

Lecturers Room Navigation : UTHM Pagoh

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Abstract: Students of UTHM Pagoh faced a little difficulties in searching for their lecturers room whenever the needs arises. Getting lost is a common thing that happen among students especially new students that are not used to which wing either. Because of that, 'Lecturer's Room Navigation' were built to help students in finding their lecturer's room without getting lost. 'Lecturer's Room Navigation' is a mobile application used to navigate direction in the building for Universiti Tun Hussein Onn Malaysia (UTHM) students. The application can be used by Android users. The problem occur because of the complex building that locate room for each lecturers. Besides that, the room number are very complicated to understand and it is confusing because of there are so many door to enter and exit. With the implementation of texts and images, it is easier to understand and students just follow the instructions given. Students can choose their starting point to start which is lobby, stairs and lift. For this project, ADDIE Model would be chosen as the methodology model for the development of our project. Five phase in model by order Analysis, Design, Development, Implementation and Evaluation for the process of development. Lecturers Room Navigation system can help in assisting students in finding their way around UTHM Pagoh campus, though currently this system is only limited to JTM lecturers only, future improvement could be made by widening the scope to include lecurers from other departments and faculty as well.

Keywords: Room Navigation, Online System, Apps

1. Introduction

In the recent times, there are so many great advancement in the information technology field. There are so many mobile applications these days that perform various sorts of activities. The application were great help for people because it can be downloaded easily in the phone. Nowadays, navigational application has taking over the world with applications line online mapping services, car navigation systems and worldwide smartphone allocation [1].

With the tremendous amount of navigation application built, there were limitation that the application cannot solve. For example, Google Maps were frequently used by user because of it effectiveness in giving direction of the route but the maps are only can be used outside of the building. People cannot used Google Maps to find direction in the building for example room in university because it was not included in their system.

Other than that, Google Maps application only show how the direction work based on the maps. They did not show how the building look like in real life. Some people found it was hard to understand because they cannot adapt to the route yet. The implementation of images and texts were great ideas to be included in building the application. With the images of buildings and routes in the application it was easier to understand and make it user friendly.

2. Literature Review

For a navigation application to work, research of the navigating system, the application functionality and specification supported, databases, the implementation of image in the application and research of existing system used widely by user had been made. Hence, this project could be accomplished as the study was focusing on indoor navigation application with pictures implementation to navigates user – student – to their respective lecturer’s room.

GPS based navigation system such as Google Maps and Waze apparently the best navigation system for user to navigates them to their destination. However, GPS only significant for outdoor navigation with accuracy. It ended exactly in the first step of entering a building. This mainly occur when entering indoor environments, basements and underground of large buildings [1].

Apps are the short form of the phrase “application software” generally downloaded from “app stores such as App Store, Google Play, Windows Phone Store, and BlackBerry App World”. Mobile apps are a software application which is intended to run on iPhones, tablets and other mobile devices. Some of the apps are free to download and some others are paid. Mobile apps categories include gaming, entertainment, and education [2]. Mobile applications are developed with two categories, smartphone browser for device-neutral and native apps such as iOS or Android [3]. The mobile application industries are spread globally and based on a recent market research report, the global mobile application market is expected to generated 20.5 percent increases by the Apple App Store only [4].

Image manipulation is a process of modifying an image. The image was choosing in order to have a better quality of the image. The key idea is to aggressively explore the “virtual world” through physical simulation and precompute many of the possible situations [5]. Using image manipulation service in the making of phone applications can help increased the quality of your phone applications and grab people’s attention. Adobe Photoshop is the main platform that will use in this project to manipulate the image. As we all know, Adobe Photoshop is one of the most popular image editing software. This project will also use Adobe Photoshop to edit the quality of the image, the size of the image and to add some arrow to show the direction of the lecturer’s room.

3. Methodology

For this project, ADDIE Model would be used as the methodology model for the development of project. ADDIE Model is very useful because of there are have five phases in order

(Analysis, Design, Development, Implementation and Evaluation). The figure 3.1 below shows the graphical representation of the phases.

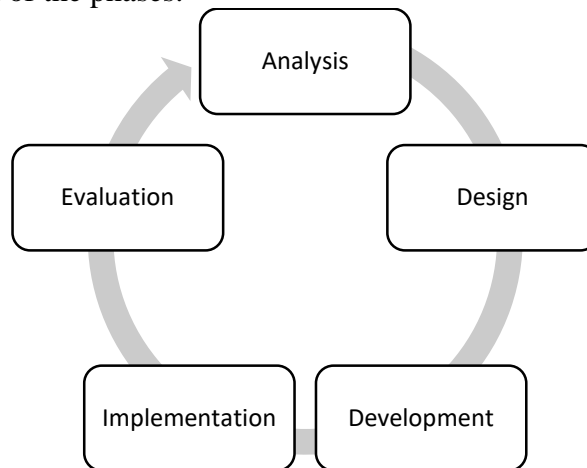


Figure 3.1 ADDIE Model

In the analysis phase, the main goal of this project is to provide direction to the lecturer's room from the starting point (lobby, lift, stairs). Users can choose their preferred starting point. After that, they need to insert the lecturer's room number in the text box provided. After the confirmation have been made, direction will be given step by step by the implementation of images and texts. Our target audiences were Jabatan Teknologi Maklumat (JTM) students. Software and hardware were an important element to build the application. The component for hardware consists of processor and memory while for software we used Operating System Window 10, Adobe Photoshop CC and Unity.

In the design phase, the interface design of the application should be simple and easy to use for our target audience. The application focus more on the function to give clear and correct direction to the user. Some application has so many functions which is unnecessary. At the search page, user can easily insert the room number and direction will be given. User can easily understand how the applications work without getting teaches by others. With the images and texts that were attach, user can recognize the place easily. The application also can be used offline without the internet connection.

In the development phase, the official development of the application will begin. As previously stated, Unity will be used to build the application while additional programs will be used to provide the elements for the application. Developing with Unity consists of interface, scripts for the user interface and events. As Unity is a new developing system for games, developing a 2D application is challenging and needed most attention on how the application might be.

For interface, simple component such as Image, Sprite, Text, Button and Scene Management will be used. For the events, the button was used to indicate the faculty of the lecturer, submitting the room number in search to obtain lecturer details, change text and image for navigation instruction, move the scene forward and back, and to start and exit the application. In order to make Image, Text and Button dynamic, script was used to change the Image sprite, Text value and Button events. However, the database is not used in the application besides, array initialization is used in the script to make it an offline application. The scenes were embedded with C# scripts using Visual Studio Editor that is supported by Unity.

For the orientation, it will be assigned as portrait in the project setting with the best resolution. In order to get the application into the smartphone, build setting in Unity is used to change the build option from windows to Android. As the application must be supported by Android and offline usable, JDK is used as Unity is Java based application. The API of the application is set to the minimum requirement of API level 19 which is the Android KitKat 4.4 version. Hence, the application can be run on smartphone establish after the year of 2013. As for the Beta testing, the build is run on a Samsung SM-J500G Android version 5.1.1. using Developer Mode in the phone by USB debugging.

In the implementation phase, the program created during the development process are introduced to the target user. The main action in this phase is to check the application whether the goal is achieved. After previous phase, the application was tested and discovered that it is not running well and the quality of the interface are low. Some picture was blurred and button are not working. Other than that, the application consists of errors when building into Android devices. Because of that, there were adjustment made to adjust the quality of the picture and correct the coding button. The build setting problem has been configured and the best solution will be found to it. After improvements were made, the user interface has become much better than before and can be running well.

The final phase was the evaluation phase to measure the application's effectiveness across each stage of the ADDIE method. In this process, all the weakness of the application was determined, and the application improved. An application must be tested many times to ensure it is running well and suit the user preference. Observation had been made in order to achieve the best improvement and deduce any errors on runtime.

4. Result and Discussion

The figure 4.1 below shows lecturer's room navigation system logo.



Figure 4.1 Lecturer Room Navigation System Logo

The logo of the application is chosen to symbolize the main build of the application which is navigation system. The orange and yellow is use as the symbolization of determination that

suits user determination to find their lecturer’s room. The phone symbolize the navigation system that supported in smartphones. Hence, these symbolization portrays the behaviour of the application which is simple, determine and easy to use.

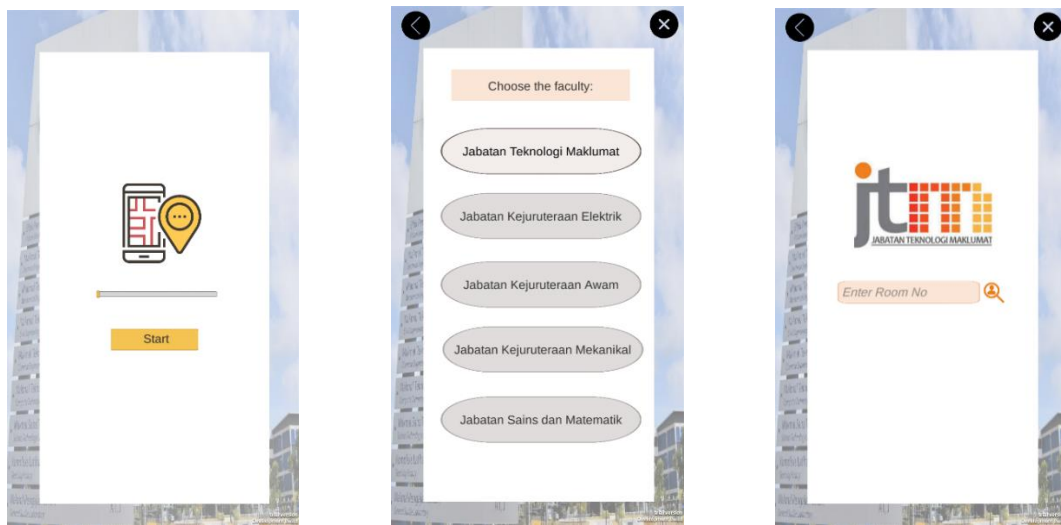


Figure 4.2 Loading, Select Faculty and Search pages.

The interface of loading page consist of the logo of the application, a loading bar and a start button. When clicked, the loading bar will load and move to the Select Faculty page. In Select Faculty page, the button that can be interacted by user to the Jabatan Teknologi Maklumat (JTM) as it is the main focus of the project. When clicked, user will be directed to the Search page with JTM logo, a text search box and a search button. These three interface is vital as it is the start and guide throughout the application.

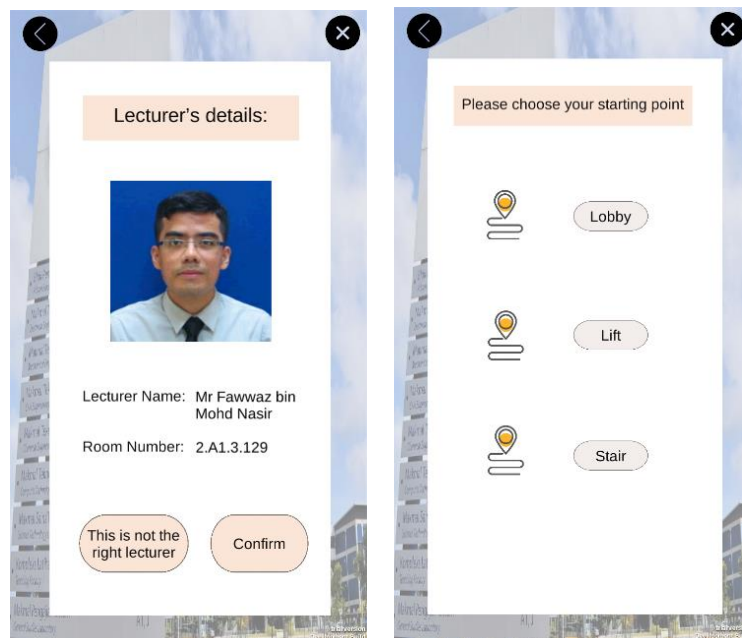


Figure 4.3 Lecturer Details and Starting Point

Lecturer Details page consist of lecturer name, room number, the confirmation of the correct lecturer button and the navigation of the correct lecturer button. The Starting Point page

consist of three navigation logo and three different button for user to choose as their starting point which are lobby, lift and stair. All the pages holds a back button to go back to the Select Faculty page.

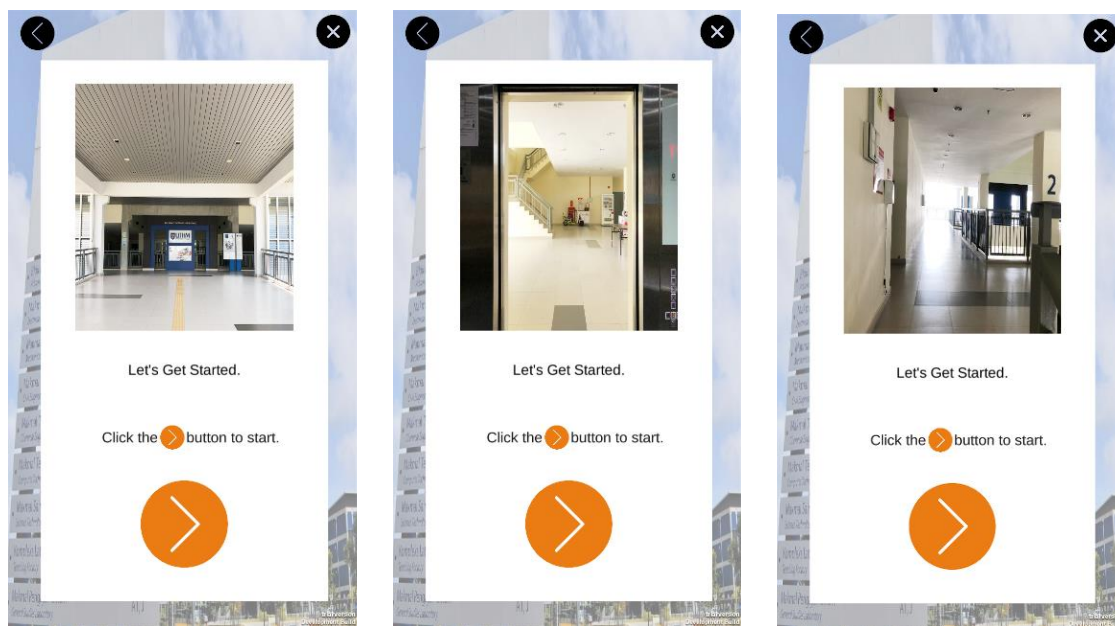


Figure 4.4 Starting Navigation from Lobby, Lift and Stair

If the starting point chosen the lobby, the picture of the Starting Navigation will be shown the main lobby of the campus while if user chose lift, it will appear the lift image. Also if user chose the stairs as the starting point, the navigation will starts with the image of the stairs. The next orange button will redirect to the Navigation Instruction page.

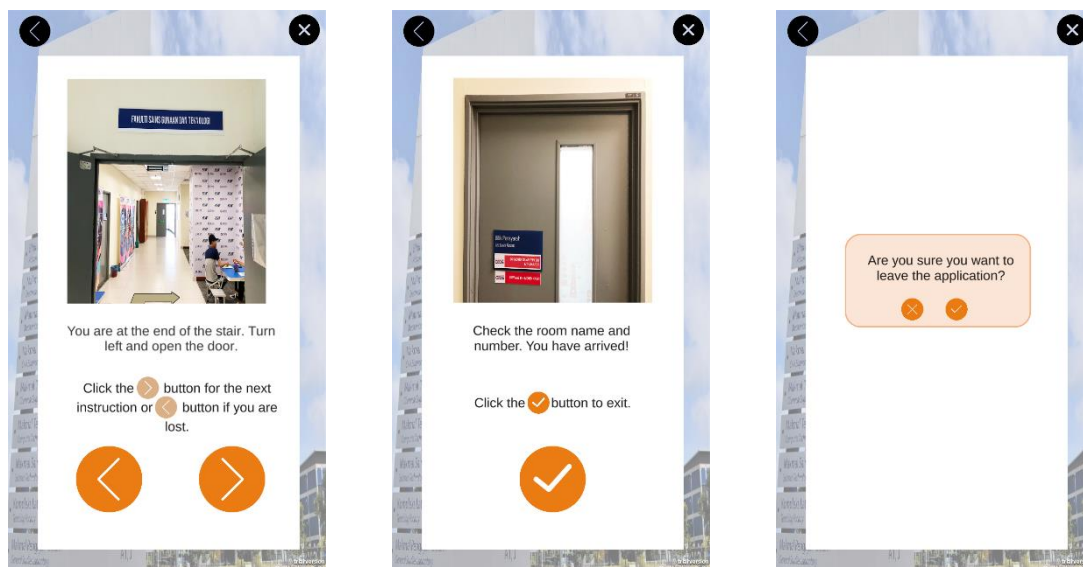


Figure 4.5 Navigation Instruction, Lecturer's Room Reached and Confirm Exit page

Then, user will be directed to the Navigation Instruction page that can be changed between direction using next and back orange button below the page. This ensure that it is easy to use and user can easily trace their pace before reaching the lecturer's room. When the

navigation ended, it will appear the door of the room with lecturer's name, and room number. If done, user can click the right orange button and directed to the confirmation page. This Confirm Exit will indicate the user selection on staying to the application or exit the application. If cross black button or right orange button is clicked then the application will exit. If the black back button or cross orange button is clicked, it will be directed to Select Faculty page to begin again.

5. Conclusion

A navigation application named 'Lecture's Room Navigation' has been successfully developed and published to be used by targeted user. With the existence of the navigation system in the campus, users can easily locate their lecture's room without getting lost. The application was built with simple features with the hope that it is convenient to use. Lastly, the project will be hoped that the navigation application can give benefits to the users and save their time in finding the room.

Acknowledgement

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