NDRIOD-BASED MOBILE ACADEMIC PORTAL APPLICATION

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The academic portal application the authors created, which is available on phones, is an open source operation with Java platform that can be easily by anyone. This application is created the students who use Android phones as media so that they can use sapplication to keep track of their academic and information. In addition, the res can also input students' grade points approve the study plan of the students who ander the same academic advising service from the apps. The academic mation system used by Andalas University me moment is in the form of website page. to the high interest in the development of technology, the authors decided to create mobile application as the client for this demic information system.

Mobile technology, Android Application, portal.

I. INTRODUCTION

The fast-paced development of cell phone inclogy has affected the entire world.

Learneless of age and life experience, even ten old teenagers and elderly people own cell phone. Almost everyone owns a cell phone, and resome people one cell phone might be

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insufficient. This kind of development can be used for an advantage in education field.

Academic portal functions as the source of information related to students' course progress, such as students' coursework plan and grade points. Academic portal has become an important part as the information exchange media in a university system. The students can access the information through a website page. There is no other alternative for accessing the students' course result and for inputting the However, with plan. coursework technological advancement of mobile phones that students widely use nowadays, there is a possibility of developing an alternative accessing academic application for information on Android phones. This alternative is expected to facilitate lecturers, students and other related parties who use Android phones in accessing academic related information through the portal.

The purpose of this research is to develop an Android-based mobile academic portal that will be used as an alternative in accessing academic related information effectively and efficiently. This academic information application that runs on an Android mobile is mostly similar with web version, and they both function as clients. The only difference is the means of data access. Data access on the website is done through an internet browser, while data access using an application can be done directly through a specifically developed application that is installed on the cell phone and is connected to the server. The data needed to generate information is from the same storage and the data is also processed by the same server.

II. RELATED WORKS

Internet and cell phones are two technologies that keep progressing and influencing the lives of millions of people worldwide. Internet provides ease of information access with less cost and it also does not depend on location. Cell phones enable people to connect and communicate over great distance. The integration of the two technologies enables people to communicate regardless of the sources of information and the location access.

The development of information technology highly affects the education field, as seen from the various android-based applications developed by students, such as the application used for helping the teaching and learning process between a lecturer and the students [1]. This application functions as a media in learning mathematics in which the learning materials and quizzes on the related subject are uploaded by the lecturer. The students then access the material and the quiz on their android phones with the application installed. Figure 1 shows the interface of the Andromath.

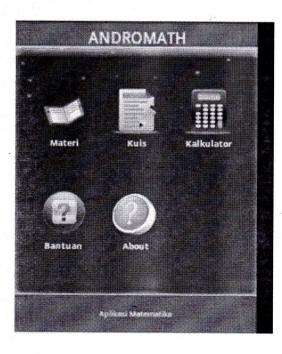


Figure 1. Interface of the Andromath

Mobile Learning (M-Learning) development through the implementation of Personal Extreme Programming method was introduced by Rizal H, et al [2]. For this application, the authors designed an android application that provides information on the courses that students completed, the learning materials, downloadable assignment, and discussion forum.

The authors [3] introduced a waterfall model on the android system design. The application is developed to promote Indonesian culture and it is also equipped with multiple questions on Indonesian culture. The authors had performed a test on several cellular devices. Based on the simulation, this application can successfully run on Android version 2.3 and higher. Figure 2 shows the feature of cultural products on the designed application.

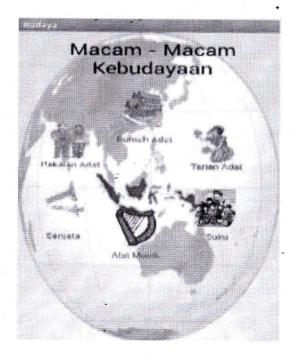


Figure 2. A Feature of Cultural Products on Android

The authors [4] created a prototype of academic portal system application that runs on an android-based operation system. Based on the

developed are able to be implemented on android-based operation system using waterfall method. Figure 3 shows the main menu of SIT Unstat.



Figure 3. The Main Menu of SIT Unsrat

III. PROPOSED METHOD

In developing this application, the methodology used is waterfall model, "a classic, systematic, and sequential model" (Sudarmawan, 2007:154) [5]. Figure 4 shows waterfall Model.

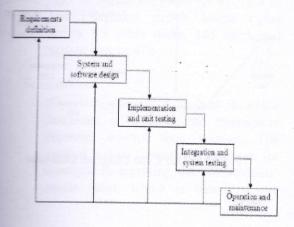


Figure 4. Waterfall Model Information:

1. Requirements Definition Analysis

This phase completely collects the necessary data to be analyzed in order to define the needs that should be met by the program being developed. This phase should be done accurately to create a well-equipped design.

2. System and Software Design

After all necessary data have been collected and completed; the process of designing can be started.

3. Implementation and Unit Testing

The design of the program is interpreted into codes using a pre-determined programming language. The program that is being developed will directly undergo unit testing, to examine whether it can operate well or not.

4. Integration and System Testing

Integration and System Testing is the integration of program units that will be tested together later (system testing).

5. Operation and Maintenance

Program operation and maintenance are in the form of adjustments and changes made to adapt with the real situation.

The system is divided into two sub systems: the system that runs on the server-side and the system that runs on the client-side. Server is a sub system run by web server that provides mobile service that can be accessed and run on another sub system. Below is flowchart illustration of the client and the server systems on a mobile portal application:



Figure 5. Server Activity Flowchart

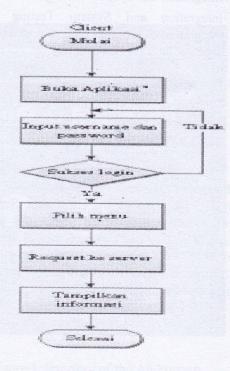


Figure 6. Client Activity Flowchart

A. Hardware and Software Specifications

Hardware

- Processor : Intel Core i3
- RAM DDR3 Memory 2 GB
- Harddisk / HDD 500 GB

Software

- Eclipse-java-indigo-SR1-win32
- ADT 20.0.0
- SDK 19
- Add on Android 4.0 (API 14)
- Notepad++ (Editor)
- Cordova
- node-v0.10.30-x86
- npm-1.4.9
- Xampp-win32-1.7.3 (Localhost, MySql)

B. Design of Use Case Diagram

1. Use Case Diagram Database

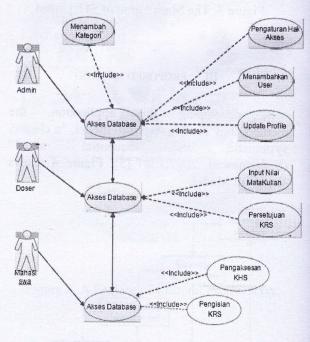


Figure 7. Use Case Diagram Database

2. Use Case Diagram Portal Application

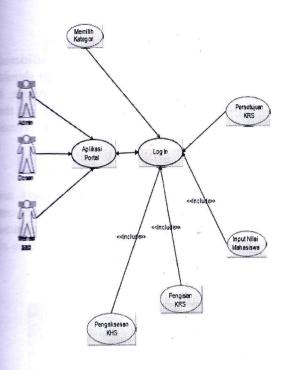


Figure 8. Use Case Diagram Portal Application

Information:

1. - Administrator

In this administrator area, there are several kinds of access that can be done either in the database part or the portal application itself. For the database access part, the administrator has the right to access the page, for example to add categories, create access rights policy for other-users, add users and update user profile.

2. Lecturer

This lecturer area is an area in which academic advisors or the responsible lecturers control their courses. The control is done through the database, for example in inputting data of students' grade point, which is based on the

courses taken, and approving the coursework plan chosen by the students.

3. Student

For the student area, the students can access information about their course results (Course Progress Card) and input their choice of courses during coursework plan entry period.

C. Design of Sequence Diagram

Sequence Diagram illustrates the interaction between objects within and surrounding the system in the form of messages being exchanged over time. Messages are illustrated in lifelines with each of its arrowhead representing movement from one object to another. messages will be mapped into operation/method from its class. Sequence Diagram consists of a vertical dimension (time) and a horizontal dimension (related objects). The sequence diagram can also be used for illustrating a scenario of a response to an event that generates a certain output. The sequence diagram for this portal consists of the administrator's sequence diagram, the lecturer's sequence diagram, and the student's sequence diagram.

1. Design of Administrator's Sequence Diagram

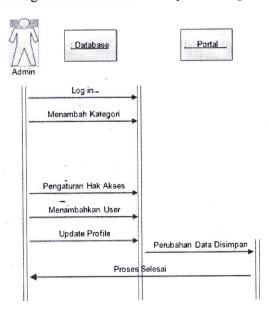


Figure 9. Administrator Sequence Diagram

2. Design of Lecturer Sequence Diagram

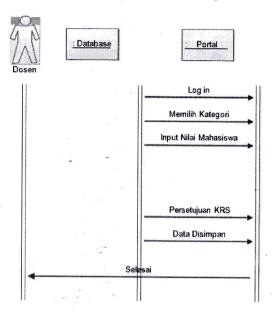


Figure 10. Lecturer Sequence Diagram

3. Design of Student Sequence Diagram

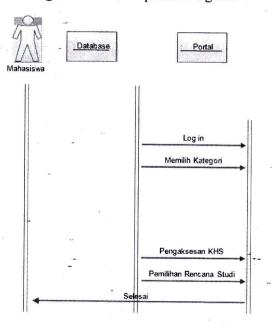


Figure 11. Student Sequence Diagram

D. Interface Design

One of the important things to be considered in designing a system is that the design should ease users in using the application; therefore, it is necessary to arrange the position of the buttons, textfield, menus, or other visual components as not to confuse the users.

1. Log in Page

Once the system starts running, users are directed into an authentication page. Users can log into their accounts by typing their username and password. Figure 12 shows the interface of menu authentication.

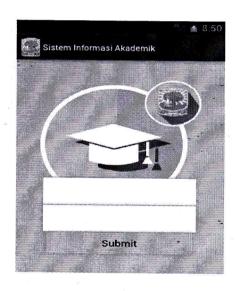


Figure 12. Authentication Interface

2. Main Page

After logging in, users can see a display of the main menu as in the picture below. The main menu consists of Coursework Plan Card and Course Progress Card. Figure 13 shows Student Web Page Interface.

Figure 14. Academic Advising Service List

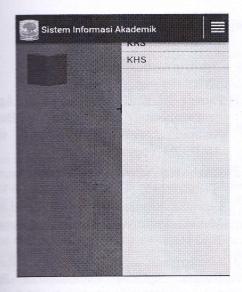


Figure 13. Student Web Page Interface

1. Lecturer Web Page

After logging in, users (lecturers) can see the main web page interface as illustrated below, the choice of menu that consists of main Advising Service List form, Students' Point Entry form, and Coursework Plan proval form.





Figure 15. Students' Grade Point Entry



Figure 16. Coursework Plan Approval

IV. CONCLUSIONS AND FUTURE WORK

Based on the simulation, it can be concluded that the Android based academic portal mobile application could run on Android version 4.1.2. The students can log on to their accounts and type in their academic entry. Lecturers can also authorize students' grade point using the same Android version.

Further application development will include adding an online final project consultation on Android phones, comparing the operating system with higher Android operation system and testing the system with other vendors such as Blackberry and iOS.

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