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THE PROTOTYPE DESIGN ACADEMIC INFORMATION FOR MANAGEMENT OF EXAMS QUIZ UNIVERSITY STUDENTS BASED ON SMS GATEWAY

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ABSTRACT

The need for quick and cheap real time information becomes a must for every higher education institution in organizing the education. The need for a web for every teacher or lecturer in building multi-channel learning process is a challenge of building the advanced education itself. The objective of this research is to create a web application design with the use of Information Technology and Telecommunication (ICT) or SMS Gateway of academic information. The method of the research used by the author is Field Research, where data collection was done through direct observation on the users in order to obtain as much information as possible from the users to learn what the users want in the making of SMS Gateway information system. Meanwhile, the methodology of the software development is using the Rapid Application Development (RAD) or Prototype model approach. For the design analysis of the academic information SMS Gateway system, the author used the Object Oriented Analysis Design (OOAD) approach using the Use Case Diagram, Sequence Diagram, Class Diagram and web application implementation using PHP and MySql software as well as SMS Gateway software with Gammu. The conclusion of this research is that the use of academic information SMS Gateway on college or university students is very effective for the learning activity process and institution service quality improvement as well as for helping the lecturers to obtain information of their students' quiz score real time. The result of this research is that the mastery of science and technology through the academic information SMS Gateway application prototype creation.
Keywords: *Sms Gateway, ICT, RAD, Academic, OOAD, PHP.*

1. INTRODUCTION

The development of Information Technology and Telecommunication (ICT) nowadays is very fast and advance, thus every company finds it necessary to transform itself by also using ICT technology in order to retain its business against its competitors.

The world of education today cannot be separated from the information technology and telecommunication requirement. Higher education institutions or school institutions, in general these days, have already had their own websites. The role of information technology here is to help provide the academic information to the learners or students in order to facilitate the process of accessing information directly to the source, such as the new students registration announcement (PMB), interactive and attractive learning materials in a form of audio/video multimedia, and the evaluation information system provided in digital form in the Internet which can be accessed by the institution and the learners or students. For the institution itself, this can provide the convenience in the service to learners or students. The cost of procuring school books for the library can be reduced by having an online library.

Along with the need for quick information these days, a problem is often encountered in the web technology, which is that the learners or students have to wait for the information such as class schedules, lecturer names, exam schedules, exam scores, and lecture classroom information to be uploaded first by the institution to the website and have to access the Internet first. Although the Internet can be accessed anytime and anywhere, the obstacle is when the learners or students have no time and no Internet connection. Evaluation for the learners or students in the learning activity is one of the methods used to test the learning outcome. The challenge frequently faced is to check a large number of students quiz results.

Based on the explanation above, the author was interested in creating a prototype of students academic information service, particularly for accessing the quiz scores, which is SMS Gateway-based with expectations that access to information

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required by the students can be obtained correctly and real time by using SMS service thus facilitating the students in the learning activity experience as well as helping the lecturers in finding out the students learning results.

2. RESEARCH METHODOLOGY

Research methodology that the author uses in this paper is as follows:

2.1 Data Collection Method

a) Field Research
The author gathered the data by performing observations on users in order to obtain as much information as possible from the users to learn what the users want in the making of SMS Gateway information system.

b) Library Research
The author gathered various information related to SMS Gateway web application from books or internet journals.

2.2 Problem Analysis

In this research, the author analyzed the problem using the Object Oriented Analysis (OOA) method approach to find the root of the problem of the students in accessing information real time during the learning activity process by specifying or observing the problem using the object oriented method. Below is the problem analysis using Fishbone Methodology.

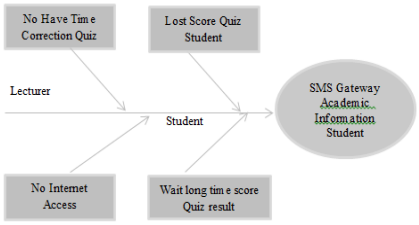

Figure 1 Fishbone methodology of the Academic Information SMS Gateway.

Analysis of the questionnaire was done to analyze the problems of lecturer and students in access information real time during the learning activity process.

1. Do Lecturers often lose data of the quiz grades students that have been kept manually ?

Answers are available	Respondents	Percentage (%)
Yes	43	61%
No	27	39%

Table 1. Analysis of lecturers often lose data of the quiz grades students that have been kept manually.

2. Do lecturers have enough time to check their students quiz results manually ?

Answers are available	Respondents	Percentage (%)
Yes	24	32%
No	49	68%

Table 2. Analysis of lecturer do not have enough time check their student quiz results manually.

3. Do students wait longer time to know their quiz grade with manual system?

Answers are available	Respondents	Percentage (%)
Yes	48	68%
No	22	32%

Table 3. Analysis of student wait longer time to know their quiz grade with manual system.

4. Do students have access to the internet to view their quiz grade ?

Answers are available	Respondents	Percentage (%)
Yes	31	41%
No	43	58%

Table 4. Analysis of students have not access to the internet to view their quiz grade.

2.3 Limitation and Assumptions Research.

2.3.1 Assumptions

a. In the process of teaching and learning activity a Lecturer should have a laptop with SMS gateway application that can be able to provide result of quiz that has been taken by students before lecture activity is started.

b. Students should have a mobile phone to answer a quiz that uses technology SMS Gateway to find out the quiz score in real time.

2.3.2 Limitation

a. SMS gateway application that is being developed is only able developed to provide results of the quiz, mid test and final grades. It Has not been able to access questions for the quiz from a mobile device.

b. SMS gateway modem which is currently used has limitation to read character. If data have

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more than 1600 characters, it will cause modem hangs so the software needs to be reinstalled.

2.4 System Development Method.

For the academic SMS Gateway system development methodology, the author used the Rapid Application Development (RAD) or Prototype model approach which consists of the following phases: Requirement Planning, Analysis Phase, Design Phase and Implementation Phase.

2.4.1 Requirement Planning

The author defined what information that can control the business process of this academic SMS Gateway, what kind of information that required, where the information is used and who will process the information as well as the planning for the completeness of the application design.

2.4.2 Analysis Phase

The author analyzed the user requirements during the making of the academic information SMS Gateway system. At this phase, the author will generate a user requirement document.

2.4.3 Design Phase

During the Design Phase, the author will translate the requirements of a software. This process focuses on the making of the application design of the required input/output design, data structure, designing Use Case, activity and class diagrams to represent the operations that can be performed by users. This phase will produce a software document that will be the programmer guide in the making of the academic SMS Gateway system.

The following is the software document from the Design Phase:

a) Use Case Diagram of the Academic Information SMS Gateway

This Use Case Diagram explains about the functionality of the academic information system, what the things that can be done by the actors - students and teachers/lectures, in this academic SMS Gateway system.

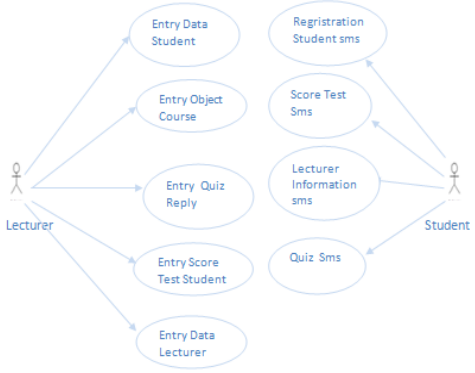

Figure 2. Use Case Diagram Of The Academic Information SMS Gateway

b) Use Case Diagram of Sms Quiz Reply Student

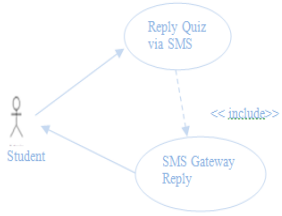

Figure 3. Use Case Diagram Of The Of SMS Quiz Reply Student

Use Case	SMS Answering Quiz Question
Brief Description	Use Case allows the students to answer the quiz based on the quiz code of a specific course.
Actor	Students
Precondition	Students use mobile phone to send SMS to answer the quiz using the SMS forma "quiz code<space>Answer1<space>Answer2<pace>Answer3<space> ... Answer10".
Main Flow	This Use Case starts when the students answer the quiz questions based on a specific quiz code by sending SMS using the defined SMS format.
Alternative Flow	If a student selects answer the quiz and find out the quiz score by sending the SMS according to the defined format, then press the Submit button. If the format is wrong then a Response SMS will be sent as an error message.
Post condition	If the SMS format is correct, an SMS Response will be sent containing information on the quiz score (the number of the correct answers and incorrect answers) which is available in the teacher/lecture's website and will be stored in the quiz table.

Table 5. Use Case Table of SMS Answering Quiz.

c) Activity Diagram

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Activity Diagram describes various activity flows in a system being designed, initial flow, decision made, and how the flow ends.

Activity Diagram of Sms Quiz Student

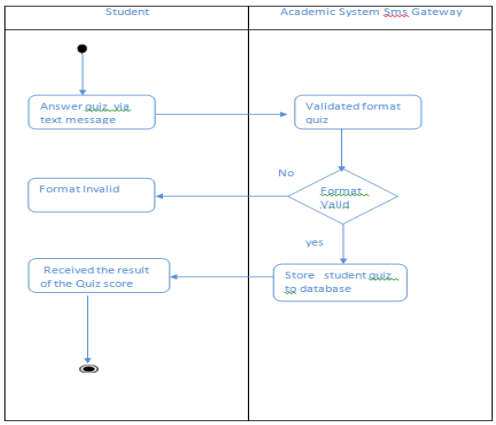

Figure 4. Activity Diagram Of SMS Quiz Student.

f) Class Diagram

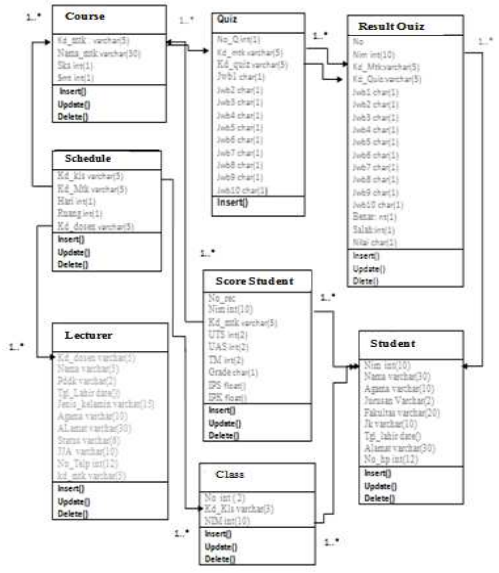

Figure 5. Class Diagram Of Academic SMS Gateway

2.3.4 Implementation Phase

This phase is the implementation phase where after the design is translated into a programming language by the programmer, there will be a system test before the system can be used by the users.

3. IMPLEMENTATION DESIGN

a) Students Quiz Reply Page

This page is used by the admin and teacher/lecturer to look at the students' quiz answers which have come in to the Database and Viewed at Student Quiz Reply Page . The design of this page is as follows:

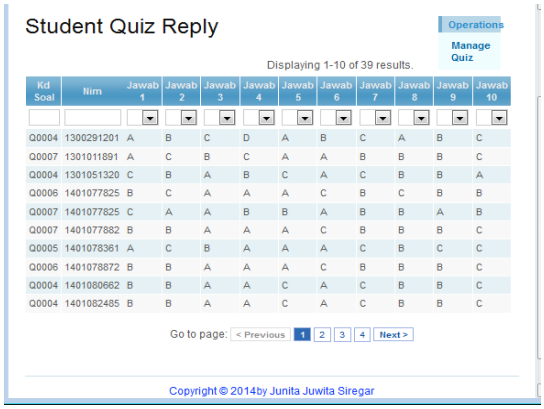

Figure 6. Sms Gateway Reply Page

b)Sms Gateway Reply Page

This page is used by the admin and lecturer to look at the respons of the system academic information gateway, which have sent to student after a student answer quiz via cellphone and automatically saved to the database. For detail sent information viewed at Sms gatewary reply page. The design of this page is as follows

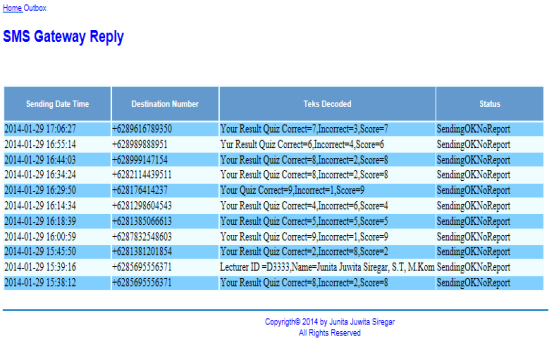

Figure 7. View Of SMS Gateway Reply Page

c) Response of SMS Quiz

This screens is respons of the system academic information gateway for detail score answer quiz which have sent to a student via cellphone.

For detail sent information viewed at Sms gateway reply page. The design of this page is as follows:

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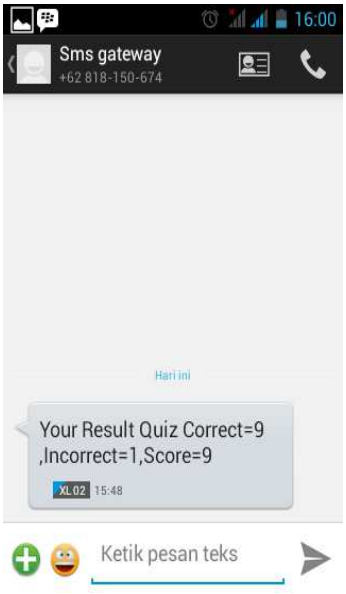

Figure 8. View Of SMS Quiz Response

Hardware Specifications

The hardware required for this SMS Gateway application consists of hardware for server (Web server and SMS server), *Processor*: Core i3-2120 3.10 Ghz, *Memory (RAM)*: 4 GB (DDR3), *Monitor*: LED LG 16" *Harddisk* : Seagate 500 GB Sata, *Keyboard* : 107 Keys, *Mouse*: Mouse Power Logic, Modem SMS Gateway: Wavecom, GSM Sim Card: Mentari, USB Data Cable for Wavecom.

Software Specifications

The software required for this SMS Gateway application consists of Web server, SMS server software and software for client with the following specifications: *Operating System*: Windows 8 Pro/Windows 7, *Programming Language*: PHP, *Interpreter* : PHP5 Engine versi 5.2.8, *Database Server*:PHP MyAdmin versi 2.1.14, *Web Server* : Xampp version 32.1.8.

Meanwhile, the minimum software required for SMS server is as follows: *Operating System*: Windows 8 Pro, *Programming Language*: Java, *Compiler*: JDK1.6.0, *Database Server*: MySQL Server versi 5.051a, *SMS Gateway Application*: Gammu, *SMS Modem Driver*: prolific-win7.

4. CONCLUSION

In this research, the author concluded the following:

1. The use of Information Telecommunication Technology (ICT) in the learning process in the university or college environment is currently indispensable for accelerating the information and knowledge transfer process accurately to the students.
2. SMS Gateway to check the students quiz results is one of the web-based application that utilizes mobile technology in accessing information real time and is a creative innovation for the teacher/lecturer to help assess the achievement of the learners' learning activity process, in this case the students.

The author's recommendations in this research are:

1. There is a need for SMS Gateway application development on the data accessing capability with larger number of data and more complex data from a computer database.
2. To complete the academic information SMS service with new features so that it becomes better.
3. In the future the exam quiz SMS gateway can be further developed by adding data capacity to the modem so it can hold more than 1600 charaters. Besides the variation of quiz items can be accessed through the mobile device.

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