

# **BULK SMS MANAGEMENT SYSTEM**

**By**

**MODONG ANNET**  
**REG No: BIT/36099/113/DU**  
**modoanita@gmail.com**

**MUBANZA IVAN**  
**REG No: BIT/40751/91/DU**  
**imubanza@gmail.com**  
**&**

**SSONKO ACHILLES**  
**REG No: BIT/35582/113/DU**  
**breezilles@gmail.com**

**A Project report Submitted to school of Computing and Information Technology for the  
Study Leading to a Project in Partial Fulfillment of the Requirements for the Award of a  
Bachelor's Degree in information technology at**

**Kampala International University**

**Supervisor**

**DR ZAKE**

**Department of Information Technology School of Computing and Information Technology,  
Kampala International University**

**tebbigwawo@gmail.com +256 788 485 749**

**August 2014**

### Declaration

We Modong Annet REG No: BIT/36099/113/DU, Mubanza Ivan REG No: BIT/40751/91/DU and Ssonko Achilles REG No: BIT/35582/113/DU hereby declare that this research is our original work and have not been published or submitted for any academic purpose as a partial requirement of any university.

Name: Modong Annet

REG No: BIT/36099/113/DU

Sign:.....

Date:.....<sup>th</sup>27/10/2014

Name: Mubanza Ivan

REG No: BIT/40751/91/DU

Sign:.....

Date:.....<sup>th</sup>27/10/2014

Name: Ssonko Achilles

REG No: BIT/35582/113/DU

Sign:.....

Date:.....<sup>th</sup>27/10/2014

## Approval

This is to confirm that I have read and studied the report about BULK SMS MANAGEMENT SYSTEM. This report clearly shows the processes and implementation of the above mentioned system carried out during the research period. It clearly states how the proposed solution is being implemented to improve the existing bulk SMS management platforms. This report has been prepared by MODONG ANNET (BIT/36099/113/DU), MUBANZA IVAN (BIT/40751/91/DU) and SSONKO ACHILLES (BIT/35582/113/DU).

Approved by Supervisor;

Name..... Muwanga-Zake

Sign..... [Signature]

Date..... 28<sup>th</sup> Oct. 2014

Contact..... 0788 485 749 . lebiggwawo@gmail.com

### **Dedication**

We would like to dedicate this project to our beloved parents for they saw us through school with their support both financially and morally. We thank them for believing in us

### **Acknowledgement**

First of all we would like to thank the almighty God for enabling us to do this research project successfully. We would like to thank our supervisor Dr Zake for his support and suggestions throughout the research and writing of this paper. We would like to thank our guardians for supporting us both morally and financially throughout this project. Finally we would like to appreciate our classmates and university students at large for their thoughtful comments during our research.

### **Abstract**

The use of uncensored customized sender IDs both numerical and alpha has been a big challenge to the Bulk SMS business since the year begun. This resulted into telecom companies blocking these bulk SMS companies from reaching their clients. For that matter, we embarked on this research using the following methods; one shot survey, questionnaires and interviews to find out whether this was a general challenge. We carried out our research on 50 people and 90% of our result confirmed our suspicion that indeed it was a general challenge. During our research, we approached MTN with a quest of finding out why they are blocking the bulk SMS companies and the response we got was that it was an initiative to protect their clients from being victims of misuse of customized sender ids. Also to promote their own bulk SMS packages but most of all to protect their clients from fraud. This being a locally identified problem, we came up with an initiative to limit the usage of customized alpha numeric sender id's so as to identify any user who tries to misuse the SMS platforms hence allowing sending of bulk SMS directly to the respective recipients using the internet both reliable and liable.

## Table of Contents

|                                                    |                                     |
|----------------------------------------------------|-------------------------------------|
| Declaration.....                                   | i                                   |
| Approval .....                                     | ii                                  |
| Dedication.....                                    | iii                                 |
| Acknowledgement .....                              | iv                                  |
| Abstract.....                                      | v                                   |
| CHAPTER 1 .....                                    | 1                                   |
| 1.0 General introduction.....                      | 1                                   |
| 1.1 Background .....                               | 1                                   |
| 1.2 Problem Statement .....                        | 3                                   |
| 1.4 Objectives of the study.....                   | 3                                   |
| 1.4.1 Main Objective.....                          | 3                                   |
| 1.4.2 Specific objectives .....                    | 3                                   |
| 1.4.3 Other objectives .....                       | <b>Error! Bookmark not defined.</b> |
| 1.5 Scope.....                                     | 3                                   |
| 1.5.1 Content scope.....                           | 3                                   |
| 1.5.2 Geographical scope .....                     | 4                                   |
| 1.5.3 Time scope .....                             | 4                                   |
| 1.6 Significance of the study.....                 | 5                                   |
| CHAPTER 2 .....                                    | 6                                   |
| LITERATURE REVIEW.....                             | 6                                   |
| 2.0 Introduction .....                             | 6                                   |
| 2.1 Bulk SMS .....                                 | 6                                   |
| 2.2 Bulk SMS Management .....                      | 7                                   |
| 1.3 SMS and mobile telecommunication networks..... | 7                                   |

|                                                                           |    |
|---------------------------------------------------------------------------|----|
| CHAPTER 3.....                                                            | 8  |
| METHODOLOGY.....                                                          | 8  |
| 3.0 Introduction.....                                                     | 8  |
| 3.1 Methods for data collection.....                                      | 8  |
| 3.2 One shot survey.....                                                  | 8  |
| 3.3 Questionnaires.....                                                   | 9  |
| 3.4 Interviews.....                                                       | 9  |
| CHAPTER 4 .....                                                           | 10 |
| Systems requirements analysis and design .....                            | 10 |
| 4.0 Introduction.....                                                     | 10 |
| 4.1 Systems requirements analysis.....                                    | 10 |
| 4.2 Systems design.....                                                   | 10 |
| 4.2.1Data Flow Diagrams (DFD).....                                        | 10 |
| 4.2.2 Data Dictionary .....                                               | 12 |
| 4.2.3Entity relational diagrams (ERD).....                                | 13 |
| 4.2.4 Systems Architecture (Diagram 3).....                               | 15 |
| 4.3 Programming languages, Operating system and software's required;..... | 17 |
| CHAPTER 5.....                                                            | 18 |
| System implementation, testing and validation .....                       | 18 |
| 5.0 Introduction.....                                                     | 18 |
| 5.1 System Validation and Testing .....                                   | 18 |
| 5.2 System Testing.....                                                   | 18 |
| 5.3 Unit Testing.....                                                     | 19 |
| 5.4 system Integration Testing .....                                      | 19 |
| 5.5 System Validation .....                                               | 19 |

|                                                                         |    |
|-------------------------------------------------------------------------|----|
| CHAPTER 6 .....                                                         | 20 |
| Discussion, Findings, Limitations, recommendations and conclusion ..... | 20 |
| 6.0 Introduction .....                                                  | 20 |
| 6.1 Discussion .....                                                    | 20 |
| 6.1.1 Functional requirements .....                                     | 20 |
| 6.1.2 Non-functional requirements.....                                  | 20 |
| 6.2 Findings.....                                                       | 20 |
| 6.2.1The Existing System study .....                                    | 21 |
| 6.2.2 Weakness of the Existing System.....                              | 21 |
| 6.3 System Limitations.....                                             | 21 |
| 6.4 Recommendation.....                                                 | 21 |
| 6.5 Conclusion.....                                                     | 22 |
| REFERENCES .....                                                        | 23 |
| APPENDICES .....                                                        | 23 |
| Appendix A .....                                                        | 24 |
| System Key(Data flow Diagram).....                                      | 24 |
| Appendix B .....                                                        | 25 |
| Questionnaire.....                                                      | 25 |
| Appendix C .....                                                        | 28 |
| System backend codes.....                                               | 28 |
| Appendix C .....                                                        | 30 |
| Sign Up page .....                                                      | 30 |
| Home page.....                                                          | 31 |
| SMS sending page .....                                                  | 32 |
| Customised sender id requisition form.....                              | 33 |

|                               |    |
|-------------------------------|----|
| Phone book creation page..... | 34 |
| Edit user details page.....   | 35 |

## **CHAPTER 1**

### **1.0 General introduction**

Communication in Uganda has of recent taken new stride as Medias are being set up. One of the fast growing platforms is Bulk SMS as a solution to ease multi-level communication and service/product marketing. Bulk SMS systems enable the sending of private and personalized bulk messages with instant deliveries to all networks (MTN, AIRTEL, UTL, SMART AND ORANGE). With the study implying that up 98% of the messages are received by the mobile users and at least 75% of mobile users do read the SMS's sent to them. This makes it a more reliable marketing strategy for service, promotion and product campaigns.

However in the recent past Ugandan telecom companies have been blocking Bulk SMS Companies that use both local/foreign SMS gateways. Which led to some client's expected public coverage not reachable by this marketing strategy. In turn the Bulk SMS companies would lose both in revenue and credibility.

This therefore called for a reliable SMS platform that would enable SMS companies to reassure their clients of their service reliability. To achieve this, we made a visit to one of the biggest and most used telecom company in Uganda (MTN) to inquire why SMSs were being blocked and if there is any requirements that needed to be met to solve the issue. To our disappointment and discovery, MTN was deliberately blocking bulk SMS companies because of a business initiative i.e. the need to promote their own bulk SMS packages besides improving security for their clients against impersonation and fraud which is brought about by the use customized sender IDs from the bulk SMS companies. MTN didn't want to be liable for any misuse of such service by unknown clients so they resorted to viewing Bulk SMS' as spam SMS hence blocking web based messages as a security measure.

### **1.1 Background**

Due to the increased quest by government to improve the private sector, many investors have been attracted to Uganda to set up business organizations/enterprises hence calling for more marketing or advertising avenues. Ugandan nationals who include the internal investors and the peasants have also increased their thrust in setting up communication Medias. Bulk SMS

business is one of the leading profitable business ventures currently in Uganda and is expected to improve the country's economy. This is because there is a market boom, which requires improvements in some of the advertisement companies in the country.

Advertisement is defined as a notice or announcement in a public medium promoting a product, service, event and publicizing a job vacancy. The idea is to drive consumer behavior in a particular way in regard to a product, service or concept. There are different forms of advertisement which include TV commercials, SMS sending, Print advertising, direct mailing, Radio among others that are used. The choice depends on the costs and the targeted public.

It is estimated that in Uganda today, at least one person owns a mobile phone in every family and there is guarantee that if one used SMS for advertisement 98% will receive and 75% will read the message even though they don't react to it right away, which is not the case with other advertising medias for instance not everyone can afford a newspaper daily, not everyone owns a radio or TV set in their home, and many businesses can't afford Radio and TV commercials. These make bulk SMS the cheapest and most reliable of all the marketing/advertisement avenues available. SMS is so effective that it calls for the development of a reliable bulk SMS management system that will mitigate the factor of unreliability.

The proposed system will possess strict security features so as to mitigate the risk of being hacked. Proper security measures will lead to great improvement in organizational performance and also minimize the risk of losing valuable data to hackers. The developed system should possess tight security measures. One security measure is the use of authentication which is the process of proving one's identity to someone else before accessing the internal sphere of a system. The main focus here is on authenticating a "live" party, at the point in time when communication is actually occurring. The development of a reliable and secure online platform, will derive from the views of system developers, bulk SMS clients, information officers, investors/proprietors and different scholars on the relevance of using online BULK SMS platform and how it can be improved in Uganda's booming Business market. Hence, it is in the area of E-Commerce, which has become an important tool for businesses worldwide not only to sale to clients but also to engage them.

## **1.2 Problem Statement**

The absence of a well-established mass messaging system to control the use of customized sender ids has led to many cases of fraud, identity theft and impersonation. This has led to the blockage of mass messages by telecom companies with an initiative of protecting their clients hence leading to loss of credibility and service unreliability of the bulk SMS companies. This is basically because of the weakness of the existing system which gives too many privileges to the users i.e. they use any desired sender ID.

## **1.3 Objectives of the study**

### **1.3.1 Main Objective**

The main objective of this project was to develop a system that will curb liability among bulk SMS management companies.

### **1.3.2 Specific objectives**

- To study the existing bulk SMS management platforms available on the market.
- To design and develop a liable SMS system
- To study the user requirements for the BULK SMS management system
- To implement the designed system
- To test the system
- To validate the designed system

## **1.4 Scope**

### **1.4.1 Content scope**

The bulk SMS management system deals with mass messaging and our system will be able to do the following:

On the user account;

- Send single, bulk and group SMS
- Schedule and delete scheduled messages
- View SMS logs
- Create groups, edit/manage groups and Save contacts on the account (phonebook)
- Use customized sender ids both numerical and alpha sender ids
- View credit details and delivery reports

On the super administrator/administrators' account;

- Create, delete and block administrative and user accounts
- Credit addition and deduction on admin and user accounts
- Approve and cancel sender id requisitions
- Send single, bulk and group SMS
- Schedule and delete scheduled messages
- View SMS logs
- Create groups, edit/manage groups and Save contacts on the account (phonebook)
- Use customized sender ids both numerical and alpha sender ids
- View credit details and delivery reports

#### **1.4.2 Geographical scope**

The study was mainly carried out in Uganda at SMS BLASTERZ LTD accompany that deals in bulk SMS management located in Kampala district, Namirembe hill, Willis drive plot 683 but we also visited the following companies; Easy SMS Uganda, SMS Media, SMS wave, SMS Jaja, SMS Empire, Be Mobile for comparison reasons.

#### **1.4.3 Time scope**

The project has taken four months from the month of June 2014 and it will be completed in September 2014.

### **1.5 Significance of the study**

- This project was beneficial to people like SMS customers as it will help SMS customers to advertise their goods and services.
- The system was intended to provide fast, secure and improve the quality of service to clients by making the platform more efficient.
- This project is beneficial to investors and nationals willing to invest in Uganda
- This project has enabled students to gain practical experience in the field of application design in computing.
- Finalization of this project has enabled students attain a Bachelor's Degree in Information technology from the school of science and information technology at Kampala international University

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

In this chapter, we study our research by analyzing the existing knowledge in regard to the subject.

#### **2.1 Bulk SMS**

SMS is the abbreviation for short message service and its way of sending short messages to mobile telephones. According to Scott Guthery and Mary Cronin the authors of Mobile application development with SMS and the SIM toolkit, short means a maximum of 160 characters in length. This book explains the range of capabilities and illustrates the steps involved in developing those possibilities. SMS is cheap, always on, gets through when other messages don't, is a store and forward system and is quite easy to build with. The SIM is tamper resistant, so it can be used to hold sensitive data and it provides access to the full range of capabilities of the handset. This book further explains that although this includes mobile commerce and financial transactions, the trust inherent in the SIM can be leveraged to a much broader group of applications where privacy and performance are important. An SMS message nearly always gets through if the mobile phone isn't on when you send a message, the system holds it until the phone is turned on and then delivers it. The system also can generate a return receipt that tells you that the message has been delivered. SMS messages are encrypted so there is no fear that your message will be snatched out of the air and read. You can even add your own encryption.

## 2.2 Bulk SMS Management

We read this book because it helps draw together findings from authoritative sources that will appeal to cellular network operators and vendors. The theory-based, practical approach will be of interest to us postgraduate students and telecommunication and consulting companies working in the field of cellular technologies. In the book

End-to-End Quality of Service over Cellular Networks, Data Services Performance Optimization in 2G/3G by Gerardo released in April 2005, and his comprehensive resource contains a detailed methodology for assessing, analyzing and optimizing End-to-End Service Performance under different cellular technologies (GPRS). It includes guidelines for analyzing numerous different services, including examples of analysis and troubleshooting from a user point-of-view. This book focuses on the following:-

- Focuses on the end-user perspective, with a detailed analysis of the main sources of service performance degradation and a comprehensive description of mobile data services.
- Provides service performance benchmarking for different technologies from real networks
- Explores a new approach to service management known as customer experience management, including the reasons why it is overcoming traditional service management and its impact on revenues and customer satisfaction
- Illustrates all points throughout using real world examples gleaned from cutting-edge research

## 2.3 SMS and mobile telecommunication networks

We identified that the Mobile Messaging Technologies and Services Second Edition by *Gwenaél Le Bodic* continues to provide an in-depth description of existing and forthcoming messaging services and underlying technologies. The Short Message Service (SMS) has been a tremendous success in the messaging roadmap and Enhanced Messaging Service (EMS), an application-level extension of SMS, has provided a smooth transition to the recently introduced Key features. It offers a complete description of the new and the most common examples of messaging

applications usage and covers advanced topics for operators involved in the deployment and configuration of mobile messaging systems. It also describes the processes involved in standardizing telecommunications services and technologies. It identified that the most important service for SMS provides the potential for the realization of future-proof services by meeting the requirements of various business models as the Internet and the mobile telecommunications environment merges. This volume represents a stimulating practical reference book for operators, content providers, manufacturers and developers of messaging applications and will also appeal to researchers and students problem like ours.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

In this chapter, we look at all the methodologies or methods we used to collect data to help us achieve our project objectives. We used survey (one shot survey), questionnaires and personal interviews to lay down the strategies or methods used to fulfill the above-mentioned objectives. Below are the methods used.

#### **3.1 Methods for data collection**

This section discusses the methods, procedures and main fact-finding techniques or data collection techniques that were used to identify the requirements of the designed system. The researchers used the following methods to collect relevant data about the research.

#### **3.2 One shot survey**

This involves reading books concerned with web applications and bulk SMS management as well as acquiring related information from the internet. Journals and books on bulk SMS management systems were used for further enlightenment about the research. Articles in the newspapers giving a brief overview about the recent trends in the business sector in regard to bulk SMS business especially systems used to manage the business. We used this information to guide us more on the development of the system.

### **3.3 Questionnaires**

Questionnaires were designed and administered to randomly selected bulk SMS managers, bulk SMS system developers and bulk SMS users or clients in the public. We used Questionnaires because they saved both the respondents' and our time and they help provide the necessary information needed without the respondents having to think a lot. The questionnaires were filled and handed back to the researchers (us). We then compiled the data, organized the data, analyzed and processed it and finally used it in the design and implementation of the system.

### **3.4 Interviews**

Under this data collection method, researchers scheduled appointments for personal interviews with various people like telecom company managers (MTN), bulk SMS managers and developers so as to discuss about bulk SMS challenges by answering the how and why question. In this process, the researchers got recommendations from the various oral interviews they carried out. The recommended measures we got from our respective respondents on how to solve the bulk SMS challenges include; Monitor customized alpha sender ids, strengthen authentication of all user accounts and administrators among others. We used this method because it provided firsthand information which we used in the design and implementation of the system.

## **CHAPTER FOUR**

### **Systems requirements analysis and design**

#### **4.0 Introduction**

The main purpose of this chapter is to identify all files, inputs, outputs and application programs that were needed in the analysis and design of the system. The software development life cycle was used which is a process by which an information system comes into life and maintains its usefulness to an organization as it moves from establishment to replacement.

#### **4.1 Systems requirements analysis**

After collecting the required information using the different data collection techniques, data was analyzed which showed that many people in the bulk SMS management business liked to have a system to be put in place to reduce on the challenges they are facing in the process of reaching out to their audience or public using the current system of management. Therefore, that calls for the development of an improved system.

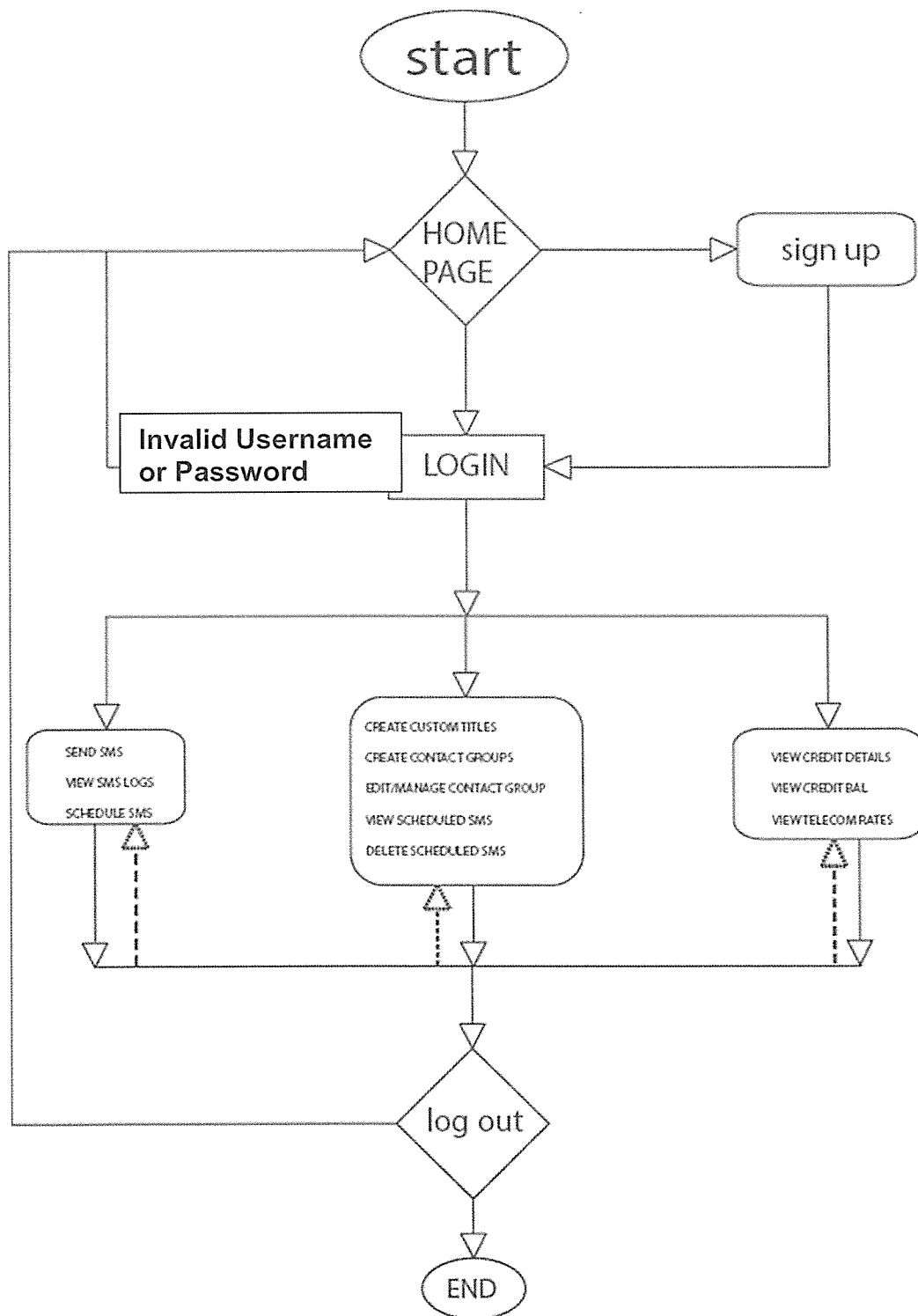
#### **4.2 Systems design**

After interpretation of the data, tables were drawn and process of data determined to guide the researcher of the design stage of the project. The tools, which were employed during this stage, were mainly tables, Data Flow Diagrams (DFDs), Data dictionary, system architecture and Entity Relationship Diagrams (ERDs). The design ensures that only allows authorized users to access the system's information.

##### **4.2.1 Data Flow Diagrams (DFD)**

Data flow diagrams illustrate how data is processed by the system in terms of inputs and outputs and the graphical representation of the system components. It reveals the relationship between various system component and processes. Below is a data flow diagram:-

## DATA FLOW DIAGRAM



#### 4.2.2 Data Dictionary

A data dictionary contains a list of all files in the database, the number of records in each file and the names and titles of each field. After each data or item is given a descriptive name, its relationship is described, the type of data is described and possible predefined values are listed and a brief textual description is provided. When developing a product that use a model, a data dictionary can be consulted to understand where a data item fits in the structure, what values it may contain and basically what the data item means in the real world. This helps programmers who need to refer to the data to easily access it. Most data management systems keep the data dictionary hidden from users to prevent them from accidentally destroying its content.

*This will be used to store data for system users (Table 1)*

| ITEM/FIELD | DATA TYPE | DESCRIPTION            |
|------------|-----------|------------------------|
| Name       | Varchar   | Customer name          |
| Username   | Varchar   | Username               |
| Password   | Varchar   | Authenticated Password |
| Email      | Varchar   | Email address          |
| Address    | Varchar   | Physical address       |

*Store SMS logs (Table 2)*

| ITEM/FIELD                      | DATA TYPE | DESCRIPTION                                        |
|---------------------------------|-----------|----------------------------------------------------|
| Sender ID                       | Varchar   | Numerical or Alpha sender id                       |
| Upload recipients               | Varchar   | Type/browse recipients or use phone book           |
| Send SMS (Single bulk or group) | Varchar   | Message box (Max 4 messages)                       |
| Schedule                        | Varchar   | Command message to be sent at a later time or date |
| Send                            | Command   | Command message to be sent or schedule             |

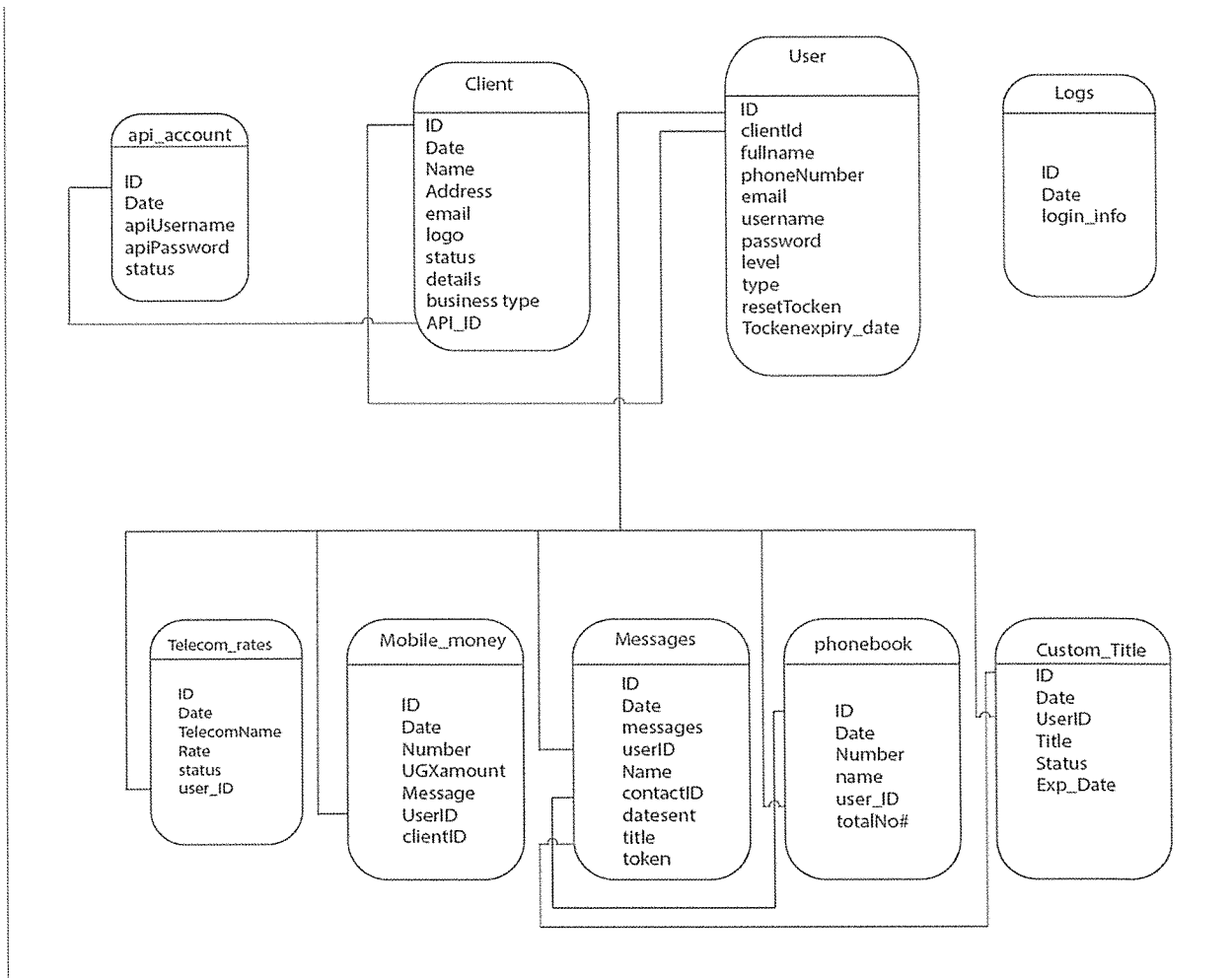
*This stores Client's logs (Table 3)*

| ITEM/FIELD        | DATA TYPE | DESCRIPTION                                                       |
|-------------------|-----------|-------------------------------------------------------------------|
| Client's ID       | Varchar   | Clients system ID                                                 |
| Client's username | Varchar   | User details                                                      |
| Credit details    | INT       | Credit rate and credit allocated<br>ie credit used and credit bal |
| Sent messages     | Varchar   | Sent and scheduled messages                                       |
| User logs         | Varchar   | Successful and failed login<br>attempts                           |
| Sender ID         | Varchar   | Sender ID requests                                                |
| Delivery reports  | Varchar   | Shows delivery reports of all<br>the message logs                 |

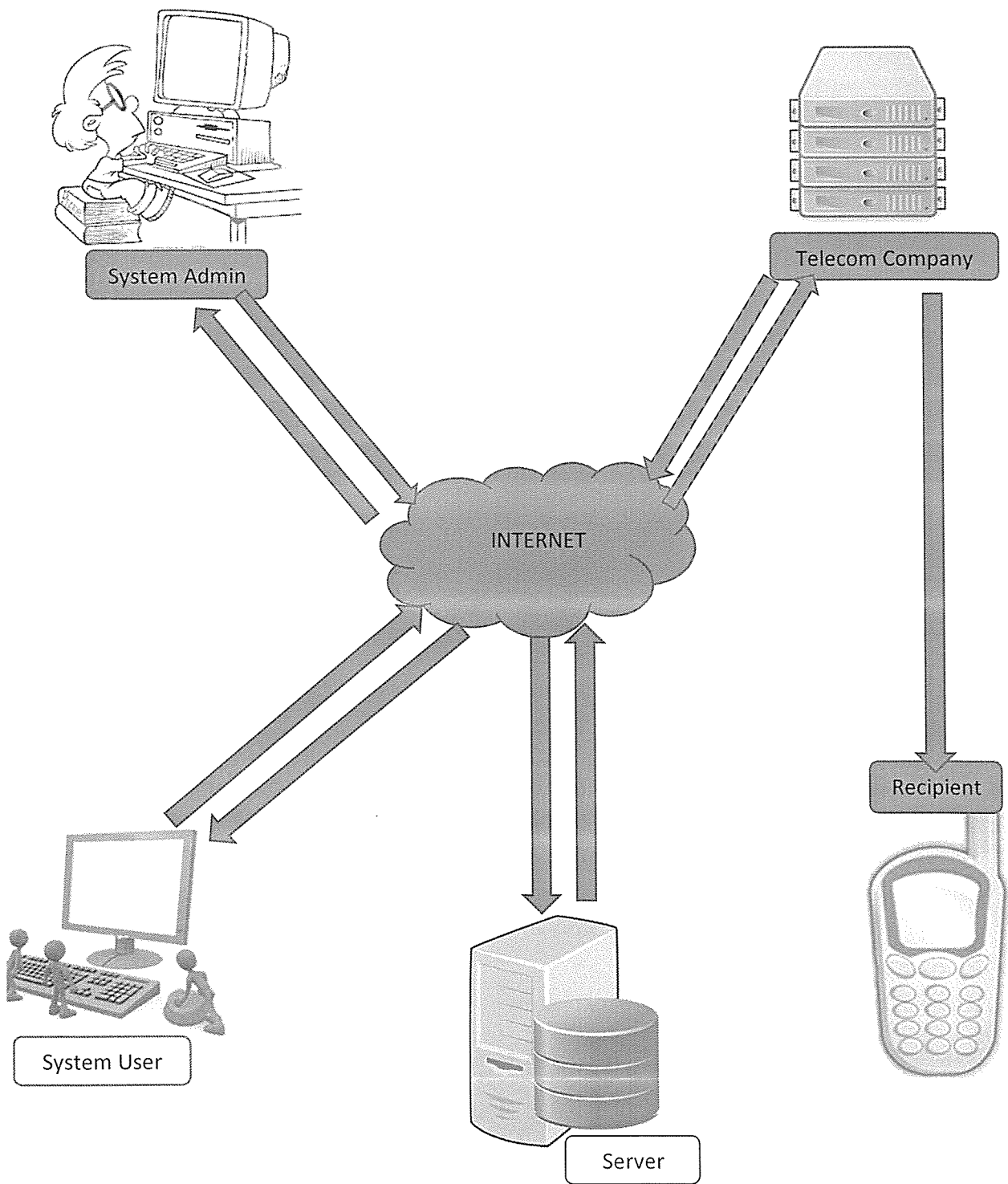
#### 4.2.3 Entity relational diagrams (ERD)

This is the main tool for data modeling; it identifies the data to be stored by the proposed system, it shows the relationship between the entities involved in the system together with their attributes. It shows commencement of the normalization process as well as refining the data dictionary and it indicates the normalization process of the system.

## ENTITY RELATIONAL DIAGRAMS



4.2.4 SYSTEMS ARCHITECTURE (DIAGRAM 3)



High level design describes the major components of our system and how they interact with one another to achieve the goals of the design. These models help us understand the architecture, discuss changes and communicate our intentions clearly. The purpose of a model is to remove the uncertainty that occurs in natural language description and to help me and my colleagues to visualize the design and to discuss alternative designs by:-

- Understanding the requirements. The starting point of any design is to understand the user's needs
- Architectural patterns. The choices we made about core technologies and architectural elements of the system
- Components and their interfaces. We drew a component diagram to show the major parts of the system and show interfaces through which they interact with one another. The interfaces of each component include all the messages that we identified in the sequence diagram.
- Interaction between components

#### 4.3 Programming languages, Operating system and software's required;

| Programs and software used | Implementation                                                                                             |
|----------------------------|------------------------------------------------------------------------------------------------------------|
| Operating system           | Windows 8, windows 7 and smart phone OS                                                                    |
| HTML                       | Display front-End or user interface.                                                                       |
| CSS                        | Rules applied on the look of the page layout, table layout and form layout on the Front-End                |
| PHP                        | Backend function and front end reports. Since it can be used to carry out both math and logical functions. |
| PHP-MYSQL                  | Communication to database, storage of data, manipulation of data and calling data from the database        |
| Illustrator                | Used to develop the report diagrams and system logos                                                       |
| JavaScript                 | Interactive effects on the front-End or user interface                                                     |
| AJAX                       | Display interaction change and table changes on the user interface or front-end.                           |
| JQuery                     | JavaScript library for specific JavaScript function effects                                                |
| Xamp /wamp server          | Base server to run the system database                                                                     |
| Photoshop                  | Used for editing system display photo images.                                                              |
| Internet browsers          | Used to test and run the system as well as a platform for the user interaction to the system.              |
| Firebug                    | Was used to identify system errors in both testing and design stages                                       |

## **CHAPTER FIVE**

### **System implementation, testing and validation**

#### **5.0 Introduction**

This chapter concentrates on the actual system implementation process. The bulk SMS management system was transformed from user requirement into a workable system. The purpose of system implementation is to make sure that all user requirements have been met. Furthermore, this chapter also concentrates on how the testing is done to confirm all user requirements have been met. System implementation involves programming and documentation of the whole process. The whole process involves the following;

- Completion of program coding:- Please refer to appendix C
- Completion of the physical model; data flow diagram, systems Architecture, Entity relationship diagram as required.
- Conversion of the data dictionary to the physical database.

#### **5.1 System Validation and Testing**

The validation and testing of the proposed system will be based on the use of the logical or physical data flow diagrams, data stores, data structures, data access diagrams and systems Architecture. The designed system will be presented to several parties in the BULK SMS business so as to test its functionality.

#### **5.2 System Testing**

System testing is defined as testing the behavior of the system with respect to the system requirements specification. The main goal of system testing is to assert that the customer requirements are met. The BULK SMS management system was tested with regard to the following types; unit testing, component testing, system integration testing, graphical user interface testing, usability testing, accessibility testing, performance testing and security testing. All the above tests were carried out and the results were positive as seen below.

### **5.3 Unit Testing**

Unit testing was carried out on user accounts of the system to ensure that they are fully functional units. We did this by examining each unit, for example the phone book or contact list was checked to ensure that it functions as required and that it adds contacts to the created group and also ensured that this data is sent to the database. The success of each individual unit gave us the go ahead to carryout integration testing. All identified errors were dealt with.

### **5.4 system Integration Testing**

We carried out system integration testing after different unit tests had been put together to make a complete system. Integration was aimed at ensuring that units are compatible and they can be integrated to form a complete working system. For example we tested to ensure that when a user is logged in, he/she is linked to the appropriate pages.

### **5.5 System Validation**

The major goal of system validation in the system development life cycle is to ensure that the intended system performs all its duties rightly without unintended side effects and that the system should be in position to meet its objectives. This has been done on our bulk SMS management system by the involved parties in the bulk SMS management business and proven to be a success (valid).

## **CHAPTER SIX**

### **Discussion, Findings, Limitations, recommendations and conclusion**

#### **6.0 Introduction**

The chapter discusses the system study, findings, limitations, recommendations and conclusion of the current system

#### **6.1 Discussion**

We discussed about the study and the system requirement.

##### **6.1.1 Functional requirements**

This describes what the system should do;

- System should allow users to access, create and to edit information saved on the account in case of any mistakes made in the insertion or creation of the account.
- The system should be able to view or display delivery reports
- The system should be able to schedule and delete scheduled messages
- The system should be able to monitor customized sender ids
- The system should be able to display SMS logs among others

##### **6.1.2 Non-functional requirements**

These are the non- functional requirements that should be fulfilled when developing the system.

The following were the non-functional requirements for the system:

- The system should be available and accessible.
- The system should use less processor time.
- The system should employ security measures for example user authentication.
- The system should use a secure hypertext transfer protocol.

#### **6.2 Findings**

We researched about the existing SMS management systems and our finding was as follows:-

### **6.2.1 The Existing System study**

The study was carried out at SMS BLASTERZ LTD and the main purpose of the study was to find out how the process of SMS sending is carried out. We found out that the system that is currently being used by SMS BLASTERZ clients has too many user privileges.

When a user wants to send SMS, that user can use any sender id they so desire because they are permitted to do so. So when any user misuses the sender ID privilege, the SMS management company is liable for their actions. And because of this, telecom companies have resorted to blocking messages from these SMS companies considering them as spam so as to protect their clients from the consequences resulting from using uncensored customized sender ids.

### **6.2.2 Weakness of the Existing System**

- The system doesn't have policies in place that can be used to monitor the use of customized sender ids which has led to problems like blockage of the SMS companies by telecom networks from reaching their audience.
- The current system is unreliable because the misuse of customized sender ids has led to the blockages of the messages by telecom networks hence SMS management companies' loose trust and credibility from their esteemed clients.

### **6.3 System Limitations**

- The Bulk SMS management system that we have developed uses a one way traffic route which is a limitation. This means clients or users can only send messages to their clients but cannot get responses directly from their clients using the same route.
- We had limited funds during our research project which was a big limitation to our research.

### **6.4 Recommendation**

We recommend that bulk SMS management companies go for systems that use two-way traffic gateways so as to improve communication between the bulk SMS management companies and their clients. This will help the bulk SMS management companies informed of the challenges their clients are facing so as to know how they can solve them hence improving the bulk SMS systems generally.

## **6.5 Conclusion**

The previous Bulk SMS management system (SMS blasterz) was unreliable due to the fact that it gave users too many privileges that they misused. The consequence of the misuse was the blockage of web based messages by telecom networks with an initiative of protecting their clients from fraud, impersonation among others. This raised researcher's attention to identify the root cause of the problem which was uncensored customized sender id usage. After identifying the problem, the researchers decided to structure and develop system policies that will monitor and control the use of customized sender ids to solve the identified problem.

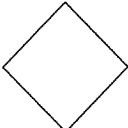
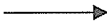
## REFERENCES

- Scott Guthery and Mary (Nov 15, 2001) Mobile Application Development with SMS and the SIM Toolkit 1<sup>st</sup> Edition
- Gwenael Le Bodic (Feb 2005) Mobile Messaging Technologies and Services: SMS, EMS and MMS 2<sup>nd</sup> Edition
- Gerardo Gomez (April 2005) End-to-End Quality of Service over Cellular Networks: Data Services Performance Optimization in 2G/3G
- Henno .J, Kiyoki.Y, Tokuda.T, Jaakkola .H, Yoshida. N (2012) Information Modeling and Knowledge Bases XXIII
- Ivo Salmre and Addison Wesley (2005) Essential software for Building Mobile Applications 6<sup>th</sup> Edition
- Michael Connolly .G. And John Kurian (2009) Developing Connector Applications for CICS (Customer Information control System) Version 7
- Alida Jatich .M. (1991) CICS Command level programming 2<sup>nd</sup> Edition
- Valentino Lee, Heather Schneider and Robbie Schell (2004) Mobile applications Architecture, Design and Development 1st Edition.
- W3SCHOOLS Web source: [http://www.w3schools.com/php/php\\_sessions.asp](http://www.w3schools.com/php/php_sessions.asp)
- PHP Hacks by jack Herrington (December 2005) <http://bulk-sms-book.software.informer.com/>
- Luke Welling and Laura Thompson (2005) PHP and MySQL web development Third edition

## APPENDICES

### Appendix A

#### System Key (Data flow Diagram)

| SYMBOL                                                                              | NAME        | DESCRIPTION                                                                        |
|-------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------|
|    | START       | This shows the beginning of the systems process.                                   |
|   | HOME PAGE   | This shows the different states a system can be in after making given decisions.   |
|  | LOGIN       | This is a decision symbol. It gives the user options of how to navigate the system |
|  | ASSOCIATION | This shows the flow of the system control from action to another.                  |
|  | LINES       | It connects the systems functions to each other                                    |
|  | BOUNDARY    | It shows the systems boundary                                                      |

## Appendix B

### Questionnaire

#### STUDY ABOUT BULK SMS SERVICE RELIABILITY

This is a research carried out to study the quality of service bulk sms companies offer the public in terms of service reliability. I declare that your participation in this exercise is voluntary.

---

##### Personal details

Name: \_\_\_\_\_

Occupation: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

1. If yes, how often do you use the service?

|                      |  |
|----------------------|--|
| Very often           |  |
| Often                |  |
| Regularly<br>(Daily) |  |
| Once in awhile       |  |
| Rarely               |  |

2. How do you find the bulk sms platforms in terms of use?

|                         |  |
|-------------------------|--|
| User friendly           |  |
| Somewhat<br>friendly    |  |
| Somewhat<br>complicated |  |
| Complicated             |  |

3. Can you please rate the quality of the service?

|           |  |
|-----------|--|
| Excellent |  |
| Very good |  |
| Good      |  |
| Fair      |  |
| Poor      |  |

4. Would you use the service again or recommend it to any one?

|     |  |
|-----|--|
| YES |  |
| NO  |  |

5. If no, why not?

.....

.....

.....

.....

6. If yes, why?

.....

.....

.....

.....

7. How would you rate the reliability of the bulk SMS service?

|                      |  |
|----------------------|--|
| Very reliable        |  |
| Reliable             |  |
| Somewhat<br>reliable |  |
| Non reliable         |  |

8. Reason for the above answer (8).

.....

.....

.....  
.....

9. What are some of the challenges you faced while using bulk sms services?

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

10. Any recommendation on how to improve the service;

.....  
.....  
.....

*Thank you for your time and participation*

## Appendix C

### System backend codes

```
#####
#   START : Enter New USER
#####
}   if (isset($_GET["action"]) && $_GET["action"] == "adduser" ) {

    $i = mysql_real_escape_string($_POST["edit"]);

    $v["fullName"] = mysql_real_escape_string(trim($_REQUEST["fullName"]));
    $v["phoneNumber"] = mysql_real_escape_string(trim($_REQUEST["phoneNumber"]));
    $v["email"] = mysql_real_escape_string(trim($_REQUEST["email"]));
    $v["username"] = mysql_real_escape_string(trim($_REQUEST["username"]));
    $v["password"] = md5($_REQUEST["password"]);
    $v["type"] = mysql_real_escape_string(trim($_REQUEST["type"]));
    $v["clientId"] = mysql_real_escape_string(trim($_REQUEST["clientId"]));
    $v["usercode"] = mysql_real_escape_string(trim($_REQUEST["usercode"]));
    //$v["branchId"] = mysql_real_escape_string(trim($_REQUEST["branchId"]));
    $passcheck = md5($_REQUEST["passcheck"]);

    #Check if the user name exists
    if (!empty($_REQUEST['edit'])) { //Means user account is being edited
        $userExists = 0;
    } else {
        $userExists = findDuplicate(array('table'=>'user', 'username'=>$v["username"], 'clientId'=>$v["clientId"]));
    }

    //$featuresAllowed = @$_POST["featuresAllowed"];
    //$_featuresAllowed = json_encode($featuresAllowed);
    //$v["featuresAllowed"] = mysql_real_escape_string($_featuresAllowed);

    if ($v["type"] == "superAdmin" ) {
        $v["level"] = md5(0);
    }
}
```

```

#####
#   START::Enter New CLIENT
#####
]   if (isset($_GET["action"]) && $_GET["action"] == "addclient" ) {

    $i = mysql_real_escape_string($_POST["edit"]);

    $v["business_typeId"] = mysql_real_escape_string(trim($_REQUEST["business_typeId"]));
    $v["logo"] = "";
    $v["name"] = mysql_real_escape_string(trim($_REQUEST["name"]));
    $v["phoneNumber"] = mysql_real_escape_string(trim($_REQUEST["phoneNumber"]));
    $v["email"] = mysql_real_escape_string(trim($_REQUEST["email"]));
    $v["address"] = mysql_real_escape_string(trim($_REQUEST["address"]));
    $v["detail"] = mysql_real_escape_string(trim($_REQUEST["detail"]));
    $v["country"] = mysql_real_escape_string(trim($_REQUEST["country"]));
    $v["status"] = "Inactive";

    $k["fullName"] = mysql_real_escape_string(trim($_REQUEST["fullName"]));
    $k["username"] = mysql_real_escape_string(trim($_REQUEST["username"]));
    $k["usercode"] = mysql_real_escape_string(trim($_REQUEST["email"]));
    $k["password"] = md5($_REQUEST["password"]);
    $passcheck = md5($_REQUEST["passcheck"]);
    $k["type"] = "manager";

    //Applicat Has to accept terms of Service
]   if ( !isset($_POST["terms_of_service"]) && empty($_POST["edit"]) ) { //???

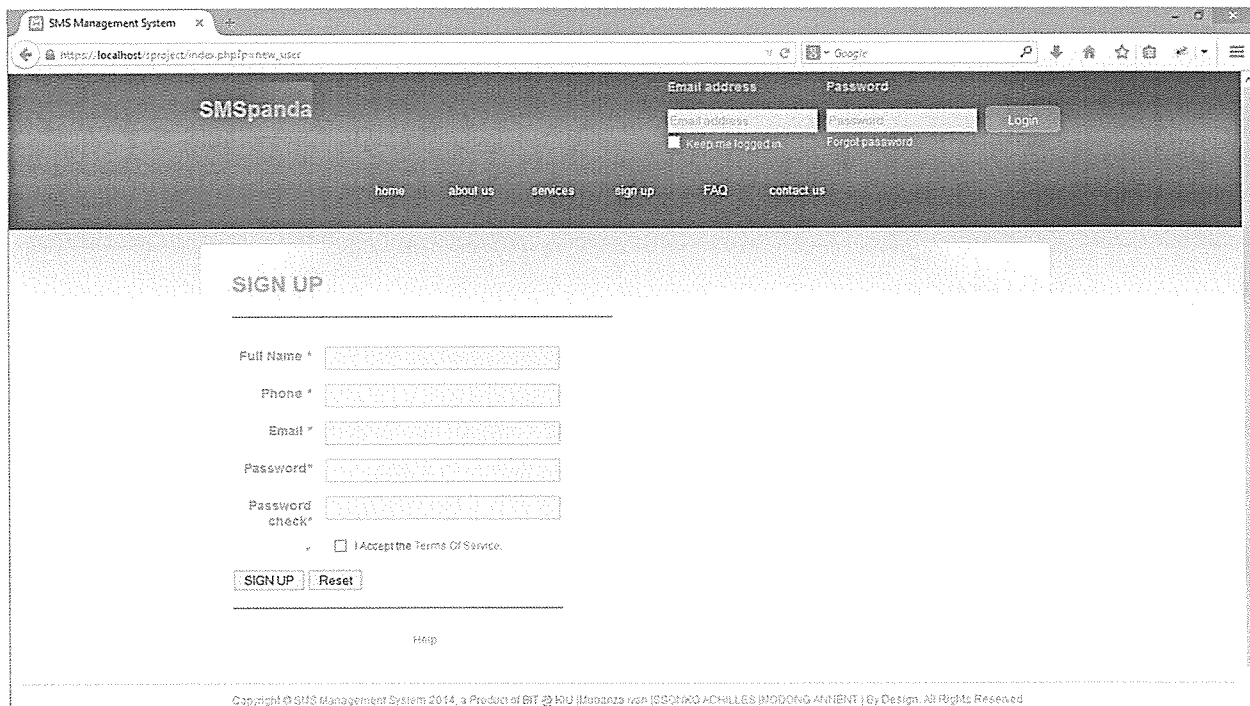
        echo "Please Accept our Terms Of Service in order to continue;";
        exit;

    }
}

```

## Appendix D

### Sign Up page



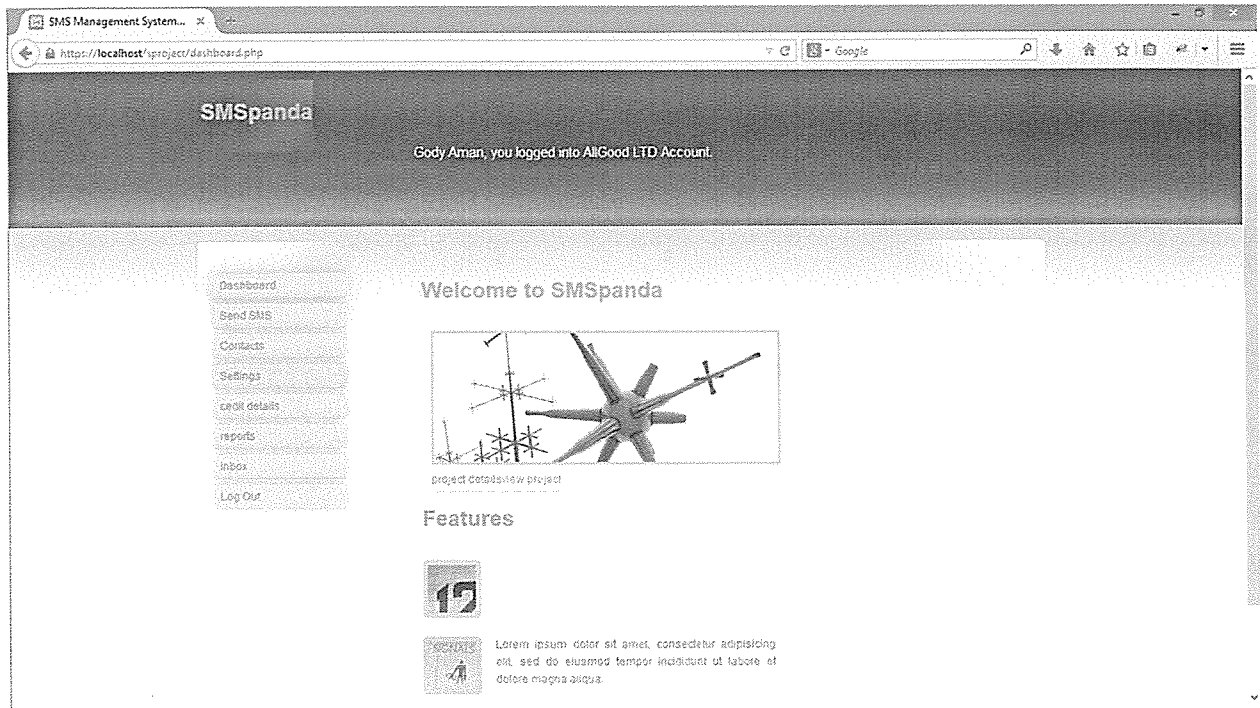
The screenshot shows a web browser window with the URL `https://localhost/project/index.php/new_user`. The page is titled "SMSpanda" and features a dark header with navigation links: home, about us, services, sign up, FAQ, and contact us. A login section in the header includes fields for "Email address" and "Password", a "Login" button, and links for "keep me logged in" and "Forgot password".

The main content area is titled "SIGN UP" and contains a registration form with the following fields and elements:

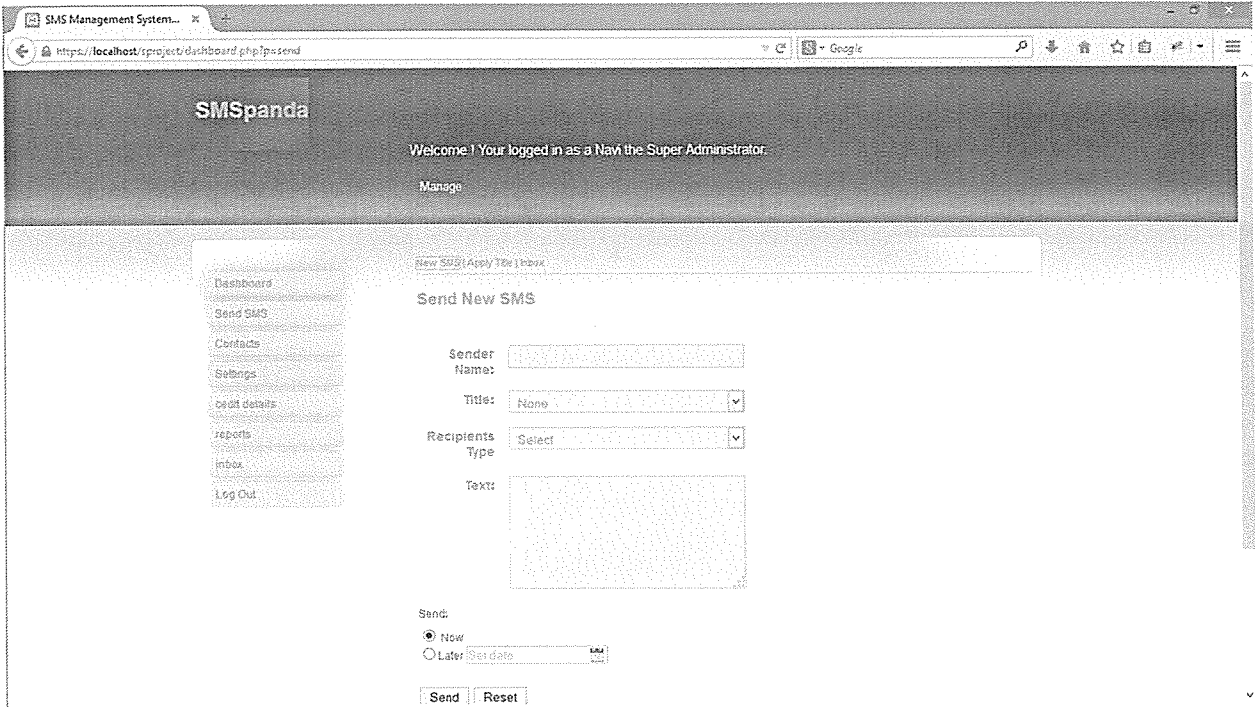
- Full Name \*
- Phone \*
- Email \*
- Password \*
- Password check \*
- ☐ I Accept the Terms Of Service.
- SIGN UP button
- Reset button

Below the form is a "Help" link. The footer contains the copyright notice: "Copyright © SMS Management System 2014, a Product of BIT KIU (Mwanza) vsh (SCHAKO) ACHILLES (MODONG) ANIBENT | By Design. All Rights Reserved".

Home page



SMS sending page



Customised sender id requisition form

SMS Management System...

https://localhost:8080/project/dsxbboard.php?ip=send

Google

SMSpanda

Welcome ! You're logged in as a Navi the Super Administrator.

Manage

Dashboard

Send SMS

Contacts

Settings

credit details

reports

inbox

Log Out

New SMS | Apply | Inbox

New custom Sender ID

Custom Sender ID:

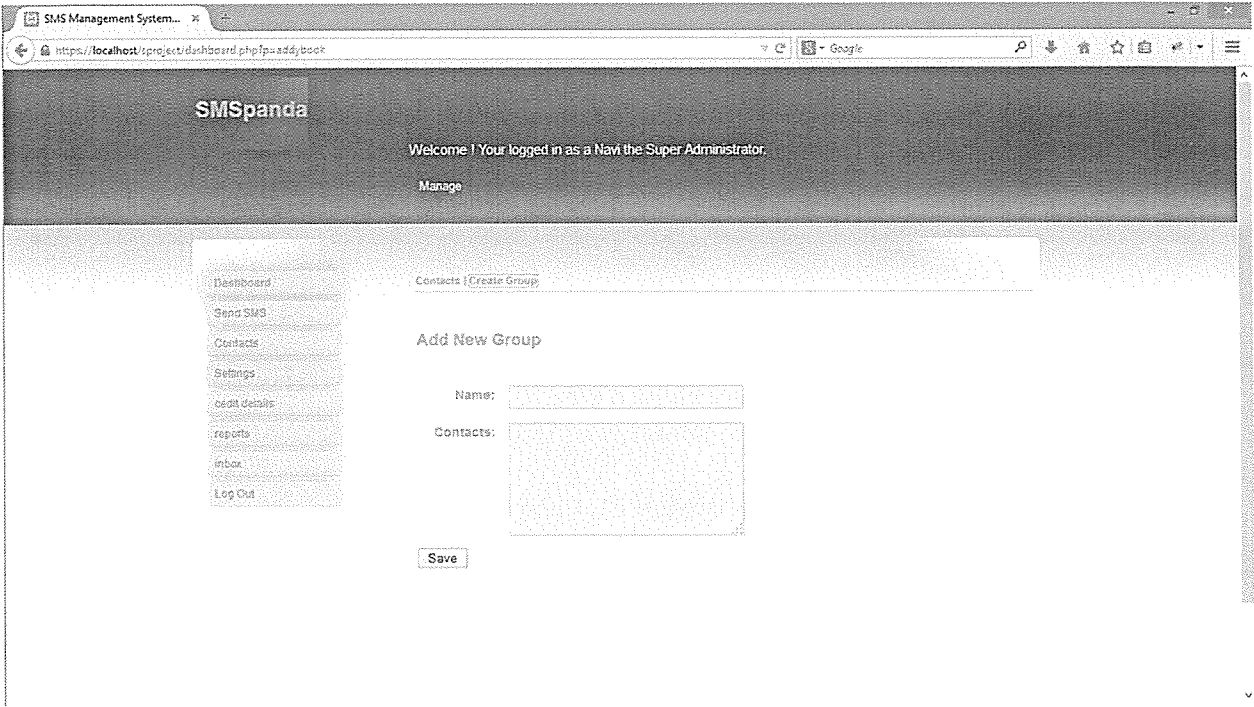
Company Name:

Contact number:

Apply

Reset

Phone book creation page



Edit user details page

