



**DETERMINING THE SHORTEST PATH OF GARAGE USING  
FLOYD-WARSHALL ALGORITHM : CASE STUDY IN KECAMATAN  
KEMBANGAN JAKARTA BARAT**



**INFORMATICS DEPARTMENT  
COMPUTER SCIENCE FACULTY  
INTERNATIONAL CLASS PROGRAM  
UNIVERSITAS MERCU BUANA  
JAKARTA  
2018**



**DETERMINING THE SHORTEST PATH OF GARAGE USING  
FLOYD-WARSHALL ALGORITHM : CASE STUDY IN KECAMATAN  
KEMBANGAN JAKARTA BARAT**

*Thesis Report*

Submitted to Fulfill Graduation Requirement to Obtain a Bachelor Degree in  
the Faculty of Computer Science

UNIVERSITAS  
Created by :  
**MERCU BUANA**  
INDAH SYAHPUTRI  
41514010085

**INFORMATICS DEPARTMENT  
COMPUTER SCIENCE FACULTY  
INTERNATIONAL CLASS PROGRAM  
UNIVERSITAS MERCU BUANA  
JAKARTA  
2018**

## STATEMENT SHEET

I, the undersigned :

NIM : 41514010085

Name : INDAH SYAHPUTRI

Thesis Title : Determining the Shortest Path of Garage Using Floyd-Warshall

Algorithm : Case Study in Kecamatan Kembangan Jakarta

Barat

This thesis is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. If in my thesis report there is an element of plagiarism, then I am ready to get the academic sanction associated with it.

UNIVERSITAS  
**MERCU BUANA**

Jakarta, January 2018



## APPROVAL SHEET

Name : INDAH SYAHPUTRI  
NIM : 41514010085  
Title : Determining the Shortest Path of Garage Using Floyd-Warshall  
Algorithm : Case Study in Kecamatan Kembangan Jakarta Barat

THIS THESIS REPORT ALREADY CHECKED AND APPROVED.

Jakarta, December 29<sup>th</sup> 2017



Supervisor

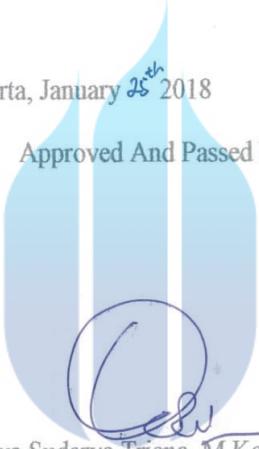
UNIVERSITAS  
**MERCU BUANA**

## VALIDATION SHEET

Name : INDAH SYAHPUTRI  
NIM : 41514010085  
Department : Informatics  
Faculty : Computer Science  
Title : Determining the Shortest Path of Garage Using Floyd-Warshall  
Algorithm : Case Study in Kecamatan Kembangan Jakarta Barat

Jakarta, January 25<sup>th</sup> 2018

Approved And Passed by:

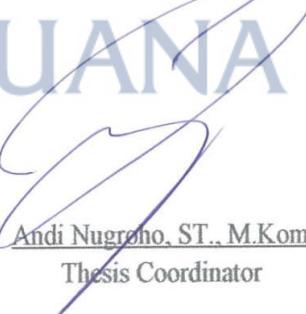
  
Yaya Sudarya Triana, M.Kom, Ph.D

Supervisor

UNIVERSITAS

MERCU BUANA

  
Desi Ramayanti, S.Kom, MT  
Head of Informatics Department

  
Andi Nugroho, ST., M.Kom  
Thesis Coordinator

## **ACKNOWLEDGEMENT**

Praise gratitude author praying to the presence of ALLAH SWT who has given all the blessings and His grace so that the author can complete this thesis report. This Thesis Report is arranged to fulfill the requirement for obtain a Bachelor's degree (S1) at Informatics Department of Universitas Mercu Buana. The writing fluency of this thesis report certainly not apart from support, help, and donation of mind from various parties.

Therefore in this occasion the author would like to give a thank you to:

1. Yaya Sudarya Triana, M.Kom., Ph.D., as Thesis Supervisor who give support and suggestion to author.
2. Desi Ramayanti, S.Kom., MT as Head of Informatics Department, Mercu Buana University.
3. Dr. Harwikarya, MT. as Dean of the Computer Science Faculty, Mercu Buana University.
4. Ardiansyah, S.Kom., MT as Secretary of Interntaional Class Program of Informatics Department, Universitas Mercu Buana.
5. All of the lecturer and staff from Bachelor's degree Of Mercu Buana University.
6. Parents and family who always praying for author until the author can complete this report.
7. Author want to say thank you to all of author friends who always helping author for giving ideas, statements, and to all parties who involved in this Thesis report.

Final words with all humility the author apologizes as much as possible for all the shortcomings and limitations in the writing of this thesis report. Hopefully this final report can provide benefits to interested parties.

Jakarta, December 29<sup>th</sup> 2017

Indah Syahputri

## TABLE OF CONTENTS

STATEMENT SHEET .....	i
APPROVAL SHEET .....	i
VALIDATION SHEET .....	iii
ACKNOWLEDGEMENT .....	iv
ABSTRACT .....	v
TABLE OF CONTENTS .....	vi
LIST OF FIGURES .....	x
LIST OF TABLES .....	xii
CHAPTER I. INTRODUCTION .....	1
1.1    Background .....	1
1.2    Research Question .....	3
1.3    Scope of Research .....	3
1.4    Objectives and Benefits Research .....	3
1.4.1    Objectives.....	3
1.4.2    Benefits .....	4
1.5    Methodology .....	4
1.5.1    Research Methodology.....	4
1.5.2    System Development Method.....	4
1.6    Systematics of Writing Report .....	5
CHAPTER II. LITERATURE REVIEW .....	6
2.1    Garage .....	6
2.2    Android.....	7
2.3    Android Studio .....	8
2.4    Floyd-Warshall .....	8

2.4.1	Path Implementation Sample On Node.....	9
2.4.2	The Logic of Floyd-Warshall Algorithm .....	10
2.5	Global Positioning System (GPS) .....	11
2.6	Google MAP Application Programming Interface (API) .....	11
2.7	Location Based Services (LBS) .....	11
2.8	Extensible Markup Language (XML) .....	12
2.9	Web Services .....	12
2.10	V-Model .....	13
2.11	Unified Modeling Language (UML) .....	15
2.11.1	Use Case Diagram.....	15
2.11.2	Activity Diagram.....	16
2.11.3	Sequence Diagram .....	17
2.12	Flowchart.....	18
2.13	Database .....	19
2.14	Firebase .....	20
2.15	JavaScript Object Notation (JSON) .....	20
CHAPTER III. ANALYSIS AND DESIGN .....		22
3.1	System Analysis .....	22
3.1.1	Problem Analysis .....	22
3.1.2	Needs Analysis.....	23
3.2	System Workflow.....	23
3.3	Method Calculation Simulation.....	24
3.3.1	Problem Solving Principle of Floyd-Warshall Algorithm .....	24
3.3.2	Calculation Method of Floyd-Warshall Algorithm.....	25
3.3.3	Implementation of Floyd-Warshall Algorithm .....	26
3.4	System Planning .....	29

3.4.1	Flowchart .....	30
3.4.2	Use Case Diagram Design .....	31
3.4.3	Activity Diagram Design .....	34
3.4.3.1	Activity Diagram of Motorcycle .....	34
3.4.3.2	Activity Diagram of Car.....	36
3.4.3.3	Activity Diagram of Help.....	37
3.4.3.4	Activity Diagram of About.....	37
3.4.4	Sequence Diagram Design .....	40
3.4.4.1	Sequence Diagram of Motorcycle .....	40
3.4.4.2	Sequence Diagram of Car.....	41
3.4.4.3	Sequence Diagram of Help.....	42
3.4.4.4	Sequence Diagram of About .....	42
3.5	Interface Design .....	44
3.5.1	Splash Screen Page Interface Design.....	45
3.5.2	Homepage Interface Design.....	46
3.5.3	Category Interface Design.....	47
3.5.4	Radius Interface Design .....	48
3.5.5	Motorcycle Interface Design.....	49
3.5.6	Car Interface Design .....	50
3.5.7	Route Interface Design.....	51
3.5.8	Help Interface Design .....	52
3.5.9	About Interface Design .....	53
CHAPTER IV. IMPLEMENTATION AND TESTING .....		54
4.1	Implementation.....	54
4.1.1	Hardware and Software Used .....	54
4.1.2	Android Implementation .....	55

4.2	Testing Method.....	60
4.2.1	Testing Scenario.....	60
4.2.2	Test Result.....	61
4.3	Analysis of Test Results .....	62
CHAPTER V. CONCLUSIONS AND RECOMMENDATIONS .....		63
5.1	Conclusion.....	63
5.2	Recommendation.....	63
REFERENCES.....		64
APPENDIX		



## LIST OF FIGURES

Figure 2.1 Path Implementation Sample On Node .....	9
Figure 2.2 V-Model .....	14
Figure 3.1 Data Retrieval Process .....	24
Figure 3.2 Shortest Path Function .....	25
Figure 3.3 Implementation of Floyd-Warshall Algorithm .....	26
Figure 3.4 Flowchart of Floyd-Warshall Algorithm .....	30
Figure 3.5 Use Case Application .....	31
Figure 3.6 Activity Diagram of Motorcycle .....	34
Figure 3.7 Activity Diagram of Car .....	35
Figure 3.8 Activity Diagram of Help .....	36
Figure 3.9 Activity Diagram of About .....	37
Figure 3.10 Sequence Diagram of Motorcycle .....	38
Figure 3.11 Sequence Diagram of Car .....	39
Figure 3.12 Sequence Diagram of Help .....	40
Figure 3.13 Sequence Diagram of About .....	40
Figure 3.14 Splash Screen Page Interface Design .....	41
Figure 3.15 Homepage Interface Design .....	42
Figure 3.16 Category Interface Design .....	43
Figure 3.17 Radius Interface Design .....	44
Figure 3.18 Motorcycle Interface Design .....	45
Figure 3.19 Car Interface Design .....	46
Figure 3.20 Route Interface Design .....	47
Figure 3.21 Help Interface Design .....	48
Figure 3.22 About Interface Design .....	49
Figure 4.1 Splash Screen Display .....	51
Figure 4.2 Homepage Display .....	52
Figure 4.3 Category Display .....	52
Figure 4.4 Radius Display .....	53
Figure 4.5 Motorcycle Display .....	53
Figure 4.6 Car Display .....	54

Figure 4.7 Route Display .....	54
Figure 4.8 Help Display .....	55
Figure 4.9 About Display .....	55



## **LIST OF TABLES**

Table 2.1 Use Case Diagram Symbol (Alan, 2010) .....	16
Table 2.2 Activity Diagram Symbol (Alan, 2010) .....	17
Table 2.3 Sequence Diagram Symbol (Alan, 2010) .....	18
Table 2.4 Flowchart Program Symbol .....	19
Table 3.1 Distance Between Locations.....	27
Table 3.2 Use Case of Motorcycle.....	32
Table 3.3 Use Case of Car .....	32
Table 3.4 Use Case of Help .....	33
Table 3.5 Use Case of About .....	33
Table 4.1 Testing Scenario .....	56
Table 4.2 Test Result .....	57

