Functional and Non-Functional Requirements (Manufacturing Module)	51
4	Data Flow Diagram (DFD) Purchase Module	52
5	Data Flow Diagram (DFD) Inventory Module	54
6	Data Flow Diagram (DFD) Manufacturing Module	55
7	User Acceptance Test (UAT) Purchase Module Result	56
8	User Acceptance Test (UAT) Inventory Module Result	57
9	User Acceptance Test (UAT) Manufacturing Module Result	58
10	Comparison of Manual Purchasing Process Time and ERP	59
11	Comparison of Manual vs ERP Inventory Processing Time	60
12	Comparison of Manual Production Process Time and ERP	61
13	Standard Operating Procedure Purchase Module	62
14	Standard Operating Procedure Inventory Module	65
15	Standard Operating Procedure Manufacturing Module	68
16	Custom Module Code for Vendor Evaluation	69