

**YANGON UNIVERSITY OF ECONOMICS  
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EXECUTIVE MASTER OF BANKING AND FINANCE  
PROGRAMME**

**ANALYSIS OF WAITING LINE MANAGEMENT PRACTICES AND  
CUSTOMER SATISFACTION AT MYANMA APEX BANK**

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**ANALYSIS OF WAITING LINE MANAGEMENT PRACTICES AND  
CUSTOMER SATISFACTION AT MYANMA APEX BANK**

**A thesis submitted as a partial fulfillment towards the requirements for  
the degree of Executive Master of Banking and Finance (EMBF)**

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## **ABSTRACT**

Queuing in MAB is an approach that involves lining up of customers in bank hall in order to be served by bank personnel at each terminal (server). At any point in service time, customers usually move to the desk for one enquiries or the other. This and other obstructions result to much delay in customers waiting time. Delay in waiting time is becoming problem for customer satisfaction and, need to manage the time spent by customers in the banking hall to remain competitive. The aim of this study is to determine waiting time in queue by proper queue management and thereby maximizing customer satisfaction. The underlying mathematical concepts of queue models: arrival and service time distributions, queue disciplines and queue behavior were presented. The operating characteristic formulas for multiple server queuing model meant to evaluate performance of practical queuing systems were also presented. Data on the arrival time of customers and service time spent by customers to receive service were collected and analyzed. This research uncovered the applicability and extent of usage of queuing models in achieving customer satisfaction.

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## LIST OF ABBREVIATIONS

ATM	Automatics Teller Machine
FCFS	First come, first served
FIFO	First in first out
MAB	Myanma Apex Bank
MADB	Myanma Agricultural Development Bank
MFTB	Myanma Foreign Trade Bank
MICB	Myanma Investment and Commercial Bank
M/M/1	Single-channel queuing model
M/M/s	Multi-channel queuing model
MPU	Myanmar Payment Union
POS	Point of Sales
SIRO	Service in random order
SMEs	Small and medium enterprises
TSD	Toxic Substance Distribution
KYC	Know your customer

# CHAPTER I

## INTRODUCTION

Current globalization makes the banking industry to be intense and growing competition. Bank managers continue to face dynamic challenges to the survival of their businesses. As commercial banks are a major component of the financial system, an intermediary between the surplus and deficit of sectors of the economy, they are still the center of attraction of many customers who want to carry out one or the other transaction through the services provided by bank. Customers are willing to invest their loyalty in business that can deliver superior value relative to the offerings of competitors.

Waiting in lines seems to be a part of our daily life. Queuing can increase the time of waiting, and induce the customer to complaint and dissatisfy. Checkout stands (service counters) are the service boxes of banks, which can see not only reflection of banks' images but also efficiency of association with banks' service quality and business. Waiting time depends on the amount of consumers (human being or objects) on queuing, the amount of servers, and therefore the amount of service time for every individual customer. The main goal of queuing management is to maximize the extent of customer satisfaction with the service provided. Low level of service may not be expensive, at least in the short run, but may incur high costs of customer dissatisfaction, such as loss of future business. A high level of service will cost more to supply and can end in lower dissatisfaction costs.

Customers waiting in line to receive services in any service system are inevitable which is why queue management has been where the manager faces huge challenge. this is often because customers who can't be served immediately need to queue (wait) for service and therefore the time could range from jiffy (acceptable) to long hours (annoying) and nonce a resource need to be managed effectively and efficiently (because time is money) the inefficiency in managing it could end in dissatisfaction of consumers. Expecting a service is usually undesirable for patrons. Time-saving and convenience are commonly mentioned by consumers as among the foremost important motivations for purchasing a service. Banks within the Myanmar are generally characterized by congestion; results in a coffee level of customer satisfaction and

encourages customer movements from one bank to a different, in search of the services provided without much delay. Waiting times are the most source of dissatisfaction for banking system. The present issue for personal banking in Myanmar may be a lack of loyal customers. Consistent with Swe (2011), the finding of study indicated that bank service quality perceived by customers isn't meeting with their expectation. Indeed, since the customer enters a system to receive a service, and leaves the premises after being served, it's important to deal with the matter of queues. Improving banking efficiency depends on the order during which the various business banking processes are streamlined.

Nowadays, customers are in all likelihood to choose the product for first class and additionally demand for speed. Problematic queuing structures ( long lines) can lead to the customer's perceptions of excessive, unfair, or unexplained waiting time- resulting in great damaging effects on the customer's common pride with the carrier transaction. Waiting lines existence constantly gave headaches to managers. They face a quandary created by way of the need to manipulate the commercial enterprise in such manner, to maintain personnel expenses as low as possible in stipulations that lead dissatisfaction about too lengthy in the queue. The queuing problem can create terrible outcomes on service excellent and client satisfaction. Speed of service has been proven to grant banks a competitive advantage in the marketplace. Time is money and waiting is a non-value delivered endeavor which can reason prolonged to shift other bank.

Queuing theory is the useful mathematical model for queuing, or waiting in lines. Waiting lines are most chance for occurrence daily, affecting people shopping for groceries, buying gasoline, or making a bank deposit. A queue system is the useful application for commercial service of banks. In service sector of Myanmar, most of service providers lack of awareness queuing theory in waiting line management. Therefore, the study focuses on customer satisfaction on waiting line management through practicing queuing theory in banks, in case of MAB bank.

## **1.1 Rationale of the Study**

Customer satisfaction has been a concern for most organizations as organizations seek to improve on their operational strategies that can result in reduction of customer complains especially on waiting lines management. Most commercial banks manage their

waiting lines through placing physical barriers aimed at guiding queue formation and organizing it in the most efficient way. This enables queue discipline which is on first come first serve basis. Commercial banks have also tried to manage waiting lines through implementation of certain measures like, Mobile banking, Internet banking, Agency banking, Seamless banking, Visa ATM debit cards, Credit cards and Pay bill systems.

Nowadays, bank service providers are more focusing on customer satisfaction for their services because it is important that only satisfied customers may loyal and remain in service and dissatisfied customers may not come back again. A highly satisfied customers will be very likely to provide repeat business and spread the positive experience by word of mouth (advertising), resulting in increased revenues and profitability. Therefore, ones must learn about the behavior of customers in the market in order to provide the efficient service to the customer as well as to stabilize the loyalty of customers. Since waiting in line is one of the major factors that to retain the customers' loyalty and to develop their business.

Queuing has become a symbol of inefficiency of private bank in the world and Myanmar is not an exception. Managing the length of the line is one of the challenges facing most banks. A few of the factors that are responsible for long waiting lines or delays in providing service are: lack of passion and commitment to work on the part of the bank staff overloading of available staff, bank officials attending to customers in more than one section etc. These put bank managers under stress and tension, hence tends to dispose of a customer without attending to their needs, which often leads to customer dissatisfaction. Despite the certain measures implemented by commercial banks on waiting lines management, queues are still found in banks. The main aim of this study is to bridge the existing gap on waiting lines management and customer satisfaction. This study will therefore seek to answer these questions; How waiting lines management influence customer satisfaction? How do commercial banks manage waiting lines? What are the challenges faced by commercial banks while managing waiting lines?

According to these situations, this study intends to examine waiting line characteristics of customers for MAB Bank in Yangon.

## **1.2 Objectives of the Study**

The objectives of the study are as follows:

1. To identify waiting lines management of MAB bank
2. To analysis customer satisfaction on waiting lines management practices.

## **1.3 Scope and Limitation of the Study**

The study establishes the application of waiting lines management on customer satisfaction at MAB bank. However, the study did not investigate whether other internal factors such as technology of the banks influence their satisfaction with the management of waiting lines in the bank. This limits generalization of the study findings to the effect that waiting lines management is exclusively affected by perceived waiting time, information provided, waiting environment and queue discipline.

## **1.4 Research Method of the Study**

The purpose of this study is to examine the queue performance characteristics of MAB bank ( Theinphyu branch). The system's characteristics of interest that will be examined in this study include; number of arrivals (number of customers arriving to the service point at a given time), service time (the time it takes for one server to complete customer's service), the average number of customers in the system, and the average time a customer spends in the system. The results of the operating characteristics will be used to evaluate the performance of the service mechanism and to ascertain whether customers are satisfied with the banks' services. Basically, the data used for this study were obtained from primary sources. The method of data collection is through direct observation. A wrist watch, a pen and a notepad were requirements needed for the recording of relevant information such as; number of customers the arrival times of customers, waiting time, and service time. The observation was made during the working hours (8am – 4pm). The recorded information was used to calculate average waiting time, average service time and the utilization factor. This study is case study applied in MAB bank. Therefore, the results have weakness in generalization for the whole banking industry. The model, used in study, is M/M/S of infinite calling population with first come, first served multiple server queue system, ( $\infty$ /FCFS).

## **1.5 Organization of the Study**

This study is organized by five chapters. Chapter one is an introduction and it describes rationale, objectives, scope and limitations, method and organization of the study. Chapter two presents the literature review which includes application of queuing models in banking system and other organizations. Chapter three reviews the theoretical background of queuing model. Chapter four describes the data analysis using the waiting line models. Chapter five presents conclusion with findings and suggestions.

## **CHAPTER II**

### **LITERATURE REVIEW**

This chapter is a literature review of queuing research that has been applied or could be used to queuing model. This chapter presents two parts. The first is theoretical background as definition of queue theory, waiting line management, and second as empirical studies.

#### **2.1 Theoretical background**

Theoretical framework provides a way of incorporating waiting line management concepts of customer's satisfaction into the queuing system design.

##### **2.1.1 Waiting Time**

Customer Wait Time (CWT) is the total elapsed time between issuance of a customer order and satisfaction of that order. (Qfinance dictionary, 2009). Much of the research on waiting has focused on strategies to reduce or avoid waits through the use of operations management techniques or altering the perceived wait through perceptions management (Katz et al., 1991; Maister, 1985). For example, queuing theory and modification of the service delivery process are two methods that can be used to reduce waiting time.

Queuing can be analyzed by either mathematical process or by simulation. Here we will describe the mathematical procedure. The method is basically a descriptive tool of analysis. Unlike most other mathematical procedure it does not provide any optimum solution rather it only describes the parameter of the queue system. The major objective of this method is to predict the behavior of the system to reflect its operating characteristics or measures of performance.

##### **2.1.2 Queue theory**

Queue theory is the method of analyzing and solving the problem due with the delays of waiting time in the waiting line. The theory will examine the component of

waiting line, such as inter-arrival time, service time, and number of servers, number of system places, and number of "customer". By applying queue theory to the real life situation it will provide faster customer service, improve traffic flow, and faster shipping orders from a place to a place. Queuing theory is used to develop more efficient queuing systems that reduce customer wait times and increase the number of customers that can be served

According to Onyeizugbe (2011), queuing theory attempts to determine the number of servers that strike an optional balance between the time customers want for services and cost of providing service. Lucy (1989) argued queuing theory as the construction of mathematical model of different kinds of queuing systems so that prediction may be made about how the system will be upon it. Queuing system or waiting line can best be described as a line comprising of arriving customers or items that are form in front of servers or service facilities in order to have the expected services.

### **2.1.3 Analyzing Queues Using Analytical Models**

Many analytical queuing models exist, each based on unique assumptions about the nature of arrivals, service times, and other aspects of the system. Some of the common models are

1. Single- or multiple-channel with Poisson arrivals and exponential service times. (This is the most elementary situation.)
2. Single-channel with Poisson arrivals and arbitrary service times. (Service times may follow any probability distribution, and only the average and the standard deviation need to be known.)
3. Single-channel with Poisson arrivals and deterministic service times. (Service times are assumed to be constant.)
4. Single- or multiple-channel with Poisson arrivals, arbitrary service times, and no waiting line. (Waiting is not permitted. If the server is busy when a unit arrives, the unit must leave the system but may try to reenter at a later time.)

5. Single- or multiple-channel with Poisson arrivals, exponential service times, and a finite calling population. (A finite population of units is permitted to arrive for service.)

## 2.2 Characteristics of Queuing Systems

To develop a queuing model, some important characteristics of the system need to identify. They are (1) the arrival distribution of the passengers, (2) the service-time distribution for the check-in operation, and (3) the waiting-line, or queue discipline for the passengers.

### 2.2.1 Arrival Distribution

Defining the arrival distribution for a waiting line consists of determining how many customers arrive for service in given periods of time. Every queuing problem involves the arrival of items such as customers, equipment, etc. The input source that generates arrivals or customers for the service system has three major characteristics. It is important to consider the size of the calling population, the pattern of arrivals at the queuing system, and the behavior of the arrivals. Population sizes are considered to be either unlimited or limited. When the number of customers or arrivals on hand at a given moment is just a small portion of potential arrivals, the calling population is considered unlimited. For many waiting lines, the arrivals occurring in a given period of time appear to have a random pattern—that is, although there is a good estimate of the total number of expected arrivals, each arrival is independent of other arrivals, and it cannot predict when it will occur. In such cases, a good description of the arrival pattern is obtained from the Poisson probability distribution.

$$P(x) = \frac{e^{-\lambda} \lambda^x}{x!}, \text{ (for } x = 0, 1, 2, \dots \text{)}$$

where  $x$  = number of arrivals in a specific period of time

$\lambda$  = average, or expected, number of arrivals for the specific period of time

e= 2.71828

### 2.2.2 Service-Time Distribution

A service-time probability distribution is needed to describe how long it takes to check in a passenger at the kiosk. This length of time is referred to as the service time for the passenger. Although many passengers will complete the check-in process in a relatively short time, others might take a longer time because of unfamiliarity with the kiosk operation, ticketing problems, flight changes, and so on. Thus we expect service times to vary from passenger to passenger. In the development of waiting-line models, operations researchers have found that the exponential probability distribution can often be used to describe the service-time distribution. Following equation defines the exponential probability distribution

$$f(t) = \mu e^{-\mu t} \text{ for } t \geq 0$$

Where t =service time (expressed in number of time periods)

$\mu$ =average or expected number of units that the service facility can handle in a specific period of time

e = 2.71828

### 2.2.3 Queue Discipline

A queue discipline is the manner in which new arrivals are ordered or prioritized for service. For the airport problem, and in general for most customer-oriented waiting lines, the waiting units are ordered on a first-come, first-served (FCFS) basis— referred to as an FCFS queue discipline.

## 2.3 Queue Models

Using Kendall Notation D. G. Kendall developed a notation that has been widely accepted for specifying the pattern of arrivals, the service time distribution, and the number of channels in a queuing model. This notation is often seen in software for queuing models. The basic three-symbol Kendall notation is in the form

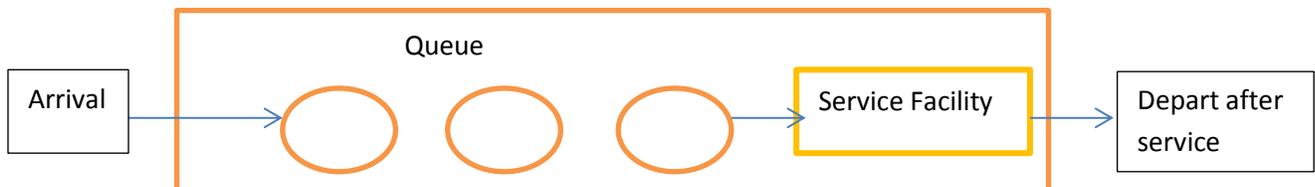
Arrival distribution>Service time distribution>Number of service channels open where specific letters are used to represent probability distributions. The following letters are commonly used in Kendall notation:

G = general distribution with mean and variance known

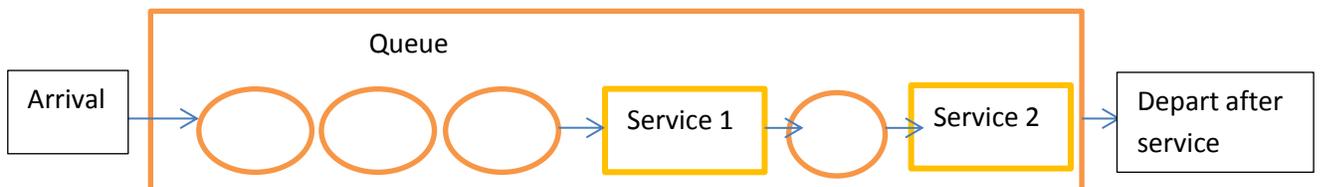
D = constant (deterministic) rate

M = Poisson distribution for number of occurrences (or exponential times)

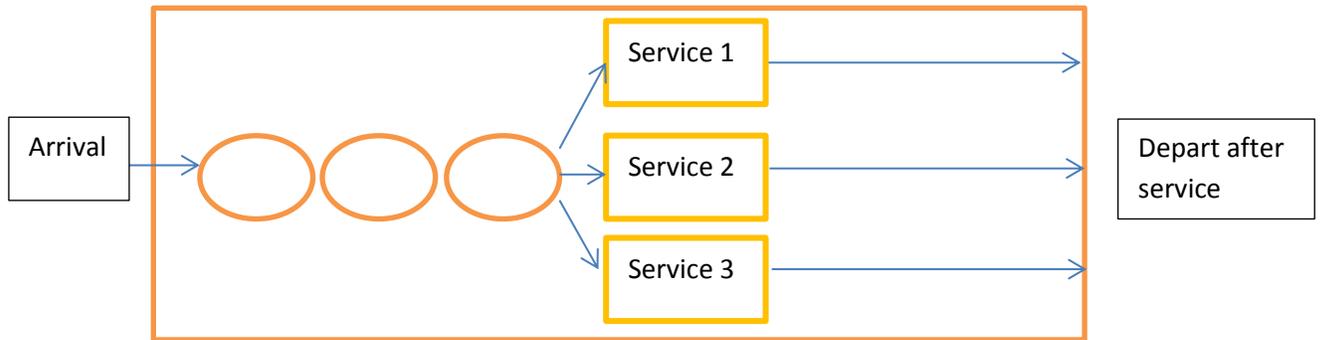
Thus, a single channel model with Poisson arrivals and exponential service times would be represented by M/M/1. When a second channel is added, we would have M/M/2. If there are m distinct service channels in the queuing system with Poisson arrivals and exponential service times. A three-channel system with Poisson arrivals and constant service time would be identified as M/M/3. A four-channel system with Poisson arrivals and service times that are normally distributed would be identified as M>G>4. The banking system used the method of analysis with the multi-server queuing modeling system which follows (M/M/s): ( $\infty$ /FCFS) specification.



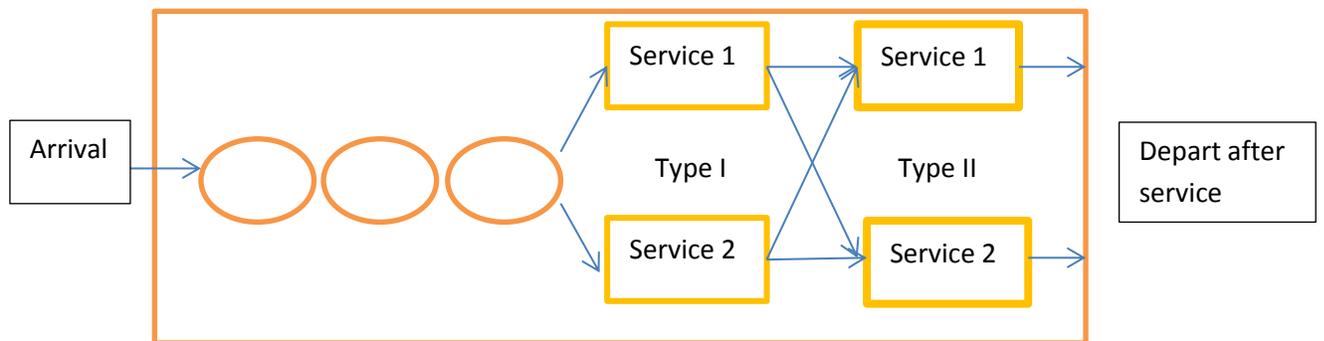
**Figure (2.1) Single Channel, Single Phase System**



**Figure (2.2) Single Channel, Multi Phase System**



**Figure (2.3) Multi Channel, Single Phase System**



**Figure (2.4) Multi Channel, Multi Phase System**

### **2.3.1 Single-Channel Queuing Model with Poisson Arrivals and Exponential Service Times (M/M/1)**

The queuing model with single server can be applied to waiting-line situations that meet these assumptions or conditions:

1. The waiting line has a single server.
2. The pattern of arrivals follows a Poisson probability distribution.
3. The service times follow an exponential probability distribution.
4. The queue discipline is first-come, first-served (FCFS).
5. No balking or reneging

Model for single channel is

Let  $\lambda$  = mean number of arrivals per period, and

$\mu$  = mean number of served per period

When determining the arrival rate ( $\lambda$ ) and the service rate ( $\mu$ ), the same period must be used. For example, if  $\lambda$  is the average number of arrivals per hour, then  $\mu$  must indicate the average number of served per hour.

The queuing equations are as follow:

1. The average number of customers or units in the system,  $L_s$ , the number in line plus the number being served:

$$L_s = \frac{\lambda}{\mu - \lambda}$$

2. The average time a customer spends in the system,  $W_s$ , the time spent in line plus, the number being served:

$$W_s = \frac{1}{\mu - \lambda}$$

3. Average number of customer in waiting line for service:

$$L_q = \frac{P_0 \rho^{s+1}}{(s-1)(s-\rho)^2} = \frac{P_0 \lambda \mu \rho^{s+1}}{(s-1)(s\mu - \lambda)^2}$$

4. Average time a customer spends in waiting line waiting for service:

$$W_q = \frac{\lambda}{\mu(\mu - \lambda)}$$

5. The utilization factor for the system,  $\rho$ , the probability that the service facility is being used:

$$\rho = \lambda \mu$$

6. The percent idle time,  $P_0$ , the probability that no one is in the system:

$$P_0 = 1 - \lambda \mu$$

7. The probability that the number of customers in the system is greater than t,  $P_n > t$ :

$$P_n > t = (\lambda \mu)^{t+1}$$

### 2.3.2 Multi-channel Queuing Model with Poisson Arrivals and Exponential Service Times (M/M/s)

The following formulas can be used to compute various operating characteristics for a multiple-server waiting line. The model can be applied to situations that meet these assumptions:

1. The waiting line has two or more identical servers
2. The arrivals follow a Poisson probability distribution with a mean arrival rate of  $\lambda$ .
3. The service times have an exponential distribution.
4. The mean service rate,  $\mu$ , is the same for each server.
5. The arrivals wait in a single line and then move to the first open server for service.
6. The queue discipline is first-come, first-served (FCFS).
7. No balking or reneging is allowed.

Model for Multi-channel Queuing Model is

Let  $s$  = number of channels open,

$\lambda$  = average arrival rate, and

$\mu$  = average service rate at each channel

The queuing equations are as follow:

1. The probability that there are zero customers or units in the system:

$$P_0 = \frac{1}{\left[ \sum_{n=0}^{s-1} \frac{1}{n!} \left( \frac{\lambda}{\mu} \right)^n \right] + \frac{1}{s!} \left( \frac{\lambda}{\mu} \right)^s \frac{s\mu}{s\mu - \lambda}} \text{ for } s\mu > \lambda$$

2. The average number of customers or units in the system:

$$L_s = \frac{\lambda\mu (\lambda/\mu)^s}{(s-1)!(s\mu - \lambda)^2} P_0 + \frac{\lambda}{\mu}$$

3. The average time a unit spends in the waiting line or being serviced (namely, in the system):

$$W_s = \frac{\lambda \mu (\lambda/\mu)^s}{(s-1)!(s\mu - \lambda)^2} P_0 + \frac{1}{\mu} = \frac{L}{\lambda}$$

4. The average number of customers or units in line waiting for service:

$$L_q = L - \frac{\lambda}{\mu}$$

5. The average time a customer or unit spends in the queue waiting for service:

$$W_q = W - \frac{1}{\mu} = \frac{L_q}{\lambda}$$

6. Utilization rate:

$$\rho = \frac{\lambda}{s\mu}$$

## 2.4 Empirical Studies

Piyush Kumar, Manohar U.Kalwani and Maqbool Dada (1997) studied that “The Impact of Waiting Time Guarantees on Customers’ Waiting Experiences”. They examined that waiting time guarantee is a commitment from a firm to serve its customers within a specified period of time if it fails to meet this commitment for some customers than it compensates for the delay. They suggest that if customers observe the service time to be less than expected, their satisfaction increases monotonically during the wait. Moreover, under such circumstances, the explicit provision of a waiting time guarantee enhances satisfaction both during as well as at the end of the wait. But if customers observe the service times to be more than expected, then their satisfaction typically declines at the beginning of the wait but increases towards the end of the wait.

Waiting in queues and service effectiveness are essential components in the business world. Hajnal Vass & Zsuzsanna K.Szabo (2015) examined “Application of Queuing Model to Patient Flow in Emergency Department”. The aim of that paper was to decrease the patients’ waiting time, to provide timely care and to improve the patient’s satisfaction. Long waiting times is the most important complaint in patient’s satisfaction surveys. The general satisfaction rate is 84, 63% and the most frequent complaints are about the waiting time which is too long, the waiting room which is small and the personnel which are insufficient. For this analysis, to use queuing models this can provide reasonably accurate evaluations of system’s performance. The results of this study can help to understand the magnitude of the broader problem, the relationship between resources and waiting times, and to provide a method for understanding and

monitoring performance, to find solutions for a better understanding and for alleviating the daily crisis.

Imran Aslan (2015) observed “Application of Queue in Hospitals in Istanbul”. The objective of this study is to define queues and models that can be used to decrease waiting an important indicator of measuring system quality and queues. Simulations are carried out to realize the reality of queues and get results. In this study simple M/M/1 queue can be used to model the arrivals of patients and service of a doctor for a single polyclinic. This study was founded that open queues are the most applicable types of queues in healthcare.

Wallace Agyei, Christian Asare-Darko, Frank Odilon (2015) attempted to find the trade-off between minimizing the total economic cost (waiting cost and service cost) and the provision of a satisfactory and reasonably shortest possible time of service to customers, in order to assist management of the bank in deciding the optimal number of tellers needed. The data for this study was collected at the Ghana Commercial Bank Ltd, Kumasi Main Branch for one month through observations and was formulated as multiserver single line queuing model. The results of the analysis presented using a five teller system was better than a four or a six-teller system in terms of average waiting time and the total economic cost. Hence the study recommends that, the management should adopt a five teller model to reduce total economic costs and increase customer satisfaction.

Al-Amin Molla (2017) investigated the restaurant queuing model with Shuruchi restaurant as a case study. This paper aimed to show the single channel queuing model M/M/1. Little’s theorem and the single channel waiting line model M/M/1 were used. That research paper had determined the arrival rate, service rate, the utilization rate and the average waiting time in the queue before getting service. The probability of buffer overflow is the probability that customers will run away, because may be they are impatient to wait in the queue. This research paper can help doing the betterment of the restaurant.

Nityangini Jhala, Pravin Bhathawala & Gujarat (2017) explored “Analysis and Application of Queuing Theory in Supermarkets”. This paper examined efficient queue management in XYZ supermarket as a study. The aim of this study was to estimate the waiting time and length of queue. The author concluded that single queue multi server is better in comparison to multi queue multi server. The waiting time of customers waiting in the queue is reduced almost 3 times to the previous one. The author proved that expected total cost is less in case of single queue multi server as compared to multi queue multi server model.

Seigha Gumus, Gordon Monday Bubou & Mobolaji Humphrey Oladeinde (2017) analyzed “Application of Queuing Theory to a Fast Food Outfit: A Study of Blue Meadows Restaurant”. The data collected was tested to show if it follows a Poisson and exponential distribution of arrival and service rate using chi square goodness of fit. This study decided that to improve operations within the waiting line, the service rate should be improved.

Suhel Ahmed, Md. Saidur Rahaman, Mohammad Abdul Hamid and Iqbal Hossain Moral (2018) investigated a study of “Expected Actual Waiting Time and Service Delivery Evidence Using Queuing Theory” in selected banking institutions in Bangladesh as a case study. The point of this paper is to find out not only the normal amount of time a customer needs to spend in a queue at the bank’s ATM, but also the actual time needed by the bank administration staff for providing the services. The Toxic Substance Distribution (TSD) approach was utilized for the information test and the result of this study revealed that each and every client needed to spend 14.55 minutes in a queue for each transaction. Finally, the queuing theory is relevant in ascertaining ideal banking and waiting times, and that these may even be protracted due to outside forces.

## **CHAPTER III**

### **HISTORICAL BACKGROUND OF MAB BANK**

The third chapter highlights on Profile of MAB bank. It also gives the details background of MAB bank, the vision and organizational set up, Powers and duties of corporation, banking services and waiting line management practices.

#### **3.1 Overview on Banking Sector in Myanmar**

The financial sector is the lifeblood of any country's economy, and its smooth functioning is central to the economy's rapid and inclusive economic growth. A well-functioning financial system must intermediate efficiently between savers and borrowers; manage risks prudently, provide a wide variety of financial services to firms, farms and households; mobilize savings effectively identify and lend for sound investments. However, achieving these aims in Myanmar will require making gradual, steady and transparent reforms to the current financial system to overcome the failing of the past, address the sector's weakness and build on its strengths. Policymakers will need to match the country's availability of skills and its institution capacity.

Central to Myanmar's economic development is the reform of its finance sector and specifically its banking sector. Banks play a fundamental role in the transformation of market economies. Recently the government has enacted a series of laws intended to reform and strengthen its banking institutions to restore investors' confidence and to make capital more accessible. Since 2011, policymakers have enacted a series of reforms meant to develop the financial sector as part of a wider agenda for accelerating economic growth. there are 28 domestic banks operating in Myanmar. This number includes four state-owned banks, three banks owned by municipal governments, 10 semi-private banks that trade privately but are partially owned by, or closely associated with, government agencies, and 14 privately owned banks. Among the privately owned banks, the so-called "Big Three" dominate the market. Combined, Kanbawza Bank (KBZ), Ayeyarwady Bank (MAB), and Co-operative Bank (CB) control about two-thirds of all loans, two-thirds of all deposits, and more than 50 percent of all bank branches in the country

Under the 2013 Central Bank of Myanmar Law and the 2016 Financial Institutions Law (FIL), Myanmar established the independence of the Central Bank of Myanmar (CBM) as the banking-sector regulator, and has put into place a framework to meet international best practices in banking supervision, including those found in the Basel Core Principles. For semi-private and privately owned banks, the CBM now acts as the sole supervisory authority for licensing, regulating, and enforcing compliance in the banking sector.

Myanmar is largely a cash-based economy. The people of Myanmar have less confidence in the banking system than in other countries in the region, having experienced a banking and currency crisis in the past. That is why most people prefer to keep cash in their hands or buy property to secure their financial situation. However, in the past couple of years, the financial sector took important steps to reduce cash transactions: 21 out of 28 banks joined the SWIFT system, whereby local banks can make financial transactions to foreign correspondent banks. In 2011, the Myanmar Payment Union (MPU) was established by Myanmar banks to serve as a national payment switch for Myanmar. MPU provides electronic channels such as the Automated Teller Machines (ATM), Point of Sale (POS) terminal, and mobile banking to support non-cash payments. MPU membership consists of three state-owned banks and 14 non state-owned banks. In 2015, MPU became a public company, and 23 out of 28 Myanmar Banks joined as members. MPU cardholders can access almost 1,700 ATMs nationwide and use almost 3,500 POS terminals in Myanmar.

Despite the efforts provided by product development to improve its service, there is still evidence of challenges on quality of the service which leads to customer satisfaction once played down by maintaining customers who are loyal to the bank and who can positively recommend it to associates. Customers are always aiming to get maximum satisfaction from the products or services that they buy or use. A competitive environment in the banking sector the banks have their own strategies to create new customers while maintaining old customers. Banks are making adjustments in service to meet customer needs. Customer service is responding to customer needs and expectations in a way that will make them have memorable experience and motivate them to come

back and to tell others. In banks, customers can wait minutes or hours before being attended to. For many customers, waiting in lines or queuing is annoying (Obamiro, 2003) or negative experience (Scotland, 1991). The unpleasant experience of waiting in line can often have a negative effect on the rest of a customer's experience with a particular bank.

Among these banks, MCB bank Pakistan is one of the leading banks with around 8 years of experience, founded in July, 2010. The bank has 98 branches operating domestically and 357 ATMs country wide. It is serving 0.6 million customers. MAB bank have to increase their customers' satisfaction to keep their competitiveness. In banking services, waiting has great impact on service level and customer satisfaction. Consequently, in time-based competition, one of the main objectives of service companies is to minimize customer waiting. Apply the waiting line model to design better service systems that improve system performance and achieve overall lower system cost. The goal of determining the optimal waiting line is to estimate the number of potential customers that can fit into the process of a service system at any given time. A service organization can reduce cost and thus improve profitability by efficient queue management. A cost is associated with customer waiting in line and there is cost associated with adding new counters to reduce service time. Queue management looks to address this trade off and offer solutions to management.

### **3.2 Profile of MAB Bank**

MAB bank is a private commercial bank in Burma (Myanmar). It was one of 4 private banks to commence operations in August 2010, the first new financial institutions in the country since the establishment of Innwa Bank in 1997. The bank is owned by Chit Khaing, a prominent Burmese billionaire and owner of Eden Group. Myanmar Apex Bank Ltd, received permission to open foreign currency accounts in July, 2010. So the bank tries to cater better services to customers, attract potential customer to fulfill their needs and wants effectively by ongoing competition. So MAB's success depends on sound human resource management practices to cater better service to customers while tapping step to the global market. In MAB, head office is located in Nay Pyi Taw and the

activities concerning HR are only centralized in head office. The following are the background history of MAB concerned with human resource department and others.

Among the private banking businesses in Myanmar, Myanmar Apex Bank is a private commercial bank limited and it was established in accord with Myanmar Companies Acts in 2010. It was opened on 17<sup>th</sup> August 2010 and the founder is Eden Group of Company Limited. At the time of its opening, the paid-up capital was kyat 1 billion and it is operating the bank with this amounts nowadays.

The audit committee, risk management and banking policy implementation committees are formed to monitor whether the MAB's branches adheres to rules, regulations and procedures in accordant with the Union of Myanmar Financial Institutions Law. Moreover, the bank is going on the right track under close supervision of two external bodies; (1) Central Bank of Myanmar and (2) Internal Audit and Bank Supervision Department of the Central Bank of Myanmar.

To undertake the banking services efficiently and effectively, MAB has opened many branches and nowadays it has already opened 34 branches around Myanmar. It is also trying to cater better services to its customers; it is now established in a well-organized HR plan. The bank formed respective departments and it undertook in the field of information technology in order to run its business successfully.

It is trying to extend more services in the near future. MAB Bank forms some departments to undertake its business functions with this talent human capital of 1097 employees. MAB's head office is formed into 11 departments. These departments are central currency accounts, loan, card, bank supervision, human resource and administration, foreign department, training center, information and technology, and marketing department as well.

### **3.2.1 Corporate Visions, Mission, and Values of MAB**

The following are the MAB's policy to perform its business clearly and objectively. The company's policy includes vision and mission statement. The mission statement is "To be a good reputable leader in banking service businesses in Myanmar". The bank's mission is "To provide exceptional financial services to customers, to create

healthy and happy working environment to its employees and develop them, to gain benefits its stakeholders”.

The company logo is “The Myanmar Apex Bank Stands for Myanmar Pride”. The bank human resource policy is to be able to appreciate its employees, to be able to helpful to bank’s customers and co-workers, to be able to treat with sympathy and to talk sweetly and smiley.

### **3.2.2 Services Provided by MAB Bank**

MAB bank needs to fulfill well human resource plan to give better services to customer. MAB bank offers to customer with the services of account opening, account closing, cash deposit and withdraw, remittance, gift cheque, loan, payment order (P.O), safety deposit locker, issue insurance document and money exchange services.

MAB Bank offers the full range of retail and commercial banking products and services and is in tune with domestic customs and international standard in its governance and operation. The bank is authorized to operate as an investment or development bank for the domestic market and the approved banking activities include:

- (a) ATM
  - (b) Cash Management
  - (c) Deposits
  - (d) Electronic Banking
  - (e) Hire Purchase
  - (f) Remittance
  - (g) Loans and Advances
  - (h) International Banking
  - (i) Other Services
- (a) ATM

With MAB ATM service, customer can conduct many routine banking transactions including cash withdrawal through ATM every day. ATM service is opened everyday so customers can do MAB banking at any time at their leisure.

(b) Cash Management

MAB banks provide payroll service for business enterprises, companies and organizations. Company staff payroll handle by the bank. The monthly payroll is deposit to the account of the staff opened with the bank. A convenient way for companies to conduct the payroll without the hassle of handing cashes them. The concern business enterprises give necessary information and MAB bank open the saving account for individual staff and at the end of the month, the staff salary will be deposited to their concern account. The staff can withdraw their salary any time at MAB branches.

MAB also collect payments quickly and manage your account receivables efficiently with MAB Collection Services MAB provides a full suite of customized collection solutions to help receive payments quickly and improve customers' cash flow. Physical collection can be facilitated through MAB extensive branch and ATM network. Alternatively, payments can be initiated via MAB electronic channels. Receive reference information/ MIS unique to the payment on an end-of-day or intra-day reporting basis. Reference information field is highly customized to customer company's requirements with even greater flexibility to determine the channel and frequency of reporting.

MAB offers timely and efficient payment solutions (suppliers payment, utilities and rental of the company and dividend payment) to meet business needs by delivering an end-to-end payables management solution. MAB comprehensive package of payments products and services integrates with the way you do business by automating customer payment process with the option of value dating customers' instructions for improved cash flow management.

With MAB, customer' liquidity needs are carefully and efficiently managed through MAB comprehensive account and liquidity management solutions which will add value to customer business and make it easier for customer to manage a group of accounts.

(c) Deposits

Banks accept the deposits of the public. In order to attract the savings of the people, the bank provides every sort of facility and inspiration to them and

collects the scattered savings of the society. The bank opens an account of those people who deposit their savings with the bank. These deposit accounts can mainly be of three types and people can open any of these three types of accounts according to their wish. These accounts are current account, saving bank account, fixed deposit account. The customer can make deposit by opening individual, joint, limited companies and associations or society account.

**MAB Current Account :** MAB Current account is a non-interest bearing account suitable for businesses that engages in regular business / financial transactions. Customer can make a payment easily with the tools provided. MAB Current Account is ideal for:

- businessmen who have regular payments and receivables
- A Cheque book is provided to customer to allow an easy access for payment.

Foreign currency account is a non-interest bearing current account and is designed for customers who want to minimize foreign exchange risk while maximizing payment efficiency in foreign currency.

MAB Seafarer Saving Account (MAB SSS) is a package of banking products and services designed especially for Myanmar seafarers. The product package consists of a Demand Account in USD, a Savings account in Kyat and a MAB Debit card.

Seafarers will be able to conveniently remit their payroll to their bank account. The seafarers or the joint account holders will have easy access to funds whenever needed.

Saving account is an interest bearing account for individuals who want to save and earn interest on the excess cash. By opening this account, account holder can inculcate frugal behaviour by saving for rainy days.

MAB Interest Maximizer Account is an interest bearing account with the chance of obtaining bonus and interest at the same time. It is designed for individuals with regular income.

The bonus is rewarded upon maintaining the minimum balance of 100,000MMK every month and a minimum deposit of 10,000MMK every month.

MAB Loyal Account is an interest bearing account with the option of obtaining bonus interest. The bonus 0.5% p.a is rewarded upon maintaining the minimum balance of 500,000 MMK in the account for the last 3 months.

MAB Premium Deposit is an interest bearing deposit account for individuals who want to save and earn daily interest. MAB Premium Saving helps people to develop frugal behaviour by rewarding a higher interest to account holders.

MAB Time Deposit is ideal for the individual who has excess cash for an extended period of time. The account is opened for a particular fixed period (time) by depositing particular amount (money) and withdrawal is only allowed at the end of the particular period.

#### (d) Electronic Banking

MAB iBanking is a web-enabled electronic delivery channel whereby customers of the bank are able to perform real time banking transactions via PCs, Laptops, Smartphone or other devices with access to the internet.

MAB mBanking is a secured mobile application for electronic delivery channel whereby customers of the bank are able to perform real time banking transactions via mobile devices through Apps and SMS channel. Internet Connection is required to use Mobile Apps but not required for SMS channel.

MAB Bank's mobile banking known as MAB mBanking, makes it easy and convenient for customers to conduct banking transactions from their mobile devices at any time of the day to their convenience in a secured manner.

Customer can pay all their bills conveniently anytime, anywhere with MAB Internet Banking or Mobile Banking. Paying their bills online is the fast and convenient way to stay on top of customer finances. MAB is the one-stop solution for all bill payment needs – choose from many billing organizations.

#### (e) Hire Purchase

Hire Purchase is a service provided by MAB Bank for the account holders, SME business owners and organizations alike to pay for goods in installments over a period of time with a required down payment of 30-50 percent.

This service is eligible for individuals or organizations to hire purchase products/items by paying only 30% – 50% (down payment) initially and paying the remainder (depending on the product/item) throughout a period fixed by the bank. The credit terms differ depending on goods purchased.

(f) Remittance

A telegraphic transfer is the quickest means whereby the beneficiary generally receives payment within 24 hrs of dispatch in local or foreign currency.

The safe and reliable way of sending your hard earned money to customer's loved ones in Myanmar from abroad. Transfer from sender in foreign countries to beneficiaries in Myanmar through agency relationships (Banks and Non-banks) with MAB Bank.

A very fast, safe and reliable way of transferring money between two persons or entities anywhere in the world through use of MAB's wide correspondent relationships and the SWIFT network.

Payment order is a form of payment settlement to individual, company and associations. It can be purchased at any MAB branches. Payment order is designed as a normal payment order to pay a particular amount for a third party that is not a Bank.

(g) Loans and Advances

The bank just don't keep with themselves the deposited amount of the people, rather they advance them in the form of loans to the businessman and entrepreneurs, just to earn profits for their partners. The loanee keeps some gold, silver, fixed and variable assets in the form of security with the bank. The bank can advance loan to their customers in three ways: overdrafts, money at call, discounting bills of exchange.

Lien Letter is an agreement letter in which Bank has a Borrower's consent to obtain or control their deposits or receivable account when there is an absent of repayment of loan or their obligations. It is suitable for the individual who want to borrow money by giving their savings account as collateral.

MAB Bank will provide long term financing of business's infrastructure, industrial projects and public services based on your cash flows of the projects.

MAB Bank shall give the cash in advance (invoice financing) to get better cash flow for trading businesses. The sellers or buyers may discount their invoices to obtain better liquidity. The bank may provide short-term advanced money to companies' receivables or help them pay their due invoices.

Floor Stock Financing of MAB Bank is mainly targeted at the automobile industry in which Automobile Dealers are able to pledge their vehicles with MAB Bank and get required finance for their businesses, enabling better liquidity.

MAB Education Loan provides financial support for diploma, degree and post graduate programs from local private or overseas institutions.

(h) Cards

MAB debit card helps the customer in paying for goods and services through electronic channels.

MAB Credit Card is a convenient way of borrowing money to pay for goods and services.

MAB MASTERCARD (PREPAID CARD) can be loaded with money by customer or someone else. Customer can then use the card to pay bills and make purchases in-store, over the phone or online. Customer can use your prepaid card wherever MasterCard or Maestro cards are accepted. A lost or stolen card can be cancelled and the balance transferred to a replacement card.

MAB Bank Visa Prepaid Card is a world travel card that allows cardholders to pay for purchases online and in stores overseas where Visa prepaid card is accepted.

MAB Point-of-Sale Service is the system where can be made a payment by customer to merchant for the goods and services instead of paying cash.

(i) Other Services

Upon shipment of goods, the exporter presents related documents to the Bank for negotiation. Negotiation means discounting the bills against advances to the beneficiary exporter. The Bank checks the documents presented against the terms and conditions of the Letter of Credit (LC) in order to determine compliance before negotiation. Negotiation is done with recourse to the

beneficiary unless LC is confirmed. A credit trade line is required before this facility can be utilized.

Pre and Post Shipment Financing is a short term financing facility extended to exporters prior to shipment of goods. This facility enables the exporter to enjoy pre-export financing for the purchase of the goods provided a firm order is secured by the exporter. The application has to be supported by a Letter of Credit in his favour or a Confirmed Purchased Order. The loan approved will only cover the costs of goods for export or a percentage of the LC submitted. A credit trade line is required before this facility can be utilized.

Outward Documentary Collections is where the exporter collects payment from his overseas buyer (the importer) through the Bank. After the shipment of goods, the exporter entrusts the trade documents to the Bank, with specific instructions and terms for the goods release to the buyer. The Bank releases the documents to the buyer only when he meets the payment terms, either by D/A (Documents against Acceptance) or D/P (Documents against Payment).

For international trade settlement by the buyer (importer) to import goods into Myanmar, LC is issued by the issuing bank on behalf of the buyer/importer in favour of the sell/exporter. It is an undertaking by the Bank at the request of a buyer to honour claims by the seller provided that the documents relating to a shipment of goods are presented within a specific time and in accordance the terms and conditions of the LC. Ideal for commercial businesses where both parties totally do not trust each other and need comfort of a reputable third party, e.g. banks.

Inward Documentary Collections is where an exporter collects payment from his overseas buyer (the importer) through the Bank. After the shipment of goods, the exporter entrusts the trade document to the Bank, with specific instructions and terms for their release to the buyer. The Bank releases the documents to the buyer only when he meets the payment terms, either by D/A (Documents against Acceptance) or D/P (Documents against Payment). Short-term financing under Trust Receipts is also available from the Bank.

The Bank provides short-term credit facilities for financing the importer when a Letter of Credit (LC) or collection is due for payment. A credit trade line is required before this facility can be utilized. This is a credit facility granted to the customer to enable him to take delivery of the goods prior to payment. As security, the goods title is with the Bank, and the customer will undertake to hold the documents, the goods and the sale proceeds in trust for the Bank.

Shipping Guarantees are indemnities given by the Bank to the carrier of goods, so that the goods can be released to the consignee without producing the Bill of Lading of Air Waybill. This helps the importer to avoid demurrage charges which otherwise will be imposed if delivery of the goods is not taken up due to the absence of shipping documents.

Bank Guarantee is issued for common commercial or statutory requirements, including contract tenders and payment guarantees.

MAB bank provides the purchase or sales of selected foreign currencies with competitive exchange rates for spot delivery.

### **3.3 Human Resources of MAB Bank (Theinphyu Branch)**

In this section, the characteristics of staff in MAB (Yangon) are presented by gender, educational attainment and their position.

#### **3.3.1 Gender**

There are 51 staffs in MAB (Yangon). The gender distribution of the staffs of the bank is presented in Table (3.1).

**Table (3.1)**  
**Gender Distribution**

Gender	No. of Staff	Percentage
Male	16	31.37
Female	35	68.63
Total	51	100.00

Source: MAB ( Yangon)

According to Table (3.1), the majority of staff 35 (68.63%) are female and the remaining 16 (31.37%) of the staffs are male. It has been found that the number of female staff is higher than of male staff.

### 3.3.2 Educational Attainment

In Table (3.2), the educational attainment of the staffs is presented.

**Table (3.2)**  
**Educational Attainment**

Education	No. of Staff	Percentage
High school	9	17.65
Graduate	42	82.35
Total	51	100.00

Source: MAB ( Yangon)

Regarding to the Table (3.4), most of the staff 42 (82.35%) are graduates and 9 (17.65%) are high school educational level.

### 3.3.3 Position of Staffs

The position of staff is shown in Table (3.5).

**Table (3.5)**  
**Position of Staff**

Position	No. of Staff	Percentage
Vice President	1	1.96
Assistant Vice President	7	13.74
Senior Officer	7	13.74
Officer	8	15.67
Senior Associate	6	11.76
Associate	14	27.45
Driver	2	3.92
Peon	4	7.84
Cleaner	2	3.92
Total	51	100.00

Source: MAB ( Yangon)

Concerning with Table (3.5), it was found that 27.45% of the staff are associate and highest percentage among other position.1.96% of the staff is vice president and the lowest percentage in MAB bank.

### **3.4 Waiting Line Management Practices at MAB Bank**

Queuing system in banks is an approach which includes lining up of customers in the bank to be served by a bank employee on each server. While in service time, customers normally move to the server for one or more inquiries. This obstruction result into the delay in providing services to other customers. It becomes one of the challenges to the banks to reduce the waiting time for customers. Queuing systems could help banks to minimize the waiting time through appropriate queue management which will also maximize throughput.

MAB Bank practice following strategies to manage waiting line system.

1. Appoint a service leader to coordinate customer-employee interactions. Perceived wait time is reduced when an employee greets customers directly, learns the purpose of their visit and then directs them accordingly. These greetings make customers feel as though employees are immediately noticing their needs and beginning the transaction right away -- as opposed to customers waiting in line before speaking to an employee.
2. Keep it moving. Customers want to see that all employees are actively working to move customers through queues. Every employee should operate with a sense of urgency and avoid what might easily be perceived as idle conversations or tasks. This reassures customers that employees are striving to help them as quickly as possible. If employees are not engaging in activities that serve customers when times are busy, they should take those interactions off the floor. In those instances, what employees are doing may very well have a large impact on the customer experience -- but from the customer's perspective, it is just two employees standing there talking to each other or an employee on a computer. Customers may think that employees are not taking the time to put their needs first.
3. Give customers something to do in line. When customers in line engage in an activity while waiting, their perceived wait time can be reduced. Televisions near lines or waiting areas or magazines lining checkout aisles are classic examples. If customers need to be prepared for their transaction, have employees or signs nearby directing them on what steps to take. To reduce wait times for everyone, ensure that customers are ready to go when it is their turn. This strategy also gives customers something productive to do.

For example, banks should ensure that customers waiting in line have everything they need for their transaction (deposit slips, debit cards, paperwork) before it's their turn.

4. Be "FAST." Even after customers are out of line and at the point of employee interaction, perceived wait time can be diminished. It all depends on the employee-customer interaction: Customers are happier and have lower perceived wait times when employees are "FAST"—Friendly to customers, Accurate during transactions, Sympathetic to customers' emotions about waiting and Thankful for customers' time and patronage.

## CHAPTER IV

### ANALYSIS OF WAITING LINE MANAGEMENT OF MAB BANK

In this chapter, the waiting line characteristics of the Myanmar Apex Bank (Yangon branch) were studied. This chapter focuses to determine the situation of waiting lines managed by MAB bank and to determine customer satisfaction on waiting lines management.

#### 4.1 Research Method

Basically, the data used for this study were obtained from primary sources. The method of data collection is through direct observation. A wrist watch, a pen and a notepad were requirements needed for the recording of relevant information such as; number of customers the arrival times of customers, waiting time, and service time. The observation was made during the working hours (9am – 3pm). The recorded information was used to calculate average waiting time, average service time and the utilization factor. The method of analysis for this study is the single- sever (M/M/1) and multi-server queuing modeling system which follows (M/M/m): ( $\infty$ /FCFS) specification. In the case, the performance measure analysis including, the arrival time, waiting time service time, priority level, for average customers and the number of servers available were computed by using TORA software. Secondly, the analytical representation of the generated performance measure values was done.

$P_w$ : The probability that a customer has to wait

$P_n$ : The probability that there are n customers in the system

#### 4.2 Analysis of Waiting Line Characteristics

In this section, the waiting line characteristics of the multi-channel and single-channel waiting line model were calculated. The model adopted in this paper is multiple channel queuing system, in which two or more servers or channels are available to handle arriving customers.

There are four types of service counters that are operating for bank service. They are withdrawing counter, deposit counter, remittance counter and exchange counter. Each counter serves as a single channel. According to the observation, the arrival rate and service rate for four counters were computed.

**Characteristics Queuing model notation:**

$\lambda$  : Mean arrival rate

$\mu$  : Mean service rate

$k$  : Number of service channels

$n$  : Number of customers

$L_s$  : Average number of customers in the system (waiting or being served)

$L_q$  : Average number of customers waiting in the queue

$W_s$  : Average time customers spend in the system

$W_q$  : Average time customers wait in the queue

$\rho$  : System utilization

$P_0$ : The probability that there are zero customers in the system

**4.2.1 Waiting Line Characteristics of Withdrawing Counter in MAB (Yangon)**

In this sub-section, the waiting line characteristics of the multi-channel waiting line model for withdrawing counter were calculated. Because the service rate ( $\mu$ ) is less than the arrival rate ( $\lambda$ ). Table (4.1) showed that the multi-channel waiting line characteristics for withdrawing counter by using the average arrival rate is 24.68 customers per hour and the average service rate is 14.47 customers per hour. The average arrival rate and average service rate are showed in Appendix (A-5).

**Table (4.1)**  
**Multi-channel Waiting Line Characteristics for Withdrawing Counter in**  
**MAB (Yangon)**

	Waiting Line Characteristics	Calculated value
$p_0$	The probability that there are no customers in the system	0.08
$L_q$	The average number of customers in the queue	4.55 customers
$L_s$	The average number of customers in the system	6.25 customers
$W_q$	The average time a customer spends in the queue	11.06 minutes
$W_s$	The average time a customer spends in the system	15.20 minutes
$\rho$	Service Utilization	$0.85 < 1$

$\lambda = 24.68, \mu = 14.47$

Source: Survey Data (2019)

According to Table (4.1), the probability that a customer has to wait for service is 0.85 and the probability that no customers are at the withdrawing counter is 0.08. The average queue length is 4.55 (5) customers and the average number of customers in the system of withdraw counter is 6.25 (6) customers. The average time a customer spends 11.06 minutes in the queue and 15.20 minutes in the system. The service utilization is less than 1. This means that the traffic intensity is less and therefore customers satisfy the bank service.

#### **4.2.2 Waiting Line Characteristics of Deposit Counter in MAB (Yangon)**

In the deposit counter, the multi-channel waiting line characteristics also used with the value of 27.71 for arrival rate and 13.42 for service rate. The result of waiting line model is showed in following Table (4.2) and the average arrival rate and service rate can be seen in Appendix (A-5).

**Table (4.2)**  
**Multi-channel Waiting Line Characteristics for Deposit Counter in MAB**  
**(Yangon)**

	Waiting Line Characteristics	Calculated value
$p_0$	The probability that there are no customers in the system	0.10
$L_q$	The average number of customers in the queue	4.55 customers
$L_s$	The average number of customers in the system	3.11 customers
$W_q$	The average time a customer spends in the queue	2.27 minutes
$W_s$	The average time a customer spends in the system	6.74 minutes
$\rho$	Service Utilization	$0.69 < 1$

$\lambda=27.71, \mu=13.42$

Source: Survey Data (2019)

As table (4.2), the results of the probability are 69% for a customer has to wait for service and 0.1 for no customers at the deposit counter respectively. And also, the average queue length and the average number of customers in the system of deposit counter are 4.55 (5) customers and 3.11 (3) customers respectively. The average time a customer spends in the queue and in the system are 2.27 and 6.74 minutes respectively. The service utilization is less than 1. This means that the traffic intensity is less and therefore customers satisfy the bank service.

#### **4.2.3 Waiting Line Characteristics of Remittance Counter in MAB (Yangon)**

The waiting line characteristic of the single-channel waiting line model for remittance counter was studied with the result of the average arrival rate (7.12) and the average service rate (11.29). The result of the waiting line model for remittance counter is shown in Table (4.3) and the value of average arrival rate and average service rate can be seen in Appendix (A-5).

**Table (4.3)**  
**Single-channel Waiting Line Characteristics for Remittance Counter in MAB (Yangon)**

	Waiting Line Characteristics	Calculated value
$p_0$	The probability that there are no customers in the system	0.37
$L_q$	The average number of customers in the queue	1.08 customers
$L_s$	The average number of customers in the system	1.71 customers
$W_q$	The average time a customer spends in the queue	9.07 minutes
$W_s$	The average time a customer spends in the system	14.39 minutes
$\rho$	Service Utilization	$0.63 < 1$

$\lambda=7.12, \mu= 11.29$

Source: Survey Data (2019)

The results shows that the capacity utilization is 63%, average number of people waiting in queue is 1.08, average number of people in the system at a point in time is 1.71, average waiting time in queue is 9.07 minutes and average time in system is 14.39 minutes and the arrival pattern has been Poisson distribution. This shows that the queue and waiting times are less and would probably result in gain of business, increase satisfaction of the customer and reduction of employee workload. The service utilization is less than 1. This means that the traffic intensity is less and therefore customers satisfy the bank service.

#### **4.2.4 Waiting Line Characteristics of Exchange Counter in MAB (Yangon)**

Table (4.4) is shown that the single channel waiting line characteristics for the exchange counter by using the average arrival rate (4.00) and average service rate (6.61) are shown in Appendix (A-5).

**Table (4.4)**  
**Single-channel Waiting Line Characteristics for Exchange Counter in**  
**MAB (Yangon)**

	Waiting Line Characteristics	Calculated value
$p_0$	The probability that there are no customers in the system	0.39
$L_q$	The average number of customers in the queue	0.93 customer
$L_s$	The average number of customers in the system	1.53 customers
$W_q$	The average time a customer spends in the queue	13.91 minutes
$W_s$	The average time a customer spends in the system	22.97 minutes
$\rho$	Service Utilization	0.61 < 1

$$\lambda=4.00, \mu= 6.61$$

Source: Survey Data (2019)

According to the Table (4.4), the value of the probabilities of a customer has to wait for service and no customer at the exchange counter are 0.61 and 0.39 respectively. The average queue length is 0.93 (1) customer and the average number of customers in the system of exchange counter is 1.53 (2) customers. The average time a customer spends in the queue and the system are 13.91 minutes and 22.97 minutes respectively. The service utilization is less than 1. This means that the traffic intensity is less and therefore customers satisfy the bank service.

### **4.3 Analysis on of Customer Satisfaction**

To determine customer satisfaction on service waiting time management, the study has used questionnaire survey with 5 likert scale to (50) customers. The customer satisfaction towards the services of a bank from six different perspectives namely, information responsiveness, service encounters, waiting time of the customer to get the service, role of intermediaries, quality of service provided by the bank and customer complaints towards the bank.

The respondents were asked to indicate the extent to which use of waiting lines management strategies listed in table satisfy them. The response was rated on a five point scale where 1= Very dissatisfied 2= Dissatisfied 3= moderately satisfied 4= Satisfied 5= very satisfied. Mean and standard deviations were the calculated.

**Table (4.5)**

**Customer Satisfaction on Waiting Time Management.**

<b>Customer Satisfaction</b>		
1	Information responsiveness	4.06
2	The time taken by the customer to interact with the service ( service encounter)	4.04
3	Minimize the waiting time to get the service	4.08
4	To meet the need so the customers in a more responsive manner.	4.08
5	Quality experience of the service environment of an organization.	4.30
6	Customer complaints towards the bank	4.08

Source: Survey Data (2019)

Regarding with Table (4.5), the average of statement 1,2,3,4,5, and 6 are greater than 4. Therefore, MAB obtained generally high satisfaction from the customer. They satisfied overall service of MAB that are currently offered. Among the service perspectives, they give the most satisfaction on quality experience of the service environment of an organization.

## **CHAPTER V**

### **CONCLUSION**

In this chapter, findings and suggestions are focus for this study. According the results from chapter 4, the findings reveal that the queuing management practices is proper for the bank and customers satisfy the service of MAB bank. And then, suggestions explored for the best to serve the customer in MAB.

#### **5.1 Findings**

Queuing theory is a powerful mathematical approach to the analysis of the waiting lines of business organization especially in bank. Because, every bank aim is that maintain the long- term relationship with the customers and the bank. With the intention of acquire the potential customers, needs and demands should be recognized also customer satisfaction has a great impact on the entire bank operations. Therefore, it is very important to the organization to understand what exactly the customers need and how to gain loyalty for the successful bank. The customer plays a crucial role in the market chain process. To make it clearer, satisfied customers are the ones who create the possibility of the new customers. If the existing customers are satisfied with the service, then there are the chances of recommendation to the new customer. This will lead to the increasing number of customer and could maintain the level of the relationship with the customers.

This thesis has gone into depth to understand the relationship between the customers' satisfaction and waiting time at bank. During the research, the researcher figured out if the customers are satisfied with the quality of the service and perform the tasks according to the customer's demand; the bank has satisfied customers along with loyalty. It can be said that customer satisfaction is the key component of bank profitability because once the customer reaches their satisfaction level; it may influence them to consume the service continuously. Moreover, they share their experiences with other people, which create the possibility of new customer. Likewise, dissatisfied people also give their opinion about the service of the bank, about their unfortunate experiences and lead towards a declining position to the number of customers.

The case study of this paper was MAB bank located in Theinphyu Township, Yangon. The reason behind choosing this bank was it was the best option regarding the

topic relationship between customer satisfactions and waiting time. The results of the observation determined the relationship between customer satisfaction and waiting time. Through the analysis, it was found that the answer of customer satisfaction from respondent and the results of queuing theory are not different. The customer satisfied for this bank service and waiting time for various services are relaxed for the customer.

As the results of MAB (Yangon), it was observed that the arrival rate varied from 18.78 to 31.27 customers per hour while the overall arrival rate was 24.68 in withdrawing counter, varied from 20.91 to 41.82 customers per hour while the overall arrival rate was 27.71 in deposit counter, varied from 4.00 to 9.27 customers per hour while the overall arrival rate was 7.12 in remittance counter and varied from 1.11 to 6.90 customers per hour while the overall arrival rate was 4.00 in exchange counter respectively.

Similarly, the service rate varied from 11.06 to 17.77 customers per hour for withdrawing counter while the overall arrival rate was 14.74, varied from 9.32 to 15.75 customers per hour for deposit counter while the overall arrival rate was 13.42, varied from 8.86 to 13.92 customers per hour for remittance counter while the overall arrival rate was 11.29 and varied from 3.33 to 12.12 customers per hour while the overall arrival rate was 6.61. Base on the results of service utilization, it was found that customers satisfy the service of this bank.

For measuring the satisfaction of the customers, various methods need to be applied to analyze the consequences. Customers predict the value of the products and services before purchasing, at the point of purchase and after purchasing. This means their satisfaction may vary accordingly. Overall this study has highlighted that satisfaction and waiting time are core element of a bank. Understanding these two terms can help the bank to build a status among bank and increase in demand of customer. The study established that majority of customers in MAB bank were satisfied with queue discipline.

## **5.2 Suggestions**

Impact of service encounters, role of intermediaries, quality of service, waiting time and customer complaints are considered essential for an organization to find out the

gaps in the perceptions and expectations of the customers. The study established that commercial banks in Myanmar have adopted waiting lines management strategies such as use of physical barriers, automatic queue measurement systems, seamless banking, internet banking and mobile banking. Queuing theory has a much-diversified range of applications. It enjoys a very dominant place in the contemporary analytical techniques. Information is obtained on the basis of analysis done by the queuing systems. Queuing theory plays a very important role in the development of everyday social life. All the applications discussed above are practical and their worth is portrayed in the actions of everyday life. This theory also explains the mathematical, as well as, social study of waiting lines in everyday life. Through the prediction and analysis of waiting times in various organizations, management is able to extract effective results and strategies. Organizations that actively integrate queuing analysis for the betterment of their organizational bodies should form recommendation plans and strategies to other organizations, which are not yet able to identify the worth of this mathematical study. Queuing analysis can give very effective results in banking industry. To measure the accurate arrival time, electronic queue management will implement at 2021 because it can able to measure and control for organizing crowded waiting areas, and optimizing operational processes using real time data analytics. EQMS leads to higher customer satisfaction, operational cost reduction, increased product promotions and continuous process efficiency.

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For Withdraw Counter Appendix (A-1)

Time	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		Day 8		D
	Arrival	Service															
9:30-10:30	32	32	33	32	43	43	43	42	34	34	23	23	28	27	32	32	20
10:30-11:30	19	18	18	18	30	30	38	36	32	32	22	22	13	14	25	25	19
11:30-12:30	15	15	12	13	27	27	26	29	16	16	29	29	17	15	17	17	19
12:30-1:30	20	21	17	16	32	28	24	21	10	10	26	26	21	22	14	9	19
1:30-2:30	25	24	24	25	28	32	32	35	20	15	24	22	29	30	20	25	15
2:30-3:30	2	3	14	14	10	10	9	9	10	15	13	15	29	29	23	23	7
Total	113	113	118	118	170	170	172	172	122	122	137	137	137	137	131	131	10

For Deposit Counter

Appendix (A-2)

S/N	Time	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		Day 8	
		Arrival	Service														
1	9:30-10:30	29	29	29	27	29	29	52	48	43	43	36	36	23	23	32	30
2	10:30-11:30	37	37	18	20	33	33	38	42	31	31	36	35	19	19	24	26
3	11:30-12:30	19	18	21	20	28	26	49	48	31	22	25	24	20	20	12	13
4	12:30-1:30	20	19	19	20	32	34	37	37	32	40	29	28	24	22	27	28
5	1:30-2:30	13	15	27	25	33	32	37	37	41	41	32	35	28	30	25	24
6	2:30-3:30	3	3	11	13	13	14	17	18	17	18	25	25	25	25	29	30
Total		121	121	125	125	168	168	230	230	195	195	183	183	139	139	149	149

For Remittance Counter

Appendix (A-3)

S/N	Time	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		Day 8	
		Arrival	Service														
1	9:30-10:30	11	11	9	9	10	10	9	9	8	7	6	6	3	3	3	3
2	10:30-11:30	5	5	4	4	5	5	10	10	6	7	11	10	6	5	5	5
3	11:30-12:30	5	5	5	5	7	7	8	7	7	7	8	8	7	8	4	4
4	12:30-1:30	5	5	12	11	8	7	7	8	4	4	5	6	5	5	2	2
5	1:30-2:30	7	7	9	10	6	7	9	9	3	2	12	11	6	6	3	3
6	2:30-3:30	-	-	2	2	-	-	2	2	3	4	4	5	6	6	5	5
Total		33	33	41	41	36	36	45	45	31	31	46	46	33	33	22	22



Total	16	16	10	10	13	13	14	14	-	-	3	3	5	5	5	5
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Appendix (A-4)

Table: Daily Record of Average Arrival Rate and Service Rate

Appendix ( A-5)

Day Counter	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		Day 8	
	$\lambda$	$\mu$														
Withdraw	21.44	12.44	21.45	16.46	30.91	11.06	31.27	17.77	24.73	12.73	25.09	14.95	24.91	16.35	23.63	14
Deposit	23.63	10.74	22.94	14.74	30.55	13.44	41.82	14.14	35.45	9.32	21.53	13.90	25.27	14.15	27.27	14
Remittance	7.07	11.87	7.62	8.86	7.5	10.43	8.36	12.23	5.69	11.48	8.30	12.78	6.31	13.92	4	9.3
Exchange	4.57	4.29	2.46	4.61	2.77	6.76	3.68	9.33	-	-	6.90	2.12	4.07	8.77	1.11	3.3