



**STUDENT ATTENDANCE SYSTEM USING  
BARCODE SCANNER**

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## **ABSTRACT**

Student attendance system play significant role in order to justify academic outcome of a student in class overall. Unfortunately, there is no automated attendance record keeping application available nowadays. Through interview session, Student Attendance System development team, have identified that lecturers and faculty management face problems in recording and managing attendance of their students.

The existing manual student attendance system is inefficient and not systematic. The existing manual student attendance system needs students to take time to sign the attendance sheet during class. It also affecting the efficiency of lecturers where lecturers have to calculate the students' attendance percentage throughout the semester and come out with their own, not standardize students' attendance report. The purpose of this project is to gather students' attendance by using students' matric card.

Therefore, Student Attendance System Using Barcode Scanner has been proposed and developed. Need for a tool to systematically keep the students attendance record increased due to increasing number of students every year. Upon completion of Student Attendance System Using Barcode Scanner, user acceptance testing conducted among potential end users.

## **LIST OF ABBREVIATIONS**

<b>FSKKP</b>	<b>Fakulti Sistem Komputer &amp; Kejuruteraan Perisian</b>
<b>UMP</b>	<b>Universiti Malaysia Pahang</b>
<b>MULTOS</b>	<b>Multi-application operating system</b>
<b>RFID</b>	<b>Radio-frequency identification</b>
<b>OS</b>	<b>Operating System</b>
<b>W3C</b>	<b>World Wide Web Consortium</b>
<b>CSS</b>	<b>Cascading Style Sheet</b>
<b>ASP</b>	<b>Active Server Pages</b>
<b>VB</b>	<b>Visual Basic</b>
<b>SDLC</b>	<b>System Development Life Cycle</b>
<b>UML</b>	<b>Unified Modeling Language</b>
<b>SQL</b>	<b>Structured query language</b>

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 INTRODUCTION**

This system is about the student attendance system using students' matric card with barcode scanner. The existing manual student attendance system is inefficient and not systematic. The existing manual student attendance system needs students to take time to sign the attendance sheet during class. It also affecting the efficiency of lecturers where lecturers have to calculate the students' attendance percentage throughout the semester and come out with their own, not standardize students' attendance report. The purpose of this system is to gather students' attendance by using students' matric card. The other purpose is to give options for lecturers to view the attendance report.

## **1.2 PROJECT AIM**

The aim of this project is to develop a student attendance system that will improve the management of student attendance in FSKKP.

## **1.3 BACKGROUND**

This student attendance system using barcode scanner read the barcode on the students' matric card. The existing manual student attendance system is inefficient for both lecturer and students. Lecturers need to calculate the students' attendance percentage throughout the semester manually and come out with their own, not standardize students' attendance report while students have to sign the attendance sheet during lecture which will disturbs their concentration of learning.

Therefore, the development of student attendance system gives many benefits to both lecturer and students. This system allows students to easily scan their matric card on the barcode reader in order to fill in the class attendance. This system allows lecturers to view the attendance report throughout the semester.

#### **1.4 PROBLEM STATEMENT**

- i. Nowadays, students didn't bring and wear their matric card. They just put their matric card in their purse and wallet. It's compulsory to hang up your matric card around your neck.
- ii. The existing manual student attendance system is inefficient and not systematic. The existing manual student attendance system needs students improperly sign the attendance sheet during class. The lecturer has to keep all attendance sheets and calculate the attendance report throughout the semester manually and come out with their own, not standardize students' attendance report.
- iii. In the manual system, students can easily forge their friends' signature purposely to fill in the class attendance.

#### **1.5 OBJECTIVE**

- i. To gather students' using their matric card.
- ii. To control students' signature forge in filling the class attendance.

## **1.6 PROJECT SCOPE**

- i. This system is developed for the student of University Malaysia Pahang in Faculty of Faculty of Computer System and Software Engineering (FSKKP).
- ii. For the student attendance system using barcode scanner, we can only use scanner to scan their matric card.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

Smart cards are programmed to perform tasks and store information. Smart cards currently are used in telephone, transportation, banking, and healthcare transactions. Smart card can store lots of information and can perform multiple functions in a wide range of industries. A recent study found that 27% of smart card applications were within banking, 18% within health and welfare and 15% within transport. In UMP, matric cards are already implemented and are gaining popularity among the UMP communities. UMP communities get many advantages by the usage of the matric card in system management. This project is going to level up the usage of the matric card in UMP by using matric card to fill in class attendance. The barcode on the students' matric card will be implementing in this project. Nowadays, barcode is frequently used in almost all industrial branches whenever an information needs to be read automatically. This literature review will focus on the advantages of using matric card to fill in class attendance, the feature of matric card, the application of bar code on matric card, the usage of barcode scanner to implement class attendance signing

system, the related issues between barcode and class attendance signing system and the usage of PHP language in developing the class attendance signing system.

## **2.2 ADVANTAGES OF USING MATRIC CARD TO FILL IN CLASS ATTENDANCE**

Matric card generally gives lots of advantages to the user. For this project, the researcher will explore the advantages of using matric card to fill in class attendance. One of the advantages is using matric card will easier the students to fill in the class attendance. The time constraint of using matric card to fill in class attendance is small compared to the existing manual system which use attendance sheet. This is because matric card allows the system to get students' identification efficiently; the main improvement is the possibility to process the information directly on the card

Other advantages is each student can use matric card securely because the unique identification that the matric card provide. Matric cards can of course retain a huge amount of information compared to the magnetic strip cards, but they can also manage this information much more securely, using authentication and user identification procedures.

Other advantage is using matric card in signature system can tackle student to attend to class. This is because the students know that the system can easily detect those students who regularly attend the class. The students can also view their class attendance percentage which will motivate them to control their attendance reputation.



Usage of matric card gives advantages to the lecturer because the matric card will directly input the information of student attendance to the system. The lecturers do not have to carry the attendance sheet every class time and filing the attendance sheet manually which is not efficient matric cards can improve access to services for the disabled and elderly. The lecturer can easily get the percentage of student attendance at the end of the semester without face the difficulties to calculate the percentage manually and view the standardize student attendance report

### **2.3 THE FEATURE OF MATRIC CARD TO FILL IN CLASS ATTENDANCE**

The interesting features and functionality of matric card that make it popular is the multi- purpose card it applies. To implement a matric card scheme certain design features is to ensure integrity across applications on multi-purpose cards. Matric cards have three broad functions authentication, storing value and storing personalized information. The matric card can also be used as a portable storage device and with the capability of holding a large amount of data of different forms and for different purposes. UMP students' matric card includes barcode which completely implemented in order to achieve the aim of this project. The feature of matric card, which it is a portable hardware unit makes it more convenient to use. A matric card is the most convenient and most portable cryptographic hardware unit; public key smart cards are able to perform the signing operation inside the card.

In recent years, many brands and types of smart cards have come to market. Several major categories of smart card are simple file-system-oriented smart cards without public key capability, advanced file-system smart cards with public key capability, Java Cards, Windows-powered smart cards, and MULTOS (multi-application operating

system) card. Smart cards are a personal piece of hardware that must communicate with some other device to gain access to a display device or a network. Cards can be plugged into a reader, commonly referred to as a card terminal

For this system, as the first-time class attendance signing system development, the researcher has decided to use UMP student's matric card where the connection is made when the barcode scanner contacts the barcode on the back of the students' matric card. The barcode scanner provides a path for the system to send and receive commands from the barcode on the students' matric card. There are many types of scanner on the market, the most prevalent being the *serial*, *PCCard*, and *keyboard* models. Once it can communicate with the scanner, there is one protocol for communicating with matric card.

## **2.4 THE APPLICATION OF THE BAR CODE ON SMART CARD TO FILL IN CLASS ATTENDANCE**

The implementation of matric card to fill in the class attendance only can be access by UMP communities (the students and the lecturers). It is show that authentication is very important in using matric card. Authentication is concerned to ensure only authorized individuals gain access to systems.

The great variety of applications led to the existence of approximately 200 different codes which are altogether subsumed under the term barcode. The barcode generator is used to generate the logical parts of a barcode. To make it easy to create the barcode generator, the BarcodeUtil singleton class is used which will choose the correct barcode implementation depending on the configuration built. The barcode on

the students' matric card must be accurate in terms of width and darkness in order to ensure the accurate data retrieved.

For this project, students have to signing electronically with a matric card at the beginnings of each class. Each student has their own matric card to fill in class attendance in class attendance signing system. By using this system, student can discipline themselves to always carry their student matric card as it is a compulsory to UMP students. The computer that implements this system is equipped with a barcode scanner. Students fill in their class attendance by scanning their card at the barcode scanner which automatically records the attendance information in the details. The scanner, in turn, communicates with card, thereby acting as the intermediary before sending the data to the database. The barcode scanner wiggles the barcode on the matric card and records the data in the database. That way, data can be processed immediately and in a totally automated way. At the end of the semester, lecturers can get the calculation of the students' attendance percentage more efficiently and view the standardize attendance report.

## **2.5 CURRENT EXISTING SYSTEM**

Attendance is the act or fact of attending (being present) class. Also, attendance is used to define the number of persons present on a particular day at class. An attendance policy provides the guidelines and expectations for students' attendance at school as defined, written, disseminated, and implemented by the class. Attendance may be entered by the class representative or by the lecturers, or possibly, both. Attendance can be recorded in many ways such as using web based, RFID, biometrics and barcode scanner.

Since most of the system developed nowadays requires the world wide accessibility, web based *system* is the most common attendance *system* that available. One of the higher institution in Malaysia have used RFID to record the attendance of their student and the record sent to online server for an online accessibility [1]. Apart from that, there is plenty of educational institutions used RFID technology to record their student attendance. Easy connection of data into internet make RFID technology most common technology used in recording student attendance [2], [3], [4]. However, RFID technologies incur high cost and need experience people to handle the system.

Apart from that, biometrics technology is another tremendous use of technology in the domain of attendance reporting and tracking. Most of the biometrics technology used thumb print as sign of system entry [5]. This allows a fair and reliable attendance to be recorded since there is no platform for any attendance cheating [6]. Biometric utilize the fingerprint apart from thumb print method. Fingerprint peripheral used to record the attendance and sent the data into system using wireless technology [7]. Image recording is another recent method used in recording attendance. Movement recorded in internal surveillance camera used as sign of attendance entry in one of the workplace in China [8]. These advanced technologies require high costing and well trained system developer. Use of barcode scanner is popular among educational institution which are not financially supported and it is not required any well trained people to install and fix [9].



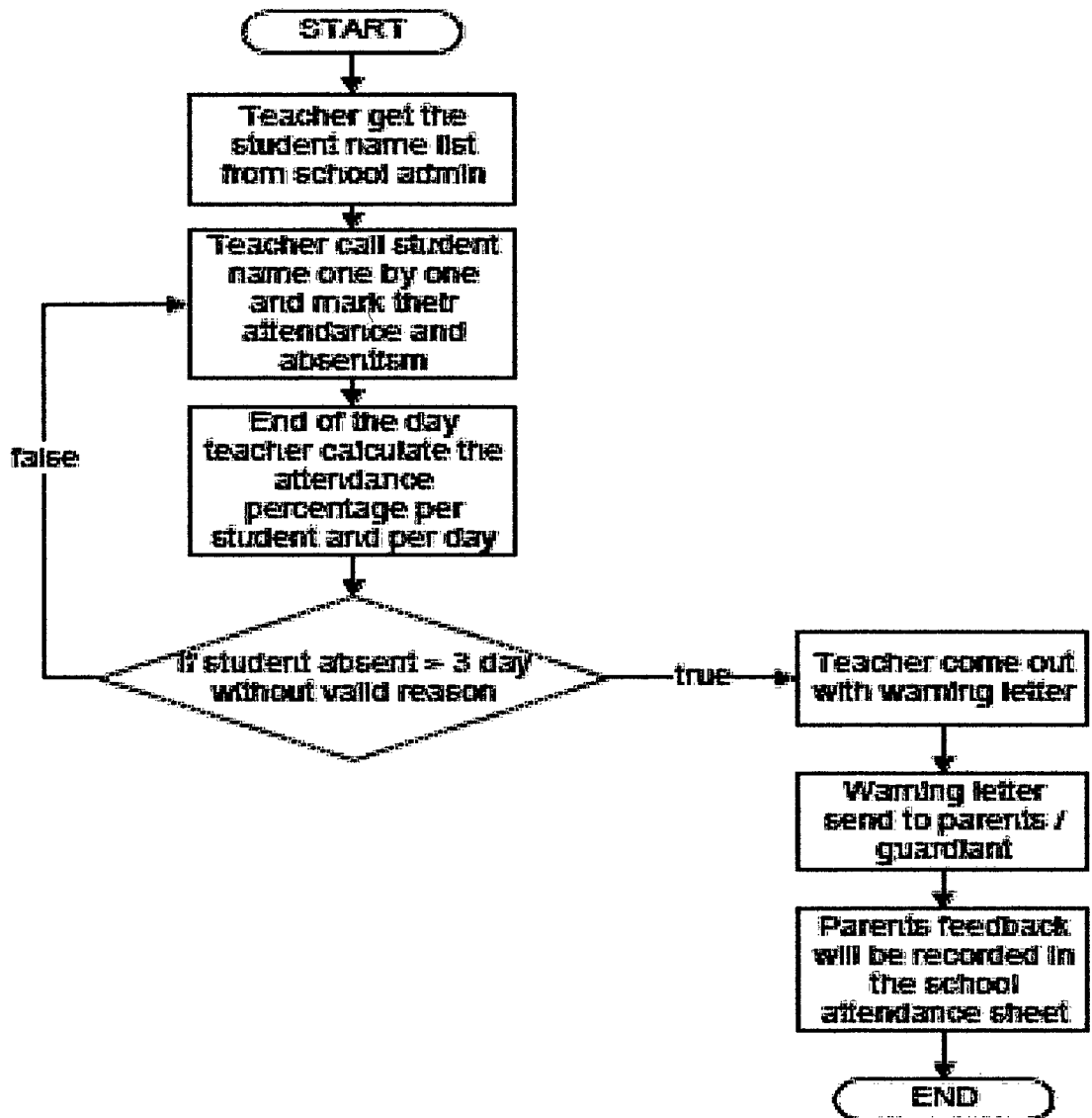


Figure 2.2 Current attendance recording process

Refer to Figure 2.2 for the flowchart representation that depicts the current manual attendance recording process in each high institution in Malaysia. Each class lecturer provided with the class attendance sheet whereby it arranged in monthly basis. Since the attendance does not involve any system or application, calculation on student attendance and absenteeism remain tedious. Even there is a tendency of wrong calculation due to human error hence it effect the student performance class or faculty.

## **2.6 PROPOSE SYSTEM**

Student Attendance System is built for automating the processing the attendance. It enhances the speed of the performing attendance task easily. Other than that, this system generates periodic reports to keep a check on the students who are regular and who are not. Lecturer has to login to the system and then in the attendance option they have to select the subject. So this system will display the students who are attending that class. This system is very useful to the lecturer because they can generate reports and submit them to respective faculties also or also can be submitted to the student academic advisor. So this kind of reports can be generated.

A computer can work more efficiently compared to a human being. The work becomes easy for the employees and thus, some amount of human resources is saved. Data accuracy is maintained. Accurate information can be achieved within a short span of time data can be accessed easily and randomly. This also saves a lot of time. Data is protected with the help of login system. Because of this login system, unauthorized persons cannot access the data .Complexity of the work can be reduced by using the

system which was not possible in manual or semi-automated system. So it saves the time utmost.

## **2.7 DEVELOPMENT TOOLS**

Development tools show what the software use to develop this system. PHP and Adobe Dreamweaver have been used to build and help for design interface of the Student Attendance System and to create programming language meanwhile MySQL as the database language.

### **2.7.1 PHP**

PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language. PHP code is interpreted by a web server with a PHP processor module, which generates the resulting web page. PHP commands can be embedded directly into an HTML source document rather than calling an external file to process data. It has also evolved to include a command-line interface capability and can be used in standalone graphical applications. PHP is free software released under the PHP License. PHP can be deployed on most web servers and also as a standalone shell on almost every operating system and platform, free of charge. [10]