Implementation of Android XJDK Java APP for Student Information Services Based SMS Gateway

Anisya Anisya*, Verina Verina
Department of Informatics Engineering, Institut Teknologi Padang, Indonesia

Abstract
A elementary school state 51 Lareh Nan Panjang has approximately 356 students by the number of teachers 17 people, including the principal, observe much number of students and the lack of teachers in elementary school made the lack of teacher control so that if a student is truant to school through teachers consent but no parental consent, and to obtain information about attendance and achievement of their children, parents should come directly to the school requiring time for the parents of these students. This study aims to build an Android XJDK Java app for Student Information Services based SMS Gateway, which will assist the school in providing attendance information and achievement to parents so that parents do not have to come to school. It was built using PHP, MySQL database, Gammu and Android Studio. By using Android XJDK Java app for Student Information Services Based SMS Gateway, attendance data and student achievement that has been to be processed by the system so that the request of parents will be reciprocated automatically.

Keywords: PHP; MySQL; database; Android

INTRODUCTION
State Elementary School 51 Lareh Nan Panjang is one of the primary school which is a favorite in North Lintau Buo especially Kenagarian Tanjung Bonai with the number of students 356 students and 17 teachers including Headmaster. A large number of students in the elementary school does not balanced by the number of teaching staff so the lack of supervision from the teachers, there are students who skip school but as far as one knows of the teacher's unknown parents. Many of the parents who want knowing the development of her children at school, but if it should come to school directly it will take special time, so that parents prefer to ask the teacher who Reside in around the her house. But the problem is that not all students known by her, as a Teacher only teach one class. there question which often were asked by parents to teachers is how children at school learning activities decreased or increased, and is their children are often absent or not. But the questions, rarely missed by teachers questioned directly, because it is not necessarily the teacher taught directly her children at school.

But there are still problems faced by parents and the school is if the teacher gives a notice to parents about the child's impairment at school through the students, but many of these letters was not until into the hands of parents. Viewed difficult to get the desired information by parents State Elementary School 51 Lareh Nan Panjang and the solution is seen by researchers with SMS technology developers, the researchers will develop technologies SMS The service information for students, making it beneficial for parents in obtaining information about attendance and achievement at school.
Based on the above can be formulation of research problems is how to design sms gateway application so that parents can get the information of attendance as well as the child's progress quickly and efficiently.

In building applications Android's Java implementation XJDK SMS-Based Student Information Services Gateway has a limited problem, that is: the information in getting parents students in the form of information the number of attendance and children's achievement in the last one month, and in terms of achievement will only be given five subjects which decreased or increased, as well as samples taken only grades 4, 5 and 6.

This research aims to design of SMS-based application so able to provide information parents needed an accurate, relevant and timely. The benefits to be achieved in making this application is for parents can find absences information and his achievements easily.

THEORETICAL BASIS

According Edhy Sutanta, (2011: 13) Information is the result of data processing so it becomes something important to its recipient and have utility as a basis for decision-making which can be felt as a result directly on the spot or not directly at a future time. Information can be said to be qualified if it has met the criteria the following:

a. Information must be accurate and clear
   That information does not contains hesitations, just meaning conveyed by receiving, free of mistakes and misleading, must be explained and reflects the intention or in other words do not cause questions for the recipient of the information

b. Up to Date (Timely)
   The information came user not be late because the information is not timely is not have value.

c. Information must be relevant
   Information was received for people in need or beneficial for those who receive.

The system is a collection of objects or people, resources, concepts and procedures that are intended to perform a function that can be identified or to serve a purpose. The information system can be understood as a set of subsystems that are interconnected, gathered together and form a unity, interact and cooperate between the each other with specific ways to perform data processing functions, receive input (input) in the form of data, then process (processing), and generating expenditure (output) in the form of information as a basis for decision-making useful and has a real value that can be felt as a result either at that time or in the future, to support operational activities, managerial, and strategic organization, by utilizing a variety of existing resources and available for these functions to achieve the goal (Sutanta, 2003).

Mobile phones and started in 1908, the United States gave a special patent to Nathan B Stubblefield on radio phone meeting first version. E Amos Joel Jr. were discovered concept handoff in 1971, which allows communication with mobile phones moving through several cell without interruption. On the other hand, after a period of competing with Bell, the first modern mobile phone finally discovered in 1973 by Martin Cooper, a Motorola researcher, later named Motorola DynaTAC 8000X. the invention patented in the United States on October 17, 1973.

Android is an operating system that was designed as an open source platform for Linux-based mobile devices that includes an operating system, middleware, and applications. Android provides all the tools and framework to develop applications easily and quickly. With the Android SDK (Software Development Kit) application developers through the application creation Android platform using the Java programming language.

PHP stands for PHP Hypertext Preprocessor is web-based programming language. PHP is a programming language used to create web-based applications. PHP included in programming language that runs server side or often referred to as server side language. To write program code must be typed PHP PHP code is to start using the "<? Php?>".

Java is an object oriented programming language developed by Sun Microsystems in 1991. This language was developed with a model similar to C++ and Smalltalk, but is designed for easy use, and platform independent, which can run on different types of operating systems.
and computer architecture. This language also is designed for programming on the Internet that is designed to be secure and portable. Apply two processes, namely Java compiler and interpreter. Both of these processes have a difference in the code execution process. The compiler will execute the program code as a whole while the interpreter translating line by line, the process is slower than the compiler. In java program results will in the form of bytecode (.class extension). Bytecode is a collection of commands in machine language for a JVM (Java Virtual Machine).

The database is a set of linked data (interrelated data) that can be kept together on a media, do not need to be a redundancy of data, the data is stored in a way that is easy to use or displayed again. (Sutanta, 2011)

Telecommunications is the technique of sending or submission of information from one place to another. in relation with telecommunication forms of remote communication can be divided into three kinds, namely (Hidayatullah, 2008):

1. Communication in one way (simplex) that the sender and receiver of information can not establish communication sustainable through the same medium. Example pager, tv and radio.
2. Two-way communication (duplex) ie the sender and receiver of information can establish continuous communication through the same medium. Examples phone and VoIP
3. Communication of semi bidirectional (half duplex) that the sender and receiver alternately communicate information yet remain sustainable. Example walkie talkie, FAX and chat room.

Telecommunications networks are all telecommunication devices that can connect use (generally men) with other users, so that two users can exchange information (by way of speaking, writing, drawing or typing) at that time. (Iradath, 2010).

Base Transceiver Station (BTS), this includes new terminology and became popular in era of mobile now. BTS serves as an intermediary for the user communications device with network to other networks. One coverage base stations can be called a cell. Modern cellular communication is communication that supports high mobility. Of several BTS then controlled by a Base Station Controller (BSC) that is connected to a microwave or fiber optic connections. BTS and mobile phones alike - each is called transceiver because it is equally able to send information and receive information. At the time of sending information to mobile phone base stations, at the same phone.

One can also send information to the base stations can jointly called Full Duplex. In topology BTS serves to provide a network of radio electromagnetic waves to users in this case is a cell phone, modem, fax, etc., (William, 2007).

![Fig. 1: Chronology of Mobile Communications Simplified.](image)

Short Message Service (SMS) is one of the features of GSM developed and standardized by ETSI (European Telecommunications Standards Institute) to send and receive short messages. SMS is the short message service-based text (text) with mobile communications
media. A text message is commonly used letters, numbers, or alphanumeric characters. One package of text messages with 160 Latin letters characters. One of the reliable communication mode at this time is a short message short messaging system (SMS). Implementation, one of the data communications models can be used is SMS. That is, the SMS should be able to conduct transactions with the database. For it is necessary to build a system known as SMS Gateway. In principle, SMS Gateway is a software that uses computer assistance and utilizing mobile technology is integrated in order to distribute the messages that are generated through the system information via SMS in the media handled by the mobile network. In particular, this system will have the following functions:

a. Message Management and Delivery
   1. Setting a message that includes a message priority management, shipping management messages, and queue management.
   2. Messages that do fail safe should wherever possible. That is, if there is interference in the telecommunication network, the system will automatically resend the message.

b. Correlation
   Function to perform correlation data to generate new data correlation results. In the system that is currently installed, the architecture of data traffic via SMS has existed quite well. However, limited access to data and SMS information of interest that has not been focused resulted in many standard answers (default replies) still a lot going on. SMS Gateway used performance various business processes and business. Business processes and services that can be handled by the SMS Gateway application, which is as follows:
   1. Inventory Management
   2. CRM (Customer Relationship Management), for example Restaurants, Café, Executive Club, Radio Stations, TV Stations, Educational Institutions.
   3. Complaints Call Center and SMS, for example the police, PLN, PAM, Government Agencies
   Some SMS Gateway capabilities, namely to:
   a. Enlarge the scale of information technology applications by using interactive SMS communication
   b. Provides application-resi kolabo WEB-based SMS communication for users in institutions or companies.
   c. Reaching consumers and service users of institutions or companies are easy to use interactive SMS communication.

Standard features SMS Gateway, the SMS communication interactive two-way SMS info on demand, SMS service settings, SMS Automatic Registration, SMS polling, sending SMS Broadcast, SMS sending to Call Group, send Timed SMS, personalized SMS, the application interface based on web, address book and call group, management users, system security access, and system parameters. Features advanced SMS Gateway, which is a dynamic interface for integration into the company's database, SMS Remote Control, E-mail to SMS, SMS to E-mail, the expansion of the GSM modem, and a direct connection to the SMSC via SMPP. SMS Gateway is the gateway for the dissemination of information by using SMS. SMS Gateway can spread the message to hundreds of numbers automatically and quickly connected directly to the database of cell phone numbers without having to type hundreds of numbers and messages on mobile phones because all the numbers will be automatically retrieved from the database so as to save time.

How it works SMS Gateway is to liaison between Sender and Receiver required operator services which consist of: BTS / Satellite and SMS Server Data Center (SMSC). BTS: for connections between Simcard with satellite and SMSC SMS is used to store data or messages sent by the sender. If the recipient's phone number is not active then the SMS messages will be stored in the SMSC in a given period (regulations vary), so after the recipient's number of active duty SMSC will send the SMS. On the receiver side only need a gadget either CDMA or GSM terkacakup in the area BTS Operator.
Recipients text message / SMS appears in the form of a regular mobile phone number as if it were sent through the phone by the sender, and the recipient can reply to the SMS sender number SMS with the condition sms gateway software is enabled to receive a reply. So how the scheme appears SMS Gateway mobile number has been illustrated below.

**Fig. 2:** How it Works SMS Gateway

**RESEARCH METHODOLOGY**
This study was an experimental study in which draft the application based on SMS Gateway. Then carry out experiments and methodology is the development of information systems or software, draft diagram context and ERD as illustrate in figure 3 and 4.

**Fig. 3:** Context Diagram

**Fig. 4:** Entity Relationship Diagram

**DISCUSSION**
The main page or main web login page is a page that appears when you type a url or web pages, this page is used by the user to access the next page suitable privileges by the user (administrators and managers). The shape of the main display is as follows in figure 5.
Admin main page is the first page to appear when the admin successful login. On this page there are several menu section to the left of the page. sms gateway Menu are selection menu where there are incoming messages, sent messages and outgoing messages, menus student is a menu that is used to edit the student data, menu parents used to edit the data of parents, menu data input sms is also used to edit information attendance as well as student achievement. User menu is used to display information about the web admin where information such as user id, full name and user name. On the incoming message page will display information about the sender hand phone numbers, messages sent, delivery time and action where action is an action option to delete messages.

---

Fig. 5: Login Page

Fig. 6: Main Page Admin & Message Sign Page

Fig. 7: Message Out Page & Page Messages Sent

Fig. 8: Page Parents & Add Data Parents
Student menu page is a page that is used to store student data and student data editing and Report menu page is a page that is used to store attendance data and student achievement. The page will look like the image below.

![Student Data Page & SMS Data Pages](image1)

**Fig. 9: Student Data Page & SMS Data Pages**

Admin page is a page that is used to store data admin. The page will look like the image below. This page is the main page login menu principals, on this page are the same submenu by admin but have differences that on the webpage principals can only see the data that is fed admin, cannot remove, alter even add data

![Admin Page & Main Page of Headmaster](image2)

**Fig. 10: Admin Page & Main Page of Headmaster**

The initial view into the first page users see when the program is run and student information display function to enter the registration numbers of students and the send button to send the message as shown in figure 11.

![Initial view Android, student Information display, and display on Application](image3)

**Fig 11. Initial view Android, student Information display, and display on Application**

**CONCLUSION**

Based on the discussion conducted in the research, it can be concluded that the presence of sms gateway application can provide the information needed by parents of people with relevant and faster manner.

After draw some conclusions from the analysis made, the authors put forward suggestions relating to the new system was partly built,
1. For further development, we recommend this sms gateway application displays a list of values of the students concerned.
2. It is expected that all schools use this system as a medium of information because the system is faster and more efficient.
3. In the implementation of this SMS gateway, certainly was not spared from the shortcomings and limitations, then it is that you can then trigger for other researchers to continue to develop and enhance these systems as this application fully using Android, and can provide information on all subjects to the parents.

REFERENCES