
Chapter 11

Android Attendance System

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Abstract

In UMS, signing attendance is very inefficient. Usually the signing of attendance starts when the lecturer gives out the attendance sheet after entering the lecture hall. If that particular class is huge, it will take almost the whole lecture time for the signing process to complete. The method used in UMS for signing attendance is basically passing the attendance sheet around. This will not only distract the class, it will also cause someone to miss the attendance sheet because of the passing process is not consistent. There is also potential data loss due to human's mistake such as misplacing the attendance sheet. In order to solve these problems, this project proposes an Android based application integrated with a web application to make the process of signing attendance more efficient. The objectives for this project are to develop Android based application with interface for student to sign attendance as well as another interface, which allows lecturers to track the students' attendance. The database for the content management system will also be developed to integrate with the Android Attendance System (AAS). In this project, the prototyping methodology will be used when developing the application. Prototype of the application will be created prior to implementing the final version of the application, which allows users to evaluate the application and provide some feedback or suggestion. The expected outcome for this project would be a fully functional attendance taking application. With this application, the whole process of taking attendance can be made easier and thus saves time as well as resources such as pen and paper.

Introduction

Nowadays, the process of taking attendance in colleges and universities is done manually either by calling out student's name or by passing around an attendance sheet for students' signature to confirm their presence (Bhalla et al., 2013). Taking attendance during each class is a both troublesome and time consuming process especially when classes are big (Masalha & Hirzallah, 2014). On top of that, it is really cumbersome for management to routinely update the record and manually compute the attendance percentage (Omidiora et al., 2015).

Global Positioning System in Attendance System

With the fast paced development of mobile technology, mobile phone has risen with and become an essential part of human life. Most of the mobile phone nowadays has built-in GPS in it to help in giving directions and tracking (Ratsameethammawong & Kasemsan, 2010). Due to the idea of most students owned a mobile phone, Lee et al. (2014) propose a location based attendance system which can help to overcome the issue of bottleneck that may occur using RFID in the attendance system. The proposed system allows every student to sign attendance simultaneously thus solve the inconvenience of students in signing attendance before a class begins. Sultana et al. (2015) decided to implement the location based approach instead of the biometric based approach because biometric based attendance system requires extra device or scanner connected to the server computation system which will then increases the computation time and extra cost for the device. According to Chawhan

et al. (2013), their project includes GPS in order to reduce the likelihood of fake attendance. User authentication plays an important role in the GPS based attendance system. The identification number along with other information of the student is saved in the mobile phone so that it can be used to authenticate when the student signs attendance (Sultana et al., 2015). In the project of Mohammad-Salahuddin et al. (2014), their system is separated into mobile application and management software. The application is installed on user's mobile with a unique user ID and location (GPS coordinate) of the workplace. While attendance software will be installed on workplace to process data retrieved from user mobile and store attendance information into the database. However, Ratsameethammawong & Kasemsan (2010) found that tracking mobile phone location by GPS alone is not enough. Once unable to receive satellite signals, for example inside buildings, tunnels or undergrounds as well as places where signals from the satellites cannot reach will cause the GPS usage inaccessible. Pawar et al. (2016) mentioned in their research that using of the Wi-Fi networks as the basis of indoor location process. Moreover in the research of Pak and Huang (2011), it is proved that the increase in availability of Wi-Fi networks has enabled more precise localization in indoor environments where GPS is less accurate.

Development of Android Attendance System

a. Android-based Application Student

When the user first installs the AAS, the landing page will be the page where it required user to either sign up for an account or login. After the user signs up for an account, it will return to the landing page. After the user login to the application, it will then redirect to the today's class page and the today's class page will become the root page for this application. Today's class will display the class available on that particular day. When the class is selected, it will then direct to the class details page where the information of the class is shown. User can sign attendance from this page, which will then redirect to the today's class page. The side menu will be containing the link to the today's class page, profile page and register course page. Figure 1 shows the storyboard for student module.

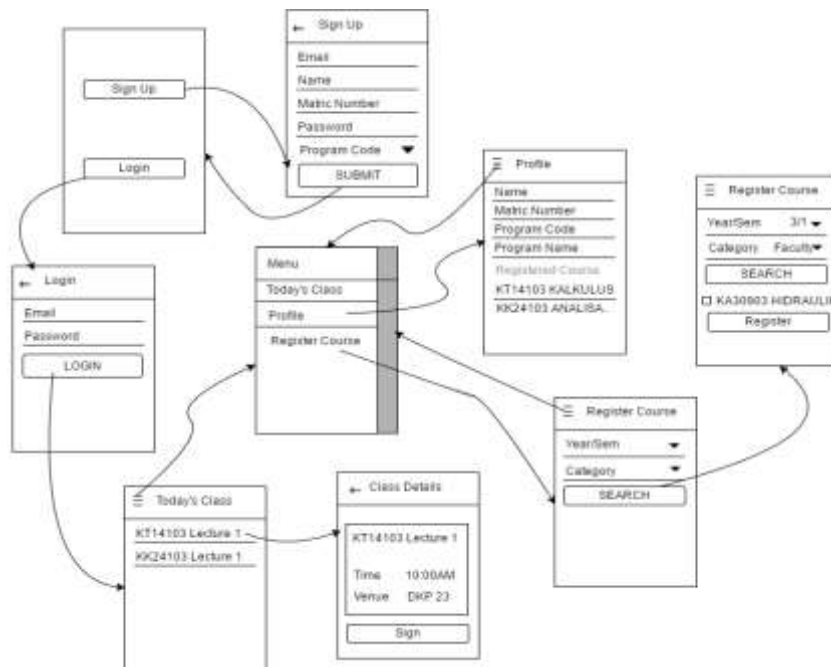


Fig.1 Storyboard for Student Module

b. Android-based Application for Lecturer

The landing page for when the user first install the application is the login page. After the user login to the application, the class page will be the root page. In order to navigate around the application, there is a side menu toggle button on the upper left corner. The floating action button is used to create new class for the class page and to create new course for the course page. By clicking the list under the class page, user can either chooses to start the class, update or cancel the class. While on the course page, clicking on the list under the course page will display the information of the selected course and give the use the option to delete the course. Figure 2 shows the storyboard for lecturer module.

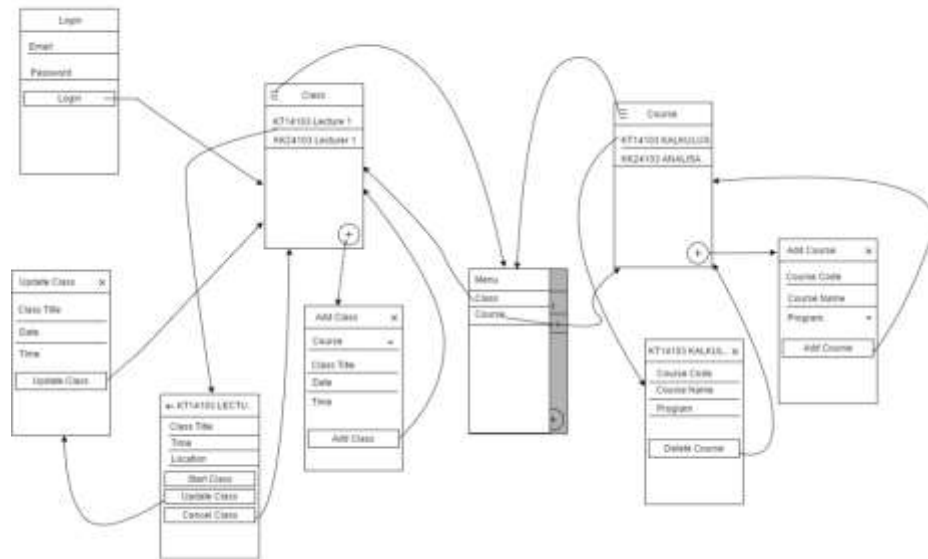


Fig.2 Storyboard for Lecturer Module

c. Content Management System for Lecturer

Other than using the mobile application, lecturer also can use the content management system, which is a web base application to manage classes and courses. Lecturers will not be able to register through the mobile-based application, because they are required to register from this content management system before using the mobile application. The landing page for the content management system for will be the login page. From here, the user can either register for an account or login to the system. After the user has been successfully login, the user will be directed to the dashboard. On the left side of the website is the navigation bar which helps user to navigate to desired page effortlessly. Figure 3 shows the storyboard for lecturer content management system.

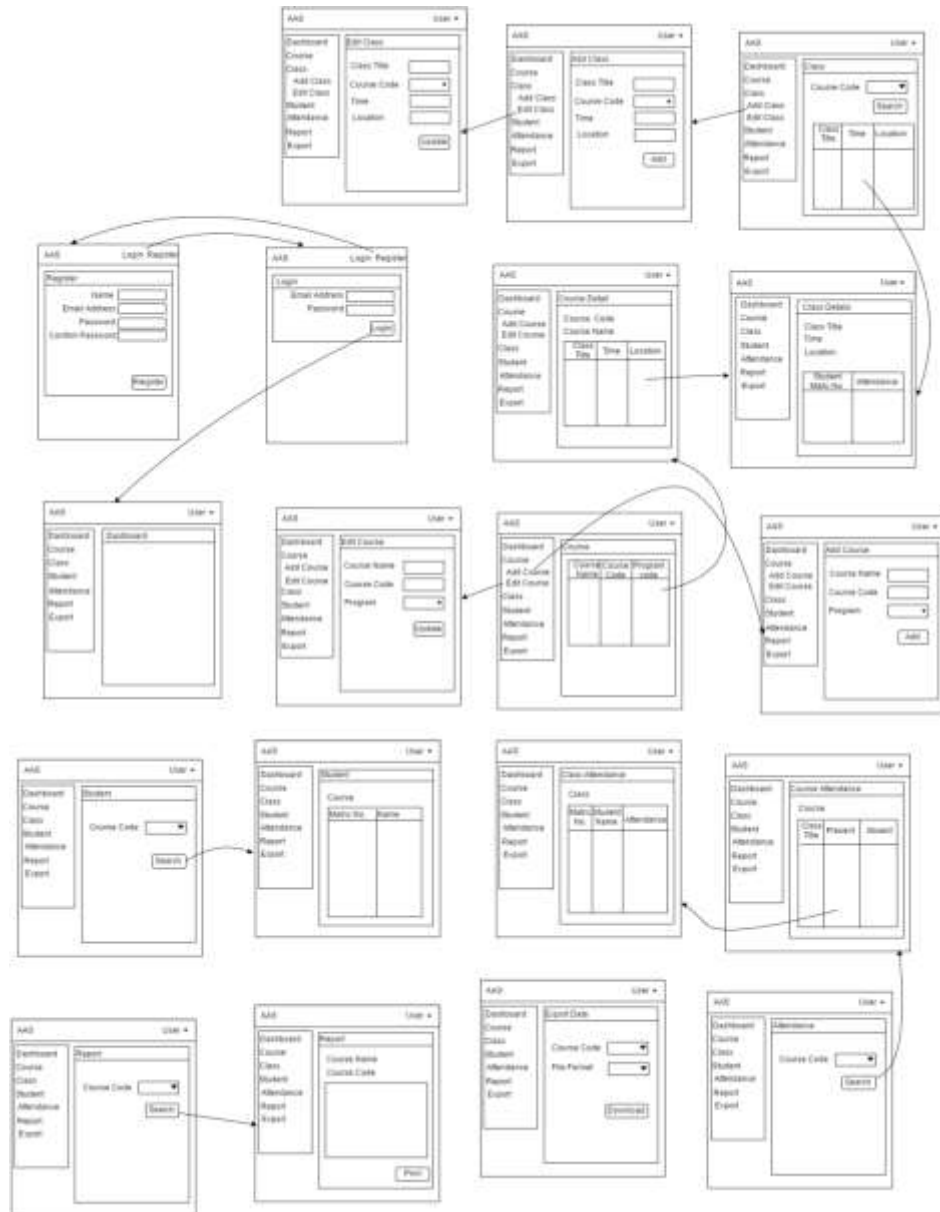


Fig.3 Storyboard for Lecturer Content Management System

Conclusion

The problem with the attendance system in UMS includes the time wasted when taking attendance and wasted resources such as paper and pen. Human error also makes the current attendance system unreliable. This project is aim to solve these problems by producing a better attendance system. Android Attendance System can provide a solution to the time waste by producing mobile application for both student and lecturer to make the process of attendance taking faster and smoother with almost no disruption to the class.As for the human error such as losing the attendance sheets, a Content Management System is developed for lecturer to manage the course, class and attendance record. There will no longer issues where lecturer loses the attendance sheets because there is no attendance sheet to begin with. However there will be other human error such as accidentally delete a course may

still cause problems. But it can be mitigated by adding confirmation dialog just before lecturer deletes a course. In the future, AAS should be moved towards the development of iOS platform. This is due to the increasing number of iOS device users, which makes AAS less effective as only users with Android can sign attendance. Other than that, more testing should also be done to ensure the system is error proof and working as intended.

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