

MOBILE APPLICATION FOR QUEUE MANAGEMENT SYSTEM BASED ON ANDROID PLATFORM





UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**MOBILE APPLICATION FOR QUEUE MANAGEMENT
SYSTEM BASED ON ANDROID PLATFORM**

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Computer Engineering Technology (Computer System) with Honours.

by

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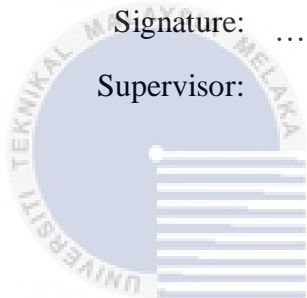
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APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electronics Engineering Technology (Computer System) with Honours. The member of the supervisory is as follow:



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ABSTRAK

Sistem Pengurusan Angka Giliran adalah sistem yang menguruskan masa menunggu pelanggan di mana-mana perkhidmatan seperti bank yang mempunyai banyak pelanggan setiap hari. Orang sekarang tidak mahu membuang masa menunggu nombor dan mahu melakukan perkara lain. Tujuan sistem ini adalah untuk mengembangkan Sistem Pengurusan Antrian berdasarkan platform Android untuk memudahkan pelanggan melihat data antrian mereka dalam masa nyata. Ini dapat ditunjukkan apabila sistem aplikasi mudah alih ini dikembangkan dalam perisian Android Studio dan menggunakan banyak komponen untuk penyelesaian projek ini. Selain daripada itu, laman web HTML telah dibangunkan untuk menguruskan sistem giliran ini. Selain itu, pangkalan data masa nyata adalah pangkalan data utama yang digunakan untuk sistem ini. XAMPP dan Firebase adalah pelayan utama untuk sistem ini yang menghubungkan antara pentadbir dan pelanggan. Beberapa kaedah seperti rajah carta alir dan rajah kes penggunaan telah digunakan. Ciri-ciri projek untuk aplikasi mudah alih adalah pilihan balas, dengan nombor giliran masa nyata yang dipaparkan dan juga pemberitahuan yang akan memberitahu pelanggan. Lebih-lebih lagi, untuk laman web, ia mempunyai pengesahan yang selamat untuk pentadbir dan juga kaunter yang mudah dikendalikan. Objektif projek telah berjaya dicapai.

ABSTRACT

Queue Management System is a system that manages customer waiting time at any services such as bank that have many customers every day. People nowadays do not want to waste their time waiting for a number and want to do other things. The purpose of this system is to develop a Queue Management System based on the Android platform for bank to ease the customer in viewing their queue data in a real-time. This can be shown when this system of the mobile application is developed in Android Studio software and used many components for a completion of this project. Other than that, HTML website has been developed in order to manage this queue system. On top of that, real-time database is the main database used for this system. XAMPP and Firebase is the main server for this system that connect between admin and customers. Some of methods such as flowchart diagram and use case diagram have been used. The project features for mobile application are counter options, with real-time queue number displayed and also notification that will notify customer. Moreover, for the website, it has secured authentication for admin and also easy to manage counters. The objectives of the project have been successfully achieved.

DEDICATION

This thesis is wholeheartedly dedicated to my beloved parents, supervisor, and my fellow friends with their continuous supports, may Allah bless them.



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LIST OF ABBREVIATION

IoT	Internet of Things
OS	Operating System
SMS	Short Message Service
IP	Internet Protocol
AI	Artificial Intelligence
ID	Identification
PC	Personal Computer
SVM	Support Vector Machine
TiQS	Ticketless Queue System
IDE	Integrated Development Environment
MAC	Media Access Control
USB	Universal Serial Bus
SQL	Structured Query Language
HTML	Hyper Text Mark Up Language
API	Application Programming Interface
SDK	Software Development Kit
APK	Android Application Package
IOS	Iphone Operating System

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CHAPTER 1

INTRODUCTION

This chapter will briefly discuss about the background, problem statements, project scope, project significance and objective of the project.

1.1 Background

A queue management system is the arrangement of people to wait turn in a retail or any public department such as bank. This can be measured when queue management system was organized by the existing queue through the gathering system of statistics in queue management system in order to identify and anticipate trends. (Alias, 2007)

There are many existing Queue Management System such as Stand Alone Queue System, Advance Queue System and Centralized Control Queue System ((Uddin *et al.*, 2016). For Stand Alone Queue System is refer to the single service and single counter operation. Next, for a system of queue processor based solution such as Advance Queue System is designed based on the single department and can carry up to 32 services and 60 counters. Lastly, the high-end PC-based solution called Centralized Control Queue System that able to support up to 20 departments.

When it comes to busy day, a focused place to go is bank where people keep on using their services daily. Many solutions have been discovered for people in queues in order to reduce waiting time such as ticketless queue management system or queue number system via SMS. For this project, Android platform will be applied to overcome the problem in queue management system especially in banks.

1.2 Problem Statement

Currently, queue management system in banks are not really efficient at this moment where most of banks have small amount of staffs and do not have many counters to allow people use their services at one time. Most of the customers do not like to wait in line since they have another things to do or do not want to waste their time. At the same time, any well-run company is concern about the customers' satisfaction but most companies do not have a small number of staff available during the busiest hours of the day to meet customer needs. Good feedback from customers are important for company to run their services continuously. So, when customers happy with their services, they will give a positive feedback. One of the current queue number system is SMS queue number system in Figure 2.1 where the system allows new customers to remotely check the queuing status at the premise (Jidin, Yusof and Sutikno, 2016). People nowadays do not really use SMS in daily life since we have a modern technology that use Android applications. Therefore, the best way to upgrade the current queue management system is to create mobile application based on Android platform. This way can make customers can go doing their stuff and wait for their turn in queue at the same time.

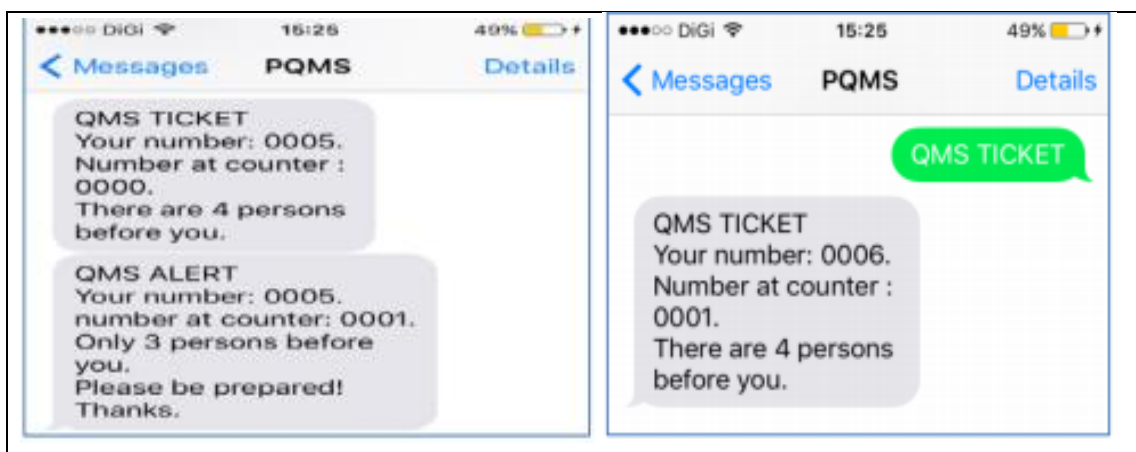


Figure 1.1: SMS Ticket (Jidin, Yusof and Sutikno, 2016)

1.3 Objective

The objectives of the project are as follows:

- (i) To develop Queue Management System based on Android platform for bank.
- (ii) To analyse the effectiveness of the system for bank's queue management system.

1.4 Project Scope

The scope for the project include the following areas:

Queue number will be displayed via an Android application in real-time database. This system can be used by all users in banks that are function to check for their queue number. Basically, the admin control the queue number on their system for customers. For customers, they must choose their counter based on services that they want through the application by choosing counter A or B and the application will update their queue number. The data will recieved by Firebase and XAMPP server. In addition, the project will be using Android Studio software to program and design the interface for queue number system.

1.5 Project Significance

This project will be a significant in helping the customers to use their waiting time to do other things while waiting in line. Since everyone has their own smartphone, the mobile application is easy to be accessed by the new user. In addition, the customer's information will be updated and have been retrieved the data from the XAMPP Database software.



CHAPTER 2

LITERATURE REVIEW

Application for mobile phone in Queue Management System based on Android platform will reviews on topics of Queue Management System and Android platform that can be combined to perform this project. Besides, there were few researches that have been discovered such as journal from previous project that can be related to this system.

2.1 Introduction

Lots of people spend their precious time in several different locations, such as banks, college, government office and hospitals, waiting in queue these days. Queue management system has been developed to help provide customers with fairness and convenience by retaining their place in queue when participating in certain activities or not in queue (Mahadik *et al.*, 2019). As a smartphone user, we find that the updated system and application will be an endless story problem, as well as the introduction of more modern and advanced system. Therefore, while our proposed system should always be able to accommodate majorities at the launch point, the system designer should be able to improve the system to maintain the existing users of the application and to attract new users (Khong *et al.*, 2017).

2.2 Overview of Queue Management System

According to Data *et al.*(2010), whether it is a supermarket or a bank lobby, most of the customers do not like waiting in line. Especially, when customers waiting lines are unacceptably long due to inadequate number of customer service workers, e.g. at bank tellers. At the same time, any well-run company is mindful that frustration of consumer is minimised. However, most companies do not have a small number of staff available during the busiest hours of the day to meet customer needs. In addition, these business owners do have to deal with low periods during which the flow of customers is minimal and so those workers on issues must be assigned to other tasks.

Businesses, such as banks, who have a small number of personnel available to meet customer needs, also need effective ways to track their customer queues such that customer frustration can be reduced within a queue wait period, thus optimizing the effective use of available service staff.

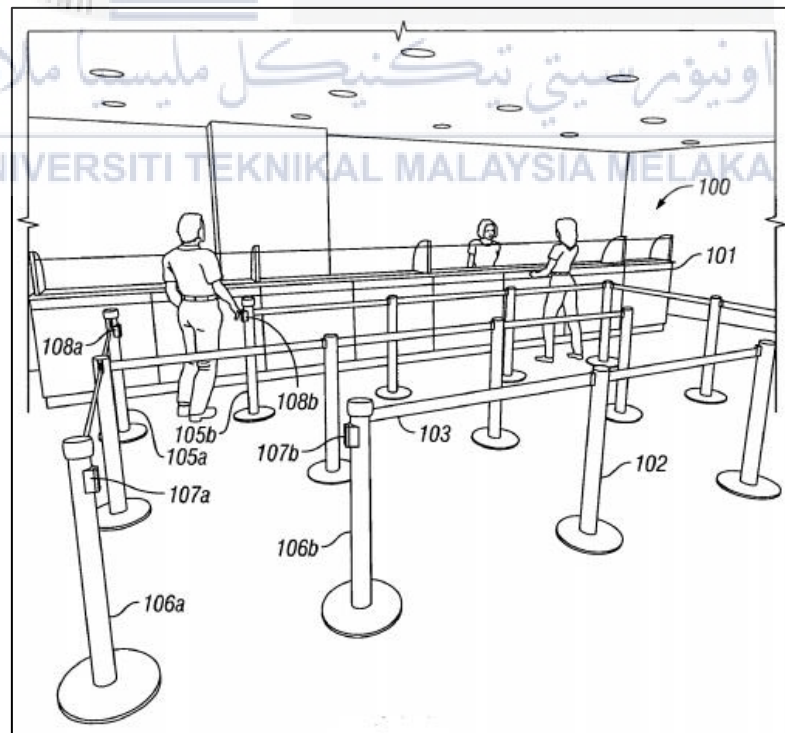


Figure 2.1: Queue Management System(Data *et al.*, 2010)

2.3 Overview of Android Platform

DiMarzio (2017) explained that the Android is a mobile operating system based on Linux component adaptation that was modified and initially created by the similar name start, Android, Inc. Google purchased Android, Inc. in 2005 and converted its development duty where Google choose the Android code to be discharged 8 under the Apache open source license. Therefore, the user can easily install the full Android source code to use Android platform.

From Table 2.1 shows the specific code name for each adaptation of Android since 1.5 had been created. Thus, all the codenames have been chosen by dessert products such as sweet or sugary foods.

Table 2.1: A brief history of Android Versions Android

Android Version	Release Date	Codename
1.5	April 30, 2009	Cupcake
1.6	September 15, 2009	Donut
2.0/2.1	October 26, 2009	Éclair
2.2	May 20, 2010	Froyo
2.3	December 6, 2010	Gingerbread
3.0/3.1/3.2	February 22, 2011	Honeycomb
4.0	October 18, 2011	Ice Cream Sandwich
4.1	July 9, 2012	Jelly Bean
4.4	October 31, 2013	KitKat
5.0	November 12, 2014	Lollipop
6.0	October 5, 2015	Marshmallow
7.0	August 22, 2016	Nougat
8.0	August 21, 2017	Oreo