CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

As developing countries and the increasing of population of society, the system management in our country is in need of improvement in terms of all aspects including of supermarket system, banking system, hospitalization system and so on. From day to day, billions of people would be demand for a service that had been provided. They would be flooded to the placed to make their daily matters such as making a loan or open an account book at bank, buying goods at the supermarket, getting treatment in a hospital or clinic and for people work at port they are waiting their container to be served and waiting line occur. Some of them had been faced to wait for a long time before they would be served. All these situations need a system so everything works smoothly. The system called as simulation. Simulation is a method of problem solving that is indispensable to solve real-world problems and it is used to describe and analyze the behavior of a system (Banks 1999) [2].

Consumers today are more constrained by the time than ever before. The services providers should be understand that consumers put their time to wait and in term of their perspective it is just as futile wait for services delivery. Furthermore, the customer waiting in line to get their services probably would be lost of customer (Sheu, McHaney et al. 2003) [12]. Figure 1.1 shows waiting cost and service level trade-off.
The source of customer service population divided into two categories such as finite and infinite. The finite customer population means the numbers of customers already in the system may be affected when the number of new customers arrived. The rates at which people generate new customers do not affect the number of the customers waiting in line called infinite.

In this situation, the cooperation between services provider and the customer are needed. For this situation should be considered as waiting line situation. Therefore, one problem at the counter services which is affected to the cost is Waiting Line Problem. Each customer has a variety of action when they are waiting in line such as balk, renege and jockey. Balking occurs when at the first views of customer to long line; they do not enter the waiting line. Reneging occurs when customer enter the waiting line but leaves before they had been served. Jockeying occurs when customer in waiting line change to another line hoping that ways could be reduce their waiting time.

The designing of model of waiting line is not easier thing. It is was designed to be more better management in service process instead of lowering the customer waiting time for satisfaction of customer (Sheu, McHaney et al. 2003) [12]. Basically, the service process occurs such as where the customer enter the service system forming a
waiting line, the customer take an order and wait for their needed. In service-based customer convenience must visit the service facilities so that the service will be provided (Sheu, McHaney et al. 2003) [12]. Figure 1.2 shows the design of waiting line model.

**Figure 1.2:** Design of waiting line model

Furthermore, the design of 1 to 4 offers different design structure in terms of the waiting line is designed and the way in which the process is a great service (Sheu, McHaney et al. 2003). Example of service process shows at Figure 1.3.1 until Figure 1.3.4.

**Figure 1.3.1:** Design Multi-stage, Single-queue, Single-server System