International Journal of Synergy in Engineering and Technology
IJSET

Development of Class Attendance via QR Code

Mohd Shah Shafie, Shahir Ilham *, Akhyari Nasir

University College TATI, 24000 Kemaman, Terengganu.
*Corresponding author: shahirilham@gmail.com

KEYWORDS

QR code
Attendance
Mobile application
Google Flutter

ABSTRACT

Majority of higher learning institution nowadays established online system for student attendance in conjunction of new digital era. In UC TATI, the current implementation of attendances system using attendances sheet to be sign by the students. Thus, this paper aim is to develop an application that can replace current class attendance system (paper) in class. The methodology used in this development is the combination of waterfall model and Rapid Application Development (RAD). Feedback from users who volunteered to test the app shows that this project is capable to replace current attendance system even though it shows a slight increment in time taken for attendance marking

1.0 INTRODUCTION

Majority of higher learning institution nowadays had established online system for student attendance in conjunction of new digital era. This is to ensure that students attend and participate all the compulsory lecture and labs sessions. However, there are many educational institutions that still using the old and manual system that need lecturers get the signature of the students in every session in a piece of paper. This current system may seem to be not too effective and efficient as there are a lot of flaws and issues. In TATIUC, the current implementation of attendances system using attendances sheet to be sign by the students. However, this implementation is not convenient for the faculty to manage the attendances record. Thus, this paper aim is to develop an application that can replace current class attendace system (paper) in class.

Taking students attendance by university instructors during each class is a time-consuming process especially when there are many students in the class. Statistics shows that 42% of smartphone users have an average age of 26 years old. Thus, with the widespread of smartphones among university students, this paper addresses the problem of such a waste in the lecture time and proposes a system that offers to reduce it by almost 90%. The proposed solution offers a QR code for the students to scan it via a specific smartphone application. The QR code along with the student identity taken by the application will confirm the students' attendance.

Received April 2021; received in revised form May 2021; accepted June 2021.

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. This will be a shortcut to connect directly with websites or online resources without having to type a URL into an internet browser.

Maramis (2017) in their project propose using RFID technology, the prototype of RFID attendance system is divided into several parts. RFID part system, which consists of RFID tag and RFID reader module. The next part is the USB port used by the computer to communicate with the RFID reader. The last part is the control unit and display section which is the user interface for the user to use the system. These both units are made by using VB.Net programming language application along with its database**.**

Folaponmile (2018) in their project propose using a capacitive fingerprint sensor, Arduino Uno board, a Bluetooth device and a mobile phone to design a prototype that can be used for students' authentication for examination purposes thereby preventing impersonation in exams. It is subdivided into two main sections, the first is the process of enrolling each student whereby the fingerprint sensor captures the student's finger pattern when the thumb is place on it and sends the information to the microcontroller on the Arduino Uno board which in turn is saved on a mobile device which is interfaced with the microcontroller by a Bluetooth. For the purpose of this work, an android mobile phone on which an application has been developed and installed is used. The second section is the process of authentication whereby each student places his/her thumb on the fingerprint sensor and the pre- stored information about the student pops up if the student had been previously registered otherwise, an error message is displayed signifying the presence of an impersonator.

Hong (2015) in his project proposes to be using QR code-based system which allows examiner to take and record the attendance of the candidates during exam time. A QR code will be provided to the candidates and they need to bring along the QR code during the exam time. The QR code will contain the basic information of each candidates such as matric card number of the students.

2.0 EXPERIMENTAL PROCEDURE

The methodology used is the combination waterfall model and Rapid Application Development (RAD).The flowchart method, as shown in Fig. 1 clearly illustrates the process flow for the lecturer from the start of the application to the database repository of data. This technique and methodology for software development happens to be one of the preferred techniques used by software developers. Users then begin to login to the system until registration is completed. The lecturer will then create a class and generate the student's QR code for scanning. The lecturer will see the subject 's attendance.

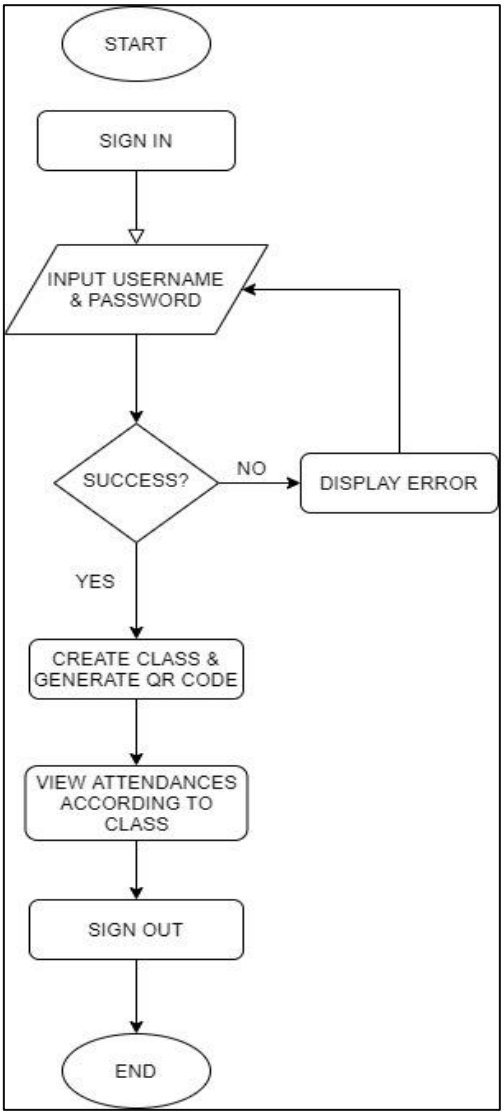

Figure 1: Lecturer flowchart diagram

The flowchart method, as shown in Fig. 2 clearly shows the process flow for the student from the beginning of the application to the system data repository. Students then begin to login to the system until registration is completed. After that, the students will need to scan the QR code that the lecturer has created. If the scanning is successful, the reports will be shown to the lecturer.

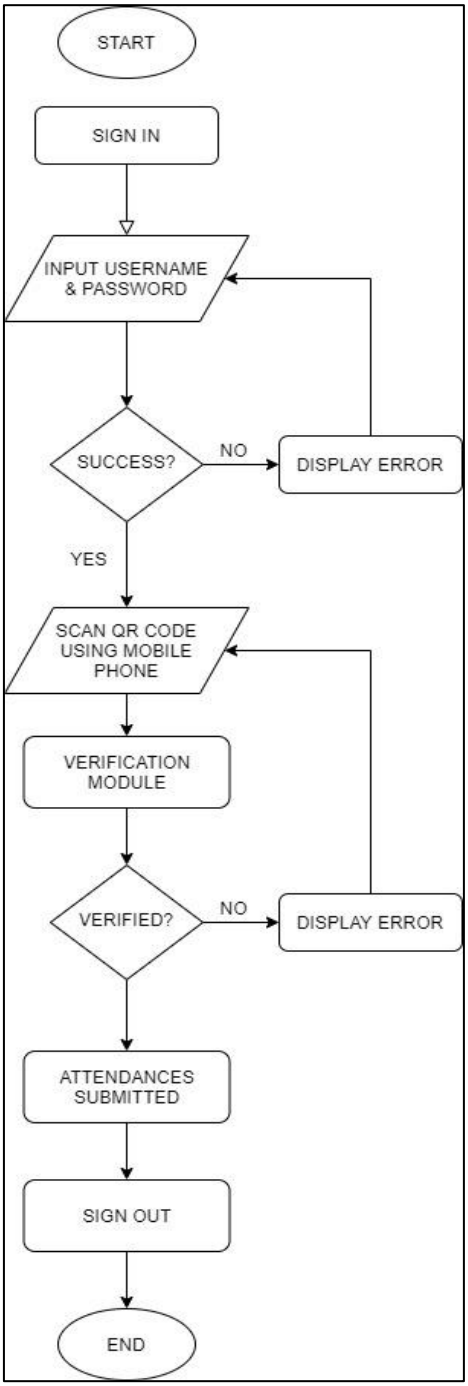

Figure 2: Student Flowchart Diagram

As the system adapted RAD with incremental prototyping approach, project is divided into three (3) main component prototypes which are QR code reader, Android application and PHP MySQL. Each component is developed one at a time and undergone individual test to satisfy the criteria determined. At the end of a prototyping cycle, all prototypes will be merged and linked together and tested as been show in Figure 3 below.

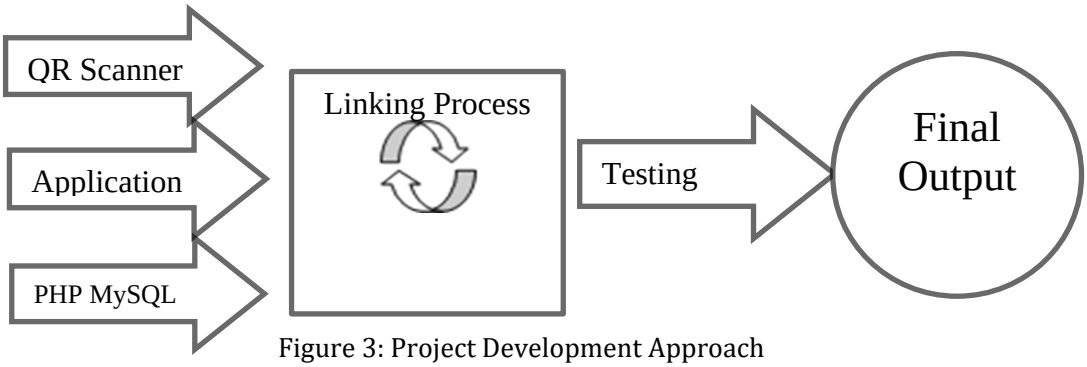

Figure 3: Project Development Approach

Currently the whole app is developed in Android. All the end users can access the system through the android app. A particular QR code will be displayed in the classroom. Each student must scan the QR code from the app after entering in the class to get attendance. The time in of every student will be recorded in the database. MySQL is used as a database to store all the data of the students, teachers, and attendance of the students. PHP is used as a middleware to store and retrieve data from the database. The android app will post request to the PHP code and that PHP code will process the query and store or retrieve the data according to the query and give back response. The system developed using Google Flutter, PHP to connect with MySQL database, and XAMPP. The computer system includes latest processor and RAM 8 or 16 GB with Windows 10 operating system. The mobile device is Android OS version 9.0.0.0 Pie. The GUI for the developed system is using Google Flutter. Figure 4 shows the first screen for the application for student and lecturer which is they are required to register for an account. Figure 5 shows the sign-up screen for lecturer and student that they need to fill up.

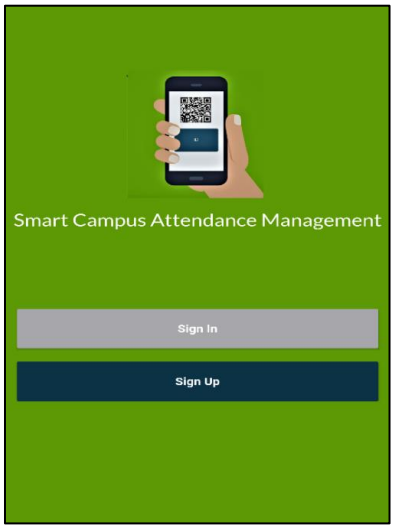

Figure 4: First Interface

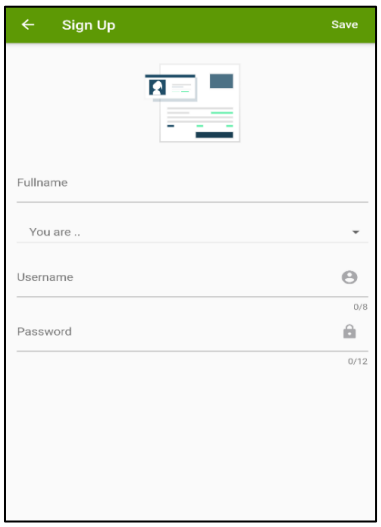

Figure 5: Sign Up screen

After the lecturer has sign in, two menus will be displayed as show in figure 6. Figure 7 shows list of subject and QR code that have been created and generated. To create a class and generate the QR code, the lecturer must click '+' button at the bottom of the screen. Figure 8 show screen for lecturer to name the class and set the time.

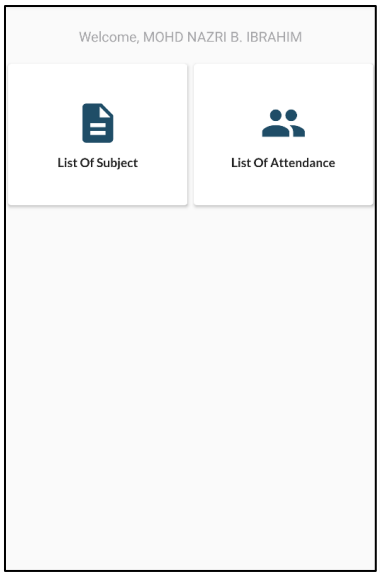

Figure 6: Lecturer Home Screen

Figure 7: Class screen

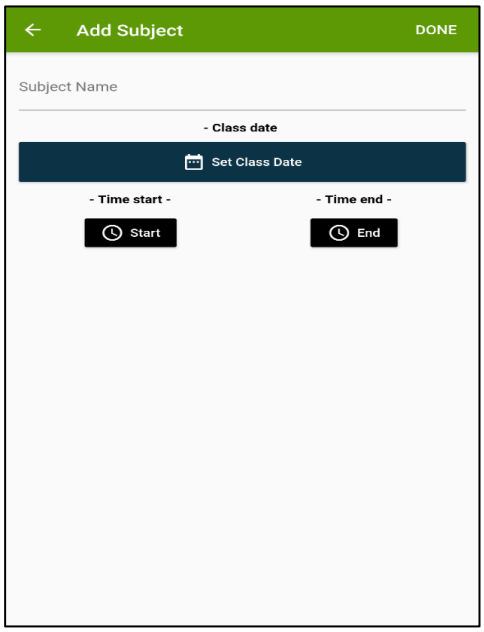

Figure 8: Add subject screen

Figure 9 shows the screen when students sign in. They required to scan the QR code that the lecturer have generate. If the scanning process is succeeding, the attendances will be submitted to the lecturer.

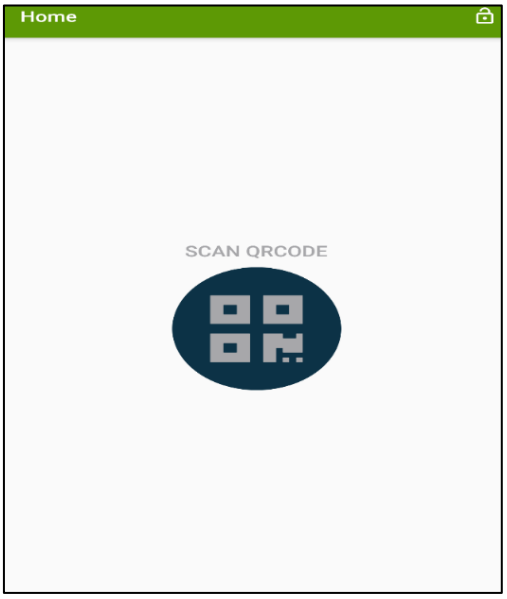

Figure 9: Student home screen

2.0 RESULTS AND DISCUSSION

Based on Figure 10, the pie chart represented at most 90.6 percent number of respondents that thinks the application would ease their attendance management in the class and at least there were 9.4 percent number of respondents were answer probably

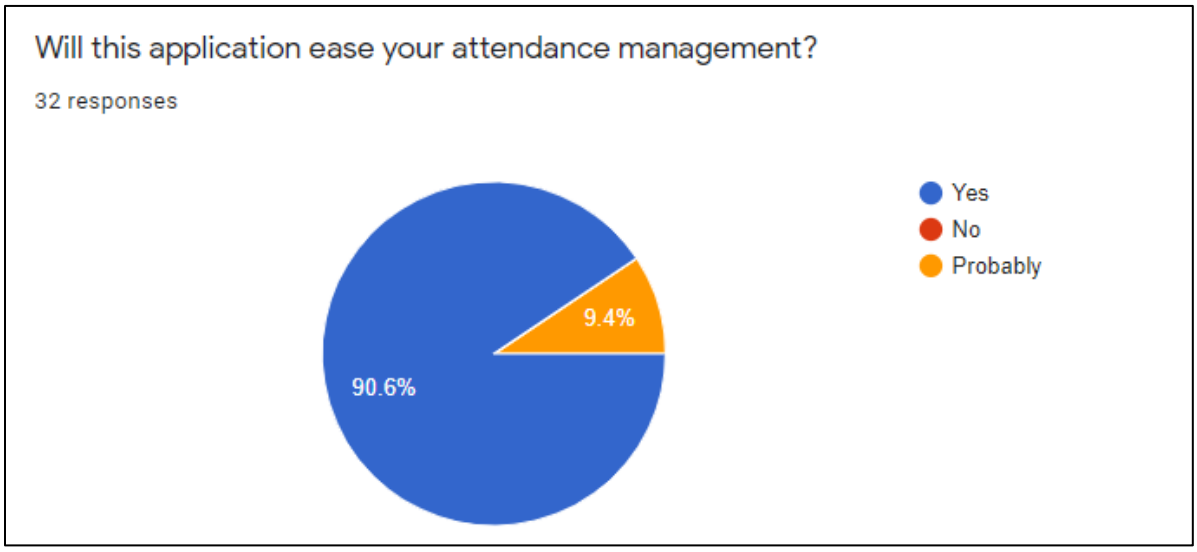

Figure 10: Awareness of attendance in class using apps

Based on Figure 11, the pie chart represented at 43.8 percent number of respondents that often used this kind of application, 43.8 percent number of respondent that only sometimes used this kind of application and at least there would ease their attendance management in the class and at only 9.4 percent number of respondents that frequently used this kind of application.

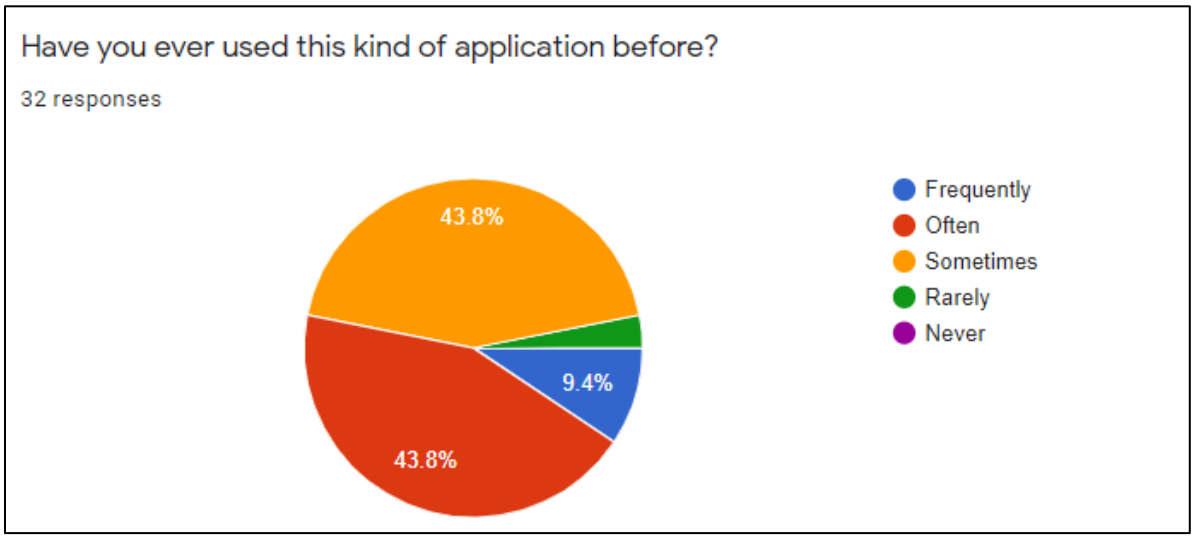

Figure 11: User experienced about the similar kind of product

Based on Figure 12, majorly of respondents agreed that the attendance application via QR code such as UC TATI was effective for them.

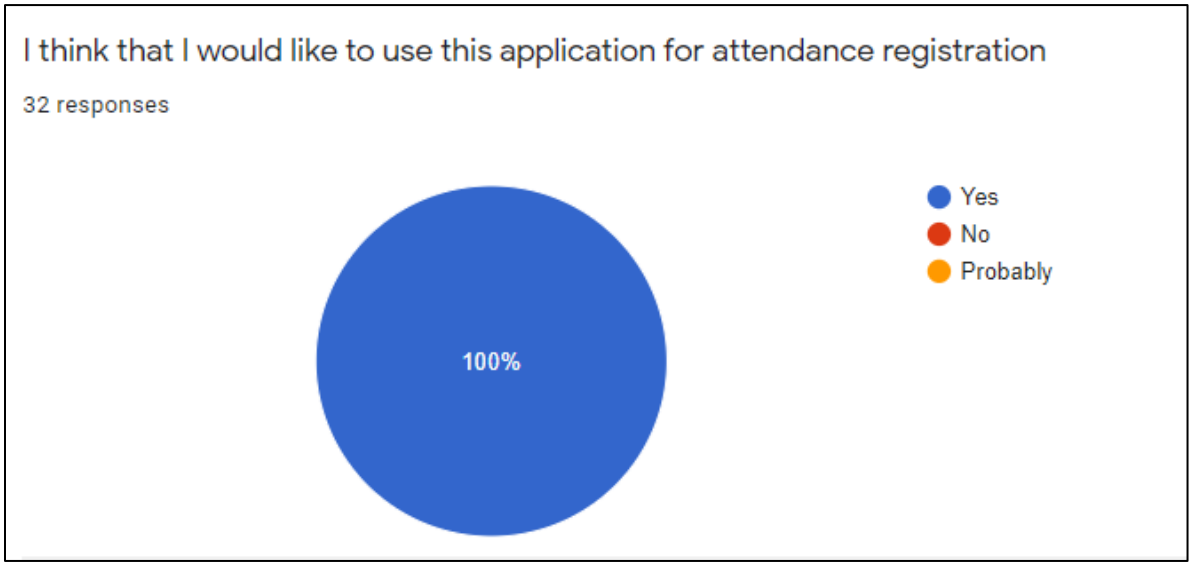

Figure 12: The effectiveness of attendance via QR code application

3.0 CONCLUSION

UC TATI attendance system may help providing an alternative electronic way for monitoring attendance. The approach taken also leads to a reduced dependency on paper as attendance medium and enhance the value of matric card. Feedback from users who volunteered to test the app shows that this project is capable to replace current attendance system even though it shows a slight increment in time taken for attendance marking. It was proven that majorly of the respondents agreed that the attendance via QR code application was attractive. By implementing the QR code technology in this application, the respondents believed this project is effective to manage their attendance in class as it is a modern yet unique approach. most respondents agreed that attendance via QR code are very effective to replace the current manual timesheet attendance.

ACKNOWLEDGEMENT

The authors gratefully acknowledge Faculty Computer, Media and Technology Management, University College TATI.

REFERENCES

Hong (2015), Attendance System (EXAM ME).

Adenike Folaponmile, J.B. Okpe and Y. J. Gwani. (2018). Student Examination Attendance Authentication System (SEAAS) 1596-8303.

G D P Maramis. Radio Frequency Identification (RFID) Based Employee Attendance Management System. 306012045