

# **Developing the Existing Queuing System for the Banking Sector Using Queuing Simulations**

By

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This dissertation is submitted in partial fulfillment of the requirement for the Master of Science Degree in Financial Mathematics.

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## DECLARATION

I do hereby declare that the work reported in thesis was exclusively carried out by me under the supervision of Mr. T.M.J.A Cooray, Senior lecturer in the department of Mathematics, University of Moratuwa. It describes the results of my own independent research except where due reference has been made in the text. No part of this project report has been submitted earlier or concurrently for any other degree.

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Project supervisor

(Mr. T.M.J.A Cooray)

# DEDICATION

Specially dedicate to  
My loving parents, husband and sisters



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## ABSTRACT

Waiting lines occur in many business operations as well as in everyday life. Most service systems, such as fast food restaurants, Banks, gasoline stations, and technical support telephone hotlines involve customer waiting. In these systems customers arrive at random times and service times are rarely predictable.

The important issue in designing such systems involves the tradeoff between customer waiting time and system cost, usually determined by number of servers. The analysis of waiting lines, called queuing theory, applies to any situations which customers arrive to the system wait and receive service.

The People's Bank is one of the important governmental banks that plays an important role in the Sri Lankan economy. The customers dealing with servers of general transaction section of Peoples Bank in metropolitan areas suffer and complain from the long times they spend in the bank to acquire their needed service. This happens especially in specific days in each week. This problem was the main motive to perform this study. However, more queuing problems in the bank's branch have been discovered through the study. The main objectives of the study are to investigate the services delivery system at the people's Bank in metropolitan areas, and to propose a more efficient system.

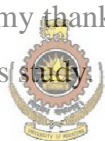
Analytical methods and simulation methods are used to analyze the queuing systems. Simulation analysis has been used to model the existing queuing system and to enhance the system by using computer simulations of Arena 12.0 statistical software. As the conclusion of this project new working schedule for counters in different days of weeks are presented and find out how arrangement of queues should change.

## ACKNOWLEDGEMENT

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# CONTENT

## Chapter 1 Introduction

1.1	Introduction	1
1.2	Project Background	1
1.3	Problem Domain	4
1.4	Aim of the Project	5
1.5	Design of the Study	5
1.6	Data Collection	6
1.7	Content of Project	6

## Chapter 2 Literature Review

2.1	Evolution of Queuing Theory	7
2.2	Conceptual Framework	7
2.3	Past Findings Related to the Queuing Theory	8

## Chapter 3 Methodology

3.1	Queuing System	10
3.1.1	Arrival Characteristics	10
3.1.2	Waiting Line Characteristics	12
3.1.3	Service Facility Characteristics	12
3.2	Mathematical Queuing Model with M/M/1	14
3.2.1	Assumptions	15
3.2.2	Equations for the Single-channel Queuing Model	16
3.3	Mathematical Queuing Model with M/M/s	16
3.3.1	Equations for the Multiple-channel Queuing Model	17
3.4	Some General Operation Characteristic Relationship	18
3.5	Simulation in Queuing Theory	19
3.5.1	Process Simulation using Arena Software	19

## **Chapter 4 Analysis**

4.1	Analysis of Collected Data	22
4.1.1	Identifying the Rush and Normal Time	23
4.1.2	Interpretation of Arrived Customers	26
4.1.3	Interpretation of Served Customers	27
4.2	Statistical Analysis	28
4.2.1	Mean Arrival Rate and Service Rate	28
4.2.2	The realization Values for Arrival Rate and Service Rate	29
4.2.3	Performance Measures of the Queuing System	30
4.3	Collection of Input Data to Model the Existing System for Rush hours	32
4.3.1	Distributions of the Arrived and Served Customers	32
4.3.2	Percentages for the Total Arrivals to the All Sections of the Bank	33
4.3.3	Percentages for the total arrivals to the each counter	35
4.4	Modeling the Existence System	35
4.5	Modification of the Existence Model for Rush Hours	37
4.5.1	Mean service Times for all transaction types for the rush time	37
4.5.2	Categorization of the All Transaction Types according to New Method	39
4.5.3	Modifying the Existence Banking System for Rush Hours	42
4.6	Modeling the Enhanced Queuing System for Rush Hour	43

## **Chapter 5 Discussion and Conclusions**

5.1	Discussion	45
5.1.1	Existence System for Rush Times using Arena Software	45
5.1.2	Modification of the existence model for rush time	46
5.1.3	Modeling the Enhanced Queuing System for Rush Time	46
5.1.4	Modeling the Queuing System for Normal Time	48
5.1.5	Constraints for the Simulation Models	48
5.3	Conclusions	49
5.4	Further analysis	50
5.5	Suggestions	50

Appendix A	References and Questionnaire	1
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Appendix B	Raw Data	3
Appendix C	Computer Output Using Arena 12.0 Statistical Software	7



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## LIST OF FIGURES

Figure 1.1: The behavior of a person who entered to the bank	3
Figure 3.1: Single-channel waiting line	15
Figure 3.2: Multiple-channel waiting line	17
Figure 4.1: The comparison of total number of arrivals to each counter in data collected period	26
Figure 4.2: The comparison of the total served customers for each counter in data collected Period	28
Figure 4.3: The locations of each counter in general transaction and pawning Sections of the bank	31
Figure 4.4: The flow of a customer for the existence queuing system in rush hours	36
Figure 4.5: Pie-chart for the optimal allocation of each counter after modified the system	41
Figure 4.6: The flow of a customer for the modified queuing system for the rush hours	42



## LIST OF TABLES

Table 4.1: The total number of arrivals to four cashier counters in the data collected period	22
Table 4.2: Total number of arrivals to each counter in a rush hour period according to the bank management decision	23
Table 4.3: The boundary for the mean number of arrivals to each counter for rush and normal hours	24
Table 4.4: The total number of arrivals to the each counter for rush hours	25
Table 4.5: The total number of arrivals to the each counter for the normal hour	25
Table 4.6: The total number of served customers from each counter in the data collected	27
Table 4.7: Calculated arrival rates and service rates for a minute for each counter for both rush and normal hour	29
Table 4.8: The realization values for mean arrival rates and mean service rates per minute for both rush and normal hours	30
Table 4.9: Performance of measures for rush time using analytical method	30
Table 4.10: Performance of measures for normal time using analytical method	32
Table 4.11: Expressions of the distributions of the arrived and served customers for each counter	33
Table 4.12: Total number of arrivals joined directly to the all sections of the bank	34
Table 4.13: Percentages for the total arrivals to the all sections of the bank	34
Table 4.14: Percentage for the total arrivals to the each counter of the bank	35
Table 4.15: Performance of measures for the existing queuing system in rush time using simulation method	36
Table 4.16: Mean service Times for all transaction types for the rush hour period	39
Table 4.17: Categorization of the all transaction types to modify the existence system	40
Table 4.18: The optimal allocation of all counters after modify the existence system	41
Table 4.19: Performance of measures for the modified queuing system using	

simulation method	43
Table 4.20: Performance of measures for the enhanced queuing system using simulation method	44
Table 5.1: Performance of measures of the existing model for rush hour	45
Table 5.2: Performance of measures of the modified model for rush hour	46
Table 5.3: Performance of measures of the modified model by increasing the counters	47



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## ABBREVIATIONS

Abbreviations	Description
ATM	Any Time Money
AO	Accounts opening section
CC	Cheques clearing section
CA	Current accounts section
C1	Cashier counter 01
C2	Cashier counter 02
C3	Cashier counter 03
C4	Cashier counter 04
FIFO	First In First Out
IS	Inquiries section
OO	Other official works section
S1	The slips filling table 01
S2	The slips filling table 02
$L_s$	Average number waiting in the system
$L_q$	Average number waiting in the queue
$W_s$	Average time in the system
$W_q$	Average time in the queue
$\rho$	Utilization factor
$P_0$	Probability the system is idle



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