



**DEVELOPMENT OF A WEB-BASED SYSTEM WITH A BARCODE
SCANNER FOR AUTOMATION AND ACCURACY OF OUTGOING
GOODS RECORDING IN THE WAREHOUSE**

UNDERGRADUATE THESIS

**Submitted as one of the requirements to obtain
Sarjana Komputer**

By:

**Naufal Dhuha Fikriandi
012202205041**

**FACULTY OF COMPUTER SCIENCE
INFORMATION SYSTEM STUDY PROGRAM
CIKARANG
AUGUST, 2025**

SIMILARITY INDEX REPORT

Final Project_Naufal Dhuha Fikriandi_012202205041.docx

ORIGINALITY REPORT

5%	3%	1%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.coursehero.com Internet Source	1%
2	repository.president.ac.id Internet Source	<1%
3	Submitted to Istanbul Aydin University Student Paper	<1%
4	Submitted to University of Bedfordshire Student Paper	<1%
5	Submitted to Australian College of Kuwait Student Paper	<1%
6	Submitted to Sheffield Hallam University Student Paper	<1%
7	thegioidisan.vn Internet Source	<1%
8	digilib.unila.ac.id Internet Source	<1%
9	Submitted to University of Suffolk Student Paper	<1%
10	medium.com Internet Source	<1%
11	docshare.tips Internet Source	<1%
12	ntnuopen.ntnu.no Internet Source	<1%

ABSTRACT

This study provides a web-based system to optimize the outbound products management at warehouse PT Dae 586 Hwa Indonesia. Automatic data capture through barcode reading and AFE (Auto Fill Entry) where items are read from one item with a touch of an OK-key to automatically record in real-time and simplify data handling by avoiding key input manually.

Only, for many warehouses and operations concerned with warehousing, such as PT Dae Hwa Indonesia, they still rely on heavy-weight Excel spreadsheets plus manual entering which causes human error and lack of consistency. The instant system is addressed to a substitute for the reliance on conventional techniques such as these that will work in less time, more accurately, and with reduced chance of error.

It reduces manual errors, eliminates double keying and speeds up the process of recording in goods by automating it. One function of the system is that information can be incorporated on-the-fly, allowing lottery operators to scan products and access up-to-date data stored in the form of new information. This provides warehouse employees and managers with accurate, up-to-date data on shipments.

It was designed to work with other ERP software packages, so that it works in the same way at every plant. It also generates a warehouse operator-friendly interface that allows users to easily access, modify, and analyze data without the need for being technically proficient.

Besides efficiency benefits, customers also experienced improved satisfaction through less shipment mistake and shipment time delay coupled with timely and more accurate deliveries. Last not the least this web application would be a great step forward for PT Dae Hwa Indonesia in improving it's warehousing system. Implementation of such method becomes beneficial to the company since it is not time-consuming, gives optimal accuracy as well as keeps at par with the tough life in a competitive world.

Keywords: Web-Based System, Barcode Scanner, Warehouse Management, Outgoing Goods, ERP Integration

**Copyright by
Naufal Dhuha Fikriandi
2025**

**DEVELOPMENT OF A WEB-BASED SYSTEM WITH A BARCODE
SCANNER FOR AUTOMATION AND ACCURACY OF OUTGOING
GOODS RECORDING IN THE WAREHOUSE**

**DEVELOPMENT OF A WEB-BASED SYSTEM WITH A BARCODE
SCANNER FOR AUTOMATION AND ACCURACY OF OUTGOING
GOODS RECORDING IN THE WAREHOUSE**

By

Naufal Dhuha Fikriandi
012202205041

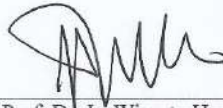
Approved:



Imron Iswanto, S.Kom., M.Kom.
Thesis Advisor



Ronny Juwono, S.Pd., M.T.
Program Head of Information System



Prof. Dr. Ir. Wiranto Herry Utomo, M.Kom.
Dean of Faculty of Computer Science

STATEMENT OF ORIGINALITY

STATEMENT OF ORIGINALITY

In my capacity as an active student of President University and as the author of the thesis/final project/business plan (underline that applies) stated below:

Name : Naufal Dhuha Fikriandi
Student ID number : 012202205041
Study Program : Information System
Faculty : Computer Science

I hereby declare that my thesis/final project/business plan entitled "**Development of a Web-Based System with a Barcode Scanner for Automation and Accuracy of Outgoing Goods Recording in the Warehouse**" is to the best of my knowledge and belief, an original piece of work based on sound academic principles. If there is any plagiarism detected in this thesis/final project/business plan, I am willing to be personally responsible for the consequences of these acts of plagiarism, and will accept the sanctions against these acts in accordance with the rules and policies of President University.

I also declare that this work, either in whole or in part, has not been submitted to another university to obtain a degree.

Cikarang, 22 September 2025



Naufal Dhuha Fikriandi

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

As an academic community member of the President's University, I, the undersigned:

Name : Naufal Dhuha Fikriandi

Student ID number : 012202205041

Study program : Information System

for the purpose of development of science and technology, certify, and approve to give President University a non-exclusive royalty-free right upon my final report with the title :

Development of a Web-Based System with a Barcode Scanner for Automation and Accuracy of Outgoing Goods Recording in the Warehouse

With this non-exclusive royalty-free right, President University is entitled to converse, to convert, to manage in a database, to maintain, and to publish my final report. There are to be done with the obligation from President University to mention my name as the copyright owner of my final report.

This statement I made in truth.

Cikarang, 22 September 2025



Naufal Dhuha Fikriandi

ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY

ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY

As an academic community member of the President's University, I, the undersigned:

Name : Imron Iswanto, S.Kom., M.Kom.
ID number : 102090006
Study program : Information System
Faculty : Computer Science

declare that following thesis :

Title of thesis : Development of a Web-Based System with a Barcode Scanner for
Automation and Accuracy of Outgoing Goods Recording in the
Warehouse
Thesis author : Naufal Dhuha Fikriandi
Student ID number : 012202205041

will be published in **journal** / **institution's repository** / **proceeding** / **unpublish** /
..... (underline that applies)

Cikarang, 22 September 2025



Imron Iswanto, S.Kom., M.Kom.

AI-BASED PLAGIARISM DETECTION



*% detected as AI

AI detection includes the possibility of false positives. Although some text in this submission is likely AI generated, scores below the 20% threshold are not surfaced because they have a higher likelihood of false positives.

Caution: Review required.

It is essential to understand the limitations of AI detection before making decisions about a student's work. We encourage you to learn more about Turnitin's AI detection capabilities before using the tool.

Disclaimer

Our AI writing assessment is designed to help educators identify text that might be prepared by a generative AI tool. Our AI writing assessment may not always be accurate (i.e., our AI models may produce either false positive results or false negative results), so it should not be used as the sole basis for adverse actions against a student. It takes further scrutiny and human judgment in conjunction with an organization's application of its specific academic policies to determine whether any academic misconduct has occurred.

Frequently Asked Questions

How should I interpret Turnitin's AI writing percentage and false positives?

The percentage shown in the AI writing report is the amount of qualifying text within the submission that Turnitin's AI writing detection model determines was either likely AI-generated text from a large-language model or likely AI-generated text that was likely revised using an AI paraphrase tool or word spinner.

False positives (incorrectly flagging human-written text as AI-generated) are a possibility in AI models.

AI detection scores under 20%, which we do not surface in new reports, have a higher likelihood of false positives. To reduce the likelihood of misinterpretation, no score or highlights are attributed and are indicated with an asterisk in the report (*%).

The AI writing percentage should not be the sole basis to determine whether misconduct has occurred. The reviewer/instructor should use the percentage as a means to start a formative conversation with their student and/or use it to examine the submitted assignment in accordance with their school's policies.

What does 'qualifying text' mean?

Our model only processes qualifying text in the form of long-form writing. Long-form writing means individual sentences contained in paragraphs that make up a longer piece of written work, such as an essay, a dissertation, or an article, etc. Qualifying text that has been determined to be likely AI-generated will be highlighted in cyan in the submission, and likely AI-generated and then likely AI-paraphrased will be highlighted purple.

Non-qualifying text, such as bullet points, annotated bibliographies, etc., will not be processed and can create disparity between the submission highlights and the percentage shown.



TABLE OF CONTENTS

DEVELOPMENT OF A WEB-BASED SYSTEM WITH A BARCODE SCANNER FOR AUTOMATION AND ACCURACY OF OUTGOING GOODS RECORDING IN THE WAREHOUSE	I
STATEMENT OF ORIGINALITY	II
SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST	III
ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY	IV
SIMILARITY INDEX REPORT	V
AI-BASED PLAGIARISM DETECTION	VI
ABSTRACT	VII
DEDICATION	VIII
ACKNOWLEDGMENTS	IX
LIST OF FIGURES	XIII
LIST OF TABLES	XIII
CHAPTER I	1
1. 1 PROBLEM FORMULATION	1
1.1.1 Background of the Problem	1
1.1.2 Problem Statement	1
1.1.3 Objective	1
1.1.4 Problem from a Customer Perspective	2
1. 2 PROBLEM CONSTRAINT ANALYSIS	2
1.2.1 Aspect 1: Economics	2
1.2.2 Aspect 2: Adaptability - Usability	2
1.2.3 Aspect 3: Sustainability	3
1.2.4 Aspect 4: Efficiency	3
1.2.5 Aspect 5: End User	3
1. 3 PROBLEM FUNCTIONAL ANALYSIS	3
1.3.1 Functionalities 1: Real-Time Barcode Scanning	3
1.3.2 Functionalities 2: Data Synchronization with Delivery Orders	4
1.3.3 Functionalities 3: Automatic Verification and Reporting	4
1. 4 SOLUTION SELECTION	4
1.4.1 Alternative Solution 1: Web-Based Barcode Scanning System	4
1.4.2 Alternative Solution 2: Excel Macros/VBA Automation	5
1.4.3 Alternative Solution 3: Enhanced Labeling for Stock Control	5
1.4.4 Solution Selection	5

1. 5 SOLUTION USAGE SCENARIOS.....	6
1. 6 DEVELOPMENT EFFORT	6
1.6.1 Man-Months.....	6
1.6.2 Machine-Months	7
1.6.3 Development Tools.....	7
1.6.4 Test Equipment	7
1.6.5 Expert Needs	7
1.6.6 Cost Estimation.....	7
1.6.7 Timelines.....	8
CHAPTER II.....	9
2. 1 EXISTING AND PROPOSED SYSTEM.....	9
2.1.1 Existing Business Process.....	9
2.1.2 Proposed Business Process.....	10
2. 2 GLOBAL DESCRIPTION OF THE PRODUCT.....	11
2.2.1 Main Functionality	11
2.2.2 User Characteristics	11
2.2.3 Constraints	12
2. 3 DATA REQUIREMENT FROM THE USER’S PERSPECTIVE.....	12
2.3.1 External Interface Requirement	12
2.3.2 Database Design.....	13
2.3.3 Functional Requirement From The User’s Perspective.....	20
2.3.4 Non-Functional Requirement.....	23
2. 4 SPECIFICATION TESTING.....	24
CHAPTER III	25
3. 1 ALTERNATIVE SOLUTION DESIGNS.....	25
3.1.1 Alternative Solution 1: Web-Based Barcode Scanning System	25
3.1.2 Alternative Solution 2: Excel Macros/VBA Automation.....	26
3.1.3 Alternative Solution 3: Enhanced Labelling with Manual Stock Control	27
3. 2 RATIONAL/SYSTEMATIC DESIGN	29
3.2.1 COMPARISON TABLE.....	29
3.2.2 SOLUTION SELECTION.....	30
3. 3 HIERARCHICAL/ITERATIVE DESIGN	31
3.3.1 Block Diagram of a Web-Based Barcode Scanning System.....	31
3.3.2 Provide Clear Interface Information Between Block Diagrams	32

3. 4 DESIGN USER INTERFACE SYSTEM	33
3. 5 PROVIDE CLEAR AND CORRECT MODELLING BY USING EXISTING MODELLING STANDARDS.....	39
3.5.1 Use Case Diagram.....	39
3.5.2 Activity Diagram.....	40
3.5.3 Entity Relationship Diagram	42
3. 6 STANDARDS USED	45
3. 7 IMPLEMENTATION AND TESTING PLANS	46
3.7.1 Gantt Chart and Task Dependencies.	46
3.7.2 Provide an S-Chart for each item in the specification, a clear test method, and the amount to be measured.....	47
CHAPTER IV.....	49
4. 1 DESIGNS IMPLEMENTATION.....	49
4.1.1 Database implementation.....	49
4.1.2 Integration	54
4.1.3 Implementation	55
4. 2 PRODUCT DISPLAY	56
4.2.1 Log In Page.....	56
4.2.2 Scan Results Page	56
4.2.3 Scan QR Page.....	57
4. 3 VIDEO DEMONSTRATION	57
CHAPTER V	58
5. 1 FUNCTIONAL TESTING RESULTS.....	58
5.1.1 Present Qualitative Testing (Questionnaire)	59
5. 2 DETAIL THE TEST PROCEDURES THAT ARE CARRIED OUT ACCORDING TO THE DESIGN	61
5. 3 PROCEDURES FOR THE DEMO ARE CREATED AND VERIFIED....	62
5.3.1 Demonstration Stages.....	62
5.3.2 Demonstration Duration	63
5.3.3 Technical Notes During Demo	63
5.3.4 Demonstration Procedure Verification	63
5. 4 TESTING OTHER SPECIFICATIONS	64
5.4.1 Non-functional specifications such as size, weight, etc.....	64
5.4.2 A photo/recording of the test is shown in the document.....	65
REFERENCE	68

LIST OF FIGURES

Figure 1 Solution Usage Scenarios	6
Figure 2 Existing Business Process	9
Figure 3 Proposed Business Process.....	10
Figure 4 Entity Relationship Diagram	14
Figure 5 Entity Tables	18
Figure 6 Cardinality customer and salesOrder.....	18
Figure 7 Cardinality salesOrder and product	18
Figure 8 Cardinality suratJalan and salesOrder	19
Figure 9 Cardinality matrixHarga and product	19
Figure 10 Context Diagram	20
Figure 11 Activity Diagram	21
Figure 12 Data Flow Diagram	22
Figure 13 Block Diagram Level 0 Web-Based Barcode Scanning System	25
Figure 14 Block Diagram Level 1 Web-Based Barcode Scanning System	26
Figure 15 Block Diagram Level 0 Excel Macros/VBA Automation	26
Figure 16 Block Diagram Level 1 Excel Macros/VBA Automation	27
Figure 17 Block Diagram Level 0 Enhanced Labeling with Manual Stock Control...	28
Figure 18 Block Diagram Level 1 Enhanced Labeling with Manual Stock Control...	28
Figure 19 Block Diagram of a Web-Based Barcode Scanning System	31
Figure 20 Login Page.....	33
Figure 21 Customer Page.....	34
Figure 22 Supplier Page.....	34
Figure 23 Order Page	35
Figure 24 Order Page	36
Figure 25 Order Page	36
Figure 26 Product Page.....	37
Figure 27 Product Page.....	37
Figure 28 Report Section	38
Figure 29 Use Case Diagram	39
Figure 30 Activity Diagram	40
Figure 31 Entity Relationship Diagram	42
Figure 32 Gantt Chart	46
Figure 33 Entity Relationship Diagram	49
Figure 34 Log In Page.....	56
Figure 35 Scan Results Page.....	56
Figure 36 Scan QR Page	57
Figure 37 Questionnaire System Evaluation 1.....	59
Figure 38 Questionnaire System Evaluation 2.....	59
Figure 39 Questionnaire Ease of Use 1.....	60
Figure 40 Questionnaire Ease of Use 2.....	60
Figure 41 Questionnaire Sustainability.....	61
Figure 42 Database User	66
Figure 43 Interface Web-Base Ver PC	67
Figure 44 Interface Scan Result.....	67

LIST OF TABLES

Table 1 Man-Months	6
Table 2 Timelines	8
Table 3 User Characteristics	11
Table 4 Customer	14
Table 5 Part	15
Table 6 matrixHarga.....	15
Table 7 salesOrder.....	16
Table 8 suratJalan.....	17
Table 9 Non-Functional Requirement.....	23
Table 10 Specification Testing	24
Table 11 Comparison Table.....	29
Table 12 Global Variable.....	32
Table 13 Message Passing	32
Table 14 Parameter Passing	33
Table 15 Users.....	42
Table 16 Customers.....	43
Table 17 Products.....	43
Table 18 Sales Orders	44
Table 19 Sales Order Items	44
Table 20 Surat Jalan	45
Table 21 STANDARDS USED.....	45
Table 22 Real-Time Barcode Scanning	47
Table 23 Data Synchronization with ERP	47
Table 24 Reporting.....	47
Table 25 Error Handling and Confirmation	48
Table 26 Proof of Delivery Upload.....	48
Table 27 Users.....	49
Table 28 Customers.....	50
Table 29 Products.....	50
Table 30 Sales Orders	51
Table 31 Sales Order Items	51
Table 32 Surat Jalan	52
Table 33 Implementation	55
Table 34 Functional Testing Results	58
Table 35 Detail The Test Procedures	61
Table 36 Demonstration Stages	62
Table 37 Demonstration Duration.....	63
Table 38 Technical Notes During Demo	63
Table 39 Verification Process.....	63
Table 40 Verification Results	64