



**E-COMMERCE WEB APPLICATION FOR BAKERIES
WITH PROVIDED 3D GRAPHICS PLATFORM**

UNDERGRADUATE THESIS

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

By:

RAYHAN JUNICKO

001201900040

**FACULTY OF COMPUTER SCIENCE
INFORMATION TECHNOLOGY STUDY PROGRAM**

CIKARANG

MARCH, 2023

Copyright by
Rayhan Junicko
2023

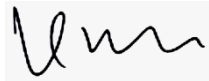
E-COMMERCE WEB APPLICATION FOR BAKERIES
WITH PROVIDED 3D GRAPHICS PLATFORM

By

Rayhan Junicko

001201900040

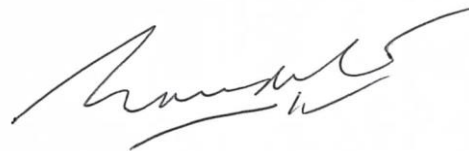
Approved:



Rikip Ginanjar, M.Sc
Final Project Advisor



Cutifa Safitri, Ph.D.
Head of Information Technology



Ir. Rila Mandala, M.Eng., Ph.D.
Dean of Faculty of Computing

ADVISOR'S APPROVAL FOR PUBLICATION

As a lecturer of the President University, I, the undersigned:

Name : Rikip Ginanjar, M.Sc
NIDN : 0424116401
Study program : Information Technology
Faculty : Computing

Declare the following thesis:

Title of thesis : E-COMMERCE WEB APPLICATION
FOR BAKERIES WITH PROVIDED 3D
GRAPHICS PLATFORM

Undergraduate Thesis author : Rayhan Junicko
Student ID number : 001201900040

will be published in **institution's repository**.

Cikarang, March 2023

A handwritten signature in black ink on a light gray background. The signature is stylized and appears to be 'Rikip Ginanjar'.

Rikip Ginanjar, M.Sc

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

As a student of the President University, I, the undersigned:

Name : Rayhan Junicko

Student ID number : 001201900040

Study program : Information Technology

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:

“E-COMMERCE WEB APPLICATION

FOR BAKERIES WITH PROVIDED 3D GRAPHICS PLATFORM”

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 2023



Rayhan Junicko

STATEMENT OF ORIGINALITY

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

Name : Rayhan Junicko
Student ID number : 00201900040
Study Program : Information Technology
Faculty : Computing

I hereby declare that my undergraduate thesis/final project/business plan entitled "E-COMMERCE WEB APPLICATION FOR BAKERIES WITH PROVIDED 3D GRAPHICS PLATFORM " is, to the best of my knowledge and belief, an original piece of work based on sound academic principles. If there is any plagiarism, including but not limited to Artificial Intelligence plagiarism, is detected in this undergraduate thesis/final project/business plan, I am willing to be personally responsible for the consequences of these acts of plagiarism, and 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 2023



Rayhan Junicko

Final Draft Rayhan Junicko

ORIGINALITY REPORT

9%	8%	3%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	repository.ub.ac.id Internet Source	1%
2	file.allitebooks.com Internet Source	1%
3	dspace.daffodilvarsity.edu.bd:8080 Internet Source	<1%
4	adoc.pub Internet Source	<1%
5	marco.stanford.edu Internet Source	<1%
6	etd.aau.edu.et Internet Source	<1%
7	oer.calebuniversity.edu.ng Internet Source	<1%
8	A Subari, S Manan, E Ariyanto. "Implementation of MVC (Model-View-Controller) architecture in online submission and reporting process at official travel warrant information system based on web	<1%

application", Journal of Physics: Conference Series, 2021

Publication

9	dspace.knust.edu.gh Internet Source	<1 %
10	core.ac.uk Internet Source	<1 %
11	Adam Freeman. "Pro Angular 9", Springer Science and Business Media LLC, 2020 Publication	<1 %
12	graveneboj.com Internet Source	<1 %
13	m.mu.edu.sa Internet Source	<1 %
14	www.coursehero.com Internet Source	<1 %
15	scholar.sun.ac.za Internet Source	<1 %
16	utpedia.utp.edu.my Internet Source	<1 %
17	www.researchgate.net Internet Source	<1 %
18	ebin.pub Internet Source	<1 %

scholarworks.iupui.edu

19	Internet Source	<1 %
20	www.dcs.bbk.ac.uk Internet Source	<1 %
21	scholar.uwindsor.ca Internet Source	<1 %
22	github.com Internet Source	<1 %
23	repository.sustech.edu Internet Source	<1 %
24	wise.vub.ac.be Internet Source	<1 %
25	www.semanticscholar.org Internet Source	<1 %
26	apepi.id Internet Source	<1 %
27	Ferguson, . "Describing and Storing the VR World", A Hitchhiker s Guide to Virtual Reality, 2007. Publication	<1 %
28	cco-sj-2.cisco.com Internet Source	<1 %
29	e-research.siam.edu Internet Source	<1 %

30	ore.exeter.ac.uk Internet Source	<1 %
31	digitalcommons.unl.edu Internet Source	<1 %
32	eprints.utm.edu.my Internet Source	<1 %
33	gamedevelopment.tutsplus.com Internet Source	<1 %
34	open.library.ubc.ca Internet Source	<1 %
35	unsworks.unsw.edu.au Internet Source	<1 %
36	www.diva-portal.org Internet Source	<1 %
37	bura.brunel.ac.uk Internet Source	<1 %
38	president.ac.id Internet Source	<1 %
39	tdtorus.ru Internet Source	<1 %
40	theses.hal.science Internet Source	<1 %
41	www.mdpi.com Internet Source	<1 %

42	1library.net Internet Source	<1 %
43	etheses.whiterose.ac.uk Internet Source	<1 %
44	ppgcc.ufersa.edu.br Internet Source	<1 %
45	usermanual.wiki Internet Source	<1 %
46	www.circal.hu Internet Source	<1 %
47	Laura García García. "Architecture and communication protocol to monitor and control water quality and irrigation in agricultural environments", Universitat Politècnica de Valencia, 2021 Publication	<1 %
48	dspace.uui.ac.id Internet Source	<1 %
49	espace.curtin.edu.au Internet Source	<1 %
50	pure.tue.nl Internet Source	<1 %
51	vdocuments.site Internet Source	<1 %
	www.nsifs.bc.ca Internet Source	<1 %
52	 Internet Source	<1 %
53	www.scss.tcd.ie Internet Source	<1 %

Your text is likely to be written entirely by a human

The nature of AI-generated content is changing constantly. While we build more robust models for GPTZero, we recommend that educators take these results as one of many pieces in a holistic assessment of student work.

Stats

Average Perplexity Score: 758.393



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

Burstiness Score: 3391.633



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

Your sentence with the highest perplexity, "*My university besties Nur Iz*", has a perplexity of: 18043

ABSTRACT

E-commerce is one of the popular digital platform types that exist nowadays. The platform, increasingly popular in recent years, allows people to shop online from the comfort of their own homes and businesses to reach a global audience. The rise of Amazon, Shopee, Tokopedia, etc open up the competition between e-commerce applications.

Nowadays e-commerce applications do not have many different features from each other. In terms of payment features, most e-commerce has their own private payment option the likes of e-wallets creating some confusion for the customer, and in the product display feature, there is not much difference between each other. Most e-commerce has not changed their product display feature from the beginning until these days.

This project aims to give a solution to the problems above by providing an e-commerce web application that has a lot of payment options variations, and new ways to display a product that helps create a new experience of using e-commerce for the users.

The application uses a payment gateway to control the payment feature. The payment feature will have a lot of payment options that can be chosen by the customer. This application has a new product displaying feature that uses the WebGL library named THREE.js to provide the 3d graphics product display that creates a different experience of using e-commerce.

Keywords: E-commerce, Payment Option, Product Display, 3d graphics, WebGL, THREE.js, Web Application.

DECLARATION OF ORIGINALITY

I hereby certify that I am sole author of this final project and that no part of this final project has been published or submitted for publication.

I certify that, to the best of my knowledge, my final project does not infringe upon anyone's copyright nor violate any proprietary rights and that any ideas, techniques, quotations, or any other material from the work of other people included in my final project, published or otherwise, are fully acknowledged in accordance with the standard referencing practices.

I declare that this is a true copy of my final project, including any final revisions, as approved by my final project committee, and that this final project has not been submitted for a higher degree to any other University or Institution.

I have read the Final Project Regulation and I am aware of the potential consequences of any breach of them.

Cikarang,

A handwritten signature in black ink, appearing to read 'Rayhan Junicko', with a large, sweeping flourish at the end.

Rayhan Junicko

ACKNOWLEDGEMENTS

First of all, all praises belong to the Almighty God for His presence, blessings, and good health that help me through this process.

I want to express my gratitude to those that help and support me during the completion of this final project:

1. My parents, and sister that always fully support me whenever I needed.
2. My thesis supervisor, Mr. Rikip. Thank you for all the knowledge that you give me during this time, and always answer although I have a lot of questions.
3. My university besties Nur Izzati Ramadhani, Luh Widya Kusuma Ganggaputri, and Padma Maheswari. There is not much to say about them but I am grateful to have them in the past 4 years.
4. To all my universities bros for all the fun we had together.
5. EF Team, and IBO-F that fully support me through this final project, look for my condition, and keeping me high motivated.
6. All Computing lecturers that guided and taught me in President Univesity.

Thank you for all the knowledge that has been shared to me.

TABLE OF CONTENT

ABSTRACT	i
DECLARATION OF ORIGINALITY	ii
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENT	iv
LIST OF TABLE	ix
LIST OF FIGURES	xi
CHAPTER I	1
INTRODUCTION	1
1.1 Background.....	1
1.2 Problem Identification	1
1.3 Final Project Objectives	2
1.4 Scope and Limitation.....	2
1.4.1 Scope	2
1.4.2 Limitation.....	2
1.5 Final Project Methodology	2
1.6 Final Project Outline.....	3
CHAPTER II	6
LITERATURE STUDY	6
2.1 Angular	6

2.1.1 Architecture.....	6
2.2 3D Computer Graphics.....	8
2.2.1 Foundation	9
2.2.2 Basic Theory	9
2.2.3 Data Structure	10
2.3 Payment Gateway.....	11
2.3.1 Introduction.....	12
2.3.2 Overview	12
2.3.3 Services and Advantages	13
2.3.4 Disadvantages	14
2.4 Related Work.....	15
2.4.1 Tokopedia.....	15
2.4.2 Shopee.....	16
2.4.3 Related Work Comparison.....	16
CHAPTER III	18
SYSTEM ANALYSIS.....	18
3.1 System Overview.....	18
3.2 Functional Analysis	18
3.3 Hardware and Software Requirements	19
3.4 Use Case Diagram	20
3.5 Use Case Narrative	21

3.6 Activity Diagram	41
3.6.1 Login	41
3.6.2 Register	42
3.6.3 Add Item	43
3.6.4 View Sale Item.....	44
3.6.5 Edit Item Information.....	45
3.6.6 Delete Item	46
3.6.7 View Order List	47
3.6.8 View Item Recommendation	48
3.6.9 View Item Information.....	49
3.6.10 Add Item to Cart	50
3.6.11 View 3D Graphics Display	51
3.6.12 View Cart	52
3.6.13 Pay Cart.....	53
3.6.14 Remove Item from Cart	54
3.6.15 Search Item	55
CHAPTER IV.....	57
SYSTEM DESIGN.....	57
4.1 User Interface Design	57
4.1.1 Login	57
4.1.2 Register	58

4.1.3 Seller Page.....	58
4.1.4 Customer Page	61
4.2 Database Table Relationship	64
4.3 Class Diagram	65
CHAPTER V	68
SYSTEM IMPLEMENTATION.....	68
5.1 User Interface Development.....	68
5.1.1 Login Page	68
5.1.2 Register Page.....	69
5.1.3 Seller Main Page	69
5.1.4 Add Item Page.....	70
5.1.5 Display Builder Page	71
5.1.5 Edit Item Page	72
5.1.6 Homepage	73
5.1.7 Search Page	74
5.1.8 Item Page.....	75
5.1.9 Display View Page.....	75
5.1.10 Cart Page	76
5.1.11 Order History Page.....	77
5.2 Application Details	78
5.2.1 3D Graphics Builder Platform	78

5.2.2 3D Graphics Display Platform	83
5.2.3 Payment.....	84
CHAPTER VI.....	86
SYSTEM TESTING AND IMPLEMENTATION	86
6.1 Testing Environment	86
6.2 Testing Scenario	86
6.2.1 Login and Register	86
6.2.2 Seller	90
6.2.3 Customer	95
6.2.4 3D Graphics	101
CHAPTER VII.....	107
CONCLUSION AND FUTURE WORK	107
7.1 Conclusion.....	107
7.2 Future Work.....	107
REFERENCES.....	109

LIST OF TABLE

Table 2.1 Relation Work Comparison Table	16
Table 3.1 Functional Description.....	18
Table 3.2 Use Case Narrative Sign In.....	21
Table 3.3 Use Case Narrative Register	22
Table 3.4 Use Case Narrative Add Item	24
Table 3.5 Use Case Narrative View Sale Item	25
Table 3.6 Use Case Narrative Edit Item	27
Table 3.7 Use Case Narrative Delete Item.....	28
Table 3.8 Use Case Narrative View Order List	29
Table 3.9 Use Case Narrative View Item Recommendation	31
Table 3.10 Use Case Narrative View Item Information	32
Table 3.11 Use Case Narrative Add Item to Cart	33
Table 3.12 Use Case Narrative View 3D Graphics Display	34
Table 3.13 Use Case Narrative View Cart List.....	35
Table 3.14 Use Case Narrative Pay Cart	37
Table 3.15 Use Case Narrative Remove Item from Cart.....	38
Table 3.16 Use Case Search Items as Customer Role	40
Table 6.1 Login Script	87
Table 6.2 Register Script.....	88
Table 6.3 Main Page	90
Table 6.4 Edit Page	92
Table 6.5 Add Page.....	94
Table 6.6 Homepage	95

Table 6.7 Item Page	97
Table 6.8 Cart Page.....	98
Table 6.9 Payment	100
Table 6.10 Display View	101
Table 6.11 Display View	103

LIST OF FIGURES

Figure 2.1 Angular Architecture [3]	6
Figure 2.2 Angular Component Example [4]	7
Figure 2.3 Cartesian System Illustration [14].....	9
Figure 2.4 Vertices Coordinate [14]	10
Figure 2.5 Data Structure Hierarchy [14]	11
Figure 2.6 Payment Gateway Service Design [8].....	12
Figure 2.7 Midtrans SnapAPI Window [10].....	14
Figure 2.8 Tokopedia Homepage.....	15
Figure 3.1 Use Case Diagram	20
Figure 3.2 Login Activity Diagram	42
Figure 3.3 Register Activity Diagram.....	43
Figure 3.4 Add Item Activity Diagram.....	44
Figure 3.5 View Sale Item Activity Diagram	45
Figure 3.6 Edit Item Information Activity Diagram.....	46
Figure 3.7 Delete Item Activity Diagram	47
Figure 3.8 View Order List Activity Diagram.....	48
Figure 3.9 View Item Recommendation Activity Diagram.....	49
Figure 3.10 View Item Information Activity Diagram.....	50
Figure 3.11 Add Item to Cart Activity Diagram.....	51
Figure 3.12 Add Item to Cart Activity Diagram.....	52
Figure 3.13 View Cart Activity Diagram	53
Figure 3.14 Pay Cart Activity Diagram	54
Figure 3.15 Remove Item from Cart Activity Diagram.....	55

Figure 3.16 Search Item Activity Diagram.....	56
Figure 4.1 Login Page.....	57
Figure 4.2 Register Page.....	58
Figure 4.3 Seller Main Page (Item List Toggled).....	59
Figure 4.4 Seller Main Page (Order List Toggled).....	59
Figure 4.5 Edit/Add Item Page.....	60
Figure 4.6 Display Builder Page.....	61
Figure 4.7 Customer Main Page.....	62
Figure 4.8 Item Information Page.....	62
Figure 4.9 Display 3D View Page.....	63
Figure 4.10 Cart Item Page.....	64
Figure 4.11 Table Relation Diagram.....	65
Figure 4.12 Class Diagram.....	66
Figure 5.1 Login Page.....	68
Figure 5.2 Register Page.....	69
Figure 5.3 Seller Main Page (Item List).....	70
Figure 5.4 Seller Main Page (Order List).....	70
Figure 5.5 Add Item Page.....	71
Figure 5.6 Display Builder Page (Empty).....	71
Figure 5.7 Display Builder Page (Cookies Rendered).....	72
Figure 5.8 Display Builder Page (Cakes Rendered).....	72
Figure 5.9 Edit Item Page.....	73
Figure 5.10 Homepage.....	73
Figure 5.11 Search Page.....	74
Figure 5.12 Search Page (No Result).....	74

Figure 5.13 Item Page	75
Figure 5.14 Display View Page	76
Figure 5.15 Cart Page	76
Figure 5.16 Order History Table.....	77
Figure 5.17 Order Details	77
Figure 5.18 Order Confirmation	77
Figure 5.19 Canvas Configuration.....	78
Figure 5.20 Render Function	79
Figure 5.21 Texture Upload.....	79
Figure 5.22 File Reading.....	80
Figure 5.23 Texture Loading	80
Figure 5.24 Material Mapping	81
Figure 5.25 Cylinder Geometry	81
Figure 5.26 Box Geometry	81
Figure 5.27 Shapes Rendering	81
Figure 5.28 Scene as Metadata	82
Figure 5.29 Saving Items	82
Figure 5.30 Collecting Metadata.....	83
Figure 5.31 Load Metadata to Canvas Scene.....	83
Figure 5.32 Camera Rotation.....	83
Figure 5.33 Midtrans Credential	84
Figure 5.34 Generating Transaction Token	84
Figure 5.35 Snap Script Configuration	85
Figure 5.36 Snap Window Function	85

Figure 6.1 Login Success Scenario	87
Figure 6.2 Login Failed Scenario.....	88
Figure 6.3 Register Failed Scenario.....	89
Figure 6.4 Register Success Scenario	89
Figure 6.5 Registration Role Dropdown Scenario.....	90
Figure 6.6 Order List Active Scenario.....	92
Figure 6.7 Item List Active Scenario	92
Figure 6.8 Edit Item Information Scenario	93
Figure 6.9 Edit Item Failed to Save	94
Figure 6.10 Add Item Failed to Save	95
Figure 6.11 Search Result Scenario	97
Figure 6.12 Search Result Not Found Scenario.....	97
Figure 6.13 Click +Cart Button Scenario	98
Figure 6.14 Default Cart Page Scenario	99
Figure 6.15 Delete Item in Cart Page Scenario.....	99
Figure 6.16 Payment Window Scenario	99
Figure 6.17 Payment Failed Scenario	100
Figure 6.18 Payment Success Scenario	101
Figure 6.19 Item Graphics Loaded Scenario	102
Figure 6.20 Camera Slider Value Changed Scenario	103
Figure 6.21 Cookies Graphics Rendered Scenario	105
Figure 6.22 Cube Graphics Rendered Scenario.....	105
Figure 6.23 Cylinder Graphics Rendered Scenario	106
Figure 6.24 Color Changed Scenario.....	106