Universiti Teknologi MARA

Development of Web - Based Short Messaging Service (SMS) in Teratai College Web Portal

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APPROVAL

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This thesis was prepared under the direction of course coordinator, Mrs. Salwani Jaafar and the thesis supervisor Mr. Kamarul Ariffin Abdul Basit has approved it. It was submitted to the Faculty of Information Technology and Quantitative Sciences and was accepted in partial fulfillment of the requirement for the Degree of Bachelor Science of Information Technology.

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DECLARATION

I certify that this thesis and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledge in accordance with the standard referring practices of the discipline. It was submitted to the Faculty of Information Technology and Quantitative Science to fulfill the course requirement.

APRIL 27, 2006

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ABSTRACT

Short Messaging Service (SMS) is quite a buzz word in the developing community nowadays. For its speed, accuracy and increased productivity, SMS is one of the most successful services among the various wireless services. When it comes to .NET environment, developers are really into it finding a solution for sending and receiving SMS from their web applications. Most of the web applications have a SMS feature in-built enabling the users to send a simple text to mobile numbers for instant correspondence. This project is mainly focusing on the development of web based SMS application in Teratai College Web Portal using combination of Waterfall Model which consists of planning, analysis, design, implementation and maintenance and prototyping method. The specific requirement needed are Gnokii 0.6.2 to integrate phone with computer, Nokia 3220 as mobile phone and data cable DKU-5 to connect computer with phone. From the findings, this system able to meet specific requirement accomplish objectives.

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CHAPTER ONE

INTRODUCTION

1.1 Background

Most of the cell phone users nowadays would certainly be aware of the short message service (SMS), which refers to the process of sending instant text messages from one mobile phone to another. The technology is called `short messaging', as the sender cannot send a message longer than 160 characters. However, sending SMS via mobile phone to one another is no longer considered as new technology even though it is widely used all over the world. This is due to the new way of sending SMS which is from our own personal computer directly to mobile phone. Moreover, the recipient of the message can still reply the message back to the sender. User can simply use this technology that provided by various web based SMS provider over the web. They only have to register an account and start using the service instantly.

In this project, I will develop a web based SMS application in Teratai College portal. Teratai College Portal is a web site or service for Teratai College in Universiti Teknologi Mara, Shah Alam that offers a broad array of information, resources and services such as information of Teratai College for students and staff, forum, module for the residence staff to make duty reports and private mail service.

In order to enhance the web portal, I will develop an SMS application through the web. This application will be used by the principal of Teratai College to send messages regarding any information, news or reminder to his residence staff directly to their mobile phone to make the delivery of messages and communication faster and easier. To develop this project, I need to define the specific software, hardware, SMS Gateway, SMS Server and tools that required to integrate the web and mobile phone for sending and receiving messages. I will discuss more for this topic in next chapter.

1.2 Problem Statement

Normally, to send an SMS message, both the sender and the receiver need a mobile phone. This means, even if one party have a cell phone, clients will not be able to contact him or her unless they also have a similar mobile link. Of course, it is possible to send e-mail messages to a mobile phone but for this the sender need to know the mobile service provider's mail server address. As there are innumerable mobile networks currently operating worldwide, this is not a simple option. So to circumvent this constraint, many web-based SMS solutions have been developed.

Currently, the principal of Teratai College is making contact and communicate with his residence staff using traditional SMS service via his mobile phone to another mobile phone or just making calls. However, some problems and drawbacks have arise during the process. The main difficulties are to deliver a same message to a group of recipient in a short time and to make sure that all of them getting the message. In addition, it will take a long time if the principal want to send same messages to his staff one by one. Moreover, there's a limitation in keeping all the record of incoming and receiving messages because it not enough space to keep all the record in a normal mobile phone especially with phone that has no memory card. Besides, there also would be a problem if there is no network in their coverage or the network is busy. Therefore, this method is no longer effective for message delivery.

Hence, Teratai Portal has enhanced it functionality of developing new SMS Service application in order to overcome such problems that arise previously. This application provides sending SMS service from web portal to recipient mobile phone and keeps track of the incoming and receiving messages in a database.

1.3 Objectives

The objectives of developing this project are :

- To identify the processes and sequences of developing web based SMS application
- To develop a web based SMS application in Teratai College Web Portal for sending and receiving private messages

1.4 Project Scope

In this project, it will cover the Teratai College Web Portal together with the principal of Teratai College and his residence staff. The web portal consists of the information of Teratai College, forum, private mail service and a module for making duty reports by the college residence staff. The web based SMS application is the additional module for this portal to enhance it functionality. The users of this system are the principal of Teratai College and the residence staff. However, only the principal can access the system in the portal to send messages. The residence staff only can receive and reply the message back to the principal from their own mobile phone to the web.

Specific requirements have been chosen for this project like Gnokii 0.6.2 sms gateway for integrating web with mobile phone, Nokia 3220 as the mobile device and also DKU-5 data cable to connect phone with computer.

1.5 Significance

There are many significance that arise when developing this project. For example, the user of this system which is the principal of Teratai College can distribute messages to individual or a group of recipient which is his residence staff easily, faster and efficiently. Besides, it can keep records of all incoming and receiving messages in inbox and outbox for further references. Compare to normal mobile phone, it has limitation and does not give enough space to keep all the records.

Moreover, after implementing the application, user can avoid any problem that can makes the process of delivering messages slower such as no network coverage on the area or the network is busy. In addition, if process of delivering messages be more efficient and effective, it can increase the productivity in doing work and improved the communication between the principal of Teratai College and his Residence Staffs.

1.6 Summary

In this chapter, it consists of five topics which are background of project, problem statement, objectives, scope and significance. In background part, it gives a brief explanation and overview of the project like the definition of web based SMS application and the development of SMS service in Teratai College Portal. Next, problem statement will discuss some drawbacks and difficulties that arise before the system is develop. In objectives, it will state some objectives and purposes of developing this project. Next topic which is the scope of project will explain the area that being covered for this project and the users of this system. The last part which is the significance of project will discuss the benefits and advantages that can be gain from completing this project.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

SMS stands for Short Messaging Service. The SMS service is simply a digital network facility that allows digital phone users to receive text messages on their digital phones. Each message may be a maximum of 160 characters long. SMS was originally designed as part of the GSM digital mobile phone standard, but is now available on a wide range of networks, including 3G networks. It is similar to other new technologies such as instant messaging, on-line chatting and so on. SMS is giving reasonably good acceptance among different categories of people including professionals, students, families and businessmen.

According to Marie Cluline(2003), the first SMS is believed to have been sent in December 1992 by Neil Papworth of Sema Group from a personal computer (PC) to a mobile phone on the Vodafone GSM network in the United Kingdom. Even though email is widely used and cheap, it may not always be possible to send messages and get immediate replies. As people carry mobile phones with them, this problem is solved with the use of SMS technology that allows people to send and receive messages anytime and anywhere with a mobile phone.

SMS was originally designed as part of the GSM digital mobile phone standard, but is now available on a wide range of networks, including 3G networks. Out-of-band packet delivery and low-bandwidth message transfer characterize SMS. Non-text based

(binary format) characters can also be supported, and are essential for Unicode and Rich Content services. SMS is based on store-and-forward technology. Messages are sent to an SMSC located at Operator's side, held for the intended recipient, and then sent from the SMSC to the recipient's mobile phone. SMS is capable of confirming whether a message has been delivered, though it is up to the individual carrier to implement this capability. The confirmation function is handled by the SMSC. A record of 15 billion sms was sent globally in 2000, which increased to 200 billion in 2001 and expected to be two trillion in 2008.

There are many benefits of SMS service. According to Simon Neville(2004) at minimum, the benefits include easy delivery of notifications and alerts, guaranteed message delivery, reliable, low-cost communication mechanism for concise information, ability to screen messages and return calls in a selective way and increased subscriber productivity. More sophisticated functionality provides the other enhanced subscriber benefits like delivery of messages to multiple subscribers at a time, ability to receive diverse information, e-mail generation, creation of user groups and integration with other data and Internet-based applications.

In addition, there are also some benefits to the service provider such as ability to increment average revenue per user which is due to increased number of calls on wireless and wireline networks by leveraging the notification capabilities of SMS, an alternative to alphanumeric paging services, which may replace or complement an existing paging offer, ability to enable wireless data access for corporate users, new revenue streams resulting from addition of value-added services such as e-mail, voice mail, fax, and Web-based application integration, reminder service, stock and currency quotes, and airline schedules, provision of key administrative services such as advice of charge, over-the-air downloading, and over-the-air service provisioning, protection of important network resources (such as voice channels), due to SMS sparing use of the control and traffic channels and notification mechanisms for newer services such as those utilizing wireless application protocol (WAP). All of these benefits are attainable

quickly, with modest incremental cost and short payback periods, which make SMS an attractive investment for service providers.

2.2 Web Based SMS

Normally, to send an SMS message, both the sender and the receiver need to have a mobile phone. This means, even if one party have a cell phone, clients will not be able to contact the other party unless they also have a similar mobile link. Of course, it is possible to send e-mail messages to a mobile phone but for this user need to know the mobile service provider's mail server address. As there are many mobile networks currently operating worldwide, this is not a simple option. So to overcome this constraint, many web-based SMS solutions have been developed.

2.3 Benefits of Web Based SMS

There are many benefits of using web to deliver messages to mobile phone. In spite of giving advantages to individual it also gives many benefits to companies and organization. The advantage of web-based SMS technology is that it allows people to send messages to a mobile phone without the help of a cell phone. To send SMS through a service, users just need to access its site, type in the necessary information into the appropriate form available at the web-to-mobile interface and send the message.

2.3.1 Business Factor

With this new technology users can now sending SMS from their own computer to mobile phone and even can reply back the SMS to the sender. There are many advantages when implementing this technology. For examples, in the business factor, a manager can message out his or her staffs either to individual or a group of recipients

instantly from his or her own computer. A single message to one person can saves time and money while a single message to many staff saves incredible time and money. Many companies are now using web based SMS to give message to their staff regarding staff meetings and shift changes, changes of appointments, reminder and latest information.

Besides, receptionists can relay important messages while still answering the incoming calls. They can automatically send SMS to particular recipient and even can save the copy of those messages for later reference. This is because the service web based SMS is provided with a Message Log which can keep track of the entire message sent and received.

In addition, small business owners can use the short messaging service (SMS) on their mobile phones to effectively advertise their business. For example, if the organizations have a new product, service, offer, announcement and others they can effectively target their customers by sending them a SMS. The popularity of mobile phones has spread through all walks of life where over 45 million text messages are sent in the UK every day.(Shenbly,2003). A majority of these text messages will be personal, however, businesses particularly small businesses can use SMS to their advantage.

Moreover, collaboration between the telephone operator and companies in the different industries such as television, airlines, banks and clubs, SMS can be used to provide all kind of reminders and information such as appointment reminders, frequent flyer mileage, loyalty program and others. SMS also can be used to avoid costly person-to-person voice calls. By delivering account status information, new service configuration and so on, some network operators find significant financial justification for deploying a customer service on such a platform.

Besides, anyone with a Global Positioning System (GPS) can receive their satellite position and find out where they are and SMS is seen as ideal for sending out GPS information such as the longitude, latitude, bearing and altitude. Job dispatch companies actively use SMS to communicate and assign new jobs. The message is normally send from a control center which is the office-based staff to mobile-based staff. SMS can be used in a retail environment for credit card authorization. When connected to a point of sale system, the credit card number is send to the bank for authorization with the authorization code being returned as a short message to a point of sale terminal.

Not forgetting, SMS also can be used in a remote monitoring environment. This application provides people with valuable information from a remote location when an important event occurs. The information is delivered automatically without having to constantly employ physical resources locally. For example an alert will be received when a vending machine runs out-of stock..

2.3.2 Individual Factor

Moreover, there are also many benefits of sending SMS from web to mobile phone. For example, it is affordable because sender can save money by interacting with any loved ones, family, friends or relatives for a fraction of the cost of long distance telephone calls. Besides, it easy to use because the interface is simple and really flexible and users can easily type using the standard keyboard on the computer or laptop rather than typing using the mobile itself. In addition, most messages are delivered in seconds, and most recipients are replied within an hour.

Moreover, there is also a voice and fax notification. This service is commonly use by telephone operators. When there is a voice or fax in the inbox, a SMS alert will be sent to the users. Unified Messaging involves a single interface where users can

access information on the various devices they have. The user will normally receive an alert via SMS when there is a message in the unified messaging inbox.

In addition it will also give an internet email alerts if there is a link to the email inbox and it can provides an alert to mobile about summary of the sender and some information about the email user received. Besides, some web based SMS also provide with downloaded ringtones and chat one another. This module is a lifestyle platform for likeminded people to download music onto their phone and communicate with people of similar interest. Last but not least any information that can be fit into the short message can be delivered via SMS. Some of the examples of such applications are share prices, weather forecast, traffic information, news, sports and others.

2.4 SMS Gateways

SMS Gateway is a highly efficient middleware system that fetches information from transaction systems or large databases and sending them in text or binary form using SMS as a bearer to any GSM cellular network. The SMS Gateway connects to an SMSC (Short Message Service Center) on one side, and connects to applications on the Internet on the other side. It functions as a "gateway" between the GSM network and the Internet, providing Internet information to mobile subscribers using SMS messaging.

2.4.1 Examples of SMS Gateway

1. Kannel

Kannel is an open source WAP gateway. It attempts to provide the essential part of the WAP infrastructure freely to everyone so that the market potential for WAP services, both from wireless operators and specialized service providers, will be realized as

efficiently as possible. Kannel also works as an SMS Gateway for GSM networks. Almost all GSM phones can send and receive SMS messages, so this is a way to serve many more clients than just those using a new WAP phone.

2. Atinav

Atinav SMS Gateway provides an easy and reliable way of sending SMS messages to mobile phones and pagers. The short message limit(160 septets) is avoided by sending messages as a sequence of short messages. It supports HTTP, SMTP interfaces, making it easier to use via email or over internet. SMS Gateway is built completely on javaTM Technology. Atinav SMS Gateway supports bidirectional messaging, ring tones and unicode alphabets. Additional features include optional message deletion from mobile phones and service centers and auto reply for messages from a selected group or all incoming messages.

3. Exomi

The Exomi SMS Gateway acts as a middleware component between the Short Messaging Service Centers (SMSCs) of mobile networks and SMS applications. On the mobile network side, the gateway connects simultaneously to several SMSCs using various internetworking protocols and handles routing, load-balancing and failover situations for optimum delivery paths in all conditions. To the SMS applications, the gateway offers a consistent set of messaging functionality regardless of the final delivery mechanism or protocol. Various APIs are available for painless application integration. The introduction of the HTTP API allows SMS service developers to easily use the same service platform for SMS, WAP and Web services while giving the gateway operator full control over SMS content, volumes and delivery paths.