

Mobile Application for Interactive Services using Android

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Abstract: The future of mobile computing becomes more attractive. Mobile devices continues growing in capability, especially in the presence of wisdom by integrated phone capabilities. The benefits of wireless networks capable transferring media in a real time, now as a new application technology. This application is an interactive service network of 24 hour news coverage exclusively for UKM and also includes 13 faculties website. An iUKM application provides several features such as providing users with geolocation from current location of each faculty and display it on a Google map, showing the campus of UKM as an importance information and the location of the bus route. Overall, this project is a real success and more importantly contributed to the Android community.

Key words: *Thai sail windmill, Passive yaw control system, Upwind and downwind rotor, Wind turbine efficiency*

INTRODUCTION

An interactive services, an iUKM mobile application using Android have many advantages. Unlike regular website, mobile website can be taken anywhere. For example, users do not need to spend a long hours in front of their computer to browse the latest news from UKM website. Users can read the news immediately, within the context of the use from the website as the first place. Although become more popular, access to the mobile website today still interoperability and usability problems. An interactive services, an iUKM mobile application using Android is the best initiatives to address these issues through the concerted efforts from developer's applications in the mobile production chain, including authoring tool vendors, handset manufacturers, browser vendors and mobile operators. The best solution was made, based on the free costing, open source, and easy customization of open source software stack comprising IDE [1].

Details designing and implementation was set out which mobile application offers interactive access to news and virtual communities, based on open technologies such as the Java programming language and Android. The goal is to create an easy to use, portable, interactive and flexible, including Java clients is easy to carry and access content web portal. As proof of this features, selection and comparison from two

different types of interactive services, news access and virtual communities, as well as plans for improvements and services in the future [2].

LITERATURE REVIEWS

Some of the literature review previously referred to mobile web application that is a news portal completely showing all news around the world, native mobile application supports access to news and interactive services to the virtual community based on open technologies such as Android and location-based services and integration Google map using Android, GPS for location tracking technology nowadays. However, a brief description of each application related to this project are described. After all aspects of this previous literature review was reviewed, a method has been identified and implemented to develop a user-friendly interactive services an iUKM mobile application using Android.

A. Web Services Based On News Portal

This project has been developed is a comprehensive news portal that listed all the news around the country with interactive methods for suitable place. It aims to provide more simplicity to get all news about current issues in the country. Each channel for newspaper and publishing news on their website. Therefore, each user must visit various websites if the user requires

information about current news for any language that users want. With the establishment of this portal, it seeks to combine all the news in a variety of languages that can be grouped under one banner with the provisions usage of web services. Multiple news, especially cricket news was discussed here. Information about daily horoscope as well as the latest stock prices can also be obtained in this single portal [3].

By 2020, mobile devices (smartphones, PDAs, Tablet), mobile web services and wireless communications, are expected as an important role in all aspects of our lives. Mobile web services is constantly growing similar with the concept of "Anywhere, Anytime and on Any Device " to the mobile computing with new paradigm. It is used to improve more meaningful access, rapid and requires information and content via the mobile web. Through this portal, multiple problems involving mobile web service can be solved by using mobile application. Another way that was promised to create a valid web service for mobile devices, increasing more additional software to a web service, both service providers and web services users [4].

B. Mobile Application for News and Interactive Services

Based on the user experience, native applications have a variety benefits capabilities of mobile devices, which includes the hardware on board (such as GPS, camera, and graphics) and software (such as e-mail, calendar, contacts, image / video gallery, file management, and home screen widget area). An advantages in native application also have offline capability. Given these application installed on the device after the download process is done, no internet connection is required. In other words, this application as 'front of mind' to penetrate better vision. Native application has its own creation symbol or logo which can be uploaded on the screen list application to facilitate users seeing it every day. Nowadays, smart phone market is most powerful provided a variety of applications in it. Native application is very popular among users of Android or iPhone. Users always combine multiple existing applications available in the apps store for their latest application because they can not live without it. For application developers, financial resources more easily available after developing and selling its own applications. Application developers can set their own prices on the list of applications that have been uploaded in the apps store, and when users buy, the money is immediately go to developers account. With native applications, users can only need to provide payment or subscription fees to generate funding according to their own desires [5].

This project describes designing and implementation of mobile applications that support access to news and interactive services to the virtual community, based on open technologies such as Android, Java programming language, Android library, MySQL database and open

web server. The goal purpose is easy to use, portable, interactive, flexible, including Android mobile client and access from portal. This application designed to make mobile application easily connected to the portal, provided access to news from outside sources www.hotnews.com and virtual community services. All users can have their own blogs with the ability to read and write, send and receive messages or adding friends. As a solution, security validation has been carried out [3].

C. Location Based Services and Google Map Integration using Android

The emergence of location-based services (LBS) developing rapidly in mobile data services with latest advances in wireless communications and location positioning technology. Users with wireless devices can find out the location-aware environment in various places regardless of the time. Location-based services (LBS) refers to the set of application that have knowledge about the geographical location of mobile device and provide location-aware services based on that information. Most of the services provided include driving directions to a specific location, search for friends and family on social networking sites, mobile devices track the location-aware, maps help as a guide to find places of interest and many others [6].

Guided by geographic location, various information related to the user who uses mobile device can be collected. Knowledge from mobile user location can increase the number of services and applications available for mobile devices users. The types of applications and services known as location-based services. Location Based Services (LBS) is a service that can help users to get geographic location and multiple information near the user's location. Location is based on information obtained from the difference terms of position, an environment, distances, context, maps, routes, places, and many others. This literature review focused about details LBS and LBS main components can be identified as the provision services to Android platform users. It also describes the usage and implementation of Google Maps and its location APIs based on the information available on Android [4].

D. Android

Android is designed based on the Linux Kernel and has some interesting features. Android is not different between the phone's core applications and third-party applications. All Android have built same access to the user's smartphone capabilities with a spectrum of application and wide services. Development of Android become more popular record against new applications and innovative applications. For example, a developer can combine information from the website with the data from individual mobile phone users such as contacts, calendar, or geographic location - to give satisfaction to the users. With Android, developers can build applications to make users easily shows location of their

friends and notification will display when they can communicate with each other. Android provides wide range of access to various libraries and tools that using to build applications successfully. For example, Android allows developers to obtain the location device, and allow the device to communicate with each other with the use of social applications [7].

Android has built an integrated browser based on the open source WebKit engine and powerful SQL database known as SQLite, which is uses for structure data storage. Android is a backbone to accommodate common audio, video, and image formats such as AAC, MPEG4, H.264, MP3, AMR, and enriched with development environments such as device emulator, tools for debugging, and a plug-in for Android Studio [6].

Android Mobile Application Development is based on Java programming language codes. Developers can write code using Java programming language. All generated codes can control mobile devices by Java libraries in Google. It provides a platform for development mobile applications using software stack provided by Google Android SDK. Android mobile operating system provides flexible environment for Android Mobile Application Development. Developers can also uses Java libraries Android and they can also uses Java IDE. Software developers who use Mobile Development having their own skills to develop applications based on Android Java Library and other important equipment. Android Mobile Application Development was developed depend on users to produce innovative applications. Mobile development has been developed extensively in game project, organizer, media player, photo editor devices and many more [7].

E. Android Studio

Android Studio officially is an integrated development environment (IDE) for development Android platform. It was announced on May 16, 2013 at the conference Google I/O. Android Studio is freely available with the Apache License 2.0 [8].

Android Studio starting early stage access preview of version 0.1 in May 2013, then continue to beta stage starting from version 0.8 released in June 2014. The first development is more stable was issued in December 2014, starting from version 1.0 [8].

Based on software JetBrains' IntelliJ IDEA, Android Studio specially designed for the development of Android. It is available to download on Windows, Mac OS X and Linux, to be replaced with an Eclipse Android Development Tools (ADT) as main IDE Google for native Android application development. Android Studio has latest features available in current stable version: [8].

- Gradle based development support

- Typical Android for factoring and correction shortcut
- Lint Tools for performance, usability, compatibility version and other problems.
- ProGuard integration and capacity-signing app
- Template-based wizards to create designs and Android components
- Layout editor which enables users to drag and drop while using UI components, layout options for configuration multiple screens preview.
- Support for development of an Android Wear application
- Built-in support for Google Cloud Platform, allows integration with Google Cloud Messaging and App Engine.

METHODOLOGY

In an iUKM mobile application development, the selection of simplest methods for this application has been determined. It is called "The Waterfall". The waterfall model is a model for software development sequence (a process for creating software) where development was viewed as flowing increasingly downwards (like a waterfall) through phases of requirements analysis, design, implementation, testing (validation), integration, and maintenance.

A. Phase 1: Analysis System Requirement

Planning was made to establish a plan to create an information system to determine the system to be developed. The system must be identified and selected. The scope of the project become the highest level to whole system requirements that need to be defined and included in project scope document. Development project plan requires all details tasks that have been completed, equipped and generally become official duties. Management and monitoring project plan enables an organization to stay on track, giving project achievement and characteristics where make it easier with early planning.

An effectiveness of this application depends on an importance standardization in making plans. Planning and software requirements clearly specify the way this application will be done simultaneously with all functions that available on an iUKM mobile application where it can be used by students, staffs and UKM visitors during campus activities. In addition, this phase have their outlines requirements for each function related to the user interface, additional features and performance requirements of the application.

B. Phase 2: Application Design & Software

An actual coding most priority, it is very important to better understanding of what should be created and this application should be look like? Requirements specification from the first phase were studied in this phase and system design was implemented. Designing

system may help to determine hardware and system requirements and also help to determine whole system architecture. Architecture system is used as input to the next phase.

Designing is where the technical system was created. The architectural design for Samsung Galaxy Note3 Neo hardware and Android Studio software was selected to design technical architecture where it is the best application and suitable for organizational systems and future demand. Application model are designed for graphic user interface (GUI), GUI screen design, and database for deployment object on the screen.

Development is also known as design implementation of a physical system. The technical architecture for development are needed to purchase all components to develop this application. An architecture design, shown in Figure 1.1 is the basic organizational and the data flow between multiple components for an iUKM project. All systems architecture design was created using Android Studio interfaces.

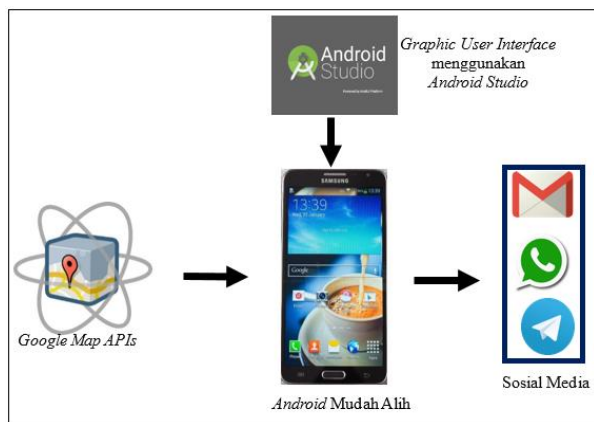


Fig. 1.1 Design Archetecture of Mobile Application iUKM

C. Phase 3: Program

Decision has been made to develop interfaces program for an iUKM using Android Studio because it has graphical environment and ease of use. Apart from that, an interfaces also can be programmed using HTML5, C++ or any related object-oriented programming language. Android Studio was selected for programming display screen interfaces. Each button on the screen mask also as a function implemented when the button is selected. Function usage has assigned to be selected in Android Studio library to send and receive information [9].

An iUKM mobile application are built repeatedly using Java programming language and XML Layout which is an application built for Android SDK. XML Layout have text field and button [10]. An iUKM mobile application will respond when a button is pressed to send contents of a text field with other activities.

D. Phase 4: Verification

An iUKM mobile application was launched in an emulator to run this project. In addition, APK file can be dragged into the emulator to install it [10]. Like other hardware devices, after installing this application on a virtual device, it remains until user delete or replace it. If necessary, testing should be conducted to determine how many applications, such as the application itself or any other application system, collaborate with each other.

E. Phase 5: Publishing Application

Publishing is common process which makes Android mobile application available to an iUKM mobile application users. Publishing this Android application must have two main tasks:

- Provides application for launch.
A preparatory step to build a version of application, where users can download and install on their Android device.
- Launch the application to the user.
A preparatory step to launch publicity an iUKM mobile application, sell and distribute the release version of application to the user.

Usually, launching application through market applications, such as Google Play. However, launching application can also be done by sending it directly to a user or to let users download from its own website.

Publishing process is usually done after completion testing the application in debug environment. Also, as the best practices, application must meet all the criteria to launch function, performance, and stability before starting the publishing process.

RESULT & DISCUSSION

Description each element was covered for development of an iUKM mobile application then completely discussed. The main focus is given as key areas that have main features of an iUKM mobile application, where an affected area or other areas of interest. Discussion as key findings was incorporated in testing phase of this project was implemented. The development of an iUKM mobile application and its creation has been contributed to four key findings.

The testing phase to analyze requirements verification and performance testing for an iUKM mobile application

- Simulation characteristic of an iUKM mobile application
- Implementation application framework and Google MAP APIs based on location-aware geolocation service

Final testing results shows that an iUKM mobile application have been launched and uploaded in real Android mobile phones using Samsung Galaxy Note3 Neo mobile phones. An iUKM mobile application also have been launch in a real Android device with the

creation of an application ID, device ID, development ID, and distribution ID on Android developer account. Results from final testing shows that an iUKM mobile application have been successfully implemented in actual Android devices and all the characteristics function properly according to the requirements specified.

Figure 1.2 shows Home menu display interface which has been successfully produced. The main menu functions of an iUKM mobile application was developed to explain an actual function of this application was built. An iUKM application is an interactive service network 24 hour exclusively for UKM news coverage and also includes 13 faculty in UKM website. This application are freely available for application users that received an iUKM mobile application on their Android mobile.

All display results can be used when enter the UKM areas for saving time as well as be able to avoid traffic jams while on UKM campus.



Fig. 1.2 Home menu interface view

Figure 1.3 shows sub menu Find UKM to track an actual location of UKM campus that has been produced. An iUKM mobile application have Navigation Bar as a backbone of this application. Figure shows the Navigation Bar as a major listing menu for connecting all functions of an iUKM mobile application to any other function via sub menu. When the sub menu Find UKM was clicked, a Google map view will appear, where one connection of an iUKM mobile application were linked to Google maps through Google Map APIs that have been set in the program. Development of UKM map features has been developed in this applications as shown in Figure 1.3.

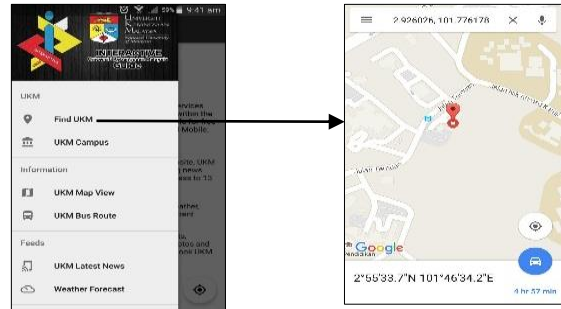


Fig. 1.3 Sub menu Find UKM Layout

Figure 1.4 shows sub menu UKM Map View to determine UKM bus routes map. Navigation Bar interface, sub menu UKM Map View will display the map and location of UKM campus covered by UKM bus. UKM bus routes map contains route, direction and location of the building to make it easier for users to wait at a particular station before bus arrival. In addition, users can find out position actual location UKM campus such as graduates office, Tun Seri Lanang Library, mosque, main and second gate, all faculties and residential college.

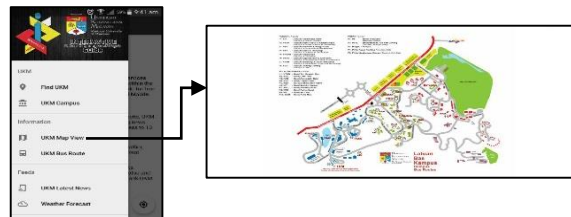


Fig. 1.4 Sub menu UKM Map View Layout

Next Figure 1.5 shows sub menu UKM Bus Route according to zones. Figure shows bus features which is describes different bus routes in UKM. Through Navigation Bar interface, sub menu UKM Bus Route, students or mobile apps users can view bus schedules according to designated zone every day. From this menu also offers bus helpful travel information such as identification buses, routes, and real time bus journey can be known.

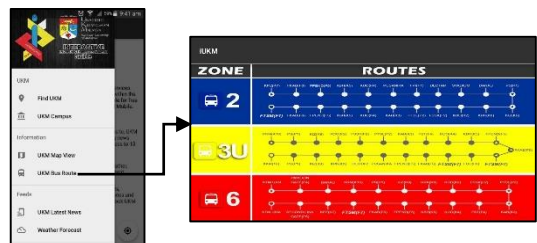


Fig. 1.5 Sub menu UKM Bus Route Layout

CONCLUSION

An iUKM mobile application using Android successfully implemented by designing and developing an user friendly Android application that can help students, staff and UKM visitors to get latest news from website source. Development of an iUKM mobile application using Android meet all specifications that was assigned. All interfaces development follows their own capabilities have successfully produced and fully functional. The goal was achieved through proof of concept (prototype) and an interactive design as application user satisfaction. This application communicate with Android Studio interfaces using Java programming language, Google MAP API and SDK component. Designing and implementation an iUKM mobile application consists news access details and an interactive virtual community services, based on open technologies such as Java programming language and Android as well as appropriate components, also IDE.

Development of an Android application that can track position of UKM campus and current routes through GPS has been successfully developed. UKM as a host campus data for tracking campus routes by users and an usage of GPS location data and information based on location-aware services. The latest development is to produce a brief report as social media communication platform also successfully implemented. With an existence report, Android users can spread UKM information to the outsider and in the same time can attract visitors to come to UKM as well as introducing UKM to the world.

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