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An SMS Based Push Email Server

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ABSTRACT

The communication industry is ever evolving with new media of communicating between people and these various media have made it impossible to determine the best means of communication. This work in its entirety aims at reducing the stress and vigour that sometimes accompany some of the different means of communication.

The email has proven to be one of the most used means of online communication. However, a major drawback of email communication is that for a mailbox to be accessed, it requires an active and working internet connection which is often times expensive and cannot be afforded continuously by an average individual.

This work was created to eliminate such factor when it comes to using the email as a means of communication by assisting the e-mail account owner to forward his newly received mail by SMS to the user's mobile phone with or without internet access on the mobile device.

Keywords- Communication, Email, SMS, Server, GSM

1 Introduction

Communication is highly essential; there are various means of communication, but there are some means of communication that cannot be overlooked in the quest for adequate communicating facilities which are: E-mail and SMS. These two means of communication have over time proven themselves to be the one of the most unavoidable, indispensable means of communication to mankind. Irrespective of the distance between the users, the information is delivered swiftly and securely.

The introduction of high-end systems has paved way for the use of Emails and SMS for data transfer, data storage and other uses that are key to the advancement of any environment. The SMS is a means of sending binary data over the air. [1].

Although it is a widely used communication mechanism for cell phone users, SMS is far more than just a technology for teenage chat. [1]

Different emails are in use nowadays, from Yahoo Mail to Gmail to Live and so on. How then do we integrate these 2 means to create a higher and more effective means of communication? This is where

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these research proffer a solution that will bridge the gap between the email owner and the ability for them to access their mails.

SMS BASED PUSH EMAIL SERVER involves the transfer of mails from the mail delivery agent to the mail user agent via SMS. [2]

With the development of networks and communication technology, especially wireless communication technology, Push email is a trend on the convergence if internet and wireless communication fails. Email is a basic service of internet all the time, since it is an important way for people's communication, over thirty percent of service on the internet is the email service. [8].

The focus of this work is to design and implement an "SMS based push e-mail server", a means by which new email is forwarded to mobile devices as SMS.

2 Review of Related Works

Amanda, C.K in her report "Advantages and benefits of Emails for Business" made known how well e-mails have contributed to the success of businesses by stating that Email has revolutionized business communications. Entrepreneurs are no longer at the mercy of the speed of the post office and do not have to roll the dice on whether someone is in the office to receive a phone call. Businesses can save money, open up effective marketing options, keep communication lines open within a company and collaborate on projects all through the use of email. Up and coming generations of workers are more comfortable using email than traditional letters or memos. Companies can explore methods of using email to reach important goals and make business more efficient.

The Electronic mail (also known as email or e-mail) was invented by Ray Tomlinson in 1972 and is one of the most commonly used services on the Internet, allowing people to send messages to one or more recipients. [3].

The following are some closely related works:

2.1 How does SMS Work?

The SMC (Short message centre) is the entity that does the job of store and forward of messages to and from the mobile station.

The SME (Short Message Entity) which can be located in the fixed network or a mobile station receives and sends short messages.

The SMS GWMS (Short gateway MSC) is a gateway MSC that can also receive short messages. The gateway MSC is a mobile network's point of contact with other networks. On receiving the short message from the short message centre, GMSC uses the SS7 network to interrogate the current position of the mobile station from the Home Location register (HLR).

HLR is the main database in a mobile network. It holds information of the subscription profile of the mobile and also about the routing information for the subscriber.

The MSC (Mobile Switching centre) is the entity in a GSM network which does the job of switching connections between mobile stations or between mobile stations and the fixed network.

The VLR (Visitor Location Register) corresponds to each MSC and contains temporary information about the mobile, information like mobile identification and the cell (or a group of cells) where the mobile is currently situated .The BSS represents the Base Station system.

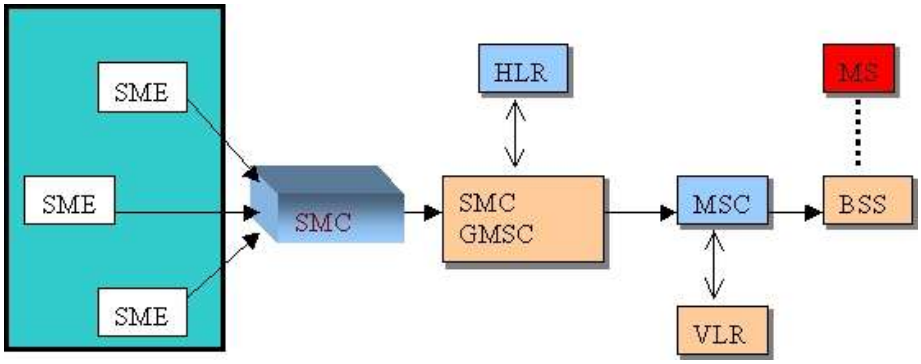

Figure 1: Organization of network elements in a GSM network that supports SMS. [4]

2.2 SMS based Facebook Notification/Registration

The SMS Based Facebook notification is software designed by Facebook to enable users receive their profile notifications via SMS.

Facebook also enables users to reply post, post updates on their timeline. This is a very effective means of communication as it enables users who are offline to be able to stay in touch with their colleagues. It also helps aids any person/people that have to reach a lot of people at the same time by update their timeline based on whatever the user has typed in his SMS. It focuses on transmission of data by the use of GSM (Global System for Mobile Communications) through asynchronous serial communication.

The objective of this work was to design a system whereby a user can send notices from cell phones and these notices sent are displayed on the user's timeline and to provide access to posting of messages. This software is only for Facebook users and is only concerned with sending of notices by authorized people. [9]

2.3 Blackberry Push E-Mail Server

Push was popularized by RIM (Research in Motion) via their implementation of a central NOC (Network Operating Centre) service for notifying devices when a new email has arrived on any of the end users email accounts. The NOC handles all the email capabilities, alleviating the processing power and constant network connectivity required for a device to continuously stay on top of its email accounts. This takes the burden off the device, and in return the device saves battery life. "Do you have a BlackBerry?" is synonymous with "do you have push email?" RIM delivered instant email to mobile devices which surpassed constantly-connected desktops in speed and efficiency in a wireless world. Perception is that RIM invented push email however this isn't the case. NTP owns the wireless email patent which many mobile handset / platform.

3 System Analysis and Design

3.1 Model

The model that was used is the waterfall model. This model has been a basis for a majority of structural system analysis methods since the 1970s. The waterfall model is also called the linear sequential life cycle

model. This model consists of different phases carried out one after the other. It is often said or believed that the model was first put forth by Winston Royce in 1970 in one of his articles; whereas he did not even used the word “waterfall.” In fact Royce later presented this model to depict a failure or a flaw in a non-working model [7]. In waterfall model each phase must be completed fully before the next phase can begin. The model is usually best small projects and projects that the requirements are certain.

The research methodology included the following steps:

- Study of the key concepts and understanding the goals of an SMS based push e-mail server.
- Reviewing related works where applicable, both successful and where such applications have failed.
- Analysis of requirements that includes user, system, functional and non-functional requirements
- Design and implementing an SMS based push e-mail server as well as testing the functionality of the system and hardware compatibility.

3.2 Application Analysis and Design

The proposed system has the following requirement as stated below

- The System shall allow users register with their e-mail address and password.
- The System shall allow users log in with their username.
- A module for checking the number of registered users.
- A module for checking the number of users with de-activated or expired accounts.
- A module for checking the number of users from a country (If the application goes international).
- A module for checking the number of visitors (people who don’t register) to the site.

3.2.1 Hardware Specification

The hardware specifications for the usage of these system is subdivided into online and offline registration.

ONLINE REGISTRATION

For online registration and improved user experience while viewing the website,

A mobile device with screen sizes above 240x320 is recommended.

- Laptops, Desktops and Tablets whose date of manufacture are not older than 2010.

OFFLINE

For optimum experience while viewing e-mails on mobile, Devices with screen resolutions above 240x320 are recommended.

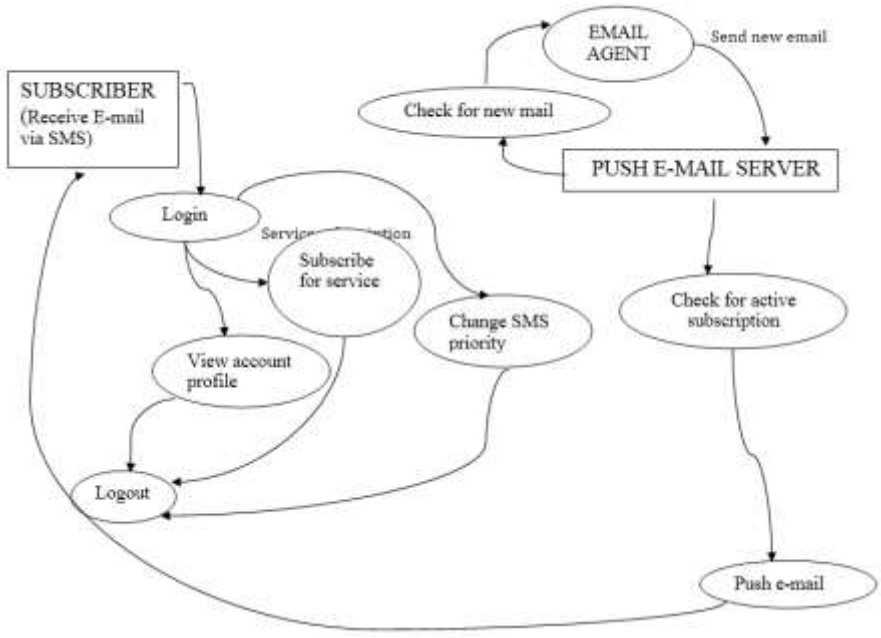

Figure 2: Data flow diagram showing the subscriber privileges

3.2.2 Explanation of the DFD

From the DFD it can be noted that, the origin of the working of the application is from the push server itself. The croon which has been set to search for new mail automatically powers up every 250 seconds and checks the mail agent (Gmail, yahoo) for new email. If croon does not detect new mail it goes back to sleep, if it does then it pulls the mail and pushes it to the actively subscribed user's mobile number as SMS. Details linked to the subscriber in the diagram indicate the services the subscriber may choose to perform without admin privileges.

3.3 System Requirements

The requirement that helps the proposed system to life after requirement gathering and implementation are divided into hardware requirements and software requirements.

3.3.1 Hardware Requirement

The hardware required to ensure the proper running of the package developed are as follows:

- An internet ready computer system.
- A Pentium or AMD processor with clock speed of 512Mhz
- A RAM size of at least 128 MB
- A hard disk capacity of at least 10 GB
- An SVGA color monitor

3.3.2 Software Requirement

These are software applications required for the proper running of the system:

- Windows 98/2000/XP/VISTA/7 operating system.

- Web Browser such Internet Explorer, Mozilla Firefox, Opera, Flock etc.
- Apache Server Version 2.0 or higher.
- MySQL database Version 5.0.51b or higher.

4 Implementation of the Application

4.1 Graphical User Interface of the Software

4.1.1 User Login/Sign Up/Administration Module

Step 1. After launching the system, the user is first taken to the system homepage upon which there is a sign up module and login module. (See Figure 3)

Figure 3: sign up module and login module

Step 2. The login page appears for the registered user to enter his or her username and password. Click the "Login" button. (See Figure 4)

Figure 4: Login Page

Step 3: The system test the validity of the login credentials, if invalid, the system remains on the login page with error notification. Otherwise, the system proceeds to the user account. On the user account page, the user can edit details previously submitted to the Admin. Details that can be edited include:

1. E-mail account associated with profile.
2. Mobile number associated with profile.

3. Deactivate account.
4. Subscribe to newsletter
5. Payment mode.

4.1.2 Sign Up Module

Step 1. The user visits the website and either logs in as an existing user or sign up as new users. During the Sign Up process the user is then prompted to enter his details and performs all earlier stated under the login module.

Figure 5: Sign up module

Step 2. Users have the opportunity using the post mail interface to forward complain or request to the admin and receives an auto reply acknowledging the complaint. (See Figure 6)

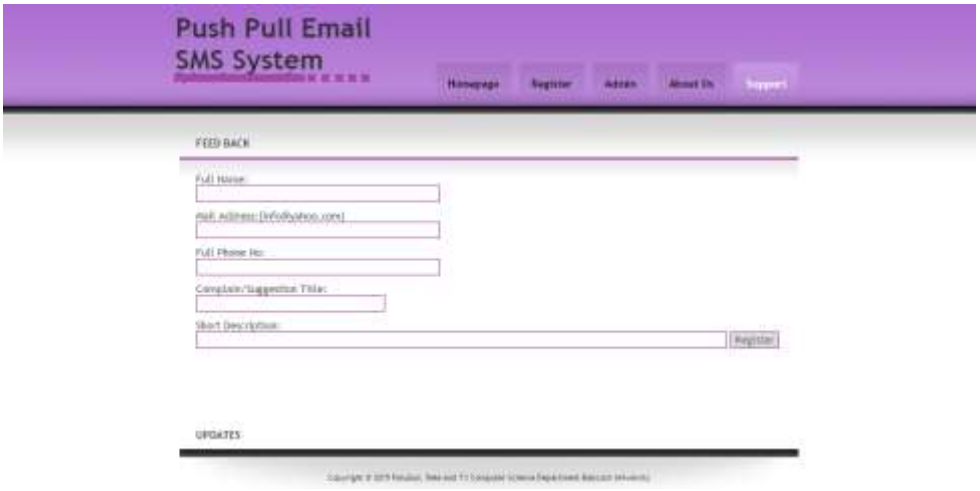

Figure 6: Feedback Mechanism

4.1.3 ADMINISTRATOR MODULE

The administrative end enables admin users to monitor the back-end application i.e. the PULL module to ensure that all aspects of the module work correctly. The administrator shall also be able to de-activate user accounts that are found to be faulty or who have breached any of the terms of usage. It provides interfaces to discharge administrative duties within the system.

Figure 7: Admin login

Figure 8: Admin panel

4.2 Summary of how our Application Work

The croon wakes up every 250 seconds to check for new email, if it does not detect any new mail it goes back to sleep and waits another 250 hours, if it detects new mail it pulls the mail using predefined IMAP protocols and assigns the header abd body of the mail to their corresponding definitions in the croon. These definitions are then called in form of a sentence by the software and sent to the user by SMS. This is done by routing the SMS through an active bulk SMS gateway.

5 Conclusion and Recommendation

Basically, Web based push e-mail server is a product which takes a lot of thought, process, time and energy to develop. To develop a product that end-users would deem irrelevant would mean a failed project has been developed. The majority of design models incorporate the end-user in the beginning of the design process when analysing the need and at the end during the testing and evaluation of the product.

The aim of this work has is to enhance communication, hence it can be used be any individual organization. The importance of network reception over data connection is that there can exist a network reception capable of receiving SMS's without the existence of a data connection. However there cannot be a data connection without network reception. Thus, because the application will solely be based on just the use of the mobile phone network reception, its use is very highly encouraged.

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