UNIVERSITI TEKNOLOGI MARA

MODELLING AND MEASURING PERFORMANCE OF QUEUING SYSTEM IN POS MALAYSIA SEREMBAN

ADIBAH BINTI MOHAMED PADIL	**2015165751**
FARIHAH AISYAH BINTI AHAMAD RUSLY	**2015441558**
WAN MUHAMMAD FAIQAL BIN WAN MOHAMAD ANNUAR	**2016534677**

Final Year Project Submitted in Partial Fulfillment of the Requirements
for the Degree of

BACHELOR OF SCIENCE (HONS) STATISTICS

FACULTY OF COMPUTER AND MATHEMATICAL SCIENCES

JANUARY 2019

ABSTRACT

Postal services have an essential role to people all around the world. Pos Malaysia Berhad is the nation's postal service provider and has a large network all over the country. The management is concerned with the queuing problem in one of its post office, namely Pos Malaysia Seremban. Therefore, this study attempt to simulate the queuing system of the post office, in order to determine the current performances of the system and propose an improved method for problems identified in the system. This is a cross-sectional study in which Visual Interactive Tool simulation software Arena, version 15.1 was used. The input for simulation was collected from Pos Malaysia Seremban through an interview session with post office's officer and eight hours observation on customers' movement at the post office. The result shows that insurance and summons service counter is the bottleneck for the whole system since the average and maximum waiting time for the service is longer than other counters. Besides that, it is also recorded as the highest counter's utilization rate. An attempt to open additional similar service counter at a certain time only which is within 10.00 a.m. to 11.00 a.m., 1.00 p.m. to 3.00 p.m. and 4.00 p.m. to 5.00 p.m. could decrease the waiting time by 66.49%. Increasing the number of servers (counter) in the post office during specific time help to solve the queuing problem. It is recommended as an improvement method in this queuing system.

ACKNOWLEDGEMENT

IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

First and foremost, praise to Allah the Most Gracious and the Most Merciful for giving us the opportunity to complete this report. It is our pleasure to thank those who have made this study possible and have given us the encouragement to proceed with this project and completing them.

We would like to express our gratitude to Puan Noorezatty Binti Mohd Yusop, our supervisor for the continued support and encouragement. Also on the advice and patience that has been given towards successful completion of this final year project.

Thanks to our beloved parents because without them not anyone of us would be in this world and thank you for the endless understanding, support, love and blessing. We also would like to thank our dear family members and friends for all the support and encouragement.

ADIBAH BINTI MOHAMED PADIL
FARIHAH AISYAH BINTI AHAMAD RUSLY
WAN MUHAMMAD FAIQAL BIN WAN MOHAMAD ANUUAR

TABLE OF CONTENTS

TOPIC		PAGE
ABSTRACT		i
ACKNOWLEDGEMENT		ii
TABLE OF CONTENTS		iii
LIST OF TABLES		v
LIST OF FIGURES		vi
CHAPTER 1:	**INTRODUCTION**	
	1.1 Background of Study	1
	1.2 Problem Statement	2
	1.3 Research Objectives	4
	1.4 Research Questions	4
	1.5 Scope and Limitations of the Study	4
	1.6 Significance of the Study	5
	1.7 Definitions of Terms	5
CHAPTER 2:	**LITERATURE REVIEW**	
	2.1 Definition of Queue	6
	2.2 Queuing System	6
	2.3 Multi-Phase System with Multi-Server	8
	2.4 Measuring The Effectiveness	9
	2.5 Simulation Model	10
	2.6 Simulation with ARENA	12
CHAPTER 3:	**METHODOLOGY**	
	3.1 Introduction	14
	3.2 Research Design	14
	3.3 Data Collection Method	14
	3.4 Simulation Process	16

3.5 ARENA Software 24

CHAPTER 4: ANALYSIS AND RESULTS

4.1 Introduction 26

4.2 Pos Malaysia Simulation Model 26

4.3 Verification and Validation of the Simulation Model 33

4.4 Analysis of Characteristics of the Queuing System 34

4.5 The Improvement for Queuing System 38

4.5.1 The Improvement Model 39

4.5.2 Comparison Between Actual Simulation Model and Improved Model 41

CHAPTER 5: CONCLUSION AND RECOMMENDATION

5.1 Conclusion 43

5.2 Recommendation 44

REFERENCES 45

APPENDICES 48