

AUTOMATIC RESPONSE SYSTEM USING SMS

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Abstract- Technology is booming in every area around us, whether it is in the field of business trade, computer, telecom or any other area. In education system lot of trends and competitions are emerging for the career and betterment of the students. Now a days many types of value added services (VAS) and various response systems and public response systems are available and running successfully around us. These value added services always adds remarkable values to the industry. Likewise here is a solution for the betterment of students and the faculties even for the parent and guardian of the students, that they can access information in a easier way from every corner of the world. An Interactive response system is been developed for fetching information over mobile by means of GPRS services, in the form of SMS, relevant information regarding students Exams registration, attendance, their daily activities in the college, on the cost of mere negligible charges. These interactive response systems will definitely going to be an asset for the institution and its students and faculties. This software deals with the SMS based applications. In this software an interactive database management system has been implemented by which the parent and guardian can get student's information using SMS service. As every mobile is having the capability of to an from SMSing, this makes the beauty part of this software as every mobile subscriber can benefit from this facility & thus saves precious time .At the same time this a very cost effective way to know about the current information of students. Finally, it may be emphasized that this system is public friendly & easy to use.

1. Introduction

Short Message Service (SMS) in wireless systems provides the capability of limited-size data messages to subscriber's cellular phone. And the development of value added services based upon the GSM standard is becoming increasingly important to both network operators and the subscribers to such networks. This project outlines a wireless service system capable of providing real time information of the student information of the college. The system allows a user to the service to receive student information on demand. Primarily by means of short messages delivered to their GSM mobile phone.

The various questionnaires for the stakeholders prepared by the school/college staff and the author were successfully administered through the system. The system supports a consultative style of decision-making that enables the stakeholders to contribute their views. The server can compile the responses, and then present the results to all. Hence, the school/college leaders can make timely and informed decisions that improve the college's programmers.

In addition, the system facilitates communication between the school and the home, and encourages collaboration. Finally, it supports the teachers in analyzing the students, and performs both formative and summative evaluation of lessons.

Today wireless technologies such as GPRS, new 3G networks and different WLAN technologies are rapidly being developed and deployed providing wireless access to the Internet in a much larger scale than before. At the same time, new mobile platforms like PDAs, advanced mobile phones and wearable computers are becoming more and more common. Together it will mean that the Internet will be accessible from anywhere, on a wide variety of different platforms and connection technologies. A user should be able to expect to access the same applications and services that are available on a fixed, connected PC from a mobile connected unit

Short message service is a mechanism of delivery of short messages over the mobile networks. It is a store and forward

way of transmitting messages to and from mobiles. The message (text only) from the sending mobile is stored in a central short message center (SMS) which then forwards it to the destination mobile. This means that in the case that the recipient is not available; the short message is stored and can be sent later. Each short message can be no longer than 160 characters. These characters can be text (alphanumeric) or binary Non-Text Short messages. An interesting feature of SMS is return receipts. This means that the sender, if wishes, can get a small message notifying if the short message was delivered to the intended recipient. Since SMS used signaling channel as opposed to dedicated channels, these messages can be sent/received simultaneously with the voice/data/fax service over a GSM network. SMS supports national and international roaming. This means that you can send short messages to any other GSM mobile user around the world. With the PCS networks based on all the three technologies, GSM, CDMA and TDMA supporting SMS, SMS is more or less a universal mobile data service.

2. Major Drawback of Sending SMS Messages through a Mobile Phone or GSM/GPRS Modem

Using a mobile phone or GSM/GPRS modem to send SMS messages has a major drawback that is the SMS sending rate is too low. Only 6-10 SMS messages can be sent per minute (when the "SMS over GSM" mode is used). The performance is not affected by the connection between the computer and the mobile phone or GSM/GPRS modem (i.e. the SMS sending rate is about the same no matter the mobile phone or GSM/GPRS modem is connected to the computer through a serial cable, USB cable, Bluetooth link or infrared link) and does not depend on whether a mobile phone or GSM/GPRS modem is used (i.e. the SMS sending rate is about the same no matter a mobile phone or a GSM/GPRS modem is used). The determining factor for the SMS sending rate is the wireless network.

3. Sending SMS Messages from a Computer through a Connection to the SMS Gateway of a Wireless Carrier

The way for sending SMS messages from a computer through a mobile phone or GSM/GPRS modem has a major limitation that is the SMS sending rate is too low. If you need a high SMS sending rate, obtaining a direct connection to the SMS center (SMSC) or SMS gateway of a wireless carrier is necessary. The connection may be made through the Internet, X.25 or dial-up. If you cannot get a direct connection to the SMSC or SMS gateway of a wireless carrier, another choice is to get a connection to the SMS gateway of an SMS service provider, which will forward SMS messages towards a suitable SMSC.

4. Connection to the SMS Center or SMS Gateway of a Wireless Carrier

It can be difficult for small businesses or individual application developers to obtain a direct connection to the SMSC or SMS gateway of a wireless carrier since a wireless carrier may only provide such service to those who have huge SMS traffic. Buying SMS messages in bulk means the total fee will be very high (although the fee per SMS message will be low).

Besides, the information about the service (for example, cost of the service, protocols supported, network coverage) is usually not stated clearly on a wireless carrier's web site. This is because the wireless carrier staff wants to know more about your SMS messaging application, such as its nature and traffic requirement, before offering a price and providing further information to you. To decide which wireless carrier's service plan is the best, you have to discuss with the sales staff of each wireless carriers. This is troublesome if you just want to send a small number of SMS messages. (Of course if you need to send a large amount of SMS messages, say one million SMS messages per month, negotiating with the wireless carrier staff for a more favorable agreement is a necessary step.)

A more convenient way to send SMS messages is to use the SMS connectivity service of an SMS service provider, which is described in the next section. SMS stands for Short Message Service. It is a technology that enables the sending and receiving of messages between mobile

phones. SMS first appeared in Europe in 1992. It was included in the GSM (Global System for Mobile Communications) standards right at the beginning. Later it was ported to wireless technologies like CDMA and TDMA. The GSM and SMS standards were originally developed by ETSI. ETSI is the abbreviation for European Telecommunications Standards Institute. Now the 3GPP (Third Generation Partnership Project) is responsible for the development and maintenance of the GSM and SMS standards.

5. Problem Statement

The very existence of rapid progress of human is due to emerging new ways of gathering & distribution of information. As the quantity of data that needs to be stored retrieved & progressed in a management & information system grows throughout the world, there arises a need for automation. Here we are taking the area of acquiring general information related to students of college. Such as his attendance in the college with current date, current percentage of presents with the name etc. One of the oldest methods is to go to institute & ask with the respective faculty of the subject for that particular information regarding the daily attendance, this concept is much more interesting for the parents and the guardians of the students as many time they are not aware of the actual curriculum of their student in the college, for this they will be informed after the completion of session about the students or the institution will provide a performance report about the student to their parents by mail. The drawback of this approach is the queue & wandering from one department to another in which user has to spend his precious time. Also if college will provide all the desired information regarding the students it has to engage several manpower for the accomplishment of this task and consequently loses time and money.

6. Toolkit and Technologies

6.1 Mobile Information Device Profile (MIDP)

MIDP is a specification published for the use of Java on embedded devices such as mobile phones and PDAs. MIDP is part of the Java Platform, Micro Edition (Java ME)

framework and sits on top of Connected Limited Device Configuration, a set of lower level programming interfaces. MIDP was developed under the Java Community Process as JSR 37 (MIDP 1.0) and JSR 118 (MIDP 2.0). The first MIDP devices were models i80s and i50sx from Motorola, launched in April 2001.

6.2 MIDlet

A MIDlet is a Java program for embedded devices, more specifically the Java ME virtual machine. Generally, these are games and applications that run on a cell phone. Basically midlets are the application created for mbile devices this application is developed in java to mobile edition using java classes. Various games and other applications are been regularly developed by the organizations these days.but the mobile should be java enabled.

6.3. Mobile Information Device toolkit

A MIDlet requires a device that implements at least Java ME, CLDC and MIDP to run. Like other Java programs, MIDlets have a "compile once, run anywhere" potential. MIDlet distributions main file is a .jar file, but MIDlet distributions can also consist of a .jad file containing the location of and describing the contents of the .jar file. The implementation of a MIDlet may or may not require the presence of a .jad file. A MIDlet has to fulfill the following requirements in order to run on a mobile phone: The main class needs to be a subclass of `javax.microedition.midlet.MIDlet`. The MIDlet needs to be packed inside a .jar file (e.g. by using the jar-tool). The .jar file needs to be pre-verified by using a preverifier. In some cases, the .jar file needs to be signed by the mobile phone's carrier. These midlets are basically developed using J2ME tool used for developing applications running on mobile device.

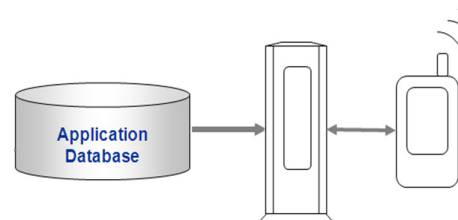
6.4. Java Platform, Micro Edition (J2ME)

In computing, the Java Platform, Micro Edition or Java ME (previously known as Java 2 Platform, Micro Edition or J2ME) is a specification of a subset of the Java platform aimed at providing a certified collection of Java APIs for the development of software for small, resource-constrained devices such as cell phones, PDAs and set-top boxes. Java ME was designed by Sun Microsystems and is a replacement for a similar technology, Personal Java. Originally developed under the Java Community Process as JSR 68, the different flavors of Java ME have evolved in separate JSRs. Sun provides a reference implementation of the specification, but has tended not to provide free binary implementations of its Java ME runtime environment for mobile devices, rather relying on third parties to provide their own. Java ME has become a popular option for creating games for cell phones, as they can be emulated on a PC during the development stage and easily uploaded to phones. This contrasts with the difficulty of developing, testing, and loading games for other special gaming platforms such as those made by Nintendo, Sony, Microsoft, and others, as expensive system-specific hardware and kits are required. Java ME devices implement a profile. The most common of these are the Mobile Information Device Profile aimed at mobile devices, such as cell phones, and the Personal Profile aimed at consumer products and embedded devices like Set-top boxes and PDAs.

7. Architecture Description

As shown in fig 4.2 Remote Mobile initiates a Data Request is made form a GPRS enabled mobile Device. Message sent over GPRS link over the air (OTA) is then captured by the Midlet application then http connection method is activated and a connection is established with the server on wireless local area network. Device Message then read by Java Mobile Application (midlet) running on Mobile Device and suitable decoding (formatting) of message is done After Message is decoded to suitable format, message is sent to Java Messaging Service Queue

(which is hosted on Application Server), Application running on server retrieves the message from the midlet application method then the data retrieve methods fires a Query through Transaction processor and retrieve desired data. The desired information, which we get, is in the form of a text string. This string is then formatted in a systematic form by a result method and sent back to the midlet application on the mobile device. Now rest task will be looking after by the MIDP application. Finally the downloaded information from the server is converted in to the form of message and displayed on the screen of the mobile.



Application server running Remote mobile web services and GPRS enabled java application
 Fig 1- Architecture for Automatic Response System

8. Use Case Diagram for Interactive Response System Using SMS

In this system we have actors like (as shown in fig 4.3 below) java enabled mobile responsible for the interaction with the use case named send message, another actor named server used for extraction of instruction carried out by the usecase processing of messages this usecase process the incomming message for further query execution which will extract the desired information from the database. Use Case diagram for Interactive Response System through SMS.

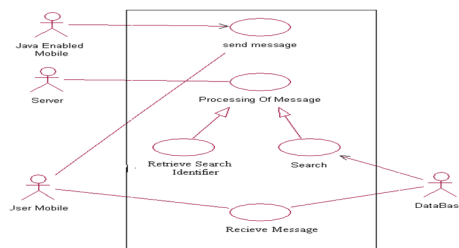


Fig 2- Use case Diagram for SMS

In this process other two use cases are also involved retrieve search identifier and search and finally the outcome is converted into the form of SMS and sent to the mobile device with the help of receive message.

Conclusion

As if now we are very much acquainted with (GSM) Global System for Mobile communications is the most popular standard for mobile phones in the world. Its promoter, the GSM Association, estimates that 82% of the global mobile market uses the standard. GSM is used by over 2 billion people across more than 212 countries and territories. Its ubiquity makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs from its predecessors in that both signaling and speech channels are digital call quality, and so is considered a *second generation* (2G) mobile phone system. This has also meant that data communication was built into the system using the 3rd Generation Partnership Project (3GPP).

The key advantage of GSM systems to consumers has been better voice quality and low-cost alternatives to making calls, such as the Short message service (SMS, also called "text messaging"). The advantage for network operators has been the ease of deploying equipment from any vendors that implement the standard. Like other cellular standards, GSM allows network operators to offer roaming services so that subscribers can use their phones on GSM networks all over the world. The major drawback of GSM technology that it is totally based on circuit switching methodology; here we can only get better voice quality rather than the data that we want to transfer on the device. Other than this the connection is totally dedicated between two devices (like mobile devices). GPRS is the technology through which we can achieve multicasting means same information or data can be sent simultaneously over the Air on different devices at the same time.

Moreover regarding GPRS (General Packet Radio Service) it is a packet based

communication service for mobile devices that allows data to be sent and received across a mobile telephone network. GPRS is a step towards 3G (third generation) and is often referred to as 2.5G. GPRS is packet switched technology using this Higher connection speeds are attainable at around 56–118 kbps, a vast improvement on circuit switched networks of 9.6 kbps. By combining standard GSM time slots theoretical speeds of 171.2 kbps are attainable. However in the very short term, speeds of 20-50 kbps are more realistic.

GPRS is an always-on service. There is no need to dial up like you have to send something on a home PC for instance. This feature is not unique to GPRS but is an important standard that will no doubt be a key feature for migration to 3G. It makes services instantaneously available to a device.

As we have discussed above about data sending over GSM service is quite slaky and slow and full of errors also as it is based on circuit switching. Hence Due to its high-speed connection and always-on connectivity GPRS enables full Internet applications and services such as video conferencing straight to your desktop or mobile device. Users are able to explore the Internet or their own corporate networks more efficiently than they could when using GSM. There is often no need to redevelop existing applications.

GSM network providers do not have to start from scratch to deploy GPRS. GPRS is an upgrade to the existing network that sits along side the GSM network. This makes it easier to deploy, there is little or no downtime of the existing GSM network while the implementation takes place, most updates are software so they can be administered remotely and it allows GSM providers to add value to their business at relatively small costs. The GSM network still provides voice and the GPRS network handles data, because of this voice and data can be sent and received at the same time.

As we have discussed in detail about the current technology, which we are supposed to develop, will going to be very helpful in the present scenario of

education system as we are heading towards the third generation of the information technology.

The above proposed and developed application is a mobile application for adding values to an institution. This application can only run on the cell phone having GPRS enabled services with them. This application can further be enhanced by adding various features to it like we can send and receive various information regarding students on a cell over the air (OTA). Even a student can view their assignments on the mobile phone by just using certain services that can be availed from the server.

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