

Development of a Smart SMS Engine

¹Md. Salman Fahad, ¹Khaleda Ferdous, ²Md. Fahim Shakil, ³Md. Hanif Ali

¹Department of Computer Science and Engineering, Institute of Science and Technology, Bangladesh

² Department of Computer Science and Engineering, East West University, Bangladesh

³Department of Computer Science and Engineering, Jahangirnagar University, Bangladesh

Abstract

SMS is very popular in our everyday life. Everybody communicates with others through SMS every day, which is expensive. Special occasions and organizational advertisement need low budget automated smart SMS system which can send user bulk SMS and recharge himself according to Telco offer. To minimize the cost an attempt has been made to develop a smart SMS engine. To carry out the work, advanced GSM technology has been used. In this work, information management is accomplished by using MYSQL/ORACLE at the database server end. API has been accomplished using PHP and the main Engine has been created using JAVA. Obtained results are highly satisfactory to be encouraged.

Keywords- GSM, API, DFD, WFD

1.INTRODUCTION

SMS stands for Short Message Service and it is also commonly referred to as a "text message" [2]. Bulk Messaging is the dissemination of large numbers of SMS for delivery to mobile phone terminals. It is used by media companies, enterprises, banks (for marketing and fraud control) and consumer brands for a variety of purposes including entertainment, enterprise and mobile marketing [1]. It is commonly used for alerts, reminders, marketing but also for information and communication between both staff and customers. Initial investigation is the phase, where we will understand what we have to do in this research. We will determine here, what was the background of this research? What about the research is? What the research need, what is current status of this research and what are the problems with the current system. As I am going to develop a general system, so we will use strategies of several companies and generates a single solution [1].

2.WHO CAN BE BENEFITED?

Restaurants, Hotels, Cafes, Event Promoters, Concert Promoters, Product Promoters, Newspapers, Magazines, Fm Radio, Cable Networks, Satellite Television, Schools, Colleges, Universities, Political Parties, NGO, Welfare Organizations, Estate Agents, Real Estate agencies, Airlines, Astrologer, Blood Banks, Couriers, Customer Relations Department, Departmental Stores, Distributors/Dealers Network, Educational Institutions, Event Management, Advertising Agencies, Hospitals, Marketing Dept. Newspapers / Magazines, Radio Stations, Railways, Retailers, Shops, Stock Brokers, Supermarket, Travel Agencies, TV Channels and Government Departments.

3.OVERVIEW OF DIFFERENT TECHNOLOGIES

A. GSM Modem

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. While these GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages. A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it can be a mobile phone that provides GSM modem capabilities. The term GSM modem is used as a generic term to refer to any modem that supports

one or more of the protocols in the GSM evolutionary family, including the 2.5G technologies GPRS and EDGE, as well as the 3G technologies WCDMA, UMTS, HSDPA and HSUPA[3].

B. API

Application program interface (API) is a set of routines, protocols, and tools for building software applications. An API specifies how software components should interact and APIs are used when programming graphical user interface (GUI) components. A good API makes it easier to develop a program by providing all the building blocks. A programmer then puts the blocks together [6].

4.METHODS AND TECHNIQUES

To implement the work, we followed some steps which are given bellow:

- A. GSM Modem Installation.
- B. Configuration of database environment, Java(JDK,JRE) and Php scripting environment.
- C. Development of User-end panels for user registration, Telco offer, Balance recharge and SMS transmission.
- D. Storing of SMS from client created pseudo code of an API or Tabular Form using Php language.
- E. Development of SMS engine according to pseudo code using java.
- F. Experimentation to communicate the message from API to mobile receiver through SMS engine.

GSM Modem Installation:

To carry out the experiment, GSM modem has been used and a Telco SIM card serial bus speed 115200. Modems COM port COM1-COM20 has been used depending on the availability of the port. Connects with computer using GSM modems AT command.

Configuration of database, Java and Php scripting environment:

We used Oracle 11g as database server. Apache web server to use PHP[4]. We installed JDK for JAVA environment and Netbeans as editor[5].

Development of User-end panels as for registration, Telco offer, Balance recharge and SMS transmission:

Registration panel: An user can be register to send sms.

Telco offer panel: It's a configuration panel where latest sms Telco offer are registered and flag wise can be ON/OFF.

Balance recharge: Balance recharge web API can be predefined configured and recharge card can be pre-stored.

SMS transmission: Single SMS can be sent directly through this panel or bulk SMS by .csv file using Oracle SQLLDR.

5.SMS CORE ENGINE PSEUDO CODE

To process the SMS inbox table to client mobile number, we write a pseudo code.

1. ENGINE (ALL TIME START) ON
2. Collect Sender_Mobile_No, SMS_Available, Slot information from Collect_current_status table.
3. If slot < sms_available then
 - Collect slot sms from inbox table and update it 'p' to 'R' status & set counter := 1
 - While counter < slot
 - Acknowledgement :=Send_sms();
 - If(Acknowledgement = ok) then
 - Store_ack_into_outbox();
 - Else if (Acknowledgement = error) then
 - Store_ack_into_errorbox();
 - Else
 - Change status 'r' to 'p'
 - End if;
 - counter increment ;

- ```

End While;
4. Else If (Slot > sms_available) then
 If (check balance > offer_balance) then
 Send_Purchase_offer_sms();
 Then go to step 3;
 Else Send_recharge_sms();
 Send_Purchase_offer_sms();
 End if;
 Then go to step 3;
5. Else then
 Send_sms_to_admin(current_status, balance);
 End if;
6. Then go to step 2 ;

```

### 6. FULL PROCEDURE API TO ENGINE TO MOBILE RECEIVER

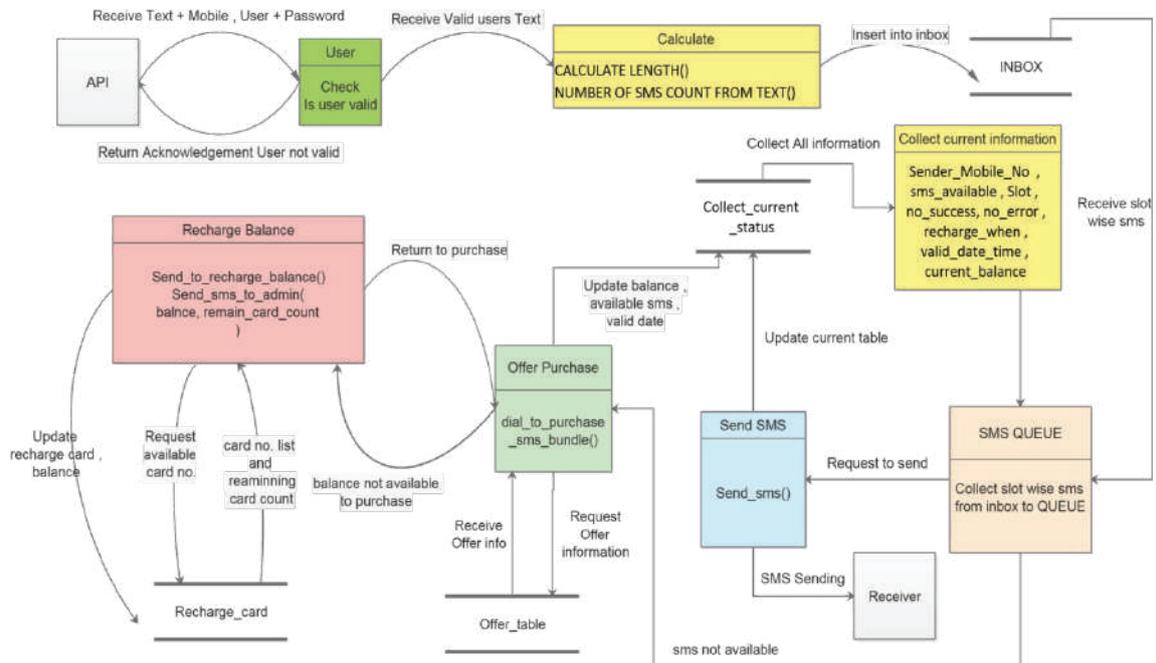


Figure 1: Data Flow Diagram, Software Process Modeling.

This Smart Engine can receives bulk SMS from form or single SMS via API, It can calculate the length of SMS and checking his current number of offer SMS is available or not, if positive then sends all SMS, otherwise it works to purchase offer and upgrades its current information or recharge himself to purchase offer. After finishing his offer purchasing it checks its current SMS status and re try to send rest of queues. It's an automated system to purchase offer, balance and send user SMS.

### 7.RESULTS AND DISCUSSION

To send single SMS, user have to select 'Standard' option (a) or To send Bulk SMS, user have to select 'Advanced'(b). All Messages are stored into inbox table and Java based Smart SMS engine will send all sms from inbox table to receiver using GSM Modem smart auto engine, When balance are not available, it can recharge himself and automatically can select best Telco offer from its list.

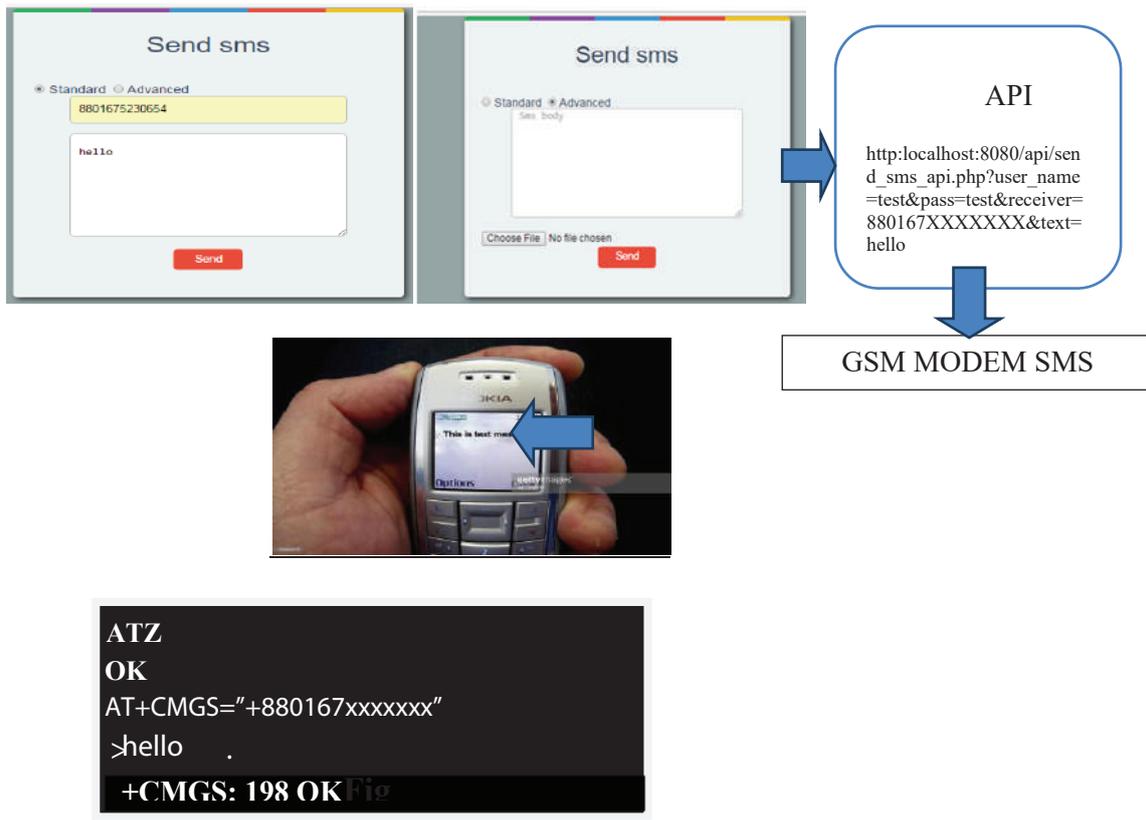


Figure 2: Form to API → API to SMS Engine (GSM Modem attached) → Receiver gets SMS from Engine.

### 8.CONCLUSION

After successful implementation of our **DEVELOPMENT OF A SMART SMS ENGINE** research we realize that our SMS engine will minimize the cost of sending bulk SMS. This is also very smart, effective and efficient. It can be used for any ERP(Enterprise Resource Planning) system as a module. The SMS engine could be used as a part or module of other big software. We are also planning to upgrade this research to incorporate voice SMS, MMS (Multimedia Message Service).

### 9.LIMITATIONS

We think there is some limitation in our research. It has limited number of access capabilities. We are not directly working with Telco, we just considering their SIM card and offers, so it is difficult to modify Telco's internal problems but it is also a positive work that we don't need to pay extra money to Telco for his device (SIM card). Right now Only 12 to 15sms can be sent per minute using our system, it is a barrier form SIM card capacity, so it can transmit approximately 17,000 to 20,000 SMS per day. If in future Telco upgrades its SIM card capacity then definitely we can ensure about our system capability that it will be faster and more capable to send large amount of SMS. Right now it is not so high for a big organization who are willing to send faster and long range of receiver. But it is very suitable on the base of cost minimizing, because it is using Telco's offer which charges per SMS cost at least approximately 0.05taka or 0.00060\$ USD ( This amount as per 2016 Bangladesh Telco's

SMS offer). We tried our best to eliminate all the limitation we got. We hope limitation will be removed with the up gradation of research.

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