MINGGU HALUAN SISWA APPLICATION

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Software Development) with Honours.

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2021

DECLARATION

I hereby declare that this project report entitled

MINGGU HALUAN SISWA APPLICATION

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : Siti N Hanna Date : 3/9/2021

(SITI NUR HANNA BINTI ZAKARIA)

I hereby declare that I have read this project report and found this project report is sufficient in term of the scope and quality for the award of Bachelor of Computer Science (Software Development) with Honours.

SUPERVISOR : _____ Date : 3/9/2021

(ASSOCIATE PROFESSOR TS. DR. MOHD SANUSI BIN AZMI)

DEDICATION

My dissertation is dedicated to my family and many friends. I am especially grateful to my loving parent, Zakaria Bin Hussin and Norhasimah Binti Rostam, whose words of encouragement to perseverance ringing in my ears. Furthermore, I would like to thanks to my previous lecturer that taught me in the previous semester. The knowledge that I learn from them are very valuable and can be implemented during the process of completing this project. Lastly, thanks to my lovely classmate and course mate that continually encourage me to complete this project.

ACKNOWLEDGEMENTS

"*In the name of Allah, most Gracious, most Compassionate*"

The outcome of this PSM is a great deal of guidance and assistance from many people, First of foremost, I would like to express my heartfelt appreciation to Associate Professor Ts. Dr. Mohd Sanusi Bin Azmi for his guidance and invaluable assistance throughout the project completion.

Furthermore, I would like to express my heartfelt appreciation for encouragement and inspiration received from our faculty members and colleagues. I am extremely grateful to have been placed in the Faculty of Information Technology where I can gain all of the expertise and skills in software development. The knowledge gained will be extremely useful and beneficial during the course of this project's development.

Last but not lease, I would like to thank to my family members and dearest classmate for their support, motivation and understanding throughout the project duration.

ABSTRACT

Minggu Haluan Siswa(MHS) application is a software application to be developed and integrated to manage most activity during the university orientation week(Minggu Haluan Siswa). During pandemic covid-19, the physical orientation week cannot be held, so as alternative way, university use online platform as the official platform to hold the orientation week for new intake student. Sudden change of platform event will give huge trouble and problem to adapt the event environment. So, this MHS Application will be developed to ease the process of orientation week. Based on the previous orientation week, I observed the flow of orientation week (as I am one of the facilitators during the orientation week) and I found several problems that faced during the orientation week. The main problem that faced by the student is that the student needs to follow and catch up the latest information and news on many social platforms such as Facebook, Instagram, WhatsApp. Students tend to lose information as there are so many social media platforms that they need to catch up to get the sudden changes in information. As the solution, this MHS Application is developed to manage most activity during orientation weeks, so that less official social media account to be caught up.

ABSTRAK

Aplikasi Minggu Haluan Siswa (MHS) adalah aplikasi perisian yang akan dibangunkan untuk menguruskan aktiviti pada minggu orientasi universiti (Minggu Haluan Siswa). Semasa pandemik Covid-19, minggu orientasi tidak dapat dilaksanakan secara fizikal. Sebagai kaedah alternatif, pihak universiti menggunakan platform dalam talian sebagai platform rasmi untuk mengadakan minggu orientasi untuk pelajar pengambilan baru. Perubahan platform acara secara tiba-tiba akan memberikan masalah. Jadi, Aplikasi MHS ini akan dibangunkan untuk memudahkan proses minggu orientasi. Berdasarkan minggu orientasi sebelumnya, saya memerhatikan aliran minggu orientasi (kerana saya adalah salah seorang fasilitator semasa minggu orientasi) dan saya menemui beberapa masalah yang dihadapi semasa minggu orientasi. Masalah utama yang dihadapi oleh pelajar adalah pelajar perlu mengikuti dan mengikuti maklumat dan berita terkini di banyak platform sosial seperti Facebook, Instagram, WhatsApp. Pelajar cenderung kehilangan maklumat kerana terdapat begitu banyak platform media sosial yang mereka perlukan untuk mendapatkan maklumat yang berubah secara tiba-tiba. Sebagai penyelesaiannya, Aplikasi MHS ini dikembangkan untuk menguruskan aktiviti selama minggu orientasi, dan akan memudahkan banyak pihak.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Minggu Haluan Siswa is a program that conducted by university, being helped by the certain organization, club that will assist new student to adapt to an unfamiliar environment of university. In every new session, there will be new student intake for every university. While adapting the new norm cause by Covid-19, the physical Minggu Haluan Siswa cannot be proceed. Therefore, Minggu Haluan Siswa Application is the alternative way for students joining the orientation activity that conducted by the university. Lots of programs are conducted during Minggu Haluan Siswa to introduce to the new intake student with the rules, or anything related to the policy of the university and with their course. The main purpose to develop this application is to integrate and combine all activity of Minggu Haluan Siswa to one platform. Easy to access and user friendly interface are the important factor to develop this application.

1.2 Problem Statement

- The new student find it is hard to find the assigned facilitator to help them in the registration process.

- The student find it is hard to take attendance in online program and tend to miss the timing to turn in attendance.

- The latest or change information are not published in one platform. The new student need to check various online platforms such as university official Facebook, Instagram account and WhatsApp, Telegram messenger to get the newest information.

1.3 Objective

- To assist new student find their facilitator that will help them prepare for university admission.

- To allow new student take their attendance easily to every session in Minggu Haluan Siswa.

- To create an application that allows student to get new announcement and the latest information effortlessly.

1.4 Scope

1.4.1 Module to be developed

- Authentication Module

  Users need to login by using email and password before entering the application.

- Attendance Module

  The student needs to take attendance in every session of program in Minggu Haluan Siswa.

- Chat Module

  Chat platform between a student and facilitator that will assist and help new students.

- News Module

  Student and facilitator can get the newest and changes announcement related to Minggu Haluan Siswa

- Notification Module

  The app will notify the user

1.4.1.1 Target User

- New intake student
- Facilitator
- Admin

1.5 Project Significance

This application will simplify most of activity of Minggu Haluan Siswa. The new intake student will facilitate in the process of registering for university and will be facilitated during Minggu Haluan Siswa. This app also eases the process of turn in new student attendance thus will save significant time than using the manual form/ google form of attendance. By using this system, the new intake student and facilitator will not miss the latest information and announcement

1.6 Expected Output

The end product of this system is a mobile application. The Minggu Haluan Siswa Application will provide a platform that allows new students chat with their facilitator, turn in attendance by using QR code and get the announcement regarding Minggu Haluan Siswa.

1.7 Conclusion

In conclusion, this application is to be developed to help university to manage the orientation week smoothly without any frustrated user that follow the event. This app will help the new intake student to join the activity that being schedule by university beside they can reach help from the facilitator to guide them during orientation weeks.

CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

Student orientation programs are designed to initiate the integration of newly admitted first-year and transfer undergraduate students into academic, cultural, and social climate of the University (Austin, 2020). Orientation is a chance for students to learn how things work at their new university and meet the other students, faculty, and staff members. A good orientation program gets students excited about starting college and helps them adjust to campus life.

Students should be made aware of opportunities to socially integrate into the college culture during the orientation. Students are less likely to stay at an institution of they do not become socially integrated within the first few weeks of their arrival (LEE, n.d.). Games, special performances, icebreakers, refreshing activity are the examples of social activities. They also can learn about the various student organizations that provided in that university such as Majlis Perwakilan Pelajar (MPP), Ashabul Maqari' (AMQAR), Badan Dakwah Dan Rohani (BADAR), Kelab Fasilitator Sahabat Siswa (FASASI).

Orientation program, on the other hand, should than fun and games. While the social aspect of one's college experience is important, the importance of academics should not be overlooked. As a result, usually student required to register for classes during orientation. Because new students require some direction and guidance when enrolling in classes, faculty members should be able to provide academic advising during orientation. Students will be better prepared to meet the challenges of collegiate academics if they are given a thorough overview of academic expectations.

While it is impossible to tell new students everything for the duration of the collegiate experience, orientation programs should provide a framework in which students will know where to go if they have additional questions.

2.2 Facts and finding

2.2.1 Domain

In the realm of software engineering, domain is commonly used to refer the subjected area on which the application is intended to apply. To put in other ways, domain is the "sphere of knowledge and activity around which the application logic revolves" (Powell-Morse, 2014). In this programming project, the goal of creation is for university. The functionality of this software is built based on the set of requirements that solved the current problems in the orientation week that organized by university.

2.2.2 Existing System

Mostly in university, they do not have any specific computerized system build to handle orientation day/weeks. The university mostly uses a manual system to prepare the orientation day/weeks. The manual ways of handling newly-intake student orientation day/weeks, usually effective and the program can be handled smoothly and efficiently, but since pandemic Covid-19 outbreaks, the physical orientation program cannot be held. The university takes initiative to hold the orientation weeks fully online and use many platforms such as FB live, YouTube Live, Instagram lives.

As the example, University Tunku Abdul Rahman (UTAR) has built a website to manage the orientation week for the new-intake student. For student use the system, they need to register for UTAR email ID. The student can obtain the announcement from the university, the information of UTAR organizations, and the link for the event live streaming.

2.2.3 Technique

This project will employ observation as the technique, which will entail a thorough detail study of the data. In this study, all the problem and solution for this project are the results of observing the orientation week that being held in University Teknikal Malaysia Melaka (UTeM) that use online platform as the official platform for orientation week.

2.3 Project Methodology

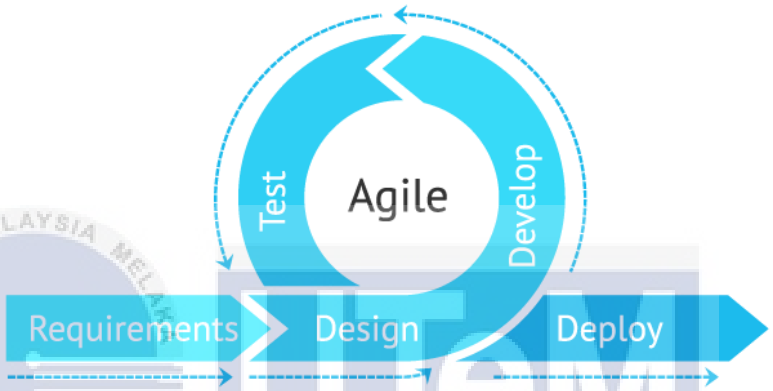


Figure 2.1: Agile methodology diagram

MHS application uses agile methodologies as the project management. The primary advantage of iterative work is that less work is wasted. For example, when something about the project changes, the amount of rework that must be done is reduce. In other side, the developer does not have to go too far down one path to discover and turn around to start over. Besides, Agile project management virtually eliminates the possibility of total project failure.

In requirement phase, all the requirements needed for this MHS application are figured out and analyzed particularly with the help of visualization analysis such as a use case diagram to determine which requirement are achievable.

In the design phase, all the critical software design is figured out for example database design, user interface design to find out how reliable, and easy-to-use the product will be.

In the development phase, the software is developed and the majority of the code for the project is written.

In the test phase, the test case document is prepared. The system is tested particularly based on the test case document to avoid any damage to the system for the future use.

2.4 Project Requirement

Project requirements are criteria or activities that must be met in order for the project to succeed or be completed. They're designed to align the project's resources with the organization's goals. Cost savings, improved project success rates, and more effective change management are all advantages of efficiently capturing project requirements.

2.4.1 Software Requirement

- Android Studio
- Minimum JDK version: Java Development kit 8
- Android Emulator

2.4.2 Hardware Requirement

- Operating System: Microsoft® Windows® 7/8/10 (32- or 64-bit), Mac® OS X® 10.10 (Yosemite) or higher, GNOME or KDE desktop.
- Random Access Memory: 4 GB RAM minimum; 8 GB RAM recommended.

2.4.3 Other Requirement

None

2.5 Project Schedule and Milestones

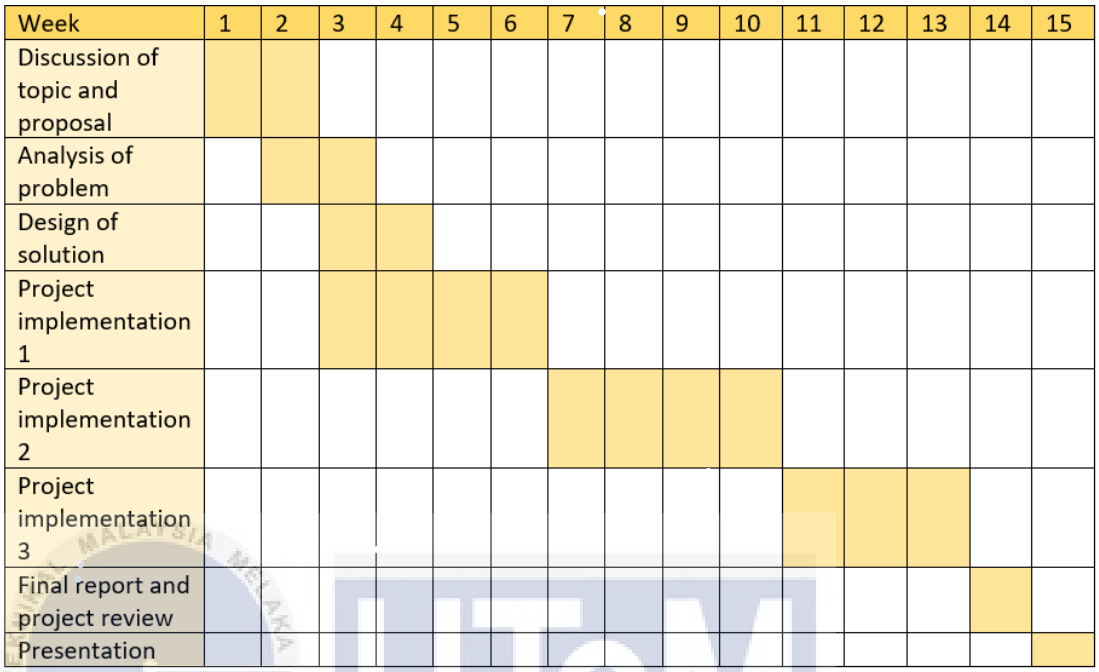


Figure 2.2: Gantt Chart

Table 2.1: The details of project schedule

Schedule	Details
Discussion of topic and proposal	Discussion with supervisor about the idea for the project.
Analysis of problem	Make details analysis about the current flow about the Minggu Haluan Siswa and list out the problems.
Design of solution	Make detail solution with the aid of diagrams such as use case diagram,

	activity diagram, and the database design for the proposed idea.
Project Implementation 1	The user interface is integrated and successfully connected to the database. For this application, it uses mainly Firebase.
Project Implementation 2	The basic function of the application is integrated such as create, read, update, and delete.
Project Implementation 3	This is the phase that most of the functions of the system are implemented, and basic testing is done.
Final Report, project review	This is the phase that the final report is completed, reviewed by supervisor before present to the evaluator.
Presentation	The final product is presented to the evaluator

2.6 Conclusion

In conclusion, when preparing the system development phase, a decision was made that is use agile methodology as our project methodology. This methodology enables the programmer or developer to track what they missed while solving the problems that may occur on the application later. The developer just needs to refer to the project methodology to determine what steps must be taken before any solution is implemented.

CHAPTER 3: ANALYSIS

3.1 Introduction

In this chapter, all relevant information is collected such as problem that need to be solve, the problem area, the analysis of current system and the proposed solution that and the requirement needed to overcome this problem. The requirement must be stated precisely and clear to avoid any problem in the next project development phase.

For MHS Application, it uses Object-Oriented Approach and Design (OOAD) approach as everything in android application is an object. Java and xml are used to create the application, where XML is used to declare components as data objects and store components in terms of objects. Java is used to perform the object operations.

3.2 Problem Analysis

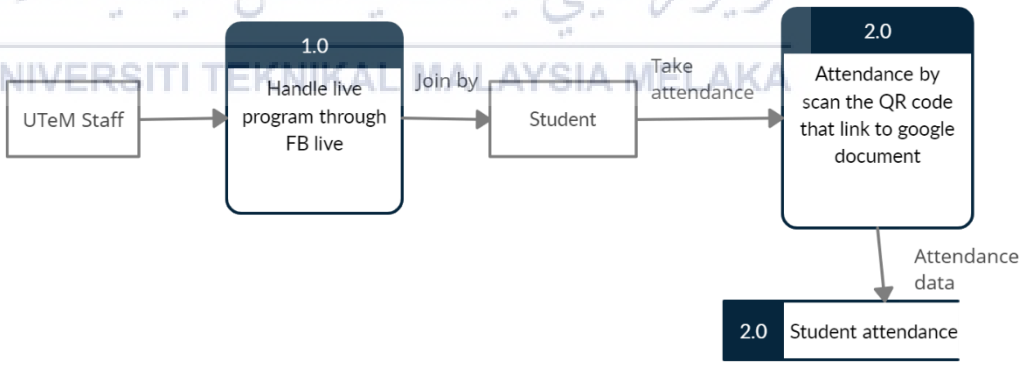


Figure 3.1: Data flow diagram for current system

3.2.1 Problem area

Since physical orientation week cannot be held by the university, they need a platform that will be use as the official to conduct the whole event activity. Based on the physical event, the new information or news will be announced in the activity slot itself. Students tend to forget the news, or the information and it will give them hard times during the event. Next, student need to scan QR code to retrieve the link to the google form. This process will take some time for the student to fill the google form as the prove that they attend the event.

3.3 Requirement Analysis

3.3.1 Data Requirement

3.3.1.1 Flowchart for MHS Application

The flowchart below is the graphical representation of each process in this project. The steps in the flowchart are organized on the chronological order. The input and output for this project are clearly stated and the arrows represent the order of process flow direction.

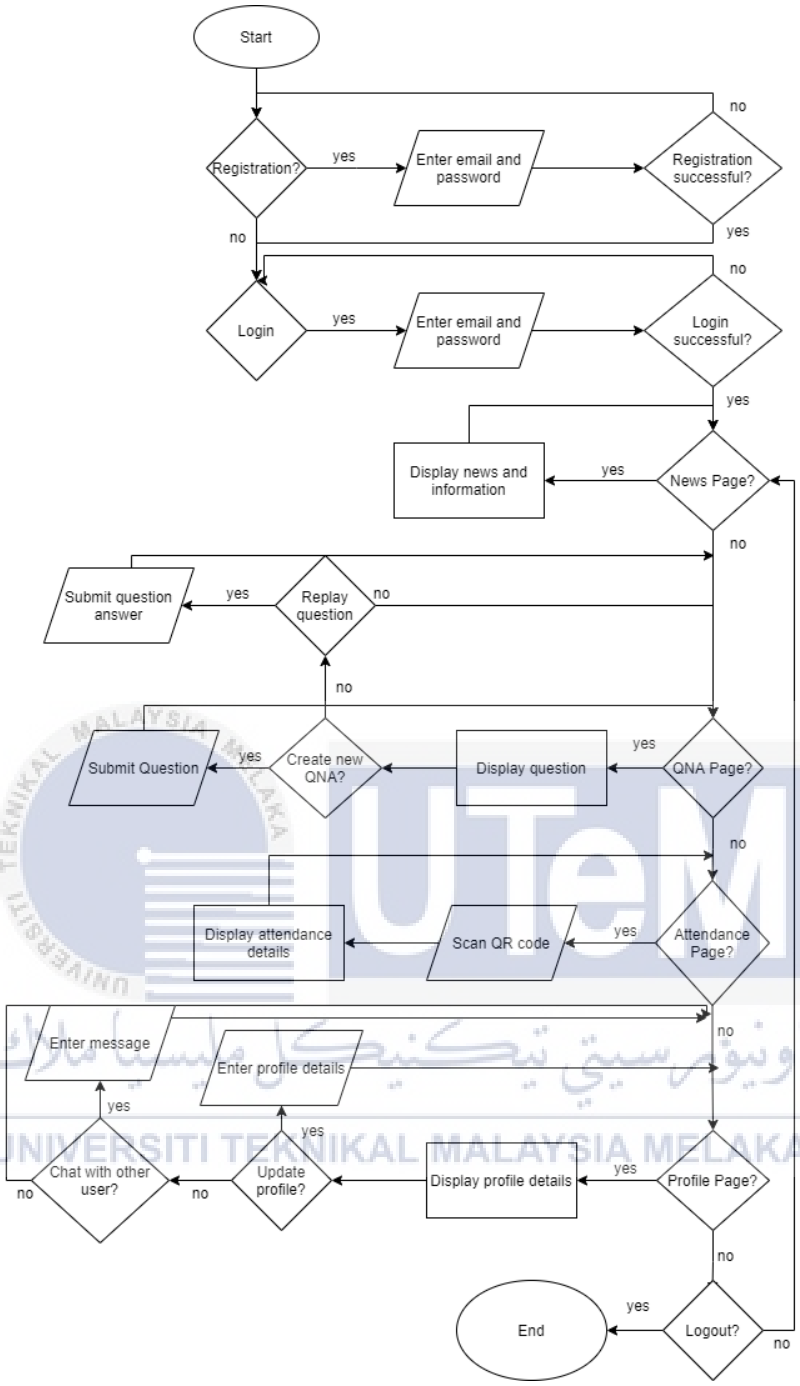


Figure 3.2: Flowchart for student user

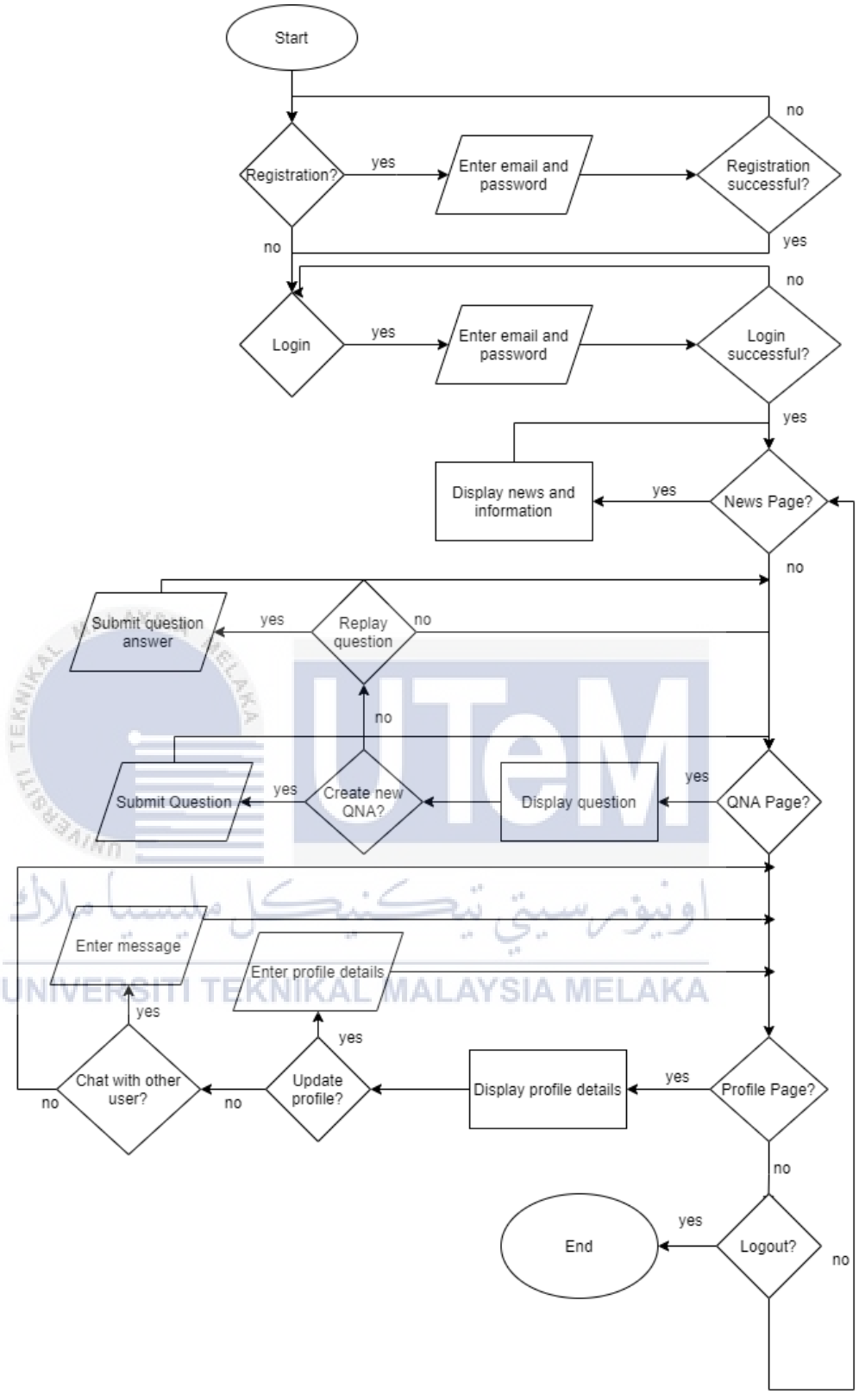


Figure 3.3: Flowchart for facilitator user

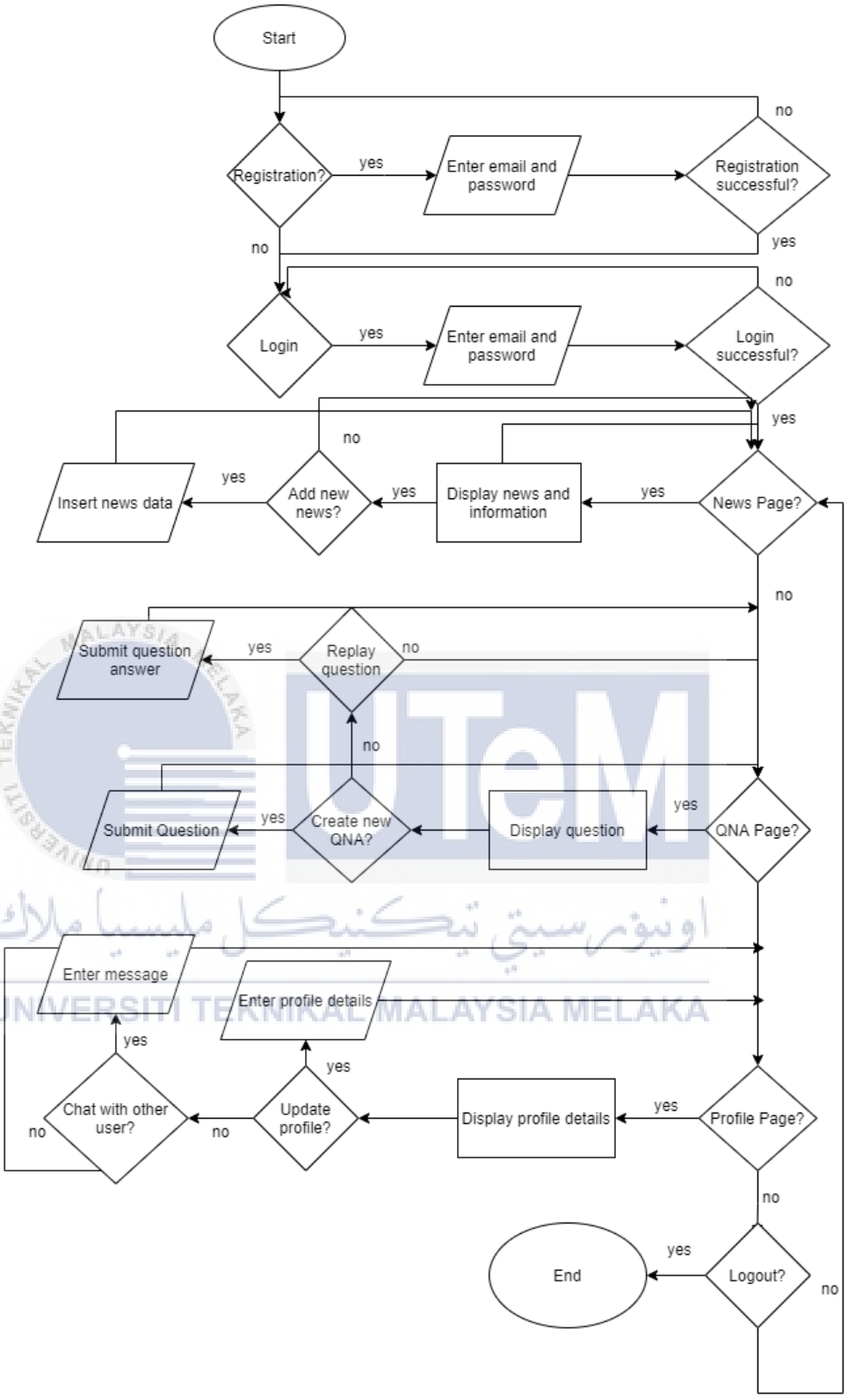


Figure 3.4: Flowchart for admin user

3.3.1.2 The UML for MHS Application

The UML diagram below shows the classes, their attributes, operations, and the relationships between objects to describe the structure of this system.

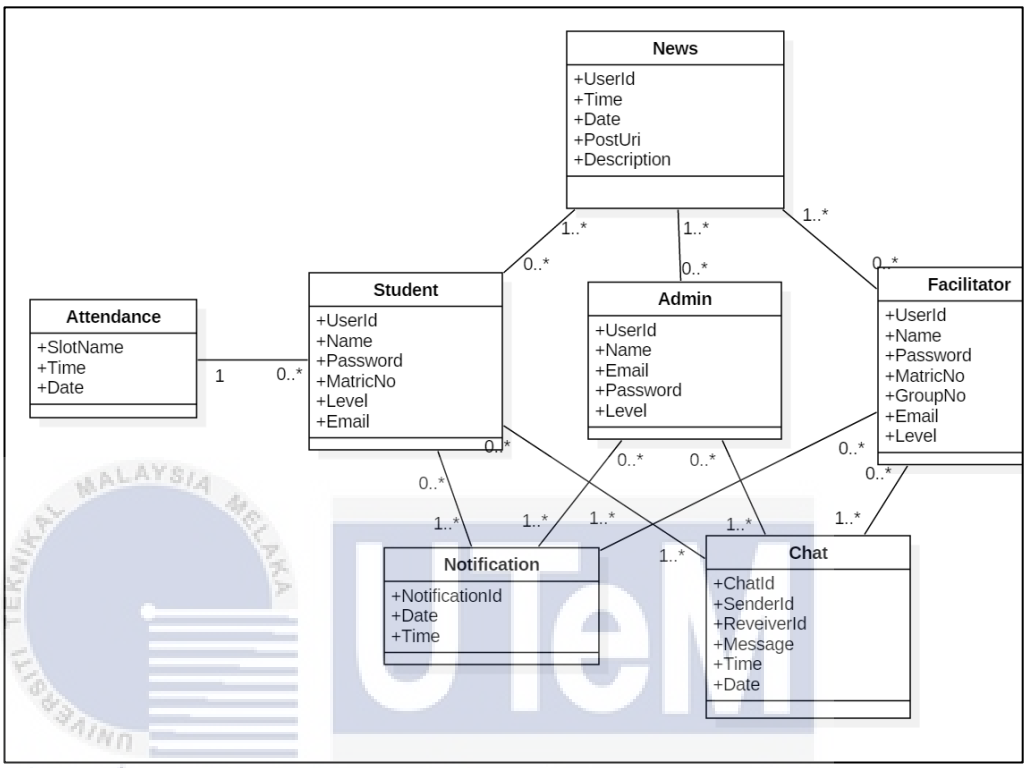


Figure 3.5: Class diagram for MHS Application

3.3.2 Functional Requirement

3.3.2.1 Use Case Diagram for MHS Application

Use case diagram is the requirement analysis concept that describes the systems' actions from the perspective of a user. It will describe the sequence of events involving and the interactions of the users with the system.

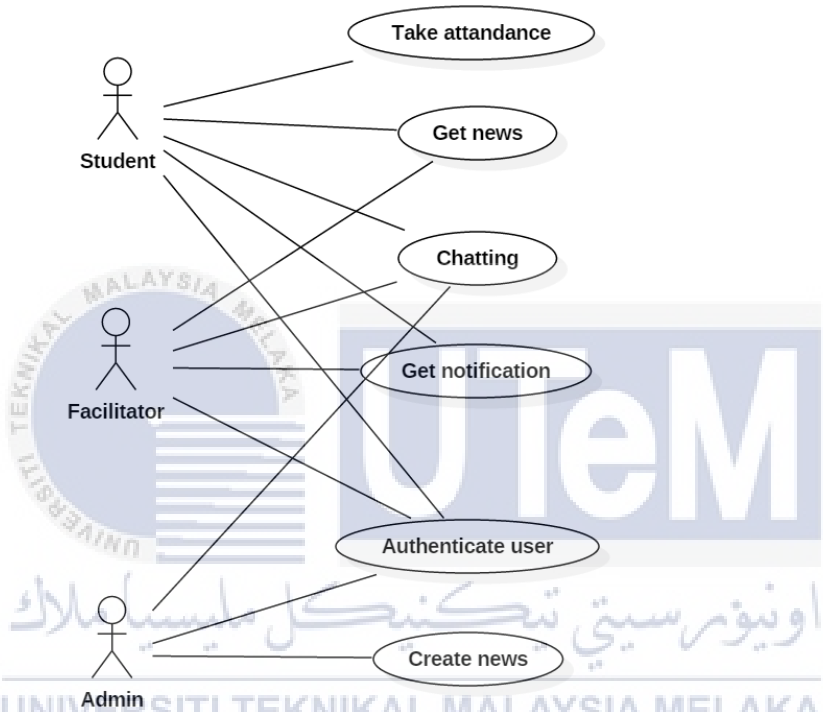


Figure 3.6: Use case diagram for MHS Application

Table 3.1: The details of use case diagram

No	Use Case	Details
FR_1	Take attendance	This use case is for students to take event attendance. The user needs to scan the QR code, and their data will be saved.
FR_2	Get news	This use case is for student and facilitator get the latest news or information that made by admin. Only admin can create, edit, delete the news while student and facilitator, they only can view the news.
FR_3	Chatting	This use case is used by all the users. The user can send message to each other. To make this use case more interesting, this chatting function also include send photos, not only can send text.
FR_4	Get notification	This use case is for student and facilitator to get event notification. For each event, the users will get notification that set by admin to avoid student forget the schedule.
FR_5	Authenticate user	The process of authenticating is used by all users (admin, student, facilitator) where the users need to login first before entering into the system. If their data doesn't exist in the database, they need to make registration and the user profile will be saved in database.

FR_6	Create news	This use case is only used by admin. Only admin can create, edit, delete the news.

The table above describe the details of MHS Applications' use case diagram. There are several use cases that are implemented to this system, that are take attendance use case, get news, chatting use case, get notification use case, authenticate user use case and create news use case. All the details about these use cases are carefully describe in the table above.

3.3.3 Non-functional Requirement

There are several non-functional requirements that applied for this MHS Application. First of foremost, the usability. This application must be easy to use especially for the non-technical users (student and facilitator) to use. Secondly, the user-friendly interface. The interface on this MHS Application is intended to ease the users by making it simple, uncomplicated, and pleasing to the eyes. Thirdly, the response time for this application. The application should perform the operations that user has requested almost immediately. Finally, the maintainability of this project. Over times, the application system should be simple to change, improve and restructure. If there is a problem with the system, it can be easily identified and corrected.

3.4 Conclusion

In system development process, the most important step is the system analysis. The existing system is thoroughly examined to identify problems and devise a solution. For this MHS Application, the manual and physical orientation week event cannot be held since pandemic Covid-19 strikes to our country. So, with this application, it will manage most of activity during the orientation week

CHAPTER 4: DESIGN

4.1 Introduction

The process of designing and defining all of the system's required elements is known as system design. The goal of system design is to provide enough detailed data and information about the system to enable the system implementation consistent with the system's structure. The system architecture, sequence diagram is presented in this phase to provide a clearer picture of the Minggu Haluan Siswa Application.

4.2 High-Level Design

The term "high level design" refers to a general system design that includes a description of the system architecture and design. HLD also includes a brief explanation of components such as platforms, systems, services, and processes. It describes the relationship between the system's various components and functions. It defines the actual logic for each module of the system, as well as the design architecture to understand the flow of the system with function and database design.

4.2.1 System Architecture

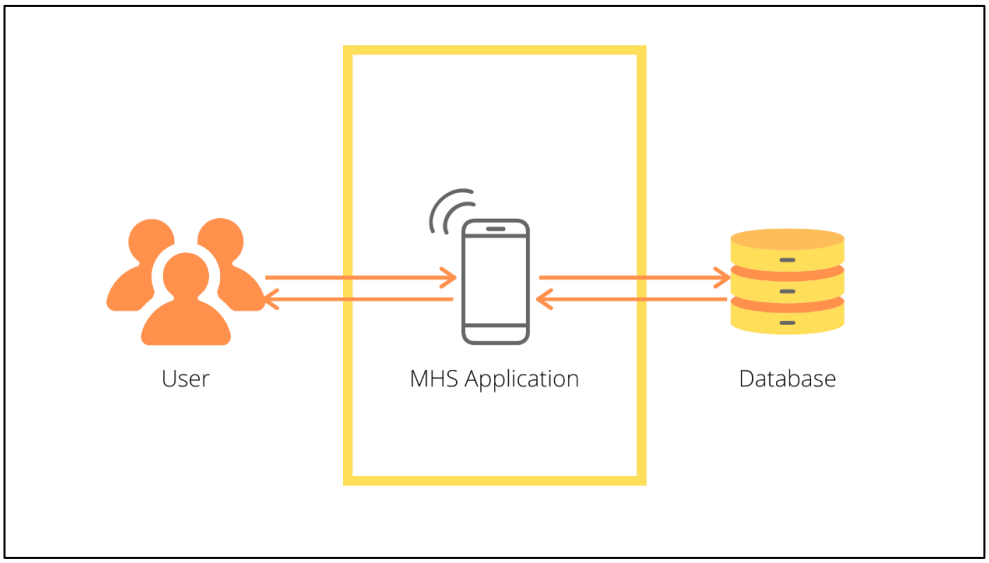


Figure 4.1: System architecture for MHS Application

Figure 4.1 shows the system architecture for MHS Application. In the diagram above, it shows 3 elements that involve that is user, application server, and database. The roles of user (admin, student, facilitator) are to make requests and send data to the server. The application server, which includes the presentation layer and the application layer to send and retrieve services for the database. The database is the place where all data is persisted and retrieved.

4.2.1.1 Sequence Diagram

A sequence diagram is used in transition from requirement expressed as use cases to the next and more formal level refinement (Bell, 2004). The sequence diagram depicts the interaction between objects within a collaboration that realizes a use case, Figures below depict the high-level interaction between active objects in the MHS Application system.

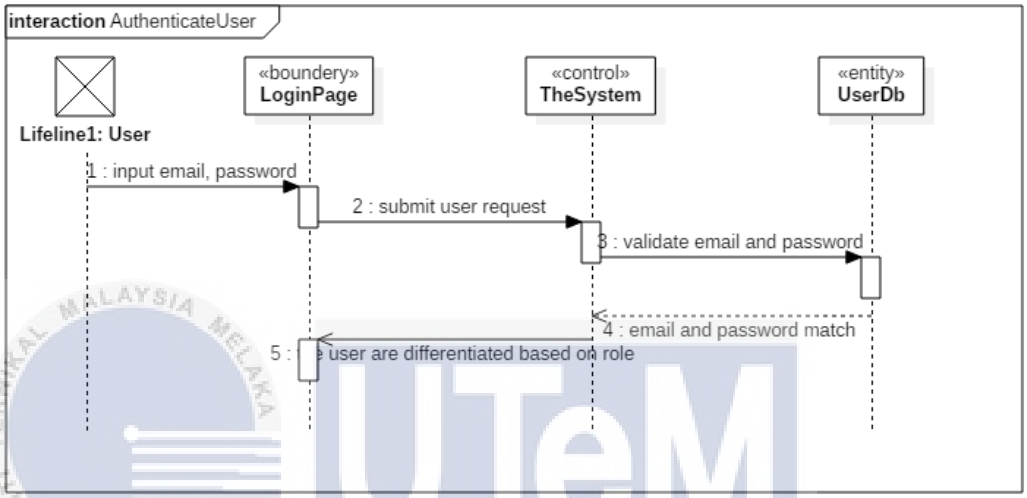


Figure 4.2: Sequence diagram for authenticate user

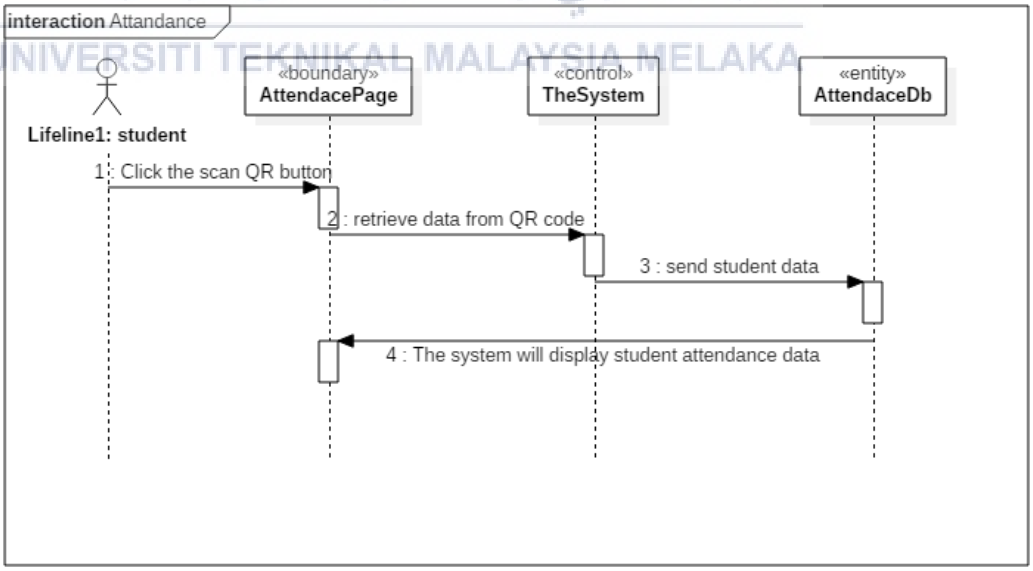


Figure 4.3: Sequence diagram for student attendance

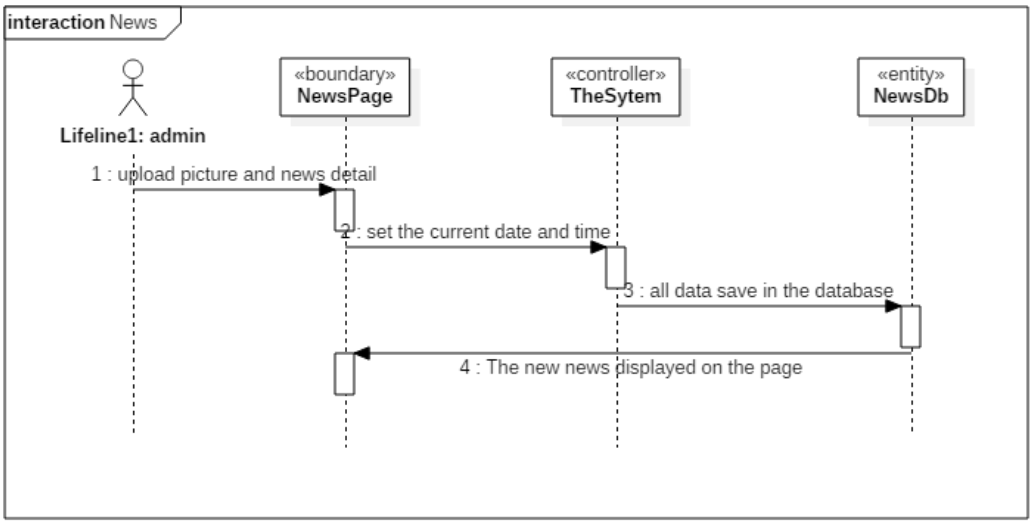


Figure 4.4: Sequence diagram for news activity

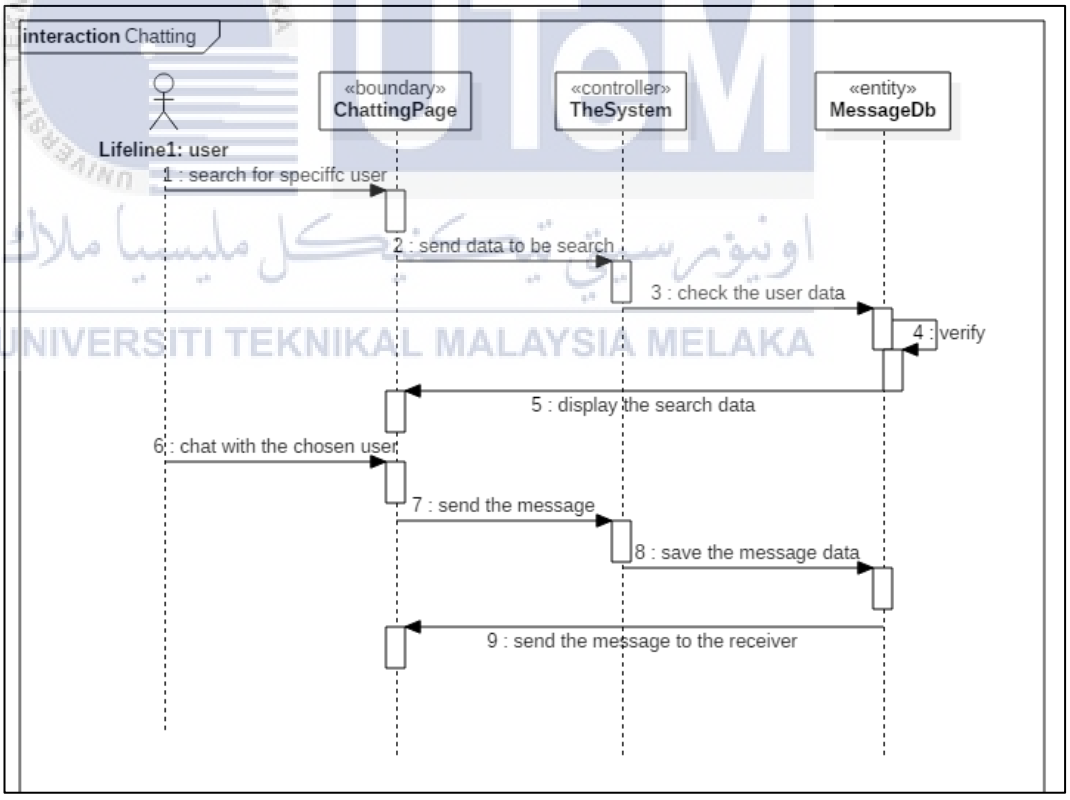


Figure 4.5: Sequence diagram for chatting activity

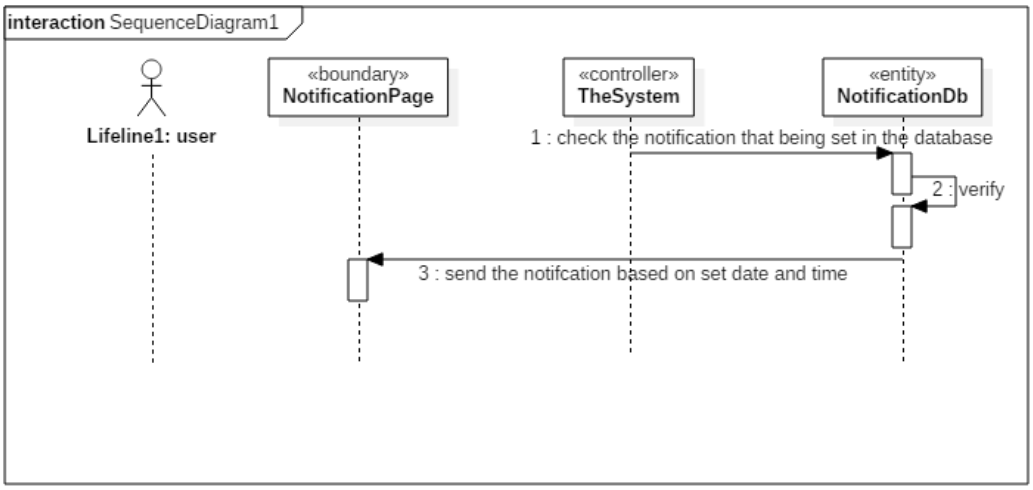


Figure 4.6: Sequence diagram for notification activity

4.2.2 User Interface Design

User Interface Design is the process of designing or fabricating interfaces that allow users to communicate with computers. The task of designing the user interface is completed by the software engineer. The software engineer ensures that the user interface is simple to understand, that it achieves its goals, that it is easy to use, that it is encouraging, and that it is forgiving.

4.2.2.1 Navigational Design

The discipline of navigation design is the creation, analysis, and implementation of methods for users to navigate through a website or app. Navigation is critical to how users interact with and use the system. The diagrams below shows the navigation flow for MHS Application.

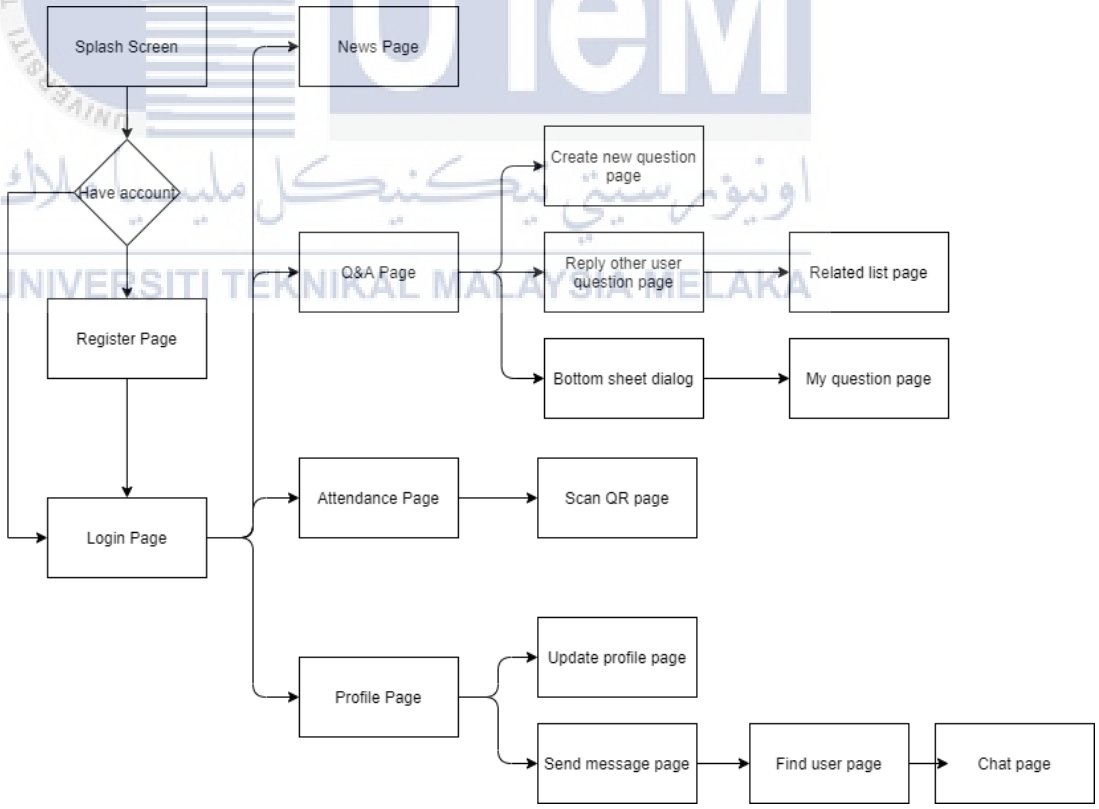


Figure 4.7: Navigation design for Student Page

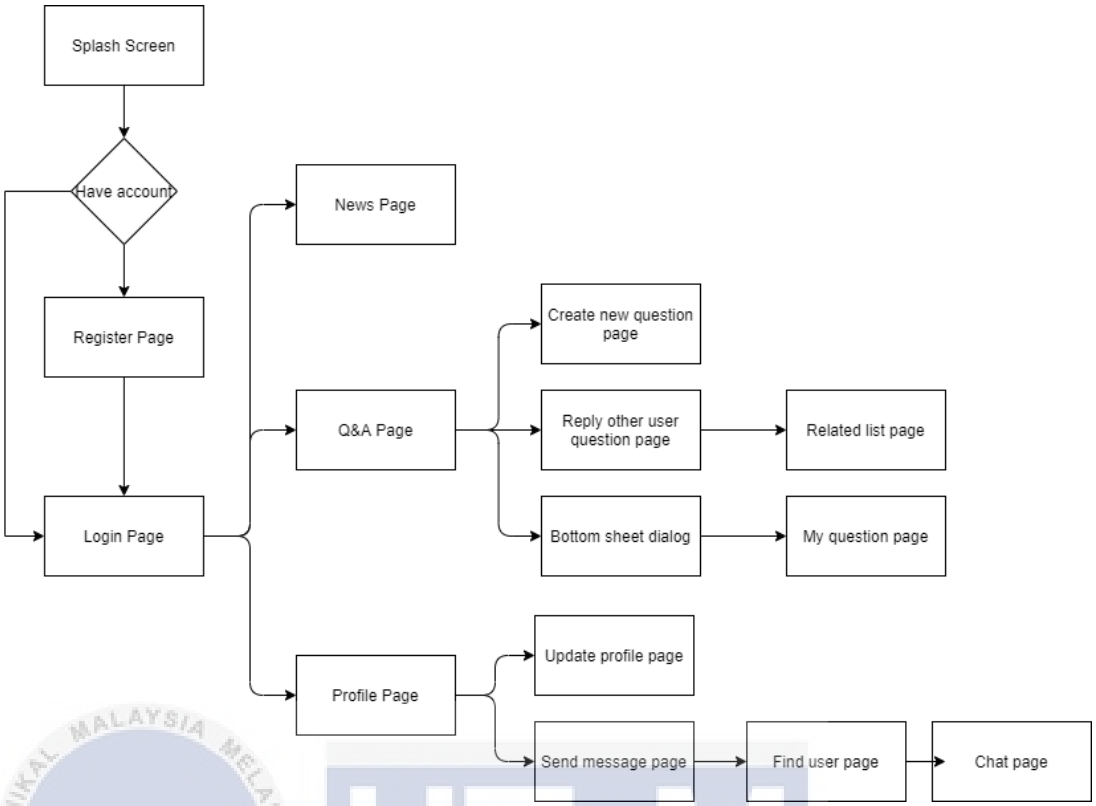


Figure 4.8: Navigation design for Facilitator Page

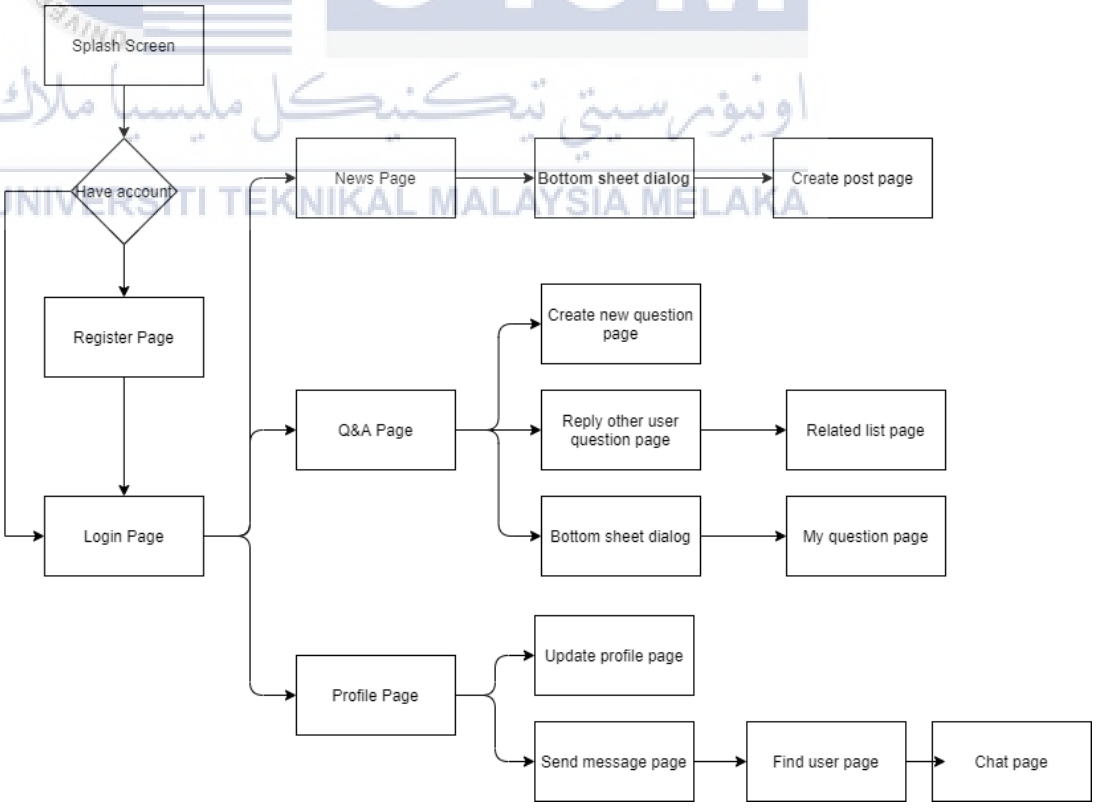


Figure 4.9: Navigation design for Admin page

4.2.2.2 User Interface

Figure 4.10: Registration Page

Figure 4.4 shows the Registration page for student and facilitator. They need to input student email (example: B031810384@student.utem.edu.my) and password to complete the registration process. The user also has to choose the user type to differentiate the user role. All the details will be saved in the database.

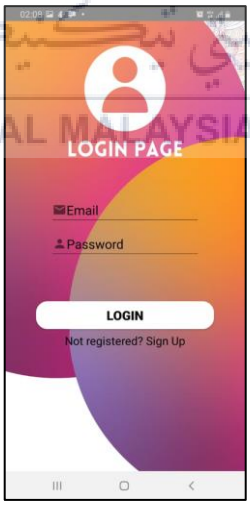


Figure 4.11: Login Page

Figure 4.5 shows the Login Page for all users (admin, student, facilitator). They need to enter the correct email and password in order to login to the application. If they enter the invalid or wrong email and password, they need to re-enter email and

password. If the email and password are correct, the application will retrieve the user role in the database. They will go to assigned homepage based on their role.

Figure 4.12: News Page

Figure 4.6 shows the news page for student and facilitator page. The news that being added by admin will be displayed at student and facilitator page. Beside that they can view the post, they also can share, copy, and download the picture of the news. Next, this page also allow the user to get the extra information for the university by click the university menu, and get all the faculty information by click the faculty menu at the top of the news page.

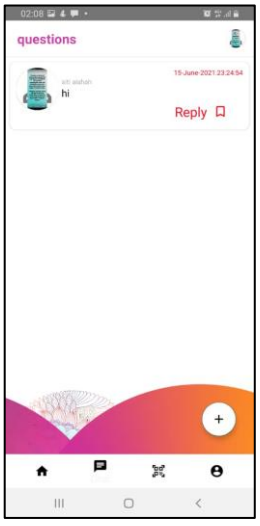


Figure 4.13: Q&A Page

Figure 4.7 shows the Q&A page. This page is used by all user (admin, facilitator, student). Everyone can upload questions, and anyone can answer the question regardless of the role of user. This page also allow user to bookmark the question that important by just click at the save icon. The user can refer to the selected question more easily than they must scroll one by one to search that important question.

Figure 4.14: Replay Question Page

Figure 4.8 shows the reply question page. If there are the answers, everyone can vote the most suitable, correct answer by click UPVOTE text view. The number of votes will be display at the right corner of the answer.

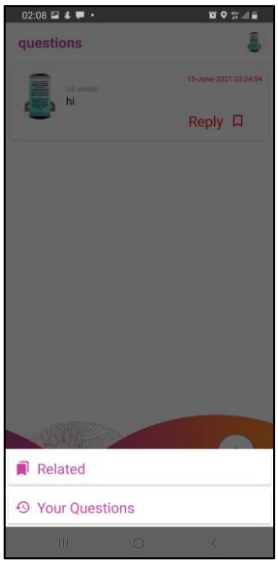


Figure 4.15: Bottom Sheet Dialog for Q&A Page

Figure 4.9 shows the bottom sheet dialog when user click the profile icon at the top right corner. The users can choose either to click the “Related” button or “Your Question” button. If the user chooses “Related” button, it will go to bookmarked question and if the user choose “Your Question” button, it will got to users’ posted page.

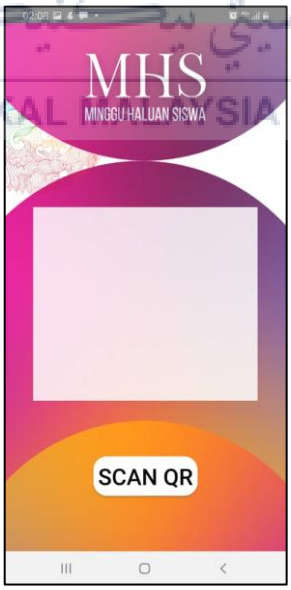


Figure 4.16 Scan QR code Page

Figure 4.10 shows the page that student can take attendance by using QR code. Only student have this page because the only new-intake student need to submit

attendance as the proof that they attend the event. After student scan the QR, the event details, user details will be show up in the page.

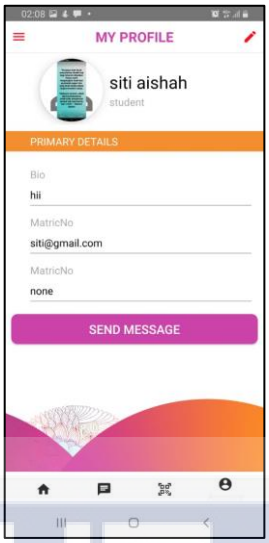


Figure 4.17: User Profile Page

Figure 4.11 shows the user profile page. This page is available for all users. The users need to fill the profile page first before use the system. In this page, it also provides the edit button that will start the intent to go to update profile page. In this page also, the users can press the “Send Message” button to start chatting with the other user.

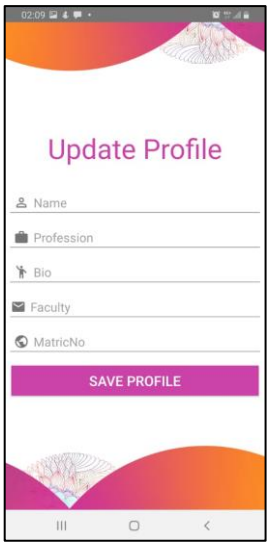


Figure 4.18: Update Profile Page

Figure 4.12 shows that the update profile page. The users can update their profile by insert the updated personal information and press the "Save Profile" button. The updated data will be saved in database.

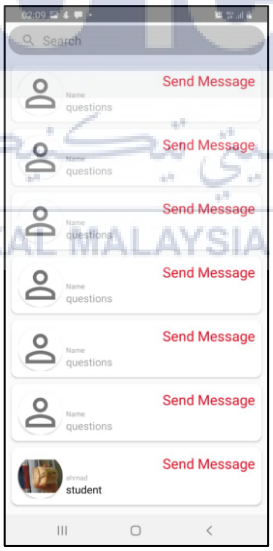


Figure 4.19: Choose User Page

Figure 4.13 shows the page that allow user to select the targeted user that they want to chat. The search function implemented to help the user to search in convenient way. They can search people by using the targeted name and the result will be displayed on the page.

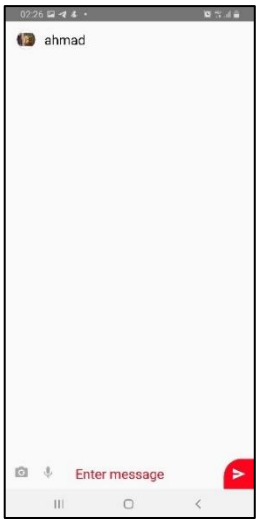


Figure 4.20: Send Message Page

Figure 4.14 shows the message page where the user can send message to the other user. Beside text, user also can send picture. If the receiver start replaying, "is typing." message will be display at the top of the page.

Figure 4.21: Create New Post Page

Figure 4.15 shows the create new post page. This page is only available for admin. Only admin can post the news or latest information. This page also allow admin to edit the description of the post and delete the post. All the changed data will be saved in the database.

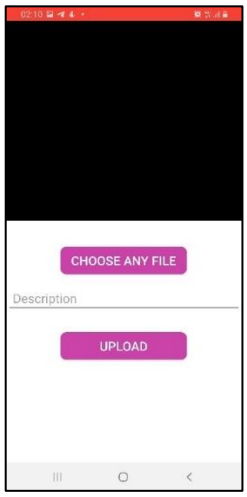


Figure 4.22: Choose Picture and Description Page

Figure 4.16 shows the page that allows the admin to choose the picture that going to be posted. The admin should pick the picture and input the description of the new post. When admin click upload button, the post data will be saved in the database and will be displayed on the news page.

4.2.3 Database Design

4.2.3.1 Conceptual and Logical Database Design

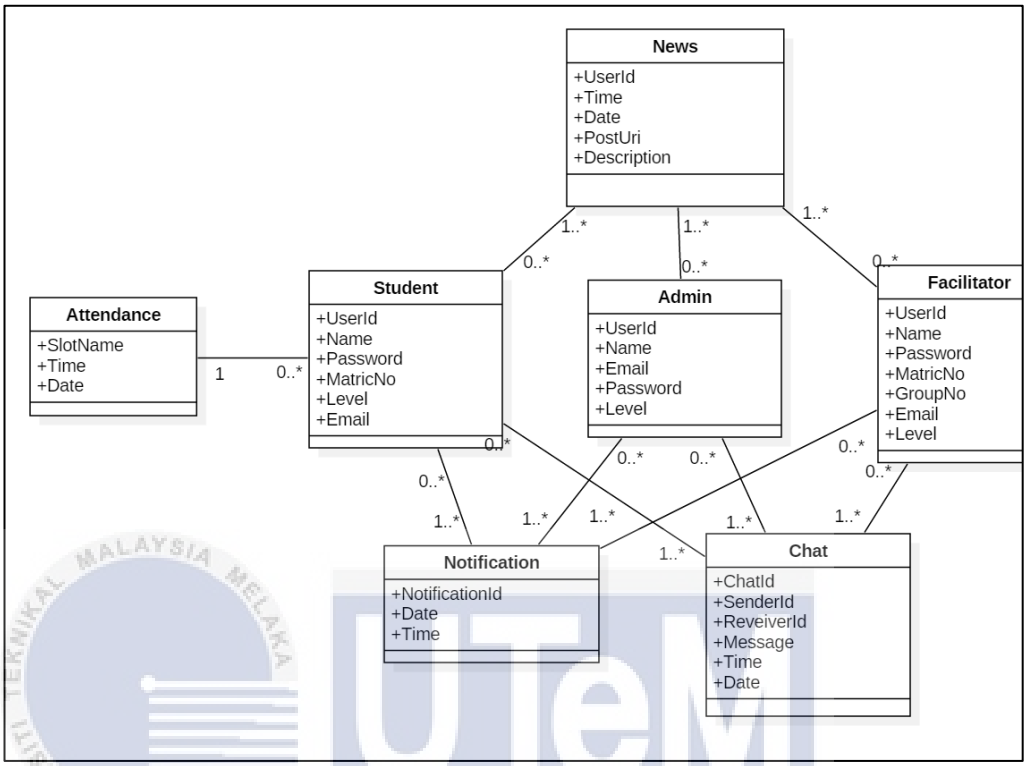


Table 4.1: Data dictionary for student

Field Name	Data Type	Field Length	Constrain	Description
UserId	varchar	N/A	Primary Key	Unique identification for each user
name	varchar	N/A	Not null	
email	varchar	N/A	Not null	
matricNo	varchar	N/A	Not null	
faculty	varchar	N/A	Not null	

level	varchar	N/A	Not null	This attribute is used for user identification to determine the user is student, facilitator, or admin

Table 4.2: Data Dictionary for Facilitator

Field Name	Data Type	Field Length	Constrain	Description
UserId	varchar	N/A	Primary Key	Unique identification for each user
name	varchar	N/A	Not null	
email	varchar	N/A	Not null	
matricNo	varchar	N/A	Not null	
Groupno	varchar	N/A	Not null	Student will be given a MHS group number in the university offer letter. The student needs to refer

				to the assigned facilitator to get help.
level	varchar	N/A	Not null	This attribute is used for user identification to determine the user is student, facilitator, or admin

Table 4.3: Data Dictionary for Admin

Field Name	Data Type	Field Length	Constrain	Description
UserId	varchar	N/A	Primary Key	Unique identification for each user
name	varchar	N/A	Not null	
email	varchar	N/A	Not null	
website	varchar	N/A	Not null	
level	varchar	N/A	Not null	This attribute is used for user identification to determine the user is student,

				facilitator, or admin

Table 4.4: Data Dictionary for Chat

Field Name	Data Type	Field Length	Constrain	Description
ChatId	varchar	N/A	Primary Key	
SenderId	varchar	N/A	Foreign Key	
ReceiverId	varchar	N/A	Foreign Key	
SenderName	varchar	N/A	Not null	
Message	varchar	N/A	Not null	
Time	Time	N/A	Not null	
Date	Date	N/A	Not null	

Table 4.5: Data Dictionary for Attendance

Field Name	Data Type	Field Length	Constrain	Description
SlotName	varchar	N/A	Primary Key	
Time	Time	N/A	Not null	
Date	Date	N/A	Not null	

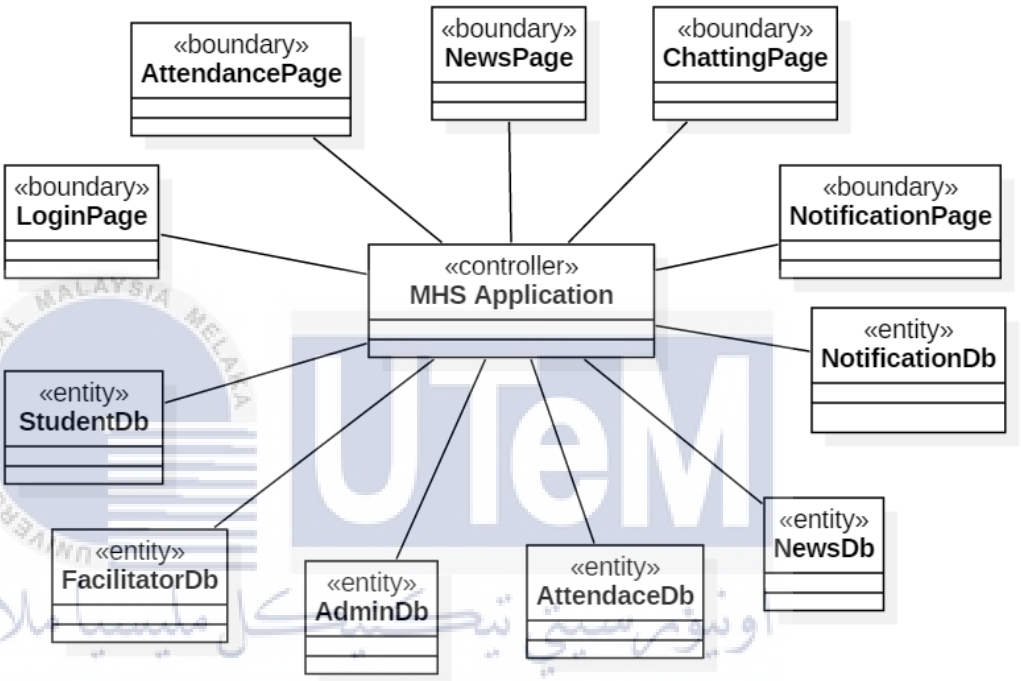
Table 4.6: Data Dictionary for News

Field Name	Data Type	Field Length	Constrain	Description
UserId	varchar	N/A	Foreign Key	The name of user that post the news
Time	Time	N/A	Not null	
Date	Date	N/A	Not null	
PostUri	Url	N/A	Not null	The image url that being upload
Description	varchar	N/A	Not null	The news description

4.3 Detailed Design

The specification of the internal elements of all major system components, their properties, relationships, processing, and, in many cases, their algorithms and data structures, is known as detailed design.

4.3.1 Software Design



4.3.1.1 Class Description

Class description describes the class properties and its method.

Class Authentication

Table 4.7: Class Description For MHS APllication

Interface class:	class
Responsibility:	To verify authorized user and to differentiate the user based on role
Attributes:	Email: String, Password: String

Method:

VerifyEmailAndPassword	
Responsibility:	Check the account is exist or not, assign the user based on role.
Input Parameter:	Email: String, password: String
Output Parameter:	Exist: boolean
I/O Table:	StudentDb, AdminDb, FacilitatorDb
Pre-condition:	Fill the email and password field

Post-condition:	The users successfully enter the application

Algorithm:	BEGIN
	
	IF (Email and password in StudentDb || AdminDb || FacillitatorDb exist)
	
	IF (Password is correct)
	
	IF (level == student)
	
	Then exist = true
	
	Go to student page
	
	ELSE IF (level == Facilitator)
	
	Then exist = true
	
	Go to facilitator page
	
	ELSE
	
	Then exist = true
	
	Go to admin page
	
	ELSE
	
	Display “Email or password is not correct”
	
	Then exist = false
	
	END

Class News

Interface class:	class
Responsibility:	To add news in the form of picture and text.
Attributes:	Picture:url, description:String, adminId:String, Exist: boolean

Method:

AddNewNews	
Responsibility:	To add new news (by adminOnly)
Input Parameter:	Picture:url, description:String, AdminId: String
Output Parameter:	Exist: boolean
I/O Table:	AdminDb, NewsDb
Pre-condition:	Choose picture and enter the news description
Post-condition:	The news is successfully added and can be displayed in the other users' page.

Algorithm:	BEGIN
	
	IF (exist == true)

	Display picture and description
	
	ELSE
	
	Admin input picture and description
	
	IF (successful)
	
	Exist =true
	
	Display picture and description
	
	ELSE
	
	Exist=false
	
	END

Method:

DisplayNews	
Responsibility:	To display all the news at the news page
Input Parameter:	-
Output Parameter:	Exist: Boolean, Picture:url, description:String,
I/O Table:	AdminDb, NewsDb
Pre-condition:	Choose picture and enter the news description

Post-condition:	The news is successfully added and can be displayed in the other users' page.

Algorithm:	BEGIN
	
	IF (exist == true)
	
	Display picture and description
	
	ELSE
	
	Display message "No news yet"
	
	END

Class Attendance

Interface class:	class
Responsibility:	To allow students' details are retrieve by scanning QR code
Attributes:	Name: String, date:date. Time:time, eventName:String

Method:

ScanQR	
Responsibility:	To retrieve the event name, users' details to be displayed
Input Parameter:	-
Output Parameter:	Name: String, date:date. Time:time, eventName:String, Exist:boolean
I/O Table:	StudentDb
Pre-condition:	Use the QR scanner provided in the app
Post-condition:	The attendance are taken, the students' and event details are displayed

Algorithm:	BEGIN
	Scan the QR code
	
	IF (exist==true)
	
	Student details and event details are displayed on the screen
	
	ELSE
	
	Display error message
	
	END

Class Notification

Interface class:	class
Responsibility:	To notify the event date and time to all the user
Attributes:	EventName:String, Date:date, Time: time

Method:

NotifyUser	
Responsibility:	To notify the event date and time to all the user
Input Parameter:	-
Output Parameter:	EventName:String, Date:date, Time: time
I/O Table:	NotificationDb
Pre-condition:	The notification details must be set manually at the Cloud Messaging
Post-condition:	The notification is displayed on time

Algorithm:	BEGIN
	
	Check the notification in the Cloud Messaging
	
	IF (Exist)

	Notify the user END

Class Chatting

Interface class:	class
Responsibility:	To allow users to send message to each other
Attributes:	MessageSend:String,MessageRecieve:String, StudentId:String, FacilitatorID:String, AdminId:String

Method:

SendMessage	
Responsibility:	To allow user to send message to another user
Input Parameter:	MessegeSend:String
Output Parameter:	
I/O Table:	MessageDb
Pre-condition:	The user must choose the target user that they want to send message
Post-condition:	The message is received by the target user

Algorithm:	BEGIN
	
	Choose the target user
	
	IF (Exist)
	
	Enter the message
	
	Click the send button
	
	IF (success)
	
	Display the message
	
	Else
	
	Display error message
	
	END

ReceiveMessage	
Responsibility:	To allow user to view the message send by the other user
Input Parameter:	-
Output Parameter:	MessageReceive:String, MessageSent:String, UserId:String
I/O Table:	MessageDb
Pre-condition:	The message must be sent by the different user

Post-condition:	The send message is displayed

Algorithm:	BEGIN
	
	IF (MessageSent != Not Null)
	
	MessageReceive==true
	
	Display MessageRecieve
	
	Else
	
	Display “No message yet”
	
	END

4.3.2 Physical Database Design

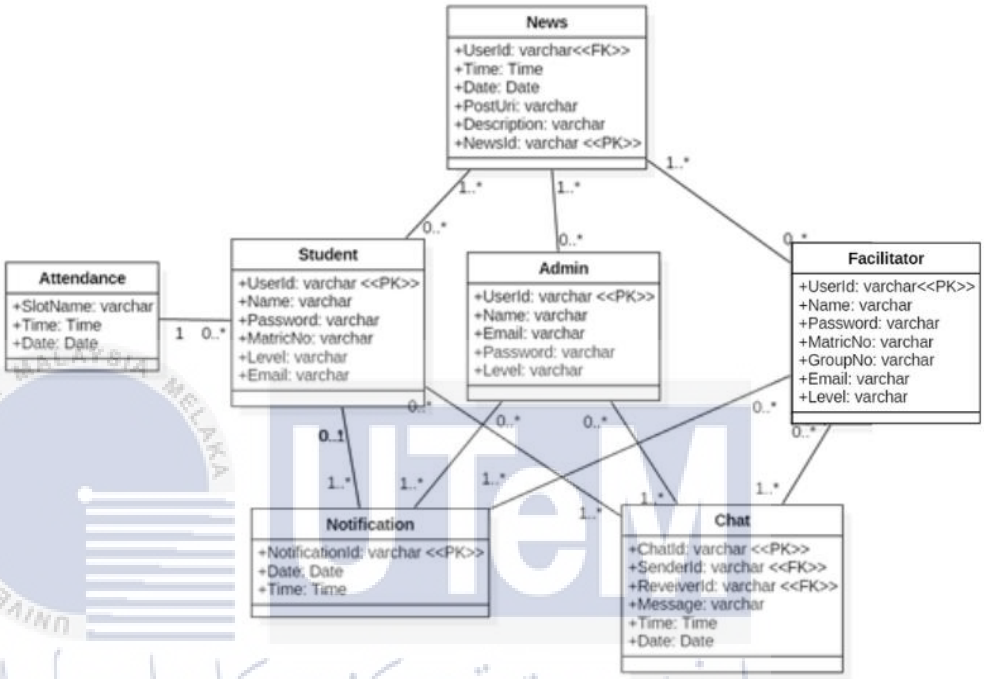


Figure 4.23: Detail UML for MHS Application

4.4 Conclusion

The overall system design is discussed in this chapter. This MHS Application design is divided into several categories: high level design and detail design. In the detail design, UML is created to show the interrelationship between the class in the MHS Application database. In the next chapter, it will discuss about the implementation phase to this MHS application system.

CHAPTER 5: IMPLEMENTATION

5.1 Introduction

The Implementation Phase's goal is to deploy and enable the new information system's activities in the production environment. The activity that involves during this implementation phase are system development environment setup, system configuration management setup, version control setup and the system implementation status.

5.2 Software Development Setup

For this project, Android Development Environment Setup is being used. To build an application for Android, it needs Java Development Kit (JDK), Android SDK and development environment (Android Studio). Android Development Environment can easily set up in any operating system to implement android applications by using the Android Studio package.

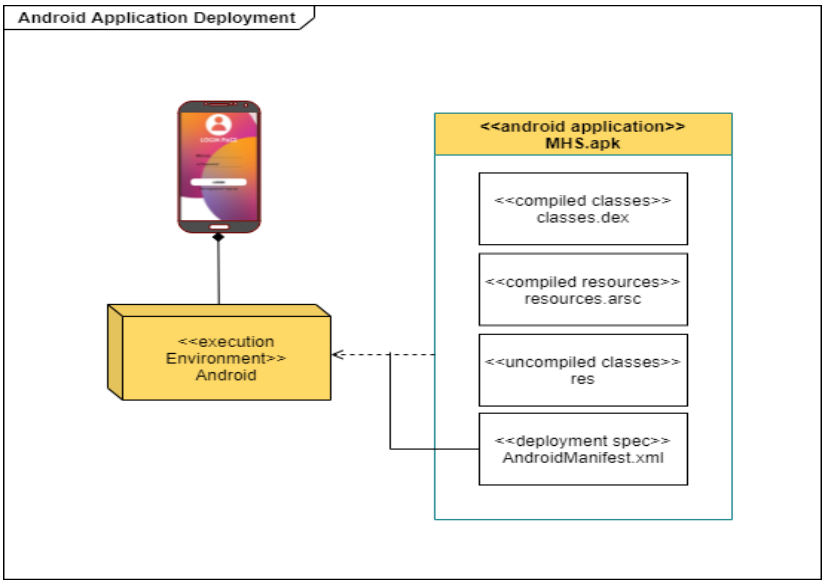


Figure 5.1: Deployment Diagram for MHS Application

5.2.1 Android Studio

Android Studio is the official integrated development environment for Android application development and build based on the IntelliJ IDEA. Android Studio delivers the quickest tools for developing apps for every Android device. It is compatible with Windows, Mac OS X, and Linux operating systems. MHS application was created using Android Studio.

5.2.2 Firebase Database

The Firebase Realtime Database is a cloud-hosted NoSQL database that lets user to store and sync data between the users in real-time (Shi, 2021). The Firebase database is straightforward and easy to set up. It includes documentation and collection querying, real-time data synchronization, and multiplatform support, including iOS, Android, and the Web system development kit, with offline data access. This NoSQL database are implemented to back of this MHS application since it easy to use and can synchronize data in real-time.

5.3 Software Configuration Management

During the Software Development Life Cycle, Software Configuration Management (SCM) is a technique for systematically managing, organizing, and controlling changes in documents, codes, and other entities. The main goal is to enhance production while making as few mistakes as possible.

5.3.1 Configuration environment setup

Configuration management is a method of keeping computer systems, servers, and software in a consistent, desired condition. It's a method of ensuring that a system continues to work as intended while changes are made over time.

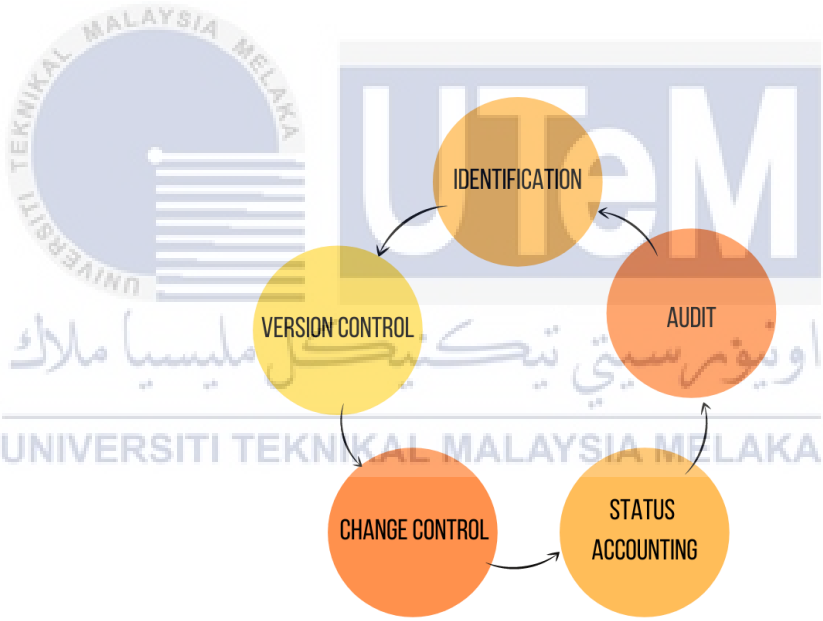


Figure 5.2 Software Configuration Management Process

Planning And Identification

Planning and identification are the first steps in the process. The purpose of this step is to plan for the software project's development and to identify the item that fall within its scope. This stage includes the following activities, for example identifying test cases, specification requirements, and code modules.

Version Control

The goal for this step is to keep track and control the changes being made for the product (system). By establishing an accepted version of the software, the version control and baseline phase ensures that the product maintains its integrity.

Change Control

Change control refers to the process of ensuring that any modifications made to the project are in line and consistent with the rest of the project. These controls aid in quality assurance and essential to the project success. This phase includes checking the merit of the change request by checking the overall impact they will have on the project when the systems' modification occurs.

Status Accounting

The next phase is to test and verify that the project is progressing and developing as planned by testing and validating against established baselines. Configuration status accounting keeps track of each version issued during the process, evaluating what's new in each and why the modifications were required. The activities involve in this process are monitoring the status of changes and checking the previous version for analysis and testing.

Audit

The goal of this process is to review of every stage in the software development life cycle (SDLC) to make sure the project is consistent and complete, and met the projects' goals.

For this MHS Application, GitHub is used as the code hosting platform for version control to support the configuration control.

5.3.2 Version Control Procedure

The source code version of this system is controlled automatically by GitHub. The features of version control system in GitHub allows developers to make real-time collaboration, download the new version of the software, keep track of the various changes made to every iteration during the system development.

In the documentation version control for MHS Application, they are stored by the date format. For example, “ReportMHS270721” so that the newest document version can easily be tracked.

5.4 Implementation Status

Table 5.1 MHS Application development status

Module Name	Description	Duration to complete	Date completed
Authentication module	This module will verify the 3 users (admin, student, facilitator) before entering to the system	2 weeks	10/5/2021
Attendance module	This module allows student to take the program attendance	1 week	17/5/2021
Chat module	This module allows student to chat with the facilitator	3 weeks	6/6/2021

News module	This module will allow student and facilitator to get news that being posted by admin	2 weeks	20/6/2021
Notification module	This module will notify the event to the users	6 weeks	25/8/2021

5.5 Conclusion

The implementation phase is crucial in order to successfully complete the software system based on project requirement and standard. In this phase, MHS application is developed according to the planning, requirement generated in the previous phase and the system also configurated and installed. In the next chapter, it will discuss about system testing that includes many activities such as test environment, test strategy and test design.

CHAPTER 6: TESTING

6.1 Introduction

Software testing is a process by which people, methods, measurements, tools, and equipment are integrated to testing a software product. The goal of the testing is to determine whether the system complies with specific standards. Software testing also a process that identifies error as many as possible to produce a high-quality software product. All the testing procedures will be generated in this chapter, such as Test Plan, Test Strategy, Test Design and it is necessary to a guide a tester what should they do and to avoid common mistake happed during the testing process.

6.2 Test Plan

A Test Plan is a detailed document that outlines the test strategy, objectives, timetable, estimation, deliverables, and resources needed to accomplish software testing. The Test Plan assists us in determining the amount of effort required to validate the quality of the application being tested.

6.2.1 Test Organization

In this testing process, it is involved 6 testers. The tester details are described below:

Table 6.1 The tester details for MHS application

Tester Id	Name	Ic No	University
Tester001	Nurul Asyiqin Binti Mohd Helmi	991104-10-5924	Universiti Teknikal Malaysia Melaka (FPTT) B061910354

Tester002	Erliana Binti Abdul Razak	900812-10-5048	Not available
Tester003	Noraishah Binti Jaafar	990905-10-5014	Universiti Teknikal Malaysia Melaka (FTMK) B031810344
Tester004	Nurul Fauziah Binti Mohamad Rais	940911-10-5728	Not available
Tester005	Muhammad Azli Bin Zakaria	940725-10-5599	Not available
Tester006	Siti Nur Hanna Binti Zakaria	991218105594	Universiti Teknikal Malaysia Melaka (FTMK) B031810384

6.2.2 Test Environment

The testing process carried out in the testers' accommodation due to Movement Control Order (MCO) restriction. The testers' accommodation is in Banting, Selangor. The hardware needed for this testing process are laptop and Android smart phone. Both of the applications (MHS application for admin only and MHS application for student and facilitator) are installed to the Android smart phone and the test document is forwarded to tester one day before to ease the tester to make preparation. The flow of the system is described to make sure the tester fully understands about the application.

6.2.3 Test Schedule

Table 6.2 MHS application test schedule

Test Step	Start Date	End Date
Test Planning		
Build Test Plan	26/7/2021	3/8/2021
Test Case Design		
Design functional test	4/8/2021	20/8/2021
Test Execution		
Setup and testing	24/8/2021	25/8/2021
Conduct system testing	26/8/2021	26/8/2021
Review	26/8/2021	1/9/2021

6.3 Test Strategies

The strategy selected for MHS Application is bottom-up testing. This strategy is selected because MHS application implements object-oriented programming language (Java). In object-oriented programming language, modules are created first, then are integrated with the main function. Test drivers are used in bottom-up integration testing to drive and pass necessary data to lower-level modules. These drivers are replaced with the actual module as soon as the code for the other module is ready. Using models, a bottom-up strategy examines and analyzes the risks in individual processes.

MHS application tested by several levels of testing, that is Unit Testing, Integration Testing. In Unit Testing, the individual components of the software are tested to validate each of the functions of the software code is performing as expected. Unit testing is a type of White-Box testing done by the developer during the system development phase. Unit tests save time and money by fix bugs or flaws in the code early in the development cycle. It assists developers in understanding the testing code base and allowing them to make quick adjustments.

Next, Integration Testing the goal of this level of testing is to find flaws in the way various software modules interact when they're combined. This testing is done by programmer or developer and tester. The Integration Testing is done by using Black-box testing. Integration testing is required to ensure that the software parts work together. Black-box testing is a software testing method in which the functionalities of software are tested without having any knowledge of internal code. Black-box testing is concern on the behavior or features of the software product. All testing is done from the perspective of the client, and the tester only knows what the software is meant to accomplish, not how the requests are handled by the software.

6.3.1 Classes of tests

In Unit Testing, White-box testing are conducted manually without using any White-box testing tools such as Parasoft Jtest, EclEmma, NUint, PyUnit. The advantages of conducting White box testing during the system development is it is improved code optimization by finding the hidden errors.

Next, for Integration Testing is done by using Black-box testing. There are two types of Black-box Testing that are conducted in this testing process that is Use Cases Tests and equivalent partitioning. A use case is a visual representation of a user's engagement with a system, or any action that provides tangible value to the user. It can test the specific features of the system or software. For example, check whether a student can login into a system as facilitator or not. Lastly, for equivalent partitioning are used when there is a specification about the function. For example, if the systems claim that the password should have more than 6 characters to improve the security.

6.4 Test Design

Test design is a method for describing “how” testing should be carried out. It contains procedures for identifying test cases by listing the steps of the defined test criteria. The steps are enumerated using the testing approaches indicated in the test strategy or plan.

6.4.1 Test Description

In this phase, it will describe the test cases for Unit-Testing and Integration Testing. 6.4.1.1 will describe all the test cases for Unit Testing and 6.4.1.2 – 6.4.1.6 will describe about the Integration Testing.

6.4.1.1 Unit Testing

(a) Sign-up function testing

Figure 6.1 Code snippet for Sign-up function

Table 6.3 Unit test for sign-up function

Test Case ID	Condition	Test Data	Expected Result
UT_SignUp_001	If (email field == empty)	None	Error message will be displayed
UT_SignUp_002	If (password filed == empty or password less than 6 characters)	Password: hanna	Error message will be displayed
UT_SignUp_003	If (password filed && email field != empty)	Email: hanna@gmail.com Password: abc123	The code will verify if the user does not exist then the registration is successful

In this unit testing, it will test the function that will verify the email and password field when they have clicked in the sign-up button. If those condition is not true, then the system will validate if the user are existing in the database.

(b) Login function testing

```
firebaseDatabase.getReference().child(task.getResult().getUser().getUid())
        .addValueEventListener(new ValueEventListener() {
            @Override
            public void onDataChange(@NonNull DataSnapshot snapshot) {
                UserDetail userDetail = snapshot.getValue(UserDetail.class);
                assert userDetail != null;
                String lvl = userDetail.getLevel();
                if(lvl.equals("Facilitator"))
                {
                    Intent i = new Intent(getApplicationContext(), FaciMainActivity.class);
                    Toast.makeText(getApplicationContext(), text: "Login Successful",Toast.LENGTH_SHORT).show();
                    // CustomToast.createToast(getApplicationContext(), "Login Successful",
                    //     false);
                    i.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK | Intent.FLAG_ACTIVITY_CLEAR_TASK);
                    i.putExtra( name: "name", lvl);
                    startActivity(i);
                }
                else
                {
                    Intent i = new Intent(getApplicationContext(), MainActivity.class);
                    Toast.makeText(getApplicationContext(), text: "Login Successful",Toast.LENGTH_SHORT).show();
                    // CustomToast.createToast(getApplicationContext(), "Login Successful",
                    //     false);
                    i.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK | Intent.FLAG_ACTIVITY_CLEAR_TASK);
                    i.putExtra( name: "name", lvl);
                    startActivity(i);
                }
```

Figure 6.2 Code snippet for Login function

Table 6.4 Unit test for login function

Test Case ID	Condition	Test Data	Expected Result
UT_Login_001	If (email field == empty)	None	Error message will be displayed
UT_ Login _002	If (password filed == empty)	None	Error message will be displayed
UT_ Login _003	If (password filed && email field != empty)	Email: hanna@gmail.com Password: abc123	The code will verify if the user are facilitator or not
UT_ Login _004	If (user = student)	User: student	The user will go to student homepage

UT_ Login _005	If(user = facilitator)	User: facilitator	The user will go to facilitator homepage

In this unit testing, it will test the sign in function where the user make attempt to enter to the system. Firstly, the condition for this function is to check whether the email and password field are field by the user. If those condition are false, then the system must verify the user type whether they are a student or a facilitator.

(c) Profile view holder function

```
public void setProfileInchat(Application fragmentActivity, String name, String uid, String prof,
                             String url){

    FirebaseUser user = FirebaseAuth.getInstance().getCurrentUser();
    String userid = user.getUid();

    ImageView imageView = itemView.findViewById(R.id.iv_ch_item);
    TextView nametv = itemView.findViewById(R.id.name_ch_item_tv);
    TextView proftv = itemView.findViewById(R.id.ch_itemprof_tv);
    sendmessagebtn = itemView.findViewById(R.id.send_messagech_item_btn);

    if (userid.equals(uid)){
        Picasso.get().load(url).into(imageView);
        nametv.setText(name);
        proftv.setText(prof);
        sendmessagebtn.setVisibility(View.INVISIBLE);
    }else {
        Picasso.get().load(url).into(imageView);
        nametv.setText(name);
        proftv.setText(prof);
    }
```

Figure 6.3 Code snippet for profile view holder function

Table 6.5 unit test for message function

Test Case ID	Condition	Test Data	Expected Result
UT_MessageProfile Holder _001	If (user id = current user id)	Login as hanna@gmail.com	The send message button in the users' profile is invisible
UT_MessageProfile Holder _002	If (user id!= current user id)	Login as SitiZainon@gmail.com	The hanna's send message button is visible

In this unit testing, it will test the function of prevent or forbit the current user to send message to themselves. This code snippet shall make the send message button invisible in their profile at the user profile message page.

(d) QR Scanner function

```
//   qrScan.initiateScan();
    Calendar cdate = Calendar.getInstance();
    SimpleDateFormat currentdate = new SimpleDateFormat( pattern: "dd-MMMM-yyyy");
    final  String savedate = currentdate.format(cdate.getTime());

    Calendar ctime = Calendar.getInstance();
    SimpleDateFormat currenttime = new SimpleDateFormat( pattern: "HH:mm:ss");
    final String savetime = currenttime.format(ctime.getTime());

    documentReference.get()
            .addOnCompleteListener(new OnCompleteListener<DocumentSnapshot>() {
                @Override
                public void onComplete(@NonNull Task<DocumentSnapshot> task) {

                    if (task.getResult().exists()){
                        String nameResult = task.getResult().getString( field: "name");
                        textViewUserName.setText(nameResult);
                        textViewDate.setText(savedate);
                        textViewTime.setText(savetime);
                    }else {
                        Toast.makeText( context: QRScannerActivity.this,  text: "QR not valid ",
                                Toast.LENGTH_SHORT).show();
                    }

                }
            });
```

Figure 6.4 Code snippet for QR scanner function

Table 6.6 Unit test for Attendance function

Test Case ID	Condition	Test Data	Expected Result
UT_QRscanner_ 001	If (QR code is valid)	Valid QR code	The current time, date, users' name, event name shall be displayed
UT_QRscanner_ 002	If (QR code is invalid)	Invalid QR code	Error message will be displayed

In this unit testing, it will test the function QR scanning function. If the scanner scans the valid QR code, all the attendance data shall be displayed at the page.

6.4.1.2 Authentication Module

(e) User Register

Table 6.7 Equivalence Partitioning for register function

Test Case ID	Password Characters	Partition Tested	Expected Output
TC_PasswordField_001	8	PasswordCharacter>5	OK
TC_PasswordField_002	2	0<PasswordCharacter<=5	Error Message
TC_PasswordField_003	5	PasswordCharacter<5	Error Message

In this equivalence portioning, it will test the password filed. The system claim that the users' password must have 6 characters and above. So, this equivalence portioning will test the password filed on registration page.

Precondition: None

Table 6.8 Test case for Register User

Test Case ID	Test Scenario	Test Case	Expected Result
TC_UsersRegister_001	Verify email and password field	Email and password field cannot be empty	Error message will be displayed if the fields is left empty
TC_UsersRegister_002	Verify password field	Enter password less than 6 characters	Error message will be displayed, and user need to reenter password at least 6 characters
TC_UsersRegister_003	Verify register button	Enter email and password and choose user type	Successful message will be displayed, and it will go to login page

(f) User Login

Precondition: User registration must be successful

Table 6.9 Test case for User Login

Test Case ID	Test Scenario	Test Case	Expected Result
TC_UsersLogin_001	Verify email and password field	Email and password field cannot be empty	Error message will be displayed if the fields is left empty
TC_UsersLogin_002	Verify login button	Enter incorrect email and password	Error message will be displayed, and user need to re-enter email and password
TC_UsersLogin_003	Verify login button	Enter correct email and password	User successfully login and go to the mainpage based on their role

6.4.1.3 News Module

(a) Add News

Precondition: Login as admin (email: tuahutem@gmail.com, password: abc123)

Table 6.10 Test case for Add News

Test Case ID	Test Scenario	Test Case	Expected Result
TC_AddNews_001	Verify create post button	The user must lead to crate post page after they click the create post button on the bottom menu	The create post page must be displayed
TC_AddNews_002	Verify upload button	Choose picture and enter the news description	Successful message must be displayed

(b) View News

Precondition: Login as student or facilitator (email: hanna@gmail.com, password: abc123)

Table 6.11 Test case for View News

Test Case ID	Test Scenario	Test Case	Expected Result
TC_ViewNews_001	Verify news page	View news uploaded by admin	News must be displayed on the news page
TC_ViewNews_002	Verify download button	Download news picture	The news' picture must be downloaded and saved on the device
TC_ViewNews_003	Verify share button	Share the news on the other devices' application	The news must be shared on other device social media
TC_ViewNews_004	Verify copy URL button	Paste the URL on the other devices' application	The news' picture URL must be pasted
TC_ViewNews_005	Verify University image view	Click the university image view	To be directed to university info page
TC_ViewNews_006	Verify Faculty image view	Click the faculty image view	To be directed to faculty info page
TC_ViewNews_06	Verify Message image view	Click the message image view	To be directed to chatting page

6.4.1.4 Chat Module

(a) Send Message

Precondition: Login as student (email: hanna@gmail.com,

password: abc123)

Table 6.12 Test case for Send Message

Test Case ID	Test Scenario	Test Case	Expected Result
TC_SendMessage_001	Verify send button	Message fields cannot leave empty	Error message "Cannot send empty message" will be displayed
TC_SendMessage_002	Verify send button	Send message to another user	Message must be sent to the selected user
TC_SendMessage_003	Verify upload picture button	Choose a picture to send to the other user	The picture must be successfully sent to the other user

(b) Reply Message

Precondition: Login as facilitator (email: siti@gmail.com, password: abc123)

Table 6.13 Test case for Reply Message

Test Case ID	Test Scenario	Test Case	Expected Result
TC_ReplyMessage_001	Verify chat page	The message from the student must be received and displayed	The other users' message must be displayed on the chatting page
TC_ReplyMessage_002	Verify send button	Message fields cannot leave empty	Error message "Cannot send empty message" will be displayed
TC_ReplyMessage_03	Verify upload picture button	Choose a picture to send to the other user	The picture must be successfully sent to the other user
TC_ReplyMessage_04	Verify typing status	Start type in the message text view	When the other user start replaying, the typing status must be displayed

6.4.1.5 Attendance Module

(a) ScanQR

Precondition: Login as student (email: hanna@gmail.com, password: abc123)

Table 6.14 Test case for ScanQR

Test Case ID	Test Scenario	Test Case	Expected Result
TC_ScanQR_001	Verify scan button	Click the scan QR button	The QR scanner must be started
TC_ScanQR_002	Verify scan button	The QR scanner scan the correct QR code	The user and event details must be displayed
TC_ScanQR_003	Verify scan button	The QR scanner scan the incorrect QR code	Error message “Cannot be read” will be displayed

6.4.1.6 Notification Module

(b) Receive Notification

Precondition: Login as student (email: hanna@gmail.com,

password: abc123)

Table 6.15 Test case for Receive Notification

Test Case ID	Test Scenario	Test Case	Expected Result
TC_ReceiveNotification_001	Verify receive notification	The device is connected to the internet	The event notification must be displayed

6.4.2 Test Data

6.4.2.1 Authentication Module

(c) User Register

Precondition: None

Table 6.16 Test data for User Registration

Test Case ID	Test Data	Expected Result
TC_UsersRegister_001	Email: None Password: None	Error message will be displayed if the fields is left empty
TC_UsersRegister_002	Password: 1. A01 2. A02 3. A003 4. A004s 5. A005 6. A006c 7. A007 8. A008g 9. A009 10. A010e 11. B001a 12. B0192 13. B0033 14. B0802 15. B0045 16. B0902 18. B0017 17. B0172 19. B001f 20. B0142	Error message will be displayed, and user need to reenter password at least 6 characters

	21. C0011 22. C0102 23. C0012 24. C0102 25. C0013 26. C0102 27. C0014 28. C0102 29. C0015 30. C0102	
TC_UsersRegister_003	Email, Password: 1. SitiNurBalqish@gmail.com, Abc123 2. NurulIffahDamia@gmail.com, Abc123 3. SitiZainon@gmail.com, Abc123 4. NurulFauziah@gmail.com, Abc123 5. NuriNoraizan@gmail.com, Abc123 6. Abdullatif@gmail.com, Abc123 7. MuhdIzwan@gmail.com, Abc123 8. MuhdAsyrof@gmail.com, Abc123 9. MuhdIzwan@gmail.com, Abc123 10. MuhdAzli@gmail.com, Abc123 11. Yooksungjae@gmail.com, , Abc123	Successful message will be displayed, and it will go to login page

	12. leechangsub@gmail.com, Abc123 13. seoeunkwang@gmail.com, Abc123 14. leeminhyuk@gmail.com, Abc123 15. hyungsikIm@gmail.com, Abc123 16. jungIlhoon@gmail.com, Abc123 17. MoonJunhui@gmail.com, Abc123 18. woozi@gmail.com, Abc123 19. kwonHoshi@gmail.com, Abc123 20. Joenwonwoo@gmail.com, Abc123 21. MinguKim@gmail.com, Abc123 22. LeeDoKyeom@gmail.com , Abc123 23. MingHaou@gmail.com, Abc123 24. SungkwanBoo@gmail.com, Abc123 25. LeeChan@gmail.com, Abc123 26. VernonChwe@gmail.com, Abc123 27. Scoups@gmail.com, Abc123	

	28. SophiaChew@gmail.com, Abc123 29. JoshuaHong@gmail.com, Abc123 30. PenielShin@gmail.com, Abc123	

(d) User Login

Precondition: The user registration must be successful

Table 6.17 Test data for User Login

Test Case ID	Test Data	Expected Result
TC_UsersLogin_001	Email: None Password: None	Error message will be displayed if the fields is left empty
TC_UsersLogin_002	Email: han@gmail.com Password: abc123	Error message will be displayed, and user need to re-enter email and password
TC_UsersLogin_003	1. SitiNurBalqish@gmail.com, Abc123 2. NurulIffahDamia@gmail.com, Abc123 3. SitiZainon@gmail.com, Abc123	User successfully login into system based on their role

	4. NurulFauziah@gmail.com, Abc123 5. NuriNoraizan@gmail.com, Abc123 6. Abdullatif@gmail.com, Abc123 7. MuhdIzwan@gmail.com, Abc123 8. MuhdAsyrof@gmail.com, Abc123 9. MuhdIzwan@gmail.com, Abc123 10. MuhdAzli@gmail.com, Abc123 11. Yooksungjae@gmail.com, , Abc123 12. leechangsub@gmail.com, Abc123 13. seoeunkwang@gmail.com, Abc123 14. leeminhyuk@gmail.com, Abc123 15. hyungsikIm@gmail.com, Abc123 16. jungIlhoon@gmail.com, Abc123 17. MoonJunhui@gmail.com, Abc123 18. woozi@gmail.com, Abc123	

	19. kwonHoshi@gmail.com, Abc123 20. Joenwonwoo@gmail.com, Abc123 21. MinguKim@gmail.com, Abc123 22. LeeDoKyeom@gmail.com , Abc123 23. MingHaou@gmail.com, Abc123 24. SungkwanBoo@gmail.com, Abc123 25. LeeChan@gmail.com, Abc123 26. VernonChwe@gmail.com, Abc123 27. Scoups@gmail.com, Abc123 28. SophiaChew@gmail.com, Abc123 29. JoshuaHong@gmail.com, Abc123 30. PenielShin@gmail.com, Abc123	

6.4.2.2 News Module

(e) Add News

Precondition: Login as admin (email: tuahutem@gmail.com, password: abc123)

Table 6.18 Test data for Add News

Test Case ID	Test Data	Expected Result
TC_AddNews_001	Picture: Any picture forms the device Description: None	Error message will be displayed if the fields is left empty
TC_AddNews_002	Picture: Any picture forms the device Description: Welcome to Universiti Teknikal Malaysia Melaka (UTeM)	Successful message must be displayed

(f) View News

Precondition: Login as student or facilitator (email: hanna@gmail.com, password: abc123)

Table 6.19 Test data for View News

Test Case ID	Test Data	Expected Result
TC_ViewNews_001	None	News must be displayed on the news page
TC_ViewNews_002	Data from news page	The news' picture must be downloaded and saved on the device
TC_ViewNews_003	Data from news page	The news must be shared on other device social media
TC_ViewNews_004	Data from news page	The news' picture URL must be pasted
TC_ViewNews_005	None	To be directed to university info page

TC_ViewNews_006	None	To be directed to faculty info page
TC_ViewNews_06	None	To be directed to chatting page

6.4.2.3 Chat Module

(a) Send Message

Precondition: Login as student (email: hanna@gmail.com, password: abc123)

Table 6.20 Test data for Send Message

Test Case ID	Test Data	Expected Result
TC_SendMessage_001	None	Error message "Cannot send empty message" will be displayed
TC_SendMessage_002	Message: Hi nice to meet you	Message must be sent to the selected user
TC_SendMessage_003	Picture: Any picture in the device	The picture must be successfully sent to the other user

(b) Reply Message

Precondition: Login as facilitator (email: siti@gmail.com, password: abc123)

Table 6.21 Test data for Reply Message

Test Case ID	Test Data	Expected Result
TC_ReplyMessage_001	Message: Message from TC_SendMessage_002	The other users' message must be displayed on the chatting page
TC_ReplyMessage_002	None	Error message "Cannot send empty message" will be displayed
TC_ReplyMessage_03	Picture: Any picture in the device	The picture must be successfully sent to the other user
TC_ReplyMessage_04	None	When the other user start replaying, the typing status must be displayed

6.4.2.4 Attendance Module

(a) ScanQR

Precondition: Login as student (email: hanna@gmail.com,

password: abc123)

Table 6.22 Test data for Scan QR

Test Case ID	Test Data	Expected Result
TC_ScanQR_001	None	The QR scanner must be started
TC_ScanQR_002	QR code	The user and event details must be displayed
TC_ScanQR_003	None	Error message “Cannot be read” will be displayed

6.4.2.5 Notification Module

(b) Receive Notification

Precondition: Login as student (email: hanna@gmail.com, password: abc123)

Table 6.23 Test data for Receive Notification

Test Case ID	Test Data	Expected Result
TC_ReceiveNotification_001	Notification Message: Introduction to MHS Event now!	The event notification must be displayed

6.5 Test Result and Analysis

In this phase, the result of test cases will be stated and analyzed and the suggestion from testers for the system improvement will be stated.

6.5.1.1 Unit Testing

(a) Sign-up function testing

Table 6.24 Test unit for sign-up function

Test Case ID	Tester Identification	Test Case Result
UT_SignUp_001	Tester006	Pass
UT_SignUp_002	Tester006	Pass
UT_SignUp_003	Tester006	Pass

During this unit testing, it takes 3 cycle of unit testing to produce the expected function. At the first cycle, the user's data is not push in the database. After the code is re-done several times, the users' data is successfully inserted in the database. This unit testing gives 100% successful rate based on the systems' expected behavior.

(b) Login function testing

Table 6.25 Test unit for login function

Test Case ID	Tester Identification	Test Case Result
UT_Login_001	Tester006	Pass
UT_ Login _002	Tester006	Pass
UT_ Login _003	Tester006	Pass
UT_ Login _004	Tester006	Pass
UT_ Login _005	Tester006	Pass

During this unit testing, it takes 6 cycle of unit testing to produce the expected function. At the first cycle, the user has separate login page. When the code is tested, it does not work. Then, changed have been made on the function code, and give pass result on the third cycle of the unit testing. To make the system to be use more efficiently, the code is re-design to allow the users login within the same login page. After the system code have been changes on the login and registration function, at the last cycle of this unit testing, the users successfully login into the system based on their user type (student and facilitator). This login function unit testing gives 100% pass rate.

(c) Profile view holder function

Table 6.26 Test unit for profile view holder function

Test Case ID	Tester Identification	Test Case Result
UT_MessageProfileHolder_001	Tester006	Pass
UT_MessageProfileHolder_002	Tester006	Pass

At the first unit testing, the users are allowed to send message to themselves. These things violate how the function should do. After several times the code is change, the user is successfully not allowed to send message to themselves. The send message buttons are hidden if the user are themselves. After the code is successfully implemented, it gives 100% pass rate.

(d) QR Scanner function

Table 6.27 Test unit for QR Scanner function

Test Case ID	Tester Identification	Test Case Result
UT_QRscanner_001	Tester006	Pass
UT_QRscanner_002	Tester006	Pass

In this unit testing, it takes 4-unit testing cycle. At the first cycle, the current users' name cannot be retrieving, so the code needs to be check and changed. After the users' name successfully retrieve, only users' name and event details are displayed. For attendance data, it should include the current date and time when the user scans the QR. At the last cycle of unit testing, the exact attendance data are successfully displayed after the user scan the QR code. This gives 100% pass rate for the function.

6.5.1.2 Authentication Module

(a) User Register

Table 6.28 Test result for Password Field

Test Case ID	Tester Identification	Test Case Result
TC_PasswordField_001	Tester001	Pass
TC_PasswordField_002	Tester001	Pass
TC_PasswordField_003	Tester001	Pass

This equivalent portioning test is 100% pass. The password field only allow the user to register their account only if the user put more than equal to 6 characters only.

Precondition: None

Table 6.29 Test result for User Registration

Test Case ID	Tester Identification	Test Case Result
TC_UsersRegister_001	Tester001	Pass
TC_UsersRegister_002	Tester001	Pass
TC_UsersRegister_003	Tester001	Pass

This black box testing for user registration gives 100% pass rate. The tester gives some suggestion for the user interface. Instead of using drop-down list for the user to choose the user type, they recommend using radio button instead to give clearer option for the user.

(b) User Login

Precondition: None

Table 6.30 Test result for User Login

Test Case ID	Tester Identification	Test Case Result
TC_UsersLogin_001	Tester002	Pass
TC_UsersLogin_002	Tester002	Pass
TC_UsersLogin_003	Tester002	Pass

This test case also gives 100% pass rate. The tester are satisfied with the single login page for multiple user instead of they need to choose the users' (student or facilitator) login page.

6.5.1.3 News Module

(a) Add News

Precondition: Login as admin (email: tuahutem@gmail.com, password: abc123)

Table 6.31 Test result for Add News

Test Case ID	Tester Identification	Test Case Result
TC_AddNews_001	Tester003	Pass
TC_AddNews_002	Tester003	Pass

This test case also gives 100% pass rate. In this test case, there are not much Black-box testing that can be conduct. The admin simply posts the news, and the news are displayed on the news page.

(b) View News

Precondition: Login as student or facilitator (email: hanna@gmail.com, password: abc123)

Table 6.32 Test result for View News

Test Case ID	Tester Identification	Test Case Result
TC_ViewNews_001	Tester005	Pass
TC_ViewNews_002	Tester005	Pass
TC_ViewNews_003	Tester005	Pass
TC_ViewNews_004	Tester005	Pass
TC_ViewNews_005	Tester005	Pass
TC_ViewNews_006	Tester005	Pass
TC_ViewNews_007	Tester005	Pass

In this test case, the tester is satisfied with all the option that user can make to the news data. The data can be download, shared and the news link data can be copied. These features will give benefits to the users. This test case gives 100% pass rate.

6.5.1.4 Chat Module

(a) Send Message

Precondition: Login as student (email: hanna@gmail.com,

password: abc123)

Table 6.33 Test result for Send Message

Test Case ID	Tester Identification	Test Case Result
TC_SendMessage_001	Tester003	Pass
TC_SendMessage_002	Tester003	Pass
TC_SendMessage_003	Tester003	Pass

In this test case, it is 100% pass. The tester also gives some recommendation to add some features such as voice recording and upload video. These features will give more variety to the system and give the user best experience while using the application.

(b) Reply Message

Precondition: Login as facilitator (email: siti@gmail.com,

password: abc123)

Table 6.34 Test result for Reply Message

Test Case ID	Tester Identification	Test Case Result
TC_ReplyMessage_001	Tester003	Pass
TC_ReplyMessage_002	Tester003	Pass
TC_ReplyMessage_003	Tester003	Pass
TC_ReplyMessage_004	Tester003	Pass

Same as Send Message test case, it is 100% pass. If the developer adds some more features in the message module, it would be more interesting.

6.5.1.5 Attendance Module

(a) ScanQR

Precondition: Login as student (email: hanna@gmail.com,

password: abc123)

Table 6.35 Test result for Attendance Module

Test Case ID	Tester Identification	Test Case Result
TC_ScanQR_001	Tester004	Pass
TC_ScanQR_002	Tester004	Pass
TC_ScanQR_003	Tester004	Pass

The pass result for this test case is 100%. The tester gives some feedback for this function that is it will be better if the scan button that user must click is reduced. For future reference, this suggestion shall be implemented to increase and improve system usability.

6.5.1.6 Notification Module

(a) Receive Notification

Precondition: Login as student (email: hanna@gmail.com,

password: abc123)

Table 6.36 Receive Notification

Test Case ID	Tester Identification	Test Case Result
TC_ReceiveNotification_001	Tester005	Pass

This test case is 100% pass. The system shall give notification to the if the event has been started. The tester also gives some suggestion to allow user to go to attendance page when they are click on the notification. This notification module can be improving by upgrade the system design for this notification module.

6.6 Conclusion

In this chapter, the detail system testing is successfully conducted. System testing is a process that must be carried out by testers to study and observe the system better in order to provide a better result. Based on all the test cases result, I can conclude that the functional requirement for this MHS Application are met the requirements. To overcome the system limitation, the system will be maintained and upgrade in the future to provide additional functionality and new features.

CHAPTER 7: CONCLUSION

7.1 Observation on Weaknesses and Strengths

7.1.1 System Strengths

Minggu Haluan Siswa Application gives a way for the new student intake to join the orientation week effortlessly. This application will give benefits in terms of management. It will help university managing the event, especially in this pandemic Covid-19. This system allows admin to post the news or any important information for the orientation event. This application also provides a platform for the new intake student to interact with their facilitator so that they can seek for help or ask any related question for the orientation week. In addition, the MHS application also provides a QnA platform that anyone can post questions and give a reply or any suitable answers. Lastly, this application introduces student to take event attendance by using QR code. As compared to the traditional method, this platform is much more efficient and easy to use. This application can be commercialized to be adapted to other university and easily tweaked to suit their own needs.

7.1.2 System Weakness

There are a few drawbacks in the MHS application. Firstly, this application only support for Android devices. This application cannot be used if the user using smartphone that have different operating system. Next, for the chat module, the user will not get the automatic notification if there is someone sent a message to them.

7.2 Proposition for Improvement

There are a few suggestions so that the system can perform better. Firstly, upgrade the notification function in the system. The notification function should also be able to notify the user with the message notification. This idea will ease the user to get notified if there is another user send message to them.

Next, the other improvement that do to this system is to include the attendance data to be retrieved by the admin in the system. This improvement more suitable to be implemented on website application compared to be implemented on the mobile application system. If this suggestion is implemented, it will ease the admin to tract the student data and make analysis and report.

7.3 Project Contribution

This MHS Application can be commercialized to be adapted for University Teknikal Malaysia Melaka (UTeM) or to another university. This mobile application will help university to conduct many events smoothly during the orientation week periods. With the digitalized platforms that implemented in this mobile application, it will ease the new intake student to join the orientation weeks held by the university. The user manual can be found in Appendix A.

7.4 Conclusion

In shorts, MHS application is a system that help university manages the new intake student to join the orientation weeks. From my point of view, this application met the system main objective of this system that is to assist the new student find their facilitator that will help them prepare for university admission. The next objective is to allow new student take their attendance easily to every session in Minggu Haluan Siswa. Lastly, to create an application that allows student to get new announcement and the latest information effortlessly. These objectives is can be achived by using this application. However, in order to make the system perform better, this application system stills need some changes. Therefore, the changes that can be implemented in the future will enhance the accessibility, security and other features. From Chapter 1 to Chapter 6, the approach of constructing the MHS Application System is explored, providing a basic overview of how to create an MHS Application.

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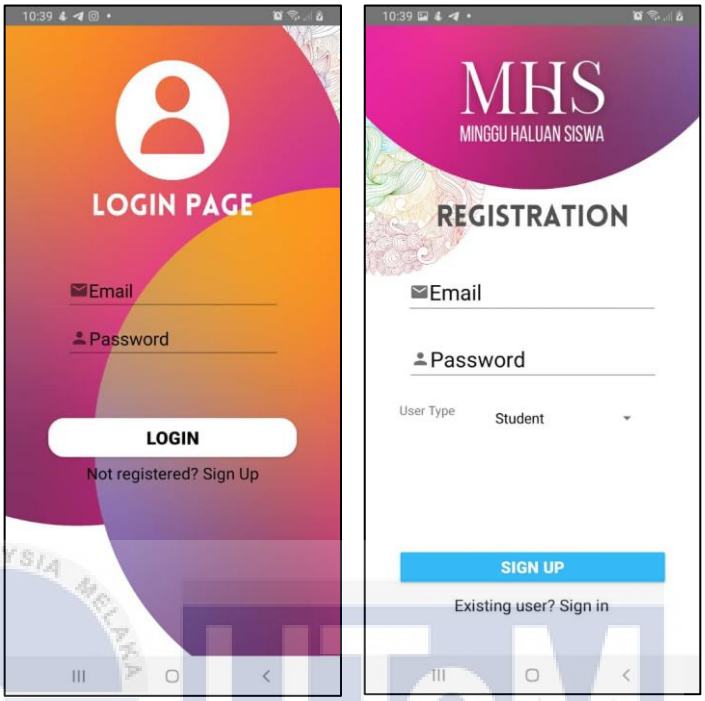
APPENDICES

Appendix A
This appendix describes about user manual.

Appendix A: User Manual

Student User Manual

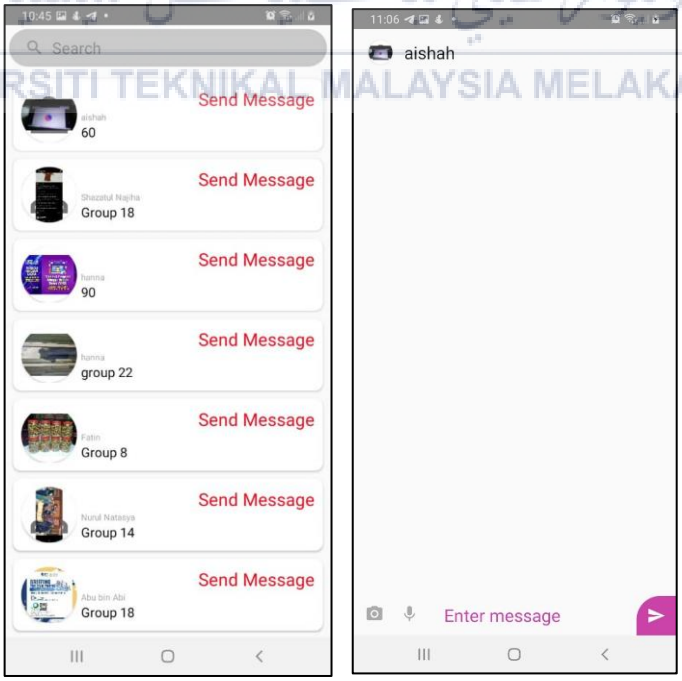


Firstly, to use this application, student need to make registration by enter their email and password. After the registration is successful, they need to login into the system.

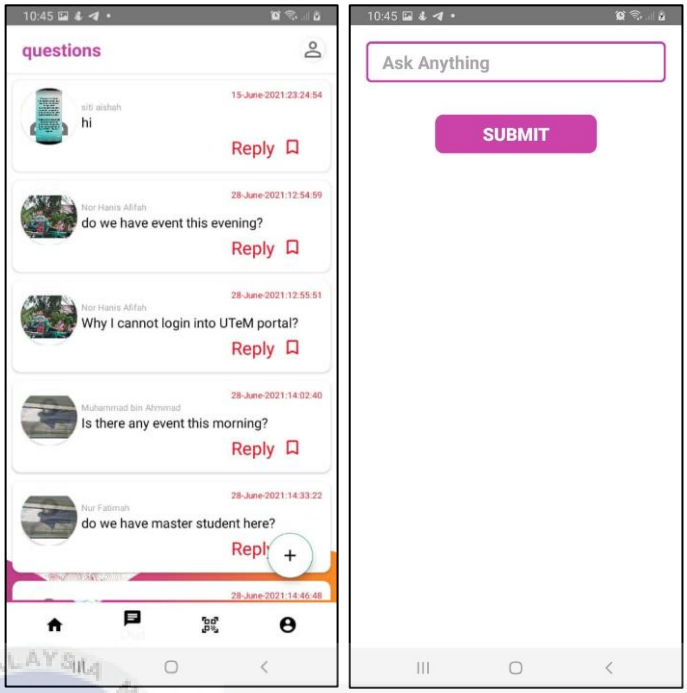
Next, user need to set their profile before use the system. They need to put their profile picture and all the details needed. After clicking the save profile button, they will lead to the application main page.

If the user clicks on the university menu, it will allow student to go to university information page.

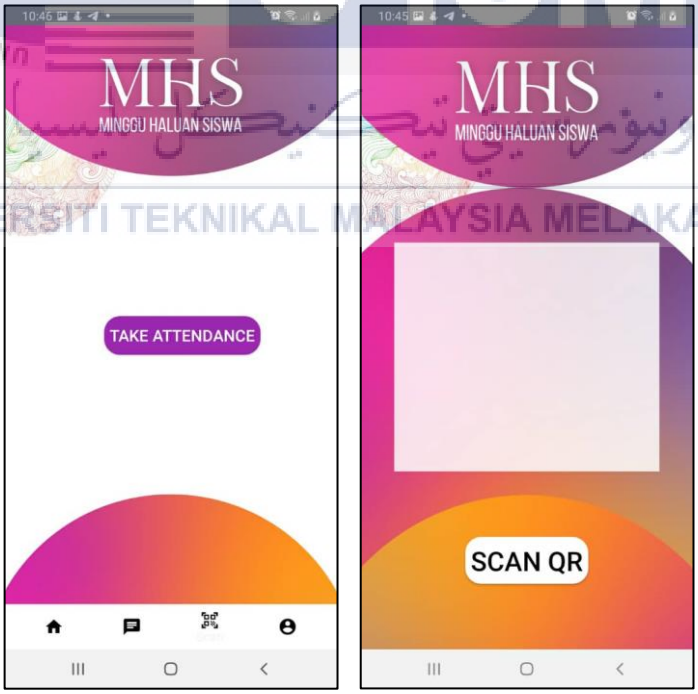
If the user clicks on the faculty menu at the main page, the list of the faculty will be displayed. Student can choose their preferred faculty in the list to view the details about the faculty.



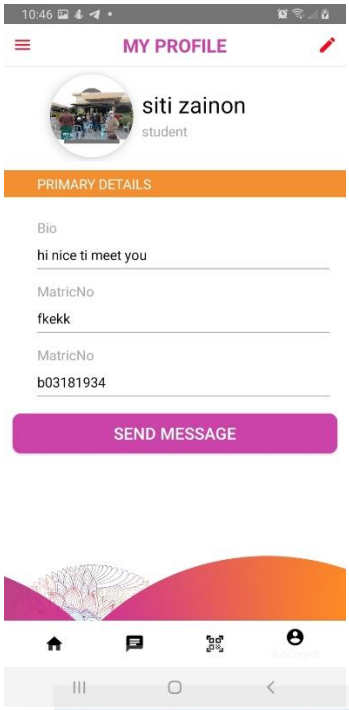
If the user click on chat menu in the main page, they will lead to view list of facilitator that they can contact.



The QNA bottom navigation bar will lead to user view all the question that posted by other user. On click of the floating button will allow to user post new questions.

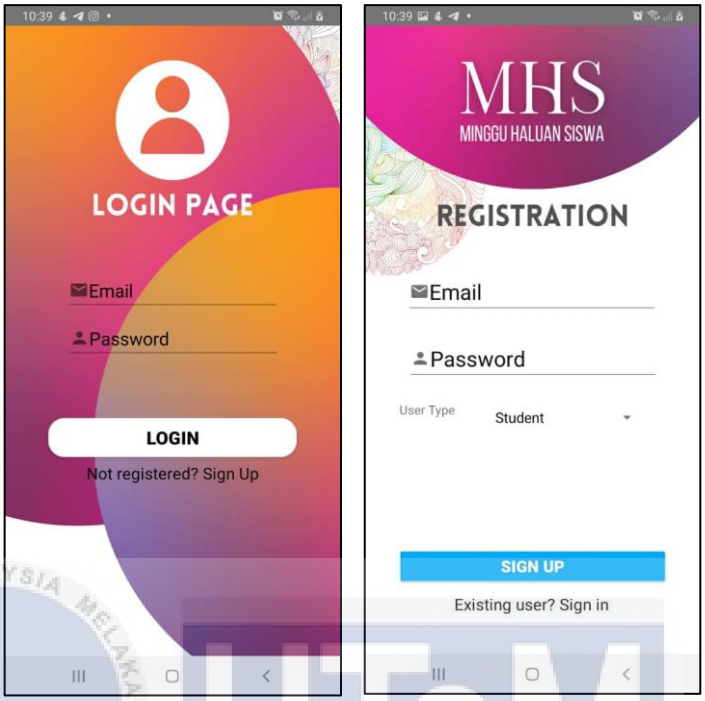


The QR scan bottom navigation bar will lead to student attendance page. If the user scan the QR code provided by the university, details of the event and their name will be displayed on the page.

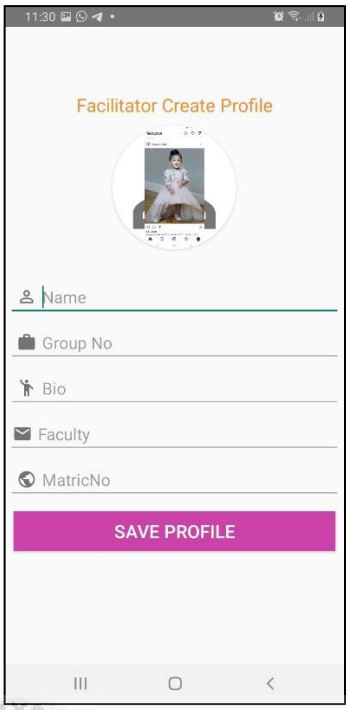


The student profiles can be access by click on the profile bottom navigation bar. This page allow student to edit their profile and also provide menu to logout from MHS Application system.

Facilitator User Manual



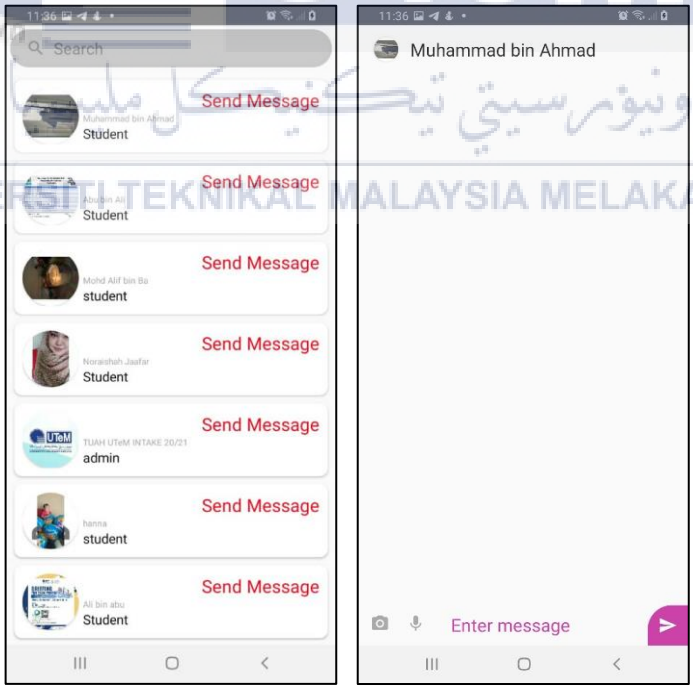
For facilitator, they need to make registration by enter their email and password and choose "Facilitator" on the user type drop down. After the registration is successful, they need to login into the system.



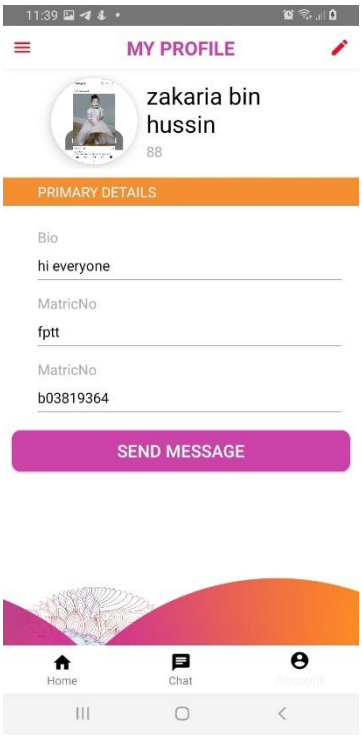
Facilitators need to set their profile before use the system. They need to put their profile picture, their assigned group number, and all the details needed. After clicking the save profile button, they will lead to the application main page.

If the user clicks on the university menu, it will allow student to go to university information page.

If the user clicks on the faculty menu at the main page, the list of the faculty will be displayed. Student can choose their preferred faculty in the list to view the details about the faculty.



The chat menu at the home page will lead the facilitator to view list of student that they can contact or reply to the new intake student.



The facilitator profiles can be access by click on the profile bottom navigation bar. This page allow facilitator to edit their profile. This page also provide update profile page so the user can update or make changes to their profile.