Design and Development of Mobile Application for Academic Reminder System

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ABSTRACT

The Academic Reminder System is built to help users, which focuses for the students in UiTM Tapah to manage their scheduled class and assignment deadline via their mobile smartphones. The application was built for android-based platform. The user only needs to update their schedule after getting logged into the system and list any important date for their assignment deadline to the system. Then, the system will give an alert to remind the user for the upcoming class and task deadline. The System Development Life Cycle (SDLC) which is the waterfall model has been chosen as the methodology for this project that containing five phases. The result of the discussion shows that Academic Reminder System receives positive feedback through usability testing that has been completed. A total 30 students completed the usability survey and 46.7% of respondent are strongly agreed that this application meets their satisfaction with interface, usability, and performance. Future work recommendation for this project is to make a sharing application tool in the system so that the user can simply share the application to their friends. Besides that, the application can engage with new technology, which is using near-field communication (NFC) in the log in page to easier for students log into the system.

Keywords: *Reminder, Self- Management, Mobile application, Academic, Android*

INTRODUCTION

Self – management is the most important thing among the students, especially for the tertiary level, such as college or university students. Self-management is a key and an effective way to encourage the student with a motivation and concentration on their studies (Darus, 2016). Apart from that, a good time management would contribute to an excellent performance in the study when they can balance it well between academic and personal things. Attending class earlier and submit the assignment before the deadline is the best way to conduct a good student lifestyle. Moreover, efficient time management will produce high quality students when they attended the class before the class started and finished the task given in desired time. Many college teachers said that attendance of the class will increase the grades among the students (Crede, 2010).

A reminder is the most important tools to be used nowadays. Currently, people tend to have a lot of things and data to be managed all the time. People nowadays, especially students often forgot about their submission deadlines (Gregory, 2009). Humans have a limited capability to store and manage or even remember information by themselves. However, memory aids can help people to remember past events and information in their life. (Graus, 2016). Darus et al (2016) stated that reminder is such an assistant

tool of current technologies. These tools can help to generate reminders associated with future activities including location, event and time as well (Darus, 2016). Students are inclined to use a reminder in their daily life to be more manageable. Reminders represent the calendar, sticky notes or visual reminder (Darus, 2016). Students can track their incomplete task and avoid last minute work and fully prepared for the upcoming works by using reminder tool. Hence, by using an academic reminder, this would increase the students' performance as well.

The objective of this paper is to develop an Android mobile application which serves as the Academic Reminder System. The application would be able to ease the students managing their daily activity and reminding them in academic purpose through mobile phone.

This paper is organized as follows; section 2 explains the methodology. Section 3 explains finding and discussion and Section 4 ends with a conclusion and recommendation

METHODOLOGY

The figure 1 below shows the summary of the applied research methodology. The first phase focuses on gathering information to develop the application. Followed by the second phase that based on the previous requirement, a design is created, and the application is built based on the design project implementation phase. In the testing phase, the developed system is delivered to the targeted users who are the UiTM Tapah students to test the usability of the system.

The project documentation is the final phase, which is the phase of compilation of the result achieved in the application after the implementation and testing phase. This phase also produces the complete report.
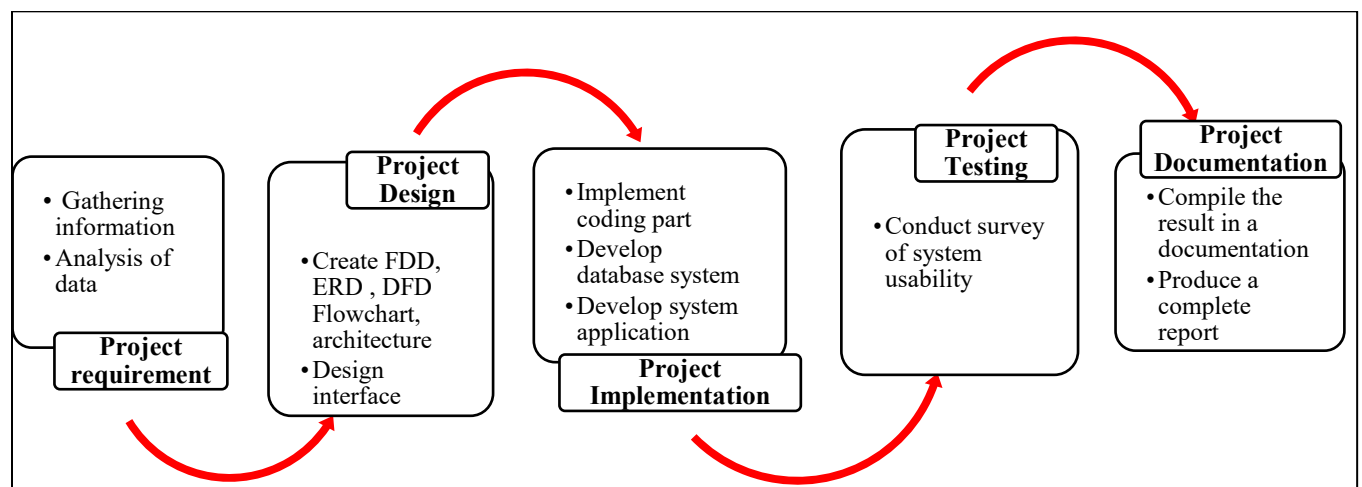

Figure 1: Academic Reminder System methodology.

System Architecture

The system architecture is a conceptual model that defines the structures, behaviour, and view of the system. The figure 2 below show the system architecture consists of two parts: Client side and server side. The client side starts when the user enters the application that is built using Java in Android Studio and PHP programming language. The user will request the information from the server side via mobile phone.

Meanwhile, the server side provides the information from the web server, whereas the MySQL software is used in order to keep the data from the user. The schedule information will be inserted by the user and directly saved in the database. Besides, the user also needs to insert the new assignment data. This application will instantly create the reminder to the user based on the data included such as the assignment list as well as the schedule generated by the system through an alert module on the devices.
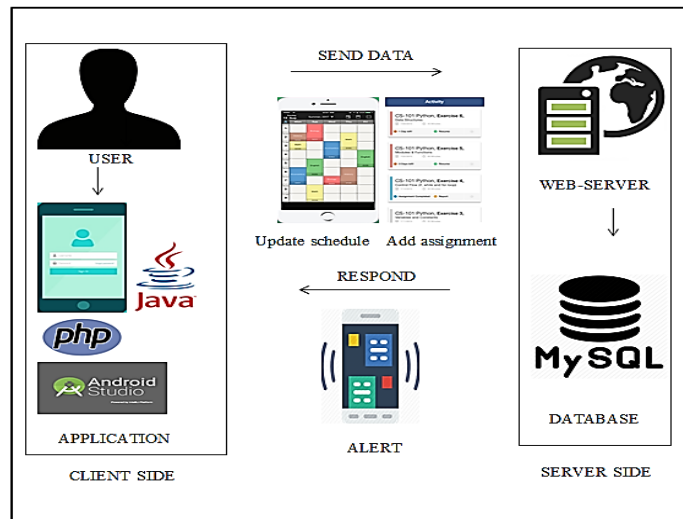

Figure 2: System architecture

Use case Diagram

Use case diagram is a graphic explanation of the interactions among the entities involved in the system. The figure below (figure 3) shows the use case diagram of the system. The diagram shows two actors, first the user which consists of student who uses the academic reminder system, and the system actor who manages the data for the mobile application. The cases shown in the diagram are the requirement summarised into a simple case.

The student as an actor needs to register with the system and provide the details in the form given. Registration need to be completed before use the system. Then, the student can proceed to the log in page after registering to the system and fill in the username and password. The user can log in and use the system. The user can view the menu on the dashboard page after successfully logged in. User can choose the given button either to add new schedule or create a new assignment list. The user also can update the schedule as assigned to the system if the user chooses the schedule card view. Users need to set the reminder for the schedule list.

The user can add a new assignment to the list if the user chooses the assignment card view. User also can delete and update the assignment. Users need to set the reminder for each assignment deadline. The system will generate the reminder after the user sets the reminder for the schedule and assignment
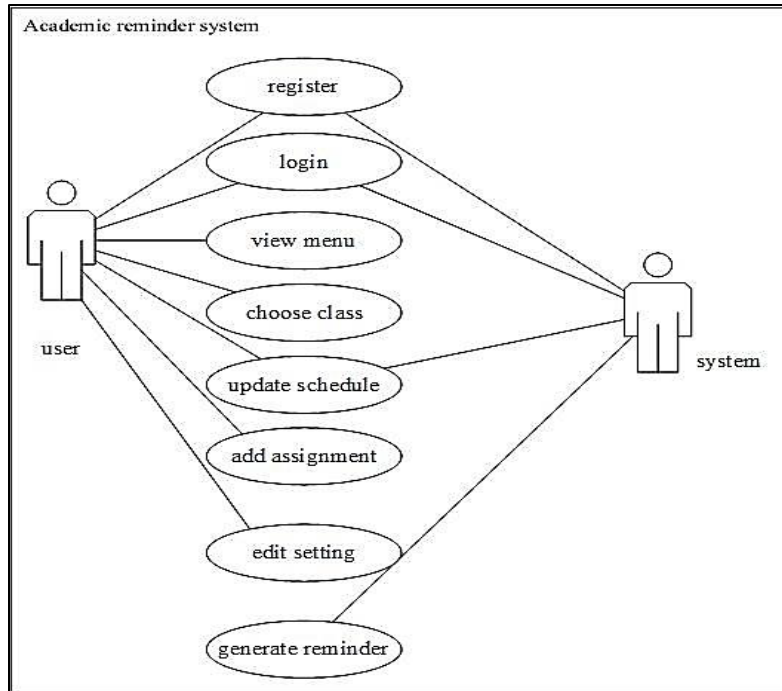
Figure 3: Use case Diagram of application

System Interface

In the design phase, the activity started with user interface design. User interface (UI) design is the process of making interfaces in software or computerized devices with focused looks or style. Therefore, UI for mobile application is the graphical and usually touch-sensitive display on a mobile device. In addition to this matter, mobile devices have a smaller screen size and touchscreen control. Hence, mobile UI needs to be simple and less in text field usage.
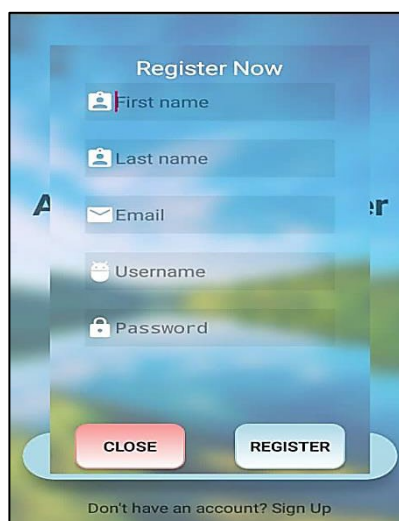

Figure 4: Log in page of the system

Figure 5: Register pop-up page

Two figures above are log in page of the system and register page. In the log in page (figure 4), users need to insert the username and password to log in to the system after the registration. If the users enter either wrong password or username, the system will pop up the message that said either the username or password is wrong. Before logging in, user needs to sign up to get an account (figure 5).

On the main page (figure 6), user able to click any of the desired functions to use the system. The user can click the "Schedule" to enter the schedule page or click "Assignment" to enter the assignment page. If the user wants to edit the alarm, the user can click on the "Setting" card view. The user can view the "Help" card view for any info needed. Besides that, user can sign out from the system by clicking the small icon on the right side of the system and will be redirected to the login page.
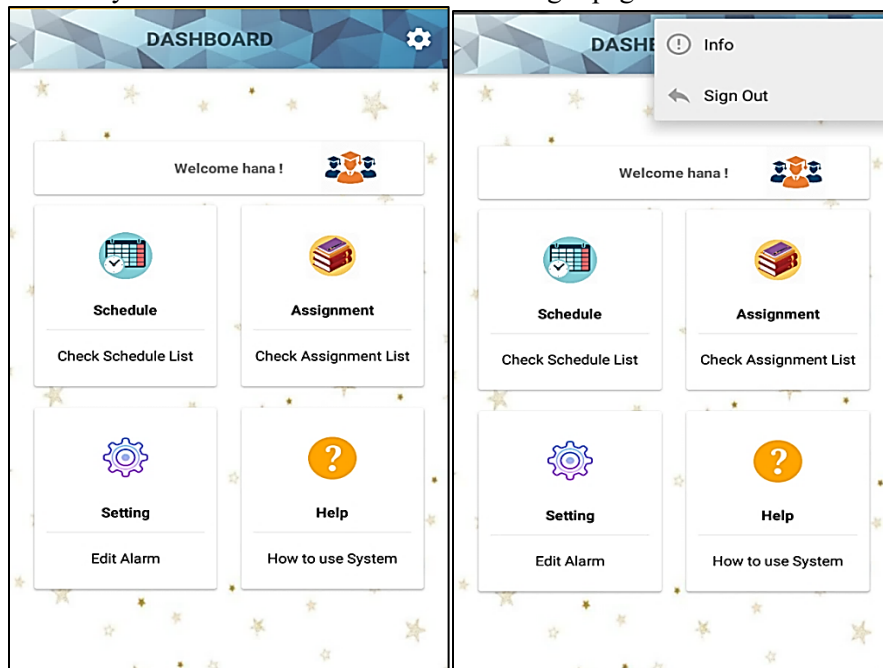

Figure 6: Main pages of the system

On the schedule page, the user able to add the new scheduled timetable based on the assigned class by clicking on the floating add button on the page and the add schedule page will be popped for the user.

Figure 7 shows the generated schedule after the user has entered the class schedule in the system. The pop-up add schedule requires user to fill in the information consisting of the subject, classroom, professor, day and time of the scheduled timetable that given by the academic department of UiTM Tapah administration. After completing the form, the user needs to send the data to the database by clicking on "SUBMIT" button on the screen. The scheduled timetable is generated on the schedule page as shown in Figure 7. The user needs to click the "ON" button which is placed on top of the page to set the reminder for the whole week of the class. Furthermore, user needs to always renew the reminder by clicking the "ON" button every week to set the reminder of the schedule. The timetable will give an alert to the user about the current day by highlighting it with blue colour. This function will help the user to know which class is assigned for that day. Besides that, the user can edit and delete the current class in the edit schedule page.
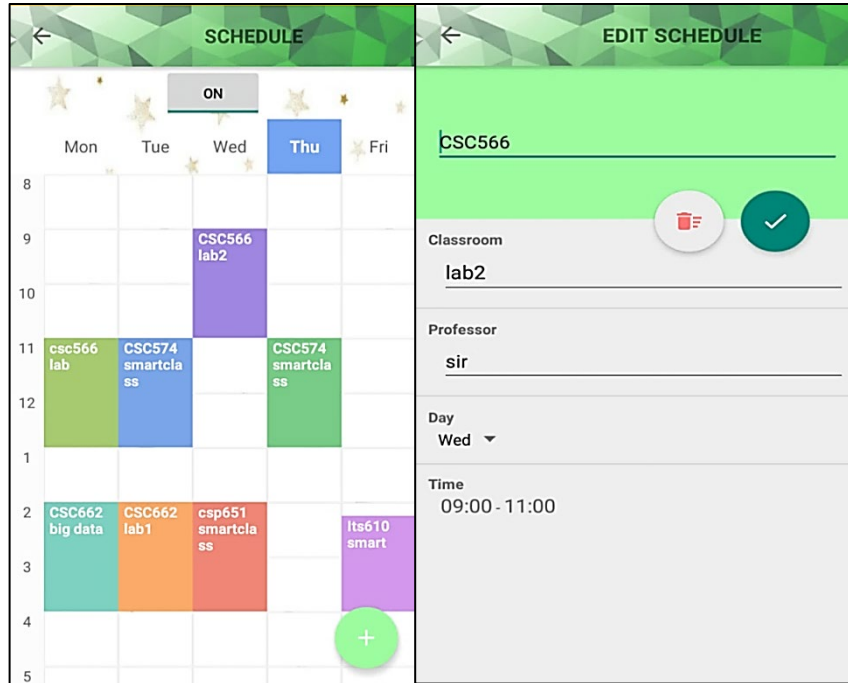
Figure 7: Generated class schedule and edit schedule page

Figure 8 shows the list of assignment and example of the assignment deadline by the system. Furthermore, the edit assignment page gives flexibility to the user to edit or update the current assignment. User needs to click "ON" to generate the reminder for the selected assignment.
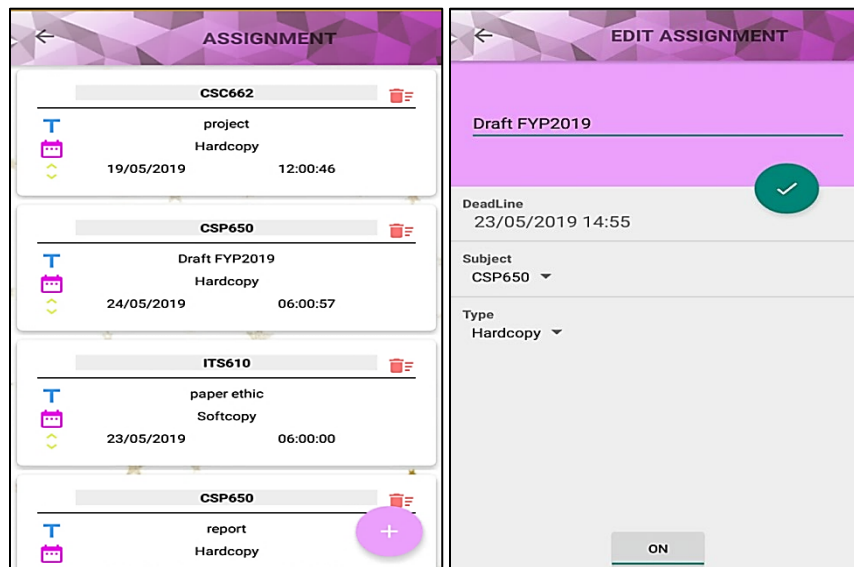

Figure 8: Assignment list and edit page

Meanwhile, figure 9 shows the generated reminder that sends the alarm and notification to the user about the upcoming class schedule or assignment deadline. This reminder alarm is still functioning even when switch off the screen. It has the function to wake the phone up and start the alarm.
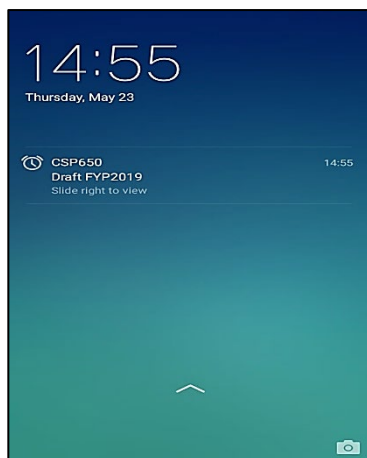

Figure 9: Generated reminder

FINDINGS AND DISCUSSION

Usability Test

According to Ammar (2019), usability is considered as a determinant factor for the success or failure of mobile apps. The concept of usability is divided into four sub-characteristics:

- Learnability: the ability of the software system to allow users to learn its application.
- Understandability: the ability of the software system to allow users to understand its application and to easily perform tasks.
- Operability: the capability of the software system to allow users to operate and control it.
- Attractiveness: the capability of the software system to be attractive to the user

For understandability, one attribute is used which is the navigability. It describes the ease with which a user can move around in the application. As for the Learnability, one usability attributes are considered which is a feedback which concerns the system responses to the user action. With regard to the Attractiveness, attributes that are related to the aesthetic design of the user interface, such as font style uniformity and colour uniformity are considered relevant to make the product attractive to the user.

Concerning the Operability sub-characteristic, one attribute is considered to measure this sub-characteristic. The Error Prevention attribute refers to the means available to prevent data entry errors.

Usability test was carried out to get the respond and to collect data from respondents about the Academic Reminder system. It is tested by the UiTM Tapah students and are given a survey. 30 participants were given a mobile phone to use and navigate through the Academic Reminder system, and then they were asked to answer a questionnaire. Table 1 shows the measurement criteria used in questionnaire for usability tests:

Table 1: Measurement Criteria

Rank	Value
Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

The measurement criteria have a ranking from 1 to 5, where 5 values the highest with strongly agree and 1 value the lowest with strongly disagree. Table 2 shows the summary result score of percentage gathered from usability test.

Table 2: Percentage score of Usability Test

Sub-Characteristic	Description	1	2	3	4	5
Understandability	1. Provides good navigation in the system.	0	0	6.6%	66.7%	26.7%
	2. Apps can be accessed anywhere and anytime	0	0	6.7%	60%	33.3%
Attractiveness	3. Provides a pleasant interface using various color and suitable font.	0	0	6.7%	40%	53.3%
	4. Provides an interactives button.	0	0	6.6%	46.7%	46.7%
Operability	5.Helps reminding the assignment deadline in a better way without error.	0	0	6.7%	60%	33.3%
	6. Helps in reminding the class schedule effectively without error	0	0	6.6%	46.7%	46.7%
Learnability	7. Get faster feedback from the system	0	0	6.6%	46.7%	46.7%
	8. User Overall Satisfaction	0	0	6.6%	46.7%	46.7%

Table 2 shows the positive outcomes from the respondents were 26.7% strongly agree that the Academic Reminder System provides good navigation in the system. They mostly agree and strongly agree that the the Academic Reminder system provides an interface which helps to navigate better because the interface has been built to be user friendly and responsive to produce a good user experience. 53.3% of the respondent are strongly agreed that this application provided an interface with pleasant colours and suitable font size and type. Most of the respondents also strongly agree that the Academic Reminder system provides an interactive button for functions which is 46.7%. The respondent also agree that Academic Reminder system can be accessed anywhere and anytime which is 60%.

Meanwhile, 46.7% of the respondent also strongly agreed that this application helps in reminding the class schedule effectively. It indicates that this application helps the user to get early alerts about the upcoming class. The respondent also agrees that the system give faster feedback to the user.
As an overall, table 2 show that 46.7% of respondent are agreed and strongly agreed that this application meet their satisfaction with interface, usability, and performance.

In a conclusion, the objectives for this application design have been achieved since most of the respondents gave a good response and it was found usable by them.

CONCLUSION AND RECOMMENDATION

Based on the results that have been discussed in the previous chapter, it can be concluded that an Academic Reminder System provide a much better platform for reminding the students on class schedule and assignment deadline. This contribution made by this application could help the students in managing daily activities of the university such as class attendance management and also contain useful links required daily for academics.

For future works is to make a sharing application tool in the system so that the user can simply share the application with their friends to help reminding them on academic purpose. Moreover, this application is suggested to have a web-based system and not only focuses on an android platform while improving the flexibility for the user to set their subjects to the system automatically. Besides that, this application also can get engaged with the current technology, which is the near field communication (NFC) for login page which is easier for the student entering the system. Furthermore, NFC is also suitable for the low-cost development sensors that provides a quick and simple way to obtain data by scanning the created tag using the tag reader without pairing the devices together (Lazaro, 2018).

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CONFLICT OF INTERESTS DECLARATION

The authors declare no conflict of interests regarding the publication of this article.

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