



DEVELOP E-COMMERCE WITH DEVOPS DEPLOYMENT

UNDERGRADUATE THESIS

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

**By:
Ayu Sulistiowati
012201900010**

**FACULTY OF COMPUTING
INFORMATION SYSTEM STUDY PROGRAM
CIKARANG
MARCH, 2023**

Copyright by

Ayu Sulistiowati

2022

PANEL OF EXAMINER APPROVAL

The Panel of Examiners declare that the undergraduate thesis entitled **Develop E-commerce With DevOps Deployment**, that was submitted by Ayu Sulistiowati majoring in Information System from faculty of Computing was assessed and approved to have passed the Oral Examination on 21 March 2023.

Panel Examiner



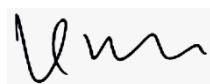
Genta Sahuri, S.Kom., M.Kom.

Chair of Panel Examiner



Hadi Suprayitno, S.Kom., M.M.

Examiner I



Rikip Ginanjar, M.Sc

Advisor

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 : Ayu Sulistiowati

Student ID number : 012201900010

Study Program : Information System

Faculty : Computer Science

I hereby declare that my thesis/final project/business plan entitled "**Develop E-commerce With DevOps Deployment**" 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, March 21, 2023



Ayu Sulistiowati

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

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

Name : Ayu Sulistiowati

Student ID number : 012201900010

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:

Develop E-commerce With DevOps Deployment

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, March 21, 2023



Ayu Sulistiowati

ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY

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

Advisor Name : Rikip Ginanjar, M.Sc

Employee ID Number : 20080800138

Study Program : Information System

Faculty : Computer Science

declare that following final project:

Title of final project : Develop E-commerce With DevOps Deployment

Final Project author : Ayu Sulistiowati

Student ID number : 012201900010

will be published in **journal / institution's repository / proceeding / unpublish**

(underline that applies)

Cikarang, March , 2023



Rikip Ginanjar, M.Sc

SIMILARITY INDEX REPORT

Turnitin of Draft Thesis

ORIGINALITY REPORT

13% SIMILARITY INDEX **13%** INTERNET SOURCES **2%** PUBLICATIONS **0%** STUDENT PAPERS

PRIMARY SOURCES

1	repository.president.ac.id Internet Source	8%
2	ntnuopen.ntnu.no Internet Source	1%
3	discovery.ucl.ac.uk Internet Source	<1%
4	hdl.handle.net Internet Source	<1%
5	Nur Khafidhoh, Azmi Maghfirotul Mutiara Ramadhyanty. "E-Pasar Application to Improve Economic Stability of MSME in Jombang", NEWTON: Networking and Information Technology, 2022 Publication	<1%
6	lanmarket.ua Internet Source	<1%
7	e-research.siam.edu Internet Source	<1%

8	S.A.I.B.S. Arachchi, Indika Perera. "Continuous Integration and Continuous Delivery Pipeline Automation for Agile Software Project Management", 2018 Moratuwa Engineering Research Conference (MERCon), 2018 Publication	<1 %
9	videosystem.de Internet Source	<1 %
10	sites.google.com Internet Source	<1 %
11	dspace.mit.edu Internet Source	<1 %
12	manualzz.com Internet Source	<1 %
13	www.coursehero.com Internet Source	<1 %
14	moam.info Internet Source	<1 %
15	www.pnnl.gov Internet Source	<1 %
16	www.security.us.panasonic.com Internet Source	<1 %
17	core.ac.uk Internet Source	<1 %

18	silo.pub Internet Source	<1 %
19	webapp.io Internet Source	<1 %
20	www.ce.jhu.edu Internet Source	<1 %
21	mafiadoc.com Internet Source	<1 %
22	sahrис.sahra.org.za Internet Source	<1 %
23	www.arxiv-vanity.com Internet Source	<1 %
24	www.db-thueringen.de Internet Source	<1 %
25	www.diva-portal.org Internet Source	<1 %
26	escholarship.mcgill.ca Internet Source	<1 %
27	ir.lib.uwo.ca Internet Source	<1 %
28	nemertes.library.upatras.gr Internet Source	<1 %
29	www.xenonstack.com Internet Source	<1 %

30	W. L. Kocay. "Partial automorphisms and the reconstruction conjecture", Journal of the Australian Mathematical Society. Series A. Pure Mathematics and Statistics, 2009 Publication	<1 %
31	elearning.reb.rw Internet Source	<1 %
32	kritikuselemek.uni-miskolc.hu Internet Source	<1 %
33	www.duo.uio.no Internet Source	<1 %
34	download.microsoft.com Internet Source	<1 %
35	etheses.whiterose.ac.uk Internet Source	<1 %
36	www.eiseverywhere.com Internet Source	<1 %
37	www.storageperformance.org Internet Source	<1 %

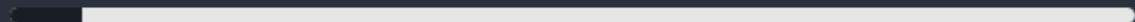
Exclude quotes Off
Exclude bibliography On

Exclude matches Off

GPTZero Report

Stats

Average Perplexity Score: 63.667



A document's perplexity is a measurement of the randomness of the text

Burstiness Score: 46.088



A document's burstiness is a measurement of the variation in perplexity

Your sentence with the highest perplexity, "*This statement I made in truth.*", has a perplexity of: 210

ABSTRACT

Currently, many companies are engaged in e-commerce to offer a shopping experience without having to come to the store in person. From long-established companies to start-ups, they strive to improve the quality and customer experience when using their e-commerce application products. In enhancing the development of e-commerce applications, cooperation from various parties is needed to achieve goals. The development and operations teams are the core teams in developing e-commerce applications.

However, it is challenging for most companies to unite cooperation between the development and operations teams because each has different priorities and goals. This project aims to provide solutions to the above problems by using DevOps in e-commerce development. DevOps is a mindset that emphasizes communication, collaboration, and integration between software developers and IT operations to increase the speed and quality of project deployment by automating the process of software delivery and infrastructure changes. By using DevOps, the development of e-commerce applications will not only be fast but also improve the quality of the application.

Keywords: *E-commerce, DevOps*

DEDICATION

I would like to dedicate this thesis to: My almighty God, my beloved parents, my family, my advisor, my lecture and my friends who support and help me in the process of finishing this final project.

ACKNOWLEDGMENTS

Foremost, I would like to express my sincere gratitude to Almighty God for the blessing and guidance. In making this thesis I am getting help from various parties. For this great opportunity, I would like to thank:

1. My beloved family and person who I care about always give encouragement and support and help me finish this thesis.
2. Rikip Ginanjar, M.Sc as my thesis advisor who guides me through this thesis
3. All lecturers of computing faculty and staff
4. Mentors and colleagues who have provided knowledge about DevOps
5. My friend who gives me advice so that this thesis can be completed on time

Cikarang, November 2022



Ayu Sulistiowati

TABLE OF CONTENTS

	Page
ABSTRACT	i
DECLARATION OF ORIGINALITY	4
DEDICATION	ii
ACKNOWLEDGMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	ix
LIST OF FIGURES	xi
CHAPTER INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement	1
1.3 Final Project Objective.....	2
1.4 Scope and Limitation	2
1.4.1 Scope.....	2
1.4.2 Limitation.....	2
1.5 Final Project Methodology	2
CHAPTER II LITERATURE STUDY	6
2.1 E-Commerce.....	6
2.2 Software Development Life Cycle	6
2.2.1 Waterfall methodology	7

2.2.2 Agile methodology.....	7
2.2.3 DevOps methodology	7
2.3 React.Js.....	8
2.4. Express.Js	8
2.4 GitHub.....	9
2.5 Docker	9
2.6 Katalon	9
2.7 Jenkins	10
2.8 Related Work.....	11
2.8.1 E-Commerce Toko Batik Pekalongan Web-Base With Waterfall Methodology.....	11
2.8.2 E-commerce Perlengkapan Haji dan Umrah Web-Based with Agile Methodology	12
2.8.3 Related Work Comparison.....	12
CHAPTER III SYSTEM ANALYSIS.....	14
3.1 System Overview	14
3.2 Functional Analysis.....	14
3.3 Software and Hardware Requirements.....	15
3.4 Use Case Diagram.....	17
3.5 Use Case Narrative.....	17
3.6 Activity Diagram.....	38
3.6.1 Sign Up	38
3.6.2 Login	39
3.6.3 Complete and Edit Profile	40

3.6.4 Add Product	41
3.6.5 Edit Product	42
3.6.6 Delete Product.....	43
3.6.7 View Seller's Product	44
3.6.8 View Wishlist.....	45
3.6.9 View Sold Product	46
3.6.10 View Category	47
3.6.11 Search Product	47
3.6.12 Detail Product	48
3.6.13 Buy Product	49
3.6.14 Seller Reject Offer	51
3.6.15 Seller Cancel Offer.....	53
3.6.16 Deployment Process.....	55
CHAPTER IV SYSTEM DESIGN.....	56
4.1 User Interface Design.....	56
4.1.1 Login	56
4.1.2 Register	57
4.1.3 Homepage	58
4.1.4 Detail Product	60
4.1.5 Sell Page.....	62
4.1.6 Profile Page.....	64
4.1.7 List Product's Seller Page	64
4.1.8 Buyer information Page	65

4.2 Database Table Relationship.....	67
4.3 Class Diagram	68
4.4 Deployment Process Design.....	71
CHAPTER V SYSTEM IMPLEMENTATION	72
5.1 User Interface Development.....	72
5.1.1 Login Page	72
5.1.2 Register Page	73
5.1.3 Homepage	74
5.1.4 Profile Page.....	75
5.1.5 Add Product	76
5.1.6. Detail Product	76
5.1.7 List Product Page	77
5.1.8 Negotiation box.....	78
5.1.9 Buyer Information Page	79
5.2 Deployment Process	80
5.2.1 Dockerfile	81
5.2.2 Jenkinsfile	81
5.2.3 Jenkins Pipeline	85
CHAPTER VI SYSTEM TESTING AND IMPLEMENTATION	87
6.1 Testing Environment.....	87
6.2 Testing Scenario.....	87
6.2.1 Check if Account Authentication Working Properly	88

6.2.2 Verify the Workings of the Profile Functionality	94
6.2.3 Confirm That the Sell Function Works as Expected.....	96
6.2.4 Confirm That the Homepage Works as Expected.....	101
6.2.5 Check if Transaction Process Working Properly	105
CHAPTER VII CONCLUSION AND FUTURE WORK.....	112
7.1 Conclusion.....	112
7.2 Future Work	112
REFERENCES.....	114

LIST OF TABLES

Table 2. 1 Related Works Comparision.....	12
Table 3. 1 Functional Description.....	14
Table 3. 2 Software Requirement	15
Table 3. 3 Hardware Requirement	16
Table 3. 4 Use Case Narrative Sign Up.....	18
Table 3. 5 Use Case Narrative Login.....	19
Table 3. 6 Use Case Narrative Complete and Edit Profile	20
Table 3. 7 Use Case Narrative Add Product	21
Table 3. 8 Use Case Narrative Edit product	22
Table 3. 9 Use Case Narrative Delete Product	23
Table 3. 10 Use Case Narrative View All Seller's Product.....	25
Table 3. 11 Use Case Narrative View Wishlist	25
Table 3. 12 Use Case Narrative View Sold Product.....	26
Table 3. 13 Use Case Narrative View Product Category.....	27
Table 3. 14 Use Case Narrative Search Product	28
Table 3. 15 Use Case Narrative Detail Product	29
Table 3. 16 Use Case Narrative Buy Product	30
Table 3. 17 Use Case Narrative Buy Product (Seller declines the offer)	32
Table 3. 18 Use Case Narrative Buy Product (Seller cancel the offer)	34
Table 3.19 Use Case Narrative Deployment Process	37
Table 6.1 Check if Account Authentication Working Properly	88
Table 6.2 Verify the Workings of the Profile Functionality	94
Table 6. 3 Confirm That the Sell Function Works as Expected	96
Table 6.4 Confirm That the Homepage Works as Expected	101

Table 6.5 Check if Transaction Process Working Properly.....	105
--	-----

LIST OF FIGURES

Figure 2.1 MVC Architecture	8
Figure 2.2 E-commerce Toko Batik Pekalongan	11
Figure 2.3 E-commerce Perlengkapan Haji dan Umrah	12
Figure 3. 1 Use Case Diagram	17
Figure 3.2 Sign Up Activity Diagram.....	39
Figure 3.3 Login Activity Diagram	40
Figure 3. 4 Complete and Edit Profile Activity Diagram	41
Figure 3. 5 Add Product Activity Diagram.....	42
Figure 3.6 Edit Product Activity Diagram.....	43
Figure 3.7 Delete Product Activity Diagram	44
Figure 3. 8 View Seller's Product Activity Diagram	45
Figure 3.9 View Wishlist Activity Diagram	46
Figure 3. 10 View Sold Product Activity Diagram.....	46
Figure 3.11 View Category Activity Diagram.....	47
Figure 3.12 Search Product Activity Diagram.....	48
Figure 3.13 Detail Product Activity Diagram.....	49
Figure 3.14 Buy Product Activity Diagram.....	50
Figure 3.15 Buy Product (Seller reject the offer) Activity Diagram	52
Figure 3. 16 Seller Cancel Offer Activity Diagram	54
Figure 3.17 Deployment Process	55
Figure 4.1 Login Page.....	57
Figure 4.2 Register Page	58
Figure 4.3 Homepage Before Login	59
Figure 4.4 Homepage After Login.....	59

Figure 4.5 Notification	60
Figure 4.6 Buyer's Detail Product Page	61
Figure 4.7 Seller's Detail Product Page	61
Figure 4.8 Negotiation Box.....	62
Figure 4.9 Sell Page	63
Figure 4.10 Categories	63
Figure 4.11 Profile Page	64
Figure 4.12 List Product's Seller Page	65
Figure 4.13 Buyer Information Page	65
Figure 4.14 Connecting Box	66
Figure 4.15 Status Box.....	67
Figure 4.16 Product Sold Card.....	67
Figure 4.17 Database Table Relationship	68
Figure 4.18 Class Diagram	69
Figure 4.19 Deployment Process Design.....	71
Figure 5.1 Login Page.....	73
Figure 5.2 Register Page	73
Figure 5.3 Homepage Before Login	74
Figure 5.4 Homepage After Login.....	75
Figure 5.5 Profile Page	75
Figure 5.6 Add Product Page	76
Figure 5.7 Seller's Detail Product Page	77
Figure 5.8 buyer's Detail Product Page.....	77
Figure 5.9 List Product Page.....	78
Figure 5.10 Negotiation Box.....	78

Figure 5.11 Buyer Information Page	79
Figure 5.12 Connect to WhatsApp.....	79
Figure 5.13 Status Box.....	80
Figure 5. 14 Generate Report.....	80
Figure 5.15 Dockerfile	81
Figure 5.16 Stage 1 SCM Checkout	82
Figure 5. 17 Add Credential.....	82
Figure 5.18 Stage 2 Npm Install	83
Figure 5.19 Stage 3 Create Image.....	83
Figure 5.20 Stage 4 Push Image	84
Figure 5.21 Set Parameter.....	84
Figure 5. 22 Stage 5 Deploy Container.....	85
Figure 5.23 Pipeline	85
Figure 5.24 E-commerce.....	86
Figure 6. 1 Automation Testing List.....	88
Figure 6.2 Register Using Username and Password.....	90
Figure 6.3 Login Using a Valid Account.....	90
Figure 6.4 Log in Using a Non-Registered Account	91
Figure 6.5 Login Using Wrong Password.....	91
Figure 6.6 Register Using Username and Password Automation Testing.....	92
Figure 6.7 Login using a valid account Automation Testing.....	92
Figure 6.8 Login and Register using a Google Account Automation Testing.....	93
Figure 6.9 Log in Using a Non-Registered Account Automation Testing	93
Figure 6. 10 Login Using Wrong Password Automation Testing	94
Figure 6. 11 Edit Profile.....	95

Figure 6.12 Edit Profile Automation Testing	96
Figure 6.13 Successfully Add product.....	97
Figure 6.14 Edit Product	98
Figure 6.15 Successfully Update Product.....	98
Figure 6.16 Delete Product	99
Figure 6.17 Add Product Automation Testing.....	99
Figure 6.18 Edit Product Automation Testing	100
Figure 6.19 Delete Product Automation Testing	100
Figure 6.20 Filter Product by Category	102
Figure 6.21 Filter Product Using Search Box	102
Figure 6.22 Detail Product.....	103
Figure 6.23 Filter Product by Category Automation Testing	103
Figure 6.24 Filter Product Using Search Box Automation Testing.....	104
Figure 6.25 Detail Product Automation Testing.....	104
Figure 6. 26 The Buyer Makes an Offer	107
Figure 6.27 Waiting seller respond.....	107
Figure 6.28 Seller Accept the Buyer Offer	108
Figure 6.29 Successfully Sold.....	108
Figure 6.30 Seller Reject the Buyer Offer	109
Figure 6. 31 Seller Cancel the Buyer Offer	109
Figure 6.32 The Buyer Makes an Offer Automation Testing	110
Figure 6.33 Seller Accept the Buyer Offer Automation Testing	110
Figure 6.34 Seller Reject the Buyer Offer Automation Testing	111
Figure 6.35 Seller Cancel the Buyer Offer Automation Testing	111