UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ATTENDANCE MONITORING SYSTEM VIA MOBILE PHONE

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Engineering Technology (Telecommunications)(Hons.)

by

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BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

TAJUK: **Attendance Monitoring System via Mobile Phone**

SESI PENGAJIAN: **2015/16 Semester 1**

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Engineering Technology (Telecommunications) (Hons.). The member of the supervisory is as follow:

…………………………………
(Mohd Fauzi Bin Ab Rahman)

ABSTRAK

Sistem Pemantauan Kehadiran melalui Telefon Pintar adalah sistem yang menyediakan satu jalan ringkas, baru dan mudah bagi pendaftaran kehadiran. Tujuan projek ini dapat mengurangkan kehadiran palsu dan mengurangkan kertas senarai kehadiran. Oleh itu, pensyarah tidak perlu lagi membawa helaian kertas kehadiran ke kelas. Tiada lagi system klasik bagi mengambil kehadiran pelajar dengan memanggil nama perseorangan atau menandatangani kehadiran di atas kertas. Maka tiada lagi proses yang menggunakan kertas. Sistem ini mengunakan satu teknologi iaitu kod QR yg mengandungi maklumat pelajar. Untuk mendaftar kehadiran, pelajar perlu mengimbas kod QR mereka pada pengimbas kod QR pada peranti pensyarah. Telefon pintar adalah satu peranti yang penting untuk mendaftar kehadiran. Sistem ini menggunakan telefon untuk memantau kehadiran pelajar. Sistem ini menggunakan Android sebagai sistem pengendali. Dan aplikasi Android sebagai sistem yang mewujudkan aplikasi ini. Dengan mengunakan aplikasi 'Android Studio' dapat memudahkan penguna mengunakan sistem ini. Projek ini akan memberi manfaat dan kesenangan kepada pensyarah untuk memantau kehadiran pelajar.Telefon pintar adalah sangat penting untuk projek ini untuk memantau kehadiran dengan menggunakan Android sebagai sistem operasi.

ABSTRACT

Attendance system monitoring via mobile phone is a system that providing a new, easy and quick way of registering attendance. The focused of this project is to reduce the fake attendance system and to avoid from using paper sheet as an attendance. So lecturer will not have to carry the sheet of the attendance. No more the classical method of taking attendance by reading out the name of student's name or signing the attendance sheet on the paper. Hence no more paper will be required in this process. Attendance Monitoring System is a system that allows collecting the attendance information by mobile phone application. The information is collected with an Android application and can monitor the attendance record which sent later through email. All the user detail and student detail are stored in the web based that called Admin Panel. Admin Panel is controlling by administration. The application needs to verify the record of student by scanning QR code of student. The student detail is compiles in QR code technology. This system proposes a system bases on QR code technology, which contains student information. To register the attendance, student needs to scan their QR code on lectures device to record their attendance. Smart phone is an importance device in this project in monitoring the attendance through Android as the operating system.

DEDICATION

I would love to dedicate this to my beloved parents, family and friends who have supported me through all the ups and down journey and have been a wonderful source of motivation and inspiration for me in order to complete this project.

ACKNOWLEDGEMENT

Alhamdulillah, thank you to Allah S.W.T because of His blessing I would like to express my gratitude and appreciation to all those who gave me the possibility to complete this report.

During the process to complete my project, I did a lot of research, either using internet, reading past year thesis, reference books or journals. With the guidance and support from peoples around me, I finally completed the report project. Here, I want to give credit to those who helped me to succeed in my final year project.

I would like to express my sincere gratitude and respect towards my project supervisor, Mr. Mohd Fauzi Bin Ab Rahman for his kind, encouragement and suggestions. Without his continued support and interest. May Allah bless and reward his.

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Thank you to all lecturers, staffs, friends and all who were directly and indirectly involved in this project. Your helps and cooperation will never be forgotten. May Allah bless and reward you for your sincere, contribution in the way of knowledge.

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UTeM	-	Universiti Teknikal Malaysia Melak
SDK	-	Software Development Kits
API	-	Application Programming Interface
IDE	-	Integrated Development Environment
QR	-	Quick Response
App	-	Application

CHAPTER 1

INTRODUCTION

This chapter is the first chapter of introduction of this project. The first chapter gives a brief introduction and idea of the project. It focuses on the overview of the project, list of objectives, explanations on the problem statement, work scope and finally the project significant.

1.1 Project Background

A purpose of system is to record and view real time attendance information in class using QR code scanner by smart phone. It is able to record a list of student that absent from class or lectures. The purpose of this project is to store the absent and present students attendance details in the easily system format, also to provide a fast and efficient attendance system for class in real time to store the data. This system much better than existing system that uses the classical methods of taking attendance by reading out the student names and check if they are present in the class or by signing a paper sheets of attendance in the classroom.

In the proposed system, students need to scan their own QR codes using mobile phones or tablet provide with the attendance application to obtain their attendance information. The QR code that contains student information is generated for attendance system administrator using software.

1.2   Objective of Project

Objectives of this project is outlined as follows:

i. To develop an efficient attendance system.
ii. To evaluate the performance of the attendance system monitoring.

1.3   Problem Statement

The existing attendance system is based on manual signing attendance that needs student to improperly sign the attendance sheet during classes. Typically, the attendance system is managed by each lecturer. The lecturer needs to record and keep all attendance sheets. Here student can easily forge the signature their friend that purposely to fill in class attendance. These non-effective system lead students to cheat and this previous system are not efficient. Therefore, universities should provide a system that able to improve the attendance system more efficiently.

1.4   Scope of Project

The work a scope is listed to ensure the project is conducted within its intended boundary. The work scope is useful to ensure that the project is heading in the right direction to achieve the goal. The scopes of this project are to study the basic of making a better attendance system.

The main goal of this project is to develop a QR code system technology scanner by using the smart phone. This system is able to read and display the QR code. A software will be used to create the interface and a database is used to store the data that being created using correct framework and software. An applications that integrates the attendance system though the mobile phone for checking the absent of students in real time will developed. The process will also include design and implementation of the database system to record the data.

MySQL is used to develop the information in a data base form. The information of real time student attendance will be appeared in the phone application. This system requires a database to store information about student attendance.

1.5 Report Outline

Chapter 1:

The first chapter gives a brief introduction and idea of the project. It focuses on the overview of the project, list of objectives, explanations on the problem statement, work scope and finally the project significant.

Chapter 2:

The background of the project is discussed in this chapter along with the methods, concepts, and theory that associated with this project. The concept of the research and related element will also discuss in this chapter.

Chapter 3:

Chapter 3 is the methodology section. In this chapter, a schedule or steps that are needed to be completed in order to achieve the objective of the project will be elaborate. This chapter also explains the procedures taken in completing this project. Moreover the detail of the project development is explained as well.

Chapter 4:

This chapter contains the performance and functioning of the product. All the simulation, data collection and analysis that were obtained from the project will be discussed in detail. The results are compared with the outlined objectives in order to state the hypothesis and conclusion of the project.

Chapter 5:

Chapter five explains the conclusion and recommendation with regard to the project.

1.6   Project Significant / Summary

This project is sought because of the lecture with regard to the difficulty in taking student attendance and maintaining it. The automated attendance android application is to provide a new, quick and easy way of registering attendance by using the QR code technology which consists of QR code reader and the QR code. The design and implementation of a comprehensive student information system and user interface will be replaced the conventional method of talking attendance. The Android mobile phone application development will be based on an open source software and open source development environment.

CHAPTER 2

LITERATURE REVIEW

2.1   Introduction

This chapter will describe about the literature review. Associated with previous study of element, component and method that needed to run and implement the project.

2.2   Attendance Monitoring System

Attendance Monitoring System is a system that allows collecting of attendance information by mobile phone application. The information is collected via an Android. It can be monitor via Android phone as well or through an email. All the user detail and student detail are stored in a web based that called Admin Panel. Admin Panel is controlled by an administration. The application needs to verify the record of student by scanning the student QR code. The student detail is compile in QR code technology.

There are three main systems for this project: Admin Panel, Lecturer application and QR Student application. Only lecturer can use the app and view the attendance list. When student enter the class, lecturer will put their phone on a table. Student will take the lecturer mobile device to scan their QR code for register their attendance. The student will scan their QR code by bring the code closest possible to the lecture phone and the information will be recorded and store in database. Before

that each student will produces their own QR code by using QR code application. At the end of class, lecturer can view the attendance list on the application or in their email.

2.3 QR code (Quick Response)

QR is short for Quick Response it can be read quickly by a mobile phone. From piece of information from a transitory media and can be read by smart phone. Figuren2.1 show the example of QR code image. QR Code always used in advertising materials in the environment such as magazine advert, on a billboard, a web page or even on television. It may give details about that business or details and show the URL (Uniform Resource Locator is a reference (an address) to a resource on the Internet) about link to the individual's full resume or website. This will be a shortcut to connect directly with websites or online resources without having to type a URL into an internet browser.

The patterns included in a QR-code image are finder, alignment, timing, and separator patterns. Each of these patterns has its own functionality.(Hikmat & Baban, 2014)

Figure 2.1: QR code

i. Finder pattern:

This pattern can be found at the edges of a QR code image. The finder pattern is a square block that contains that contains a black square. There are three finder patterns on every QR code image; at the top left, top right, and bottom left. There is not finder pattern at the bottom right. The primary functionality of the finder pattern is to tell a scanner or decoder that the image that has been encoded as a QR-code image. No data is stored in the finder pattern.

ii. Alignment pattern:

Similar to the finder, there is no data stored in the alignment pattern; however, it provides information scanner devices to correctly position the data stored in the encoded data region. The alignment pattern is positioned between encoded data and is usually in the center of the image. The structure of this pattern consists of a small square with a tiny dot inside. In addition, the number of alignment patterns can differ for different QR codes.

iii. Timing pattern:

This pattern lies between two finder patterns. Timing patterns are arranged both vertically and horizontally. There is a black dot inside each timing pattern. The main purpose of the timing pattern is to correct the central coordinate for each data cell when any distortion occurs during decoding of symbols or when an error is found in any cell pitch in the QR code. No data is stored in the timing pattern.

iv. Encoded data:

This pattern is located at the center of the image. Data is stored within this pattern. In addition, when data is inserted, it is converted to

binary data. This binary data is converted back to the normal text when the image is decoded by a scanner.

2.4 QR Reader

QR Reader is used to read the QR Code information by using smart phone set up with the camera. It an application in smart phone that need to install in it. To read a QR code, it scans or capture by a smart phone camera and a QR code reader is required. (A.L. Hou, F. Yuan, G. Ying, 2011)

Figure 2.2: Flow of QR code reader

2.5 Barcode vs RFID vs QR code

The Barcode is an optical machine-readable representation of data relating to the object to which it is attached. On the other hand the Radio-frequency identification (RFID) is the use of a wireless non-contact system that uses radio frequency electromagnetic fields to transfer data from a tag attached to an object, for the purposes of automatic identification and tracking. Quick response (QR) codes are a very convenient way to display a small bit of information that is easily scanned and processed typically by mobile devices allowing physical items to almost become interactive, by providing information that is easily scanned like a website URL.

RFID involves applying RFID tags to items or boxes or pallets. Tags vary greatly in size, shape and capabilities, but one example is in figure2.3 below. The tag with its small antenna emits a radio frequency signal that is picked up and read by a special wireless RFID reader, conveying information from the tag about the item it is affixed to.

The QR (Quick Response) Code is a two-dimensional (2-D) matrix code as shown on figure 2.3, which belongs to a larger set of machine-readable codes, all of which are often referred to as barcodes, regardless of whether they are made up of bars, squares or other shaped elements. Compared with 1-D codes, 2-D codes can hold a larger amount of data in a smaller space, and compared with other 2-D codes, the QR Code can hold much more data still. In addition, an advanced error-correction method and other unique characteristics allow the QR Code to be read more reliably than other codes.

Figure 2.3: The different of RFID, Barcode and QR code.

2.6 Android

Android is presently the world most well known operating system. The ubiquity of the Android around the world has blasted. Android is a versatile operating system (OS) in view of the Linux bit and as of now created by Google. In the Google Play Store once in the past known as the Android Market which android application are available. With the greater part of the additional elements that Android holds, it has made Android the most prominent operating system for users