SMS Based Exam Schedule Information Unit Link Using Data Protocol Method

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Abstract

SMS from these various considerations is feasible to use. The level of ownership of cellular phones and affordable costs are considerations that support the adoption of this technology to be widely applied for the application of information system development in the present and in the future. Distance and long time are no longer a problem that can hinder obtaining information about the exam schedule, the SMS received does not come directly from the sender, but comes from the SMS Center. So, before the SMS reaches the recipient, the SMS actually enters the SMS Center first. The PDU contains not only the message, but also a lot of information about the sender. Starting from the sender's number, the sender's SMSC number, the validity time of the SMS, and so on. Everything is built in the form of hexadecimal numbers. SMS-based student exam scheduling using AT Command GSM which is used as a command in communication with the serial port. Scheduling with the AT command technique is very effective as information for students.

Keywords: Information, Exam Schedule, SMS Unit Link, Data Protocol Method.

INTRODUCTION

Along with increasing telecommunication technology is now very fast with the increasing demand for this technology [1]. These developments provide several facilities that can be used by users of communication services, such as Short Message Services [2]. At first this message was used between mobile phones, but with the development of technology, the message can be done via a computer or landline [3]. Short Message Service (SMS) is one of the features of GSM which was developed and standardized by the European Telecommunication Standards Institute (ETSI) [4]. SMS (Short Messaging Service) is one of the most widely used services by society today, in addition to being able to be used as a sender of SMS messages, SMS can also be used as a transfer of data or information in a small capacity [5]. This Short Message Service-based application provides facilities for users to carry out activities that are not limited by space and time, simply by using a cell phone [6]. SMS-based information system from these various considerations is feasible to use [7]. The level of ownership of cellular phones and affordable costs are considerations that support the adoption of this technology to be widely applied for the application of information system development in the present and in the future [8]. For example, a -based exam information system application Short Message Service on students. Information access services can be implemented using a gateway that connects information service providers with the Global System for Mobile Communications (GSM) network [9]. The gateway will automatically access the information service provider database and if the information is obtained it will be sent to the user who made the request. One of the technologies currently developing is the Global System for Mobile communication (GSM)

or better known as digital cellular telephones [10]. GSM is used as a global standard for cellular communication as well as cellular technology that is most widely used by people around the world [11]. In general, it is difficult to get information on the exam schedule without having to be present at the study site in question, especially if the announcement of the exam schedule is late. Although it is difficult, it is possible to share exam schedule information for those who need it without having to be present at the place of study in question [12]. AdaThis application will make it easier for students to get information about the time of the exam and when it will be held. The exam schedule information service was created to assist students in getting information about the exam schedule on campus [13]. In this study the authors designed a system that utilizes Short Message Service as a medium to share exam schedule information for those in need. Thus the information service that will be designed can be enjoyed and immediately obtained the information needed by students, so that distance and long time are no longer a problem that can hinder obtaining information about the exam schedule. It is very important for students to get information about the exam schedule that will be carried out, therefore it is necessary to design an application that functions as an information system. This information application utilizes technology that has been tested for its existence and is often used by every student, which is based on Short Messaging Service.

METHODS

SMS (Short Message Service) technology

Short Message Service is one of the messaging features defined by the European Telecommunication Standard Institute (ETSI) standard, which is the specification-making body for GSM. Short Message Service is a mobile application that provides services for sending and receiving short messages in the form of letters and numbers from or to mobile devices [14]. Short Message Service as a document on GSM 03.40 and GSM 03.38 which can contain text up to 160 characters (standard character is generally 160) where each character is counted with a value of 7 bits. In addition to the 7-bit ones, there are also SMS messages with an 8-bit value but the characters are limited to 140 and are used for pictures and ringtones [15].

MeHow SMS (Short Message Service) Works

With the existence of a Short Message Service (SMSC) server, users can find out the status of the sent Short Message Service, whether it has arrived or failed to be received by the destination cellphone [16]. If the destination cellphone is active and receives the Short Message Service sent, the Short Message Service will send a confirmation message back to the Short Message Service center stating that the Short Message Service has been received, then the Short Message Service center will send the status back to the sender. However, if the destination phone is inactive or out of range, the Short Message Service sent will be stored in the Short Message Service center until the validity period is met.

Figure 1: How the Short Message Service Works
Source: SaInfotech Institute, 2005

Protocol Data Unit

There are 2 ways to send and receive SMS, namely by text and PDU. The text method is only used on some cell phone models. This text way is just a way of encoding the bitstream the PDU represents. If this method is implemented, the application must limit it by specifying the encoding options. If the PDU method is used, any encoding can be applied. The PDU contains not only the message, but also a lot of information about the sender. Starting from the sender's number, the sender's SMSC number, the validity time of the SMS, and so on. Everything is built in the form of hexadecimal numbers. Every SMS sent will go through a conversion process to PDU format, as well as when receiving SMS. The PDU for sending SMS and the PDU for receiving SMS are different.

Protocol Data Unit Sending SMS

Before reaching the recipient, the short message to be sent will be via SMSC (not in its original form, but first converted into PDU format, which consists of a combination of hexadecimal numbers). In general, the PDU for sending SMS consists of 8 parts[17].

Figure 2: Submit SMS

Protocol Data Unit For Receiving SMS

SMS received does not come directly from the sender, but comes from the SMS Center. So, before the SMS reaches the recipient, the SMS actually enters the SMS Center first, then the SMS Center forwards it to the recipient. In Figure 4 below, you can see the arrangement of the SMS Deliver data section. It can be seen in Figure 4 that the data section is a parameter.

Figure 3: Data Structure Submit SMS

RESULTS & DISCUSSION

Device Implementation

The hardware in question is all the equipment needed to operate a computer system. Software specification aims to specify the software used in the manufacture of a system. Without software, the computerized process is impossible.

The hardware that the author uses in making this SMS system, among others:

1. Compaq 14 inch monitor with 1366 x 768 . resolution
2. *Processor* Intel Pentium
3. *Hard disk* 500GB
4. Memory with a capacity of 1 GB
5. *Mouse* and Keyboard as a data input tool
6. Nexian G522 . data cable
7. *WL* Nexian G522 as a medium for sending SMS in the system.
8. *Nokia Mobile* which is used as a Mobile Client to receive SMS from the server.

Mobile data cable is plugged into the serial port of the computer, the MT6225 USB Modem Driver port (COM 3) will appear as the modem from the cellphone that will be used for the SMS system. Henceforth COM 3 can be used in Visual Basic 6.0 applications in the Port Settings of the SMS system. For more details, see the following image:

Figure 4: Port Settings on the System

The software used in the manufacture of this SMS system, among others:

1. *Microsoft WindowsXP* as the operating system.
2. *MySQL 5.0*as databases.
3. *Visual Basic 6.0* as a programming language.
4. *AT Command GSM* to access to Mobile.

System Implementation

In the implementation of this SMS system there are several programs that are used which these programs have different functions. The steps for implementing the SMS-based Exam Schedule Information System are as follows: Click "Master & Tools" as shown below:

Figure 5: Master and Tools

Lecturer Data Form

Lecturer data is used to fill in lecturer data which consists of lecturer code and lecturer name. For more details, see the following image.

kodedosen	namadosen
0125068001	Erwinsyah Simanungkalit, M.Kom
0107097001	Henry Kristian Siburian, M.H
0128127501	Hery Sunandar, S.T
0118097801	Permanan Ginting Munthe, M.B.A
0118127801	Tonni Limbong, M.Kom
0111078501	Abdul Sani Sembiring, S.Kom
0110118502	Berto Nadeak, S.Kom
0108017102	Ikwan Lubis, M.M
0122046701	Kennedi Tampubolon, S.Si
0120027302	Lince Tomoria Sianturi, M.Kom
0107128302	Marzuki Sinambela, S.Kom

Figure 6: From Lecturer Data

Course Data

Course data is used to fill in course data consisting of course code, course name and credits. For more details, see the following image.

Form Data Mata Kuliah

Kode Mata Kuliah :

Nama Mata Kuliah :

SKS :

	kodematkul	namamatkul	sks
	KKTI4703	Sistem Terdistribusi	2
	KBTI4702	Pemograman Jaringan	3
	KKTI4702	Pemograman Berorientasi Objek	3
▶	KKTI4701	Metode Numerik	3
	KBTI4701	Manajemen Proyek IT	2
	KKTI4705	Kriptografi	2
	KBTI4706	Kapita Selekt	3
	KBTI4303	Sistem basis Data	3
	KKTI4101	Matrix dan transformasi Linear	2
	KBTI4302	Komunikasi Data	2
	KBTI4713	Keamanan Komputer	2

Simpan Hapus Batal Keluar

Figure 7 : From Course Data

Course Schedule Data Form

Course schedule data is used to fill in course schedule data consisting of majors, levels, classes, theories, semesters, courses, days, hours, rooms, lecturers. For more details, see the following image.

Form Data Jadwal Kuliah

Jurusan : Tingkat : Kelas : Teori/Praktek : Semester :

Hari :

Mata Kuliah :

Jam : Dosen :

Ruang :

	id	jurusan	tingkat	waktu	kelas	Teori	hari	kodematakuliah	jam
▶	23	TI	IV	Sore	TI-MT0710	T	Jumat	KKTI4703	17:45-19:15
	24	TI	IV	Sore	TI-MT0710	P	Rabu	KBTI4702	17:45-19:15
	25	TI	IV	Sore	TI-MT0710	P	Selasa	KKTI4702	17:45-19:15
	26	TI	IV	Sore	TI-MT0710	T	Rabu	KKTI4701	17:45-19:15
	27	TI	IV	Sore	TI-MT0710	T	Selasa	KBTI4701	19:30-21:00
	28	TI	IV	Sore	TI-MT0710	T	Senin	KKTI4705	19:30-21:00
	29	TI	IV	Pagi	TI-MT0710	T	Sabtu	KBTI4706	08:00-10:00
	30	TI	II	Sore	TI-M0708	T	Senin	KBTI4303	17:45-19:00
	31	SI	III	Siang	SI-P0804	T	Senin	KKTI4601	11:45-13:15
	32	SI	III	Siang	SI-P0804	P	Senin	KKTI4602	13:30-15:45

Simpan Hapus Batal Keluar

Figure 8 : From Course Schedule Data

Incoming SMS Form

The incoming SMS form is used to view the incoming SMS number with the message

content or message format requested by the student.

No	From Number	Isi Pe...	Jam
1	+6282160780081	jadwal#ti#III#senin#sore#ti-m0708#p	8/20/2011 11:57:12 AM
2	+6282160780081	jadwal#ti#III#senin#sore#ti-m0708#p	8/20/2011 11:55:13 AM
3	+6282160780081	jadwal#si#III#senin#siang#si-p0804#t	8/20/2011 11:48:08 AM
4	+6282160780081	jadwal#si#III#senin#siang#si-p0804#p	8/20/2011 11:40:29 AM
5	+6281264624561	jadwal#si#III#Jumat#siang#si-p0804#t	8/19/2011 11:13:49 PM
6	+6285763105324	jadwal#ti#II#senin#sore#ti-m0708#t	8/19/2011 10:29:59 PM
7	+6285763105324	jadwal#ti#II#senin#sore#ti-m0710#t	8/19/2011 10:28:24 PM
8	+6285763105324	jadwal#ti#IV#Jumat#sore#ti-mt0710#t	8/19/2011 10:07:39 PM
9	+6285762474184	jadwal#si#II#Kamis#siang#TI-MT0710#p	8/19/2011 11:29:23 AM
10	+6285762474184	jadwal#ti#I#senin#pagi#TI-MT0710#t	8/19/2011 11:26:41 AM

Figure 9 : From Incoming SMS

SMS sending

Sending this SMS is done by students by typing the SMS format that has been determined by the bureaucracy. The system will reply according to the SMS format automatically. If in accordance with the request, then the requested request will be sent in full. For more details on how to send SMS requested by students, see the following picture:

Figure 10 : SMS Sending Format

In the picture above, the student makes a theoretical schedule request to the server. The contents of the message requested by the student are already stored in the system. The process of sending SMS from the system which is an SMS reply from student requests

according to the requested format. Which is shown in the following image.

Figure 11 : SMS Sending Process

In the picture above, it can be seen that the process of sending messages automatically that has been successfully sent is shown in the following picture.

Figure 12 Successfully Sent SMS

SMS Reply

This SMS reply is sent from the system automatically. The contents of the SMS correspond to the format requested by the student, namely the theoretical schedule. For more details, see the following image:

Figure 13 : SMS Reply

SMS Alert

This SMS alert is used to notify students if there is a schedule change at any time. For more details, see the following image.

Figure 14 : SMS Alert

Outbox

Outbox form is used to view outgoing SMS reports consisting of destination number, SMS content, and delivery time.

To	IsiSMS	TanggalJam
085763105324	Tidak ada Jadwal untuk tersebut	8/18/2011 2:21:43 PM
085763105324	Tidak ada Jadwal untuk tersebut	8/18/2011 2:26:19 PM
085763105324	Tidak ada Jadwal untuk tersebut	8/18/2011 2:33:36 PM
085763105324	Tidak ada Jadwal untuk tersebut	8/19/2011 10:51:16 AM
081370544984	Tidak ada Jadwal untuk tersebut	8/19/2011 10:55:48 AM
085762474184	Kapita Selekt-3SKS-08.15-10.00-Abdul Sani Sembiring, S	8/19/2011 11:27:11 AM
085762474184	Metode Numerik-3SKS-12.00-14.00-Erwinsyah Simanung	8/19/2011 11:29:49 AM
085763105324	Sistem Terdistribusi-2SKS-17:45-19:15-Sinar Sinurat, ST-R	8/19/2011 10:08:03 PM
085763105324	Tidak ada Jadwal untuk tersebut	8/19/2011 10:28:37 PM
085763105324	Sistem basis Data-3SKS-17:45-19:00-Yuyun Yusnida Lase	8/19/2011 10:30:54 PM

Figure 15 : Outbox Form

Sending messages for scheduling to make it easier for users to receive information with the sender's workflow sending a lecture schedule message will be filtered in the SMSC and then sent to the recipient. Messages sent by the sender are not immediately received by the recipient must go through the Service Message Service.

CONCLUSION

Based on the results of the research and discussion that has been done, the authors can conclude that this system can make it easier for students to get exam schedule information quickly and anywhere. The system designed is an SMS-based student exam schedule information system using AT Command GSM which is used as a command in communication with the serial port. This system only uses GSM network and is capable of receiving a maximum of 1 SMS request.

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