Donation thru SMS

By

Abdul Halim Bin Ku Ahmad

Dissertation submitted in partial fulfillment of

the requirements for the

Bachelor of Technolgy (Hons)

(Information System)

January 2005

Universiti Teknologi PETRONAS

Bandar Seri Iskandar

31750 Tronoh

Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

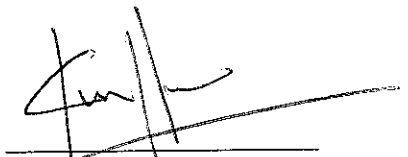
Donation thru SMS

By

Abdul Halim Bin Ku Ahmad

A Final draft submission to the
Information System Programme
Universiti Teknologi PETRONAS
in partial fulfillment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(INFORMATION SYSTEM)

Approved by,

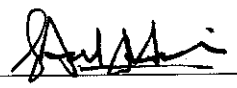


(Mr. Faizal Ahmad Fadzil)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
January 2005

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.



ABDUL HALIM KU AHMAD

ABSTRACT

The main objective of this project is to develop a system for donation could happen thru SMS system. This project will concern on developing an integrated system to allow SMS being transferred via mobile phone gateway to enable mobile phone user make a donation thru sending SMS. This system will display out the main components such SMS data management system, SMS server itself and tools being used to run the system. The entire introduction, problem statement, objectives, and the scope of the studies for the project will be further explained. This document also gives related information about the system in literature review section. This section presents several judgments from journalist and professional writer that relate to the project topic. The proposed methodology is then discussed in the next section. This section also includes the tools and hardware that are to being used in developing the system. In Result and Discussion part, I had explained about my findings and results of my work during four month I've develop this project. I had done some research regarding this area and gather all the data. The outcome of this project is a good SMS system design for donation business could be implemented in easy and effective way.

ACKNOWLEDGEMENT

Alhamdulillah, finally I had successfully completed my final report for the Final Year Project semester January 2005. First of all, I would like to express a greatest gratitude to my grateful Supervisor, Mr. Faizal Ahmad Fadzil for his guidance and assistance provided throughout the project. It's about four months plus struggling the idea, skills and communication with people around, I manage to complete the report and the project itself. With this project, I manage myself to be more precise in time management and communication skill. Within the FYP itself, I manage to enhance my skills in using Visual Basic .Net and MySQL database. I would to thank all people who from starting till the end keep supporting me to complete the project.

TABLE OF CONTENT

LIST OF FIGURE

CHAPTER 1
INTRODUCTION

1.1 Background of Study

SMS service is the simplest and the most inexpensive text communication between mobile phones. By typing and sending some text to the recipient, user usually reaches their meaning of the message. Nowadays there is a communication company that provide 1 cent per SMS to local users. In 2004, local report said that SMS based businesses like ring tone and wallpaper download can easily got RM1 million profit per year. It's also predicted that their revenue will increase due to increasing of mobile phone users.

We've realize that the SMS service give the simplest method to make a businesses transaction. One of those businesses is donation thru SMS. With this service we can provide a user an easiest way for them to make a donation at anytime and anywhere as long as they have an enough credit balance. Furthermore, the disaster people or organization which receives the donation fund should provided with the trustful transaction so people who make a donation believe that their money is not going anywhere but to the respected recipient.

Currently the donation thru SMS only provided to the mass disaster people like tsunami. There is no donation thru SMS to charity organization like orphans house or incapable people. This is because people still wonder the effectiveness of the system and still hesitate to money they gave whether it used expectedly or not.

1.2 Problem Statement

1.2.1 Problem Identification

Usually donation to charity organization always make in term of money by hand or cheque. Doing so need some effort and usually did not apply to small amount of money because people mostly shy to donate RM 2. This will limit the ability of people to make a donation as he or she intend to. Donation process by putting the box into public area is a good idea but the option like SMS system can make a donation more organize. This is because SMS system is done through computerized system that can give an analysis result in a second and collection of donations guaranteed through the software platform.

In a recent day people mostly had a difficulty to reach the charity center especially for people in the isolated area. They however have the mobile phone as we can see in our country nowadays. So, it is possible to them to make a donation even they don't know where the charity organization is.

Some of the current donation thru SMS system is less confidence because they might not distribute the money to the disaster people as expected. We are not surprise if we told that some donation collector has lift donation fund. During tsunami tragedy, it is normal to know that tsunami victims always anxious whereas a lot of money has been collected as it been told on television. In this project, it was included the auto payment to the disaster people thru their registered account. Donation fund recipient will be provided complete information on the donation fund they received. This is very important to ensure the rightness of the money that donates by public.

Encouragement of each religious to help incapable people, really make us easy to donate even in small amount of money. However we always forget to do so due to lots of works and busy with our life. It is very convenience if such system that can help us to make a

donation for each month. This donation thru SMS will provide people to set the amount of money to be deducted from their phone credit monthly.

1.2.2 Significant of the Project

Polling, surveying and TV chatting is the new trend of business that can easily get the reaction from mobile phone users. We can easily see the polling and surveying thru SMS in newspaper or television and its really profitable to the business by charging the specific amount to the mobile phone user. It is not impossible that a new and attractive business that use SMS based transaction will arise significantly. The average charge for sending a text message in the Malaysia nowadays is 10cent per message, making texting a cheaper alternative to voice calls on wireless mobile phone or landlines.

This project can remove users nervous to make a donation thru SMS by provide them with a supporting website that stated the money transaction to the recipient accounts. I've planned to build this website to show the effectiveness of the project by providing this communication medium with users. In this website, I'll setting up any relevance information which showing the rightfulness of the money that funding by people which successfully inserted to the user account.

Efficiency in this project not only depends on the functioning of the system but also approved to be reliable and unquestionable. These two elements being the main objective of the project since it will create the big opportunity to the society to make a donation in a simple and very effective way. This project is reliable when it combines the good interface of SMS server and website to communicate with users. In another way, this project is indisputable when users believe that the money they've fund is going to the right person whereas it is the big challenge to this project and it going to be completed in any way. Furthermore, any responsible institute such as 'Jabatan Kebajikan Masyarakat' also being inform about the fund received by orphanage organization. This is to avoid any misunderstanding that would arise between them.

A good management of SMS server is very crucial because it promise the good maintainability and expandability. I've selected Visual Basic.Net as a main IDE to build the SMS server. VB.Net is easy to use and it's approved to be function expectedly. For the website, I've chosen ASP.Net with Visual Basic programming language. ASP.Net is come along with Visual Studio.Net, so I need no additional IDE to build both SMS server and website.

1.3 Objectives and Scope of Study

Objectives of Donation thru SMS system are:

1. To make a donation well organize with a computerize system.
2. To allow all people with mobile phone facility make a donation.
3. To make a donation process more honest.
4. To enable a charity organization expands their method of getting money.
5. To create a good and reliable design system by applying a well known database management system and programming language.

Scope of study is to learn how donation thru SMS has being build and developed. The study also discovers to how the effective payment should be created to ensure the rightfulness of the donation process in order to satisfy donor and recipient. The project will covered the SMS system for donation to orphan house take place; come up with SMS data management that form out by using windows application. The main purpose of data management is to allow administrator to manage the related data that being used in this system. The duration of project will take for approximately four month to complete.

CHAPTER 2

LITERATURE REVIEW

Geoffrey Elliot and Nigel Phillips (2004) define the SMS, known colloquially as 'text messaging', is a massive phenomenon in Europe and Asia, particularly among young user in the 12-22 age. Michael's (2004) declare that worldwide, 100 billion SMS text messages will be sent each month in 2005. According to Kris Walmsley (2004) "Malaysia appears to be on the next wave of a mobile data revolution. The country has an advanced telecom infrastructure and a government directive promises total coverage throughout the country. Its population of 24 million boasts 52 percent mobile penetration, making it the second highest in Asia after Singapore. And mobile data services are expected to increase 11 percent in 2004".

Kris Walmsley's statement describes that SMS service in our country is at best performance. Even the introduction of new mobile phone technology such as MMS, however SMS still being the best medium for communication. Kris Walmsley (2004) has report that although incumbent Telekom Malaysia, together with Maxis, are committed to rolling out a 3G system, Maxis expects the bulk of its revenue to come from SMS until at least 2006.

NSTP (2005) has reported that he Malaysian Tsunami Disaster Fund (MTDF) ended an unprecedented 32-day run today, closing with an astounding RM44.5 million collected from Malaysians who rallied to help victims of the Dec 26 tragedy. The grand tally includes SMS collections from Maxis (RM1, 079,534) and Celcom (RM879, 225).

From the total, the MTDF has handed over RM26.285 million to The National Disaster Relief Fund (NDRF) managed by the National Disaster Management and Relief Committee chaired by Deputy Prime Minister Datuk Seri Najib Razak. From this report we can conclude that Malaysian is graceful to donate to disaster fund.

CWSL (2001) in his Website articles stated that SMS is a relatively simple messaging system provided by the mobile phone networks. SMS messages are supported by GSM, TDMA and CDMA based mobile phone networks currently in use. Although services based on SMS have been feasible for many years, the recent mobile phone penetration and large scale adoption of the existing services by users have made the SMS based services even more attractive to service providers. Dr. Subrahmaniam Karuturi (2003) added that SMS is convenient and cost effective for a number of reasons. When you compare it with the cost of airtime for voice calls or wireless web access, SMS is a real bargain.

According to CSWL (2001), Tom Celements (2003) agreed that the benefits of SMS to subscribers center on convenience, flexibility, and seamless integration of messaging services and data access. From this perspective, the primary benefit is the ability to use the handset as an extension of the computer. However Tom Celements (2003) realize that several problems persist in the SMS space, holding back full-scale implementation of SMS. Makaleler (2001) added that data Coding Scheme, Origination Address, Protocol Identifier, and other header fields are fixed; this automatically limits the number of possible scenarios when developing an application.

CHAPTER 3

METHODOLOGY/PROJECT WORK

3.1 Procedure Identification

The methodology being used in the development of the prototype is Rapid Application Development (RAD). RAD methodology emphasizes extensive user involvement in a rapid and evolutionary construction of working process of a system to accelerate the system development process. RAD helps in decreasing time needed to implement information systems radically through speedy development and shorter schedules. RAD aims to analyze business process rapidly, design a viable system solution through intense cooperation between users and developers as well as to get the finished application into the hands of users quickly. This methodology relies on extensive user involvement, Joint Application Design session, prototyping, integrated CASE tools and code generators.

RAD methodology consists of four (4) phases: Requirements Planning Phase (Analysis), User Design Phase (Design), Construction (Detailed design and code generation) and Cutover (Installation and Handover). This project will go through all phases in order to come out with the prototype of Donation thru SMS System. The following diagram depicts the relationships between stages in the RAD process.

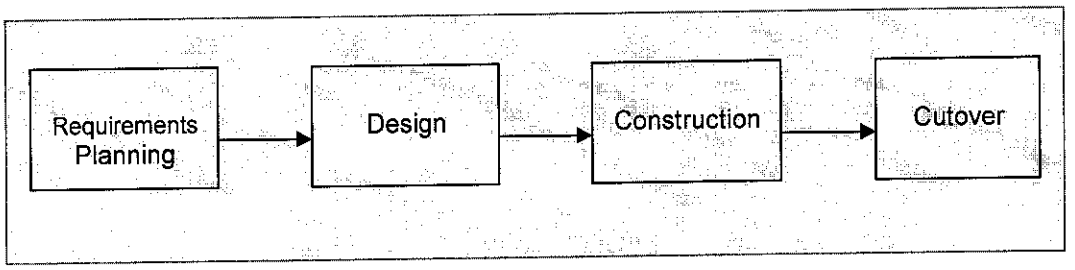


Figure 3.1: Rapid Application Development Process

3.1.1. Requirements Planning Phase (Analysis)

It is also known as the Concept Definition Stage. During this first phase of RAD, the author identified the objectives of this project and the requirement specification including hardware and software requirements for the system for the prototype. The author also identified the high-level process decomposition that determines the functions of the prototype as well as the area it will support. In addition, the scope of the project was identified in this phase, which is SMS system itself as the area of study.

The author has to ensure there is a need of having the prototype and demonstrate that the prototype able to work as expected. Besides, the author also identified the potential or key users of the system. Author determined the tasks and activities that will be incorporated throughout the project with respect to time frame given. Possible cost and risks associated with this project were also outlined. In addition, the author spent a lot of time throughout this analysis phase by conducting many readings and studies on various research papers, journals, white papers, articles and relevant websites covering the SMS system, SMS gateway and related areas. The findings from those activities were used for completing literature review and producing desired result.

3.1.2. User Design Phase (Design)

This phase is also known as Functional Design Stage where design and refine involved. In this stage, the outcomes from the analysis phase were reviewed and revised in term of scope, objectives, data models and reports. Initial design using prototyping also was started. Based on findings of research and studies during analysis phase, the author had come out with system's framework as guided by the Supervisor, hence provides initial views on the designing the application.

Installation and configuration of software were also done during this phase by using Microsoft Visual Basic. The designation of the application will be discussed later with Supervisor in order to enhance the method of animation done by several programmers. This has given basic idea of what the system or prototype will look like when the construction starts later.

3.1.3. Construction (Detailed Design and Code Generation)

This phase is usually known as development stage. During the development, detailed design is done using suitable design tool and the design is translated into code via code generator. Adjustments and necessary modifications will be made. The system's prototype will be implemented module by module with respect to functionalities and features developed. The changes will be done during design as the codes will be regenerated and optimized. Selected users will be selected to validate and test the system comprising the screens layout and also the functions of the prototype itself. Usability will be done on every subsystem to ensure that the system's prototype is easy to use. Testing will be done on the features and functionalities to ensure they are operational.

3.1.4. Cutover (Installation and Handover)

Cutover or Deployment Stage involves various activities towards the implementation fully functional prototype into real environment. These include final user testing and training, data conversion, and the implementation of the application. The system is put into real operation and is ready to be widely-used by all end-users. The system is the modified version as the result from feedback during testing. In this phase, the system is already fully tested as final documentation is prepared to guide end-users in using the system. The system is expected to function correctly and is capable of meeting the user requirements.

Applying RAD as the chosen methodology has provided the author with various advantages. RAD tools are easy to learn and promote good design of a user-friendly interface. Furthermore, RAD allows for quick testing and debugging of a system as it provides early visibility through prototyping. In addition, RAD also offers greater flexibility in which redesign process is done almost at will.

3.2 Evaluation

Two summative evaluations have been performed on SMS server and; mobile phone and website. These summative evaluations have occur at the end of the project and it Evaluate by users. Selection is made to particular users among student from various backgrounds of course. Heuristic evaluation has been applied for both summative evaluations. Heuristic evaluation is the most popular of the usability inspection methods. Heuristic evaluation is done as a systematic inspection of a user interface design for usability. The goal of heuristic evaluation is to find the usability problems in the design so that they can be attended to as part of an iterative design process.

Several tasks during the heuristic evaluation:

1. Plan evaluation
    i. Develop a set of tasks and ask evaluators to carry them out.
    ii. Provide evaluators with the goals of the system, and allow them to develop their own tasks.
    iii. Ask evaluators to assess dialogue elements.
2. Choose evaluators
    - Those with experience
    - Those without experience
3. Review the heuristics
    i. Visibility of system status
    ii. Match between the system and the real world
    iii. User control and freedom
    iv. Consistency and standards
    v. Error prevention
    vi. Recognition rather than recall
    vii. Flexibility and ease of use
    viii. Aesthetic and minimalist design
    ix. Help users recognize, diagnose, and recover from errors
    x. Help and documentation
4. Conducting the evaluation
5. Analyzing the results

SMS server evaluation

The evaluation for SMS server is to determine whether its suit the requirement as an administrative system for SMS transaction and data management. For that I've selected five IT and IS student as they would be suitable to evaluate my SMS server interface since they have knowledge on human computer interaction and system development. Questions generally base on interface, functionality and significance of the system.

Donation process and website evaluation

This evaluation is to determine the effectiveness of using mobile phone in making donation; and website to view the related information and donation record.

3.3 Tools Required

3.2.1 Visual Studio .Net IDE with Visual Basic programming language

This project use Visual Studio .NET version 2003 Enterprise Edition as an integrated development environment (IDE). Visual Studio .NET is a complete set of development tools for building ASP Web applications, XML Web services, desktop applications, and mobile applications. Visual Basic .NET along with other language such as Visual C++ .NET, Visual C# .NET, and Visual J# .NET all use the same IDE, which allows them to share tools and facilitates in the creation of mixed-language solutions.

Visual Studio .Net provides a complete set of tutorial that being a complete guide for developer during application development. Furthermore, there are many Visual Basic forum, code and program example on website that can assist a programmer to solve their coding problem or to give them an idea on developing application.

3.2.2 MySQL Relational Database Management System

MySQL, the most popular Open Source SQL database management system, is developed, distributed, and supported by MySQL AB. MySQL AB is a commercial company, founded by the MySQL developers. It is a second generation open source company that unites open source values and methodology with a successful business model. There are several reasons why most developer chooses MySQL:

i. The MySQL software is dual licensed. Users can choose to use the MySQL software as an Open Source/Free Software product under the

terms of the GNU General Public License or can purchase a standard commercial license.

ii. MySQL software is Open Source. Open Source means that it is possible for anyone to use and modify the software

iii. The MySQL Database Server is very fast, reliable, and easy to use.

iv. MySQL Server works in client/server or embedded systems.

CHAPTER 4

RESULT AND DISCUSSION

4.1 System Flow

Donation thru SMS system flow start with the sending SMS by customer and ending with the inserting donation fund to recipient account along with the notification. It is essential to clarify technical terms and users who involve within the system before continue with the next details.

i. Donor: mobile phone user who make a donation by sending a message

ii. Client: orphanage organizations that receive the donation fund.

iii. User: people who interact with the system (SMS Server).

The process flow of Donation thru SMS system could be display in figure below:

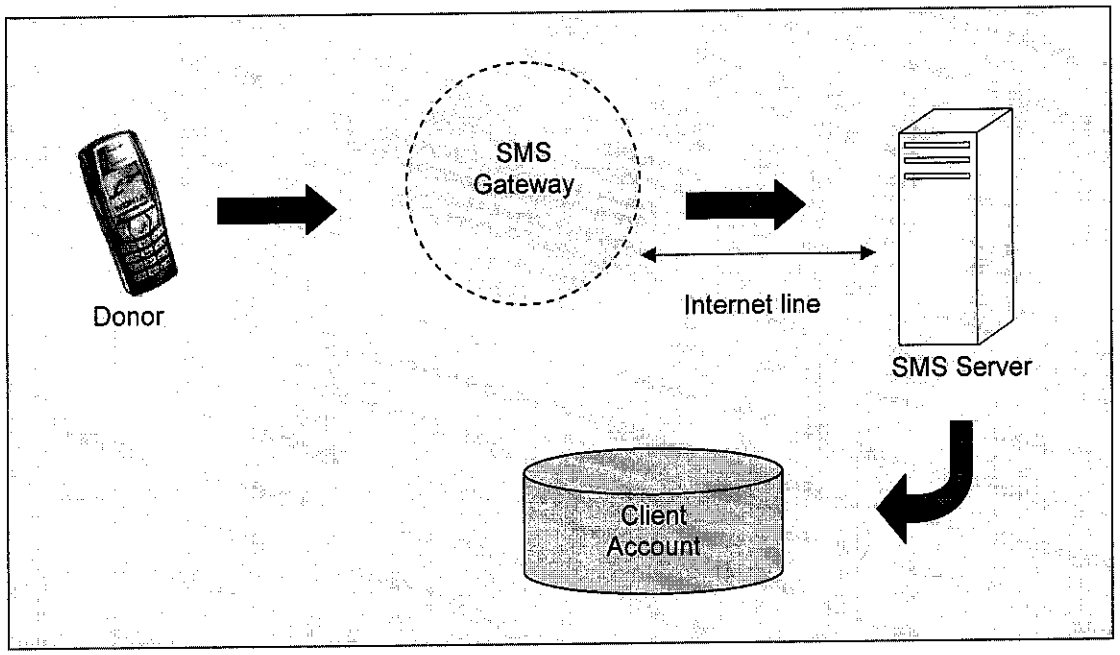


Figure 4.1: Donation thru SMS system flow

Above figure depict the flow of the system where the data initiate from the donor mobile phone to the client account. However, above process is only the basic flow that recaps the donation process which it is more complex. The complete donation process will be explained in the next and diagramming part. It is reasonable to avoid any confusing and misunderstanding by displaying a simple and clear picture at the start. To understand more on the donation process we need to identify these entities:

i. Mobile phone: any donor mobile phone that can send SMS and has enough credit (for the prepaid SIM card).

ii. SMS gateway: handle by network operator that has link to major communication company such as Maxis and DiGi. SMS gateway will translate SMS server IP address to five digits number such as 33555.

iii. SMS server: application at the server that can receive process and reply SMS to donor. This SMS server has a link to SMS gateway via internet line. SMS server needs a direct internet connection to SMS gateway with a registered and unique IP address.

iv. Client account: Orphanage organization need to create an account to enable fund transfer to their account automatically.

4.1.1 Steps of the Donation Process

There are several steps involve in donation thru SMS process. These steps have been presented with an example to ensure a clearly comprehend of the process. Please refer to figure 4.3 that illustrate these processes.

Step 1: Donor sends SMS to 33555 with message content "donate 10". Its mean donor tend to make RM10 donation.

Step 2: SMS gateway will receive this SMS and identify user phone and credit balance. It then forwards this SMS to the SMS server along with donor phone credit details. SMS server will check either credit balance is enough to deduct RM10. If so SMS server will reply a message to SMS gateway to deduct RM10 from donor mobile phone.

Step 3: SMS server will send back SMS to notify donor if credit deduction has been occurred. So does if donor doesn't have an enough credit balance, SMS server also will send back SMS regarding this fail transaction.

Step 4: SMS server will stored the donation amount into database which it can be view on the website where client and donor could see it.

Step 5: After company issues cheque to donation client, notification will be sent to the client or and respective government institute for acknowledgment.

For the auto credit deduction that occurred monthly, donor need to set and affirm that he/she want to allow system deduct their credit by each month. The process is similar to the above process except donor would not send any SMS each time they want to donate. Every month system will notify donor when the credit deduction has been occurred. For the prepaid phone user who has not enough credit balance, system will send SMS to the donor to ask them about the credit deduction and ask them to top up the prepaid. Donor has an option either to top up or just ignore the message. If they agree to make a donation they might top up the prepaid balance and send back the SMS to system with a

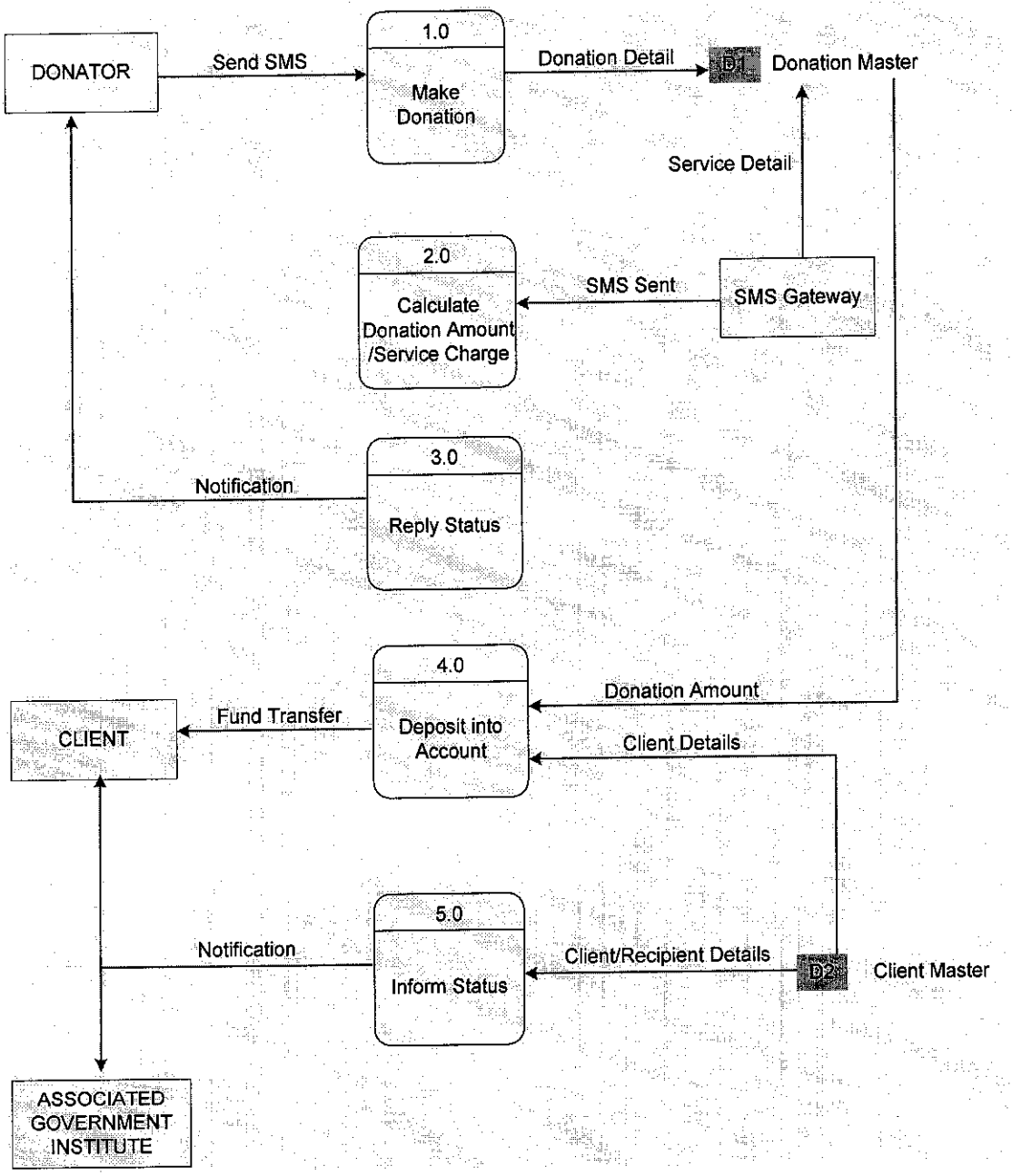


Figure 4.3: Data Flow Diagram level 0

4.2 Main Focus of the Project

Current donation thru SMS system in Malaysia come out with the same concept with my project except on one part that is very difficult to implement. That part is automatically insert donation fund directly to the client bank account as it is the safest way to avoid any middle people. Given that the objective of the project is to avoid any middle people who might mistreat a donation fund which might reduce the efficiency of the system itself if this situation happens. So my focus in this project is trying to implement the auto payment to client account bank. Let see below figure that show how the direct payment to bank account is feasible to implement.

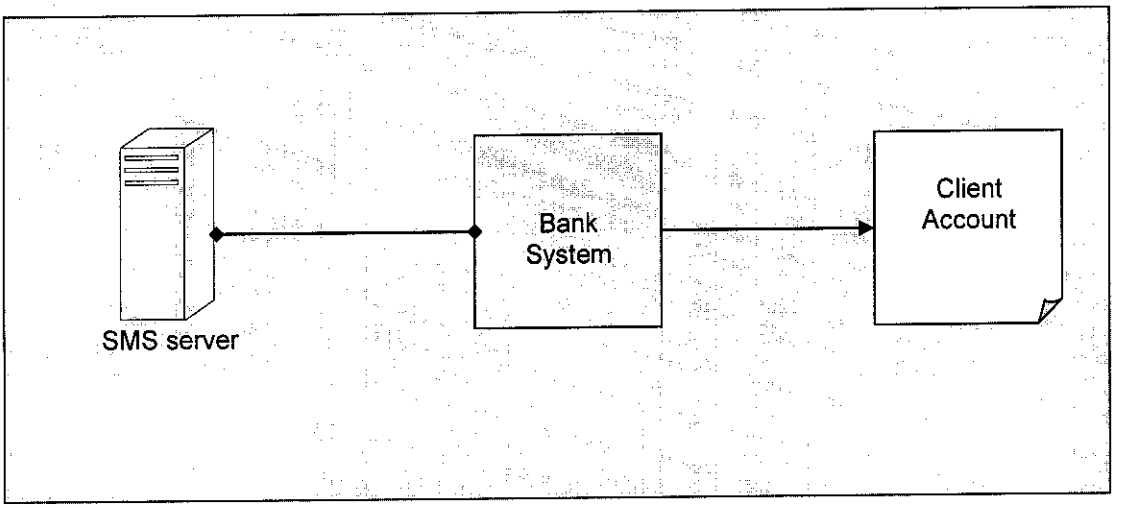


Figure 4.4: Direct payment to client account.

Figure above show how SMS server is linkage with a bank system to enable direct payment to the client account. Let one company named ABC is build to handle Donation thru SMS service. This company has develop SMS server that link with SMS gateway and able to receive donation from mobile phone user. ABC Company required client to cerate an account bank of the same bank. Assume that SMS server receive one SMS "donate 10" that is RM10 will be donated to client or orphanage organization. In real

time SMS server will inform the bank that RM10 will be deduct from ABC back account to the client account. Client will be notified about the donation fund when it reaches at the certain amount.

4.2.1 Difficulty to Implement Direct Payment

Most commercial bank in Malaysia such as Bank Islam, BCB and Maybank didn't come out with the solution to enable business radically expands their method of the payment. Bank will not allow external system interact with their unique network because of the security purpose. This mean no other system can be linkage directly to the bank system to pass and get the value of money amount inside the account. To insert money to account bank, bank client need to provide white paper that list down the client's account number and amount of money to be inserted. Another way is to use online banking where money can be transferred to client's account manually. This is the main problem to the Donation thru SMS system to implement the direct payment to client account.

According one of the management staff of the Bank Islam Malaysia who I met during project analysis phase, bank will only open their system to be linked with the external system only after bank determined the profit of the services to them. Several aspects would be considered especially security measurement need to be at the perfect level to avoid any hacking activity occurred through the connection line. Approval from government finance institute is highly required to avoid any mistreat of the data that can make a lost of money. He added that it is quite impossible to implement such system of direct payment. This is the hard job to be done and hopefully further study will overcome this problem.

4.2.2 Alternative Solution

Due to difficulty to implement direct payment to client through bank account, one alternative has been emerging. Clients or orphanage organizations needs to register with ABC Company to create an account. Clients can view detail donation fund on website as well as manage their account. This is very important to avoid any misjudgment to ABC Company. By monthly ABC Company will issues clients cheque with the amount that equal as stated in a website.

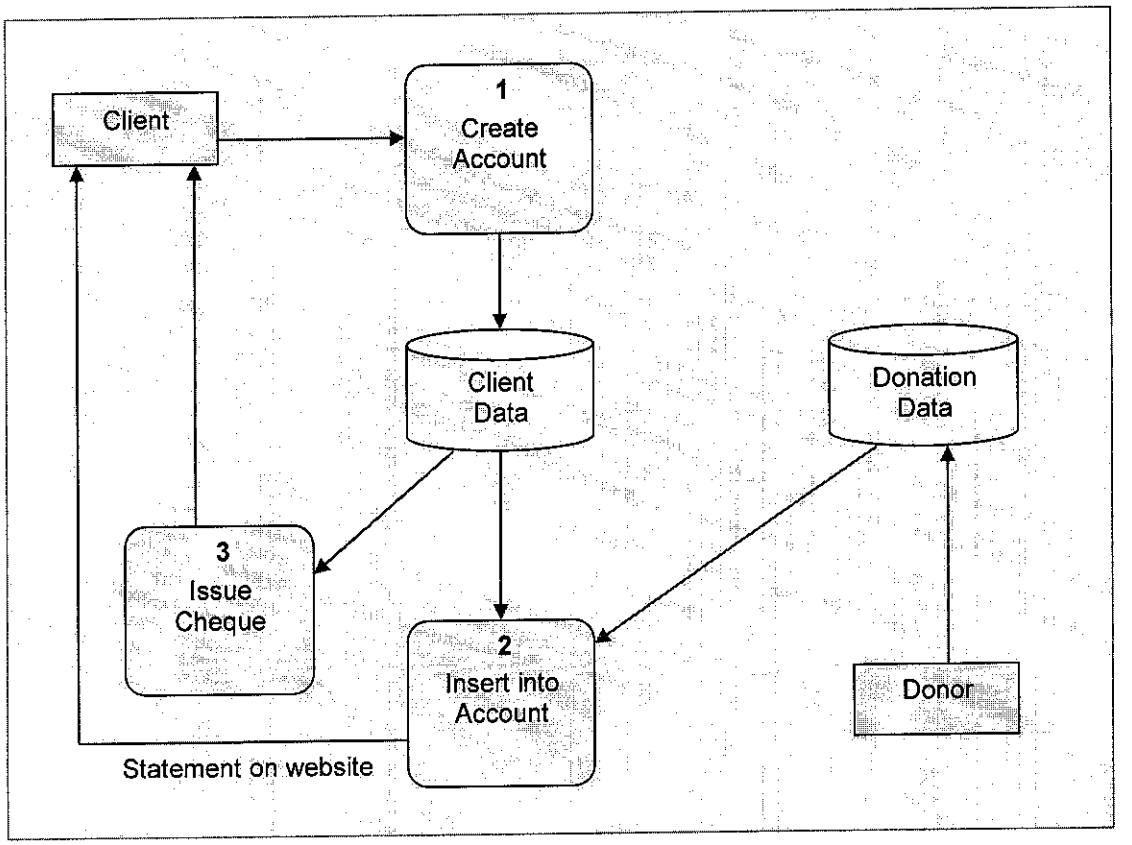


Figure 4.5: Alternative solution on direct payment to client account.

4.3 Limitation of the System

This system is only applicable to donor to make donation RM100 and below at a day. This is because to avoid any misuse of phone by third party such as child. For the amount above RM100 donor are encouraged to register with the monthly auto credit deduction. However this option is available only to post paid user. For prepaid user they only limited to RM10 donation at one time. They need to make donation manually or by getting the system automatically deduct their credit for each month.

4.4 Analysis of the Service Provider

In this system, there is one provider that interact and linkage with the SMS server. SMS gateway manages the credit deduction from donor mobile phone while forward SMS to the SMS server to be processed.

4.4.1 MobileExec SMS Gateway

This project has chosen MobileExec Sdn. Bhd. as mobile network to handle SMS gateway. As mentioned before that the main purpose of SMS gateway is to enable donor credit deduction occurred. MobileExec aims to be the premier mobile messaging service provider for the business and corporate sectors by acting as a mobile applications service provider (MASP) that unifies mobile network operators in Malaysia. The gateway service allows corporate and enterprise servers to connect to their Mobile Internet Platform for send and receive SMS. The gateway support bulk and premium SMS to all major mobile operators in Malaysia i.e. Celcom, DiGi and Maxis. Located at MobileExec mobile messaging center, the gateway provides the necessary software components for applications to connect to their Mobile Internet Platform (MIP) servers through industry standard network protocols like TCP/IP.

The servers manage the business critical message queuing, switching from the applications to the mobile operators' SMS centers in Malaysia. Further information about MobileExec can be reached at www.mobileexec.net/s_products/gateway.htm. As The gateway service cost is significantly lower than an out right purchase of any gateway software. Their Clients only need to pay for the initial setup charge PLUS a monthly network charge that covers technical support and all fixes, patches and future upgrades. We provide a virtual "port" for your servers to connect and submit SMS to our MIP servers. The physical connections can be through:

i. Internet - where a fixed public IP is required

ii. Virtual Private Network (with 3DES Encryption)

iii. Direct leased line to MobileExec servers

MobileExec will also provide the necessary application programming interfaces (API) to help developers integrate the servers with Their MIP gateway. Some customization is required on the enterprises' application server, which is usually done by the IT department. MobileExec systems engineers will work together with the IT department for the integration and end-to-end testing before going "live".

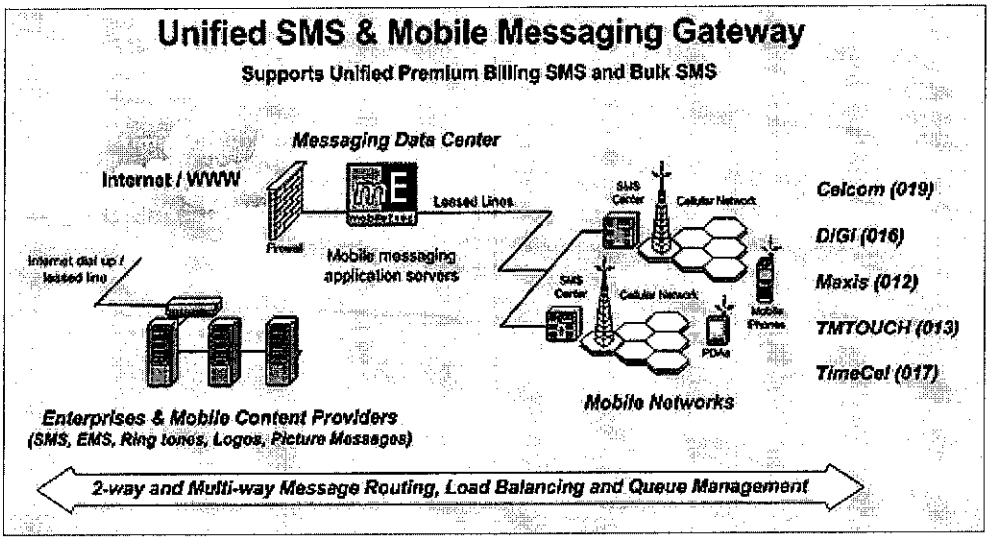


Figure 4.6: MobileExec SMS gateway solution

4.5 Application and Program Develop for the System

Two applications were built to allow donation process done successfully there are SMS Server and website. Both of application used Visual Studio.Net IDE with Visual Basic programming language. These applications access same database that run on MySQL Relational Database Management System (RDBMS).

4.5.1 SMS Server

SMS server is separated into five modules of interface:

i. *Main*

This module consist the main information to be displayed like control to on and off the server as well the statistic of data such as total receiving SMS and total donation.

ii. *Manage SMS*

At this module, admin can view all receiving SMS based on the selective period, month and year.

iii. *Service Account*

This module consist the information of SMS gateway service and donation amount that being paid by SMS Gateway Company.

iv. *Administrator*

This module enable administrator to set the password on application start up.

v. *Report*

Enable administrator to produce a printed report.

4.5.2 Website

The main objective of the existing of the website is to support the business operation of the donation system. This website will provide the information of the donation process as well as who was handle the process and how they handle it. Moreover the website will display the client of donation fund and how much they receive monthly. This website is very important to include to a project because it can make the user fully confidence that their money is not going somewhere but to the respected client. Otherwise they might donate by their hand which its time consuming and money quantity issue, which people normally shy to donate RM 2 by hand. Clients can view detail donation fund on website as well as manage their account. They need to log on by using username and password that given early during account registration.

The website has been separated into four main pages:

i. *Home*

   This main page depicts the information on how to make the donation by SMS. It also displays the link to donation process, and about us. From this page user can easily see their donation history by using search menu on the left side of the page.

ii. *Donation process*

   Display the process of donation where it shows the picture on how the money going to the client account which it make user is trust.

iii. *Donation fund recipient*

   List the orphanage organizations that obtain the benefit from the donation.

iv. *About us*

   Brief information of company that handle a donation process.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Problem Face during Project Implementation

In order to link SMS server and SMS gateway through internet line, SMS server required direct internet connection (not behind proxy) with fixed IP address locate on it. This is very crucial to the project to enable phone credit deducted through SMS gateway. After connection was made, I can submit trial form of SMS gateway that valid for 21 days and get testing on how it functions. However I cannot obtain direct internet connection to my computer because forbidden from Security Department of UTP to allow internal computer link directly to internet. Their reason is hacking activity could be happened thru the line when they let student has the connection. So I come out with a simulation during testing and prototyping that used serial data cable to send and receive SMS. Using data cable will not cause phone credit being deducted during testing and prototyping. However it can show how the donation process occurred and data been transferred from mobile phone to SMS server.

MySQL database is license free and can be install to any computer to being used for any purpose except for the profit making where it need to buy the license. The installation of MySQL is very east despite to its capability to support a large and robust database application. Configuration to the installed MySQL software on my computer is very difficult when software cannot create database instance. I'd try several time to create database instance and not successful until I make some configuration to my computer security and setting. However this problem might not occurred if MySQL database is

installed on dedicated computer. When they are too many other software install on the computer, it can disturb MySQL software functionality.

My first planned on implementation direct payment to client account bank was not successful due to the limitation on the bank itself. I've come out with some research and interview regarding this issue where it is impossible to link external system with internal bank system to allow money transfer between two accounts. Security is the main consideration to bank where they will avoid any risky operation as they can to avoid any hacking activity through connection line from external system that link to their system.

5.2 Recommendations

There are many aspects should be considered in order to make the system run properly as in real system. Thus, project should hold the very carefully by clearly define every requirements before proceed to the construction phase. Otherwise the problem will occurred especially on obtaining direct internet connection to SMS gateway from SMS server during development phase. Some organization limits user connection to internet to avoid any hacking activities from outside of their intranet. UTP itself use proxy to provide their students an internet service using Internet Explorer. However SMS server cannot be linked to SMS gateway by using connection behind proxy. It need direct connection with unique and static IP address. This is one example of the problem that might student face when they try to implement such system like donation thru SMS.

Development tools like Visual Studio.Net and MySQL that used to develop SMS server and website is essential to student to grasp. Student must be able to make a program that can be used to develop their application if they want to achieve project objectives. Otherwise they might face a difficulty to explain their product functionality with the incomplete application. Given that the main objectives of fyp project is to offer them an experience in developing real system, that different than standard group project.

In globalization world nowadays, there is nothing possible to make with the system that linkage to each other. With an objective to make a transaction more easy and competitive, bank system should be opened to external company in order to them to make the transaction straightforward and fast. What its mean is automatically payment only could be done if our system is directly link to the bank system in order to allow specific amount of money being transferred to another account without need any additional task. What the bank needs to do is build a system that allows external data to be accepted within their system with a purpose to allow money transactions between account holders. This could be implemented by applying the best security method and limit user connection to bank system.

Selection of devices and tools should be make carefully especially to whom unable to catch up new things fast. Student should able to provide a prototype of system by using any devices that appropriate to the project. For the application that required data transfer between mobile phone to computer, student should used serial data cable that compatible with the phone model. Otherwise they might use infrared or Bluetooth embedded mobile phone to communicate with computer. Programming such as Java and C++ is very interested to apply to the project because of their stability and fast in compilation. However those programming languages are not the right choice for the beginner of the programming. Instead student should obtain Visual Basic programming language to use for their project because lots of sample program and coding are available for the Visual Basic application. Furthermore, Visual basic is easy to learn and use.

5.3 Conclusion

After several testing and discussion, the main focus of the system that is direct payment to client account has been decided not to include bank system because of the complexity to implement it. This mean client need to register with a company to create an account where they can manage it through website and company will issue client a cheque by monthly. The website was build as a communication medium with the donor and client. Donor can view their donation history as well as information about orphanage organizations and the payment to them. Meanwhile client or orphanage organizations can manage their account by login into the website and can view details report on overall donation fund. Those all provided to them to ensure total satisfaction on donation process and remove their misjudgment to the process and company.

Generally the project is considered successful to deliver an idea of donation process. However the phone credit deduction only can be performing with the linkage of SMS server to the SMS gateway through direct internet line. The benefit of this project is the reliability of the donation process has been depicted where it can satisfy the objectives that stated earlier. Furthermore the proposed system will eliminate the intermediate people who might take opportunity to lift donation fund. Besides, the website as a communication medium will satisfy enough people mostly to who need additional information about the donation process which handling by SMS system. Within the timeframe given to complete this project, hopefully it can be the useful system that at least being a good reference even it cannot afford for the real business demand.

REFERENCES

1. Geoffrey Elliot and Nigel Philips, 2004, *Mobile Commerce and Wireless Computing System*, Pearson Addison Wesley, p. 316.

2. Jeffrey J. Tsay, 2003, *Visual Basic .Net Programming Business Applications with a Design Perspective*, Prentice Hall.

3. Paul Dubois and Stefan Hinz, 2004, *MySQL Certification Study Guide*, MySQL Press

4. NSTP. 26 Jan 2005. <http://www.nst.com.my/Current_News/NST/Thursday/National/NST32223543.txt/Article/indexb_html>

5. CSWL. 26 April 2001. *SMS (Short Message Service) -Technical Overview* < http://www.cswl.com/whiteppr/tech/sms.html>

6. Dr. Subrahmaniam Karuturi. June 2003. <http://www.funsms.net/what_is_sms.htm>

7. CSWL. 26 April 2001. *SMS (Short Message Service) -Technical Overview* < http://www.cswl.com/whiteppr/tech/sms.html>

8. Tom Clements. Feb 2003. < http://developers.sun.com/techtopics/mobility/midp/articles/sms/>

9. Makaleler. 1 Nov 2001. *Ericsson: Ericsson Mobility World.* < http://www1.ericsson.com.tr/e/mobilityworld/articles/essentials/100701-03092001.htm>

APPENDICES

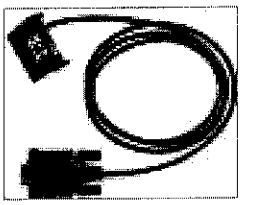


Figure A1: Serial data cable used for simulation that able to send and receive SMS from computer.

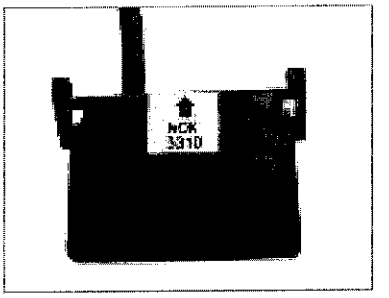


Figure A2: Part of serial data cable that attached to the Nokia 3315 mobile phone.

Figure A3: Nokia 3315 Mobile phone

Modules of the SMS server interface:

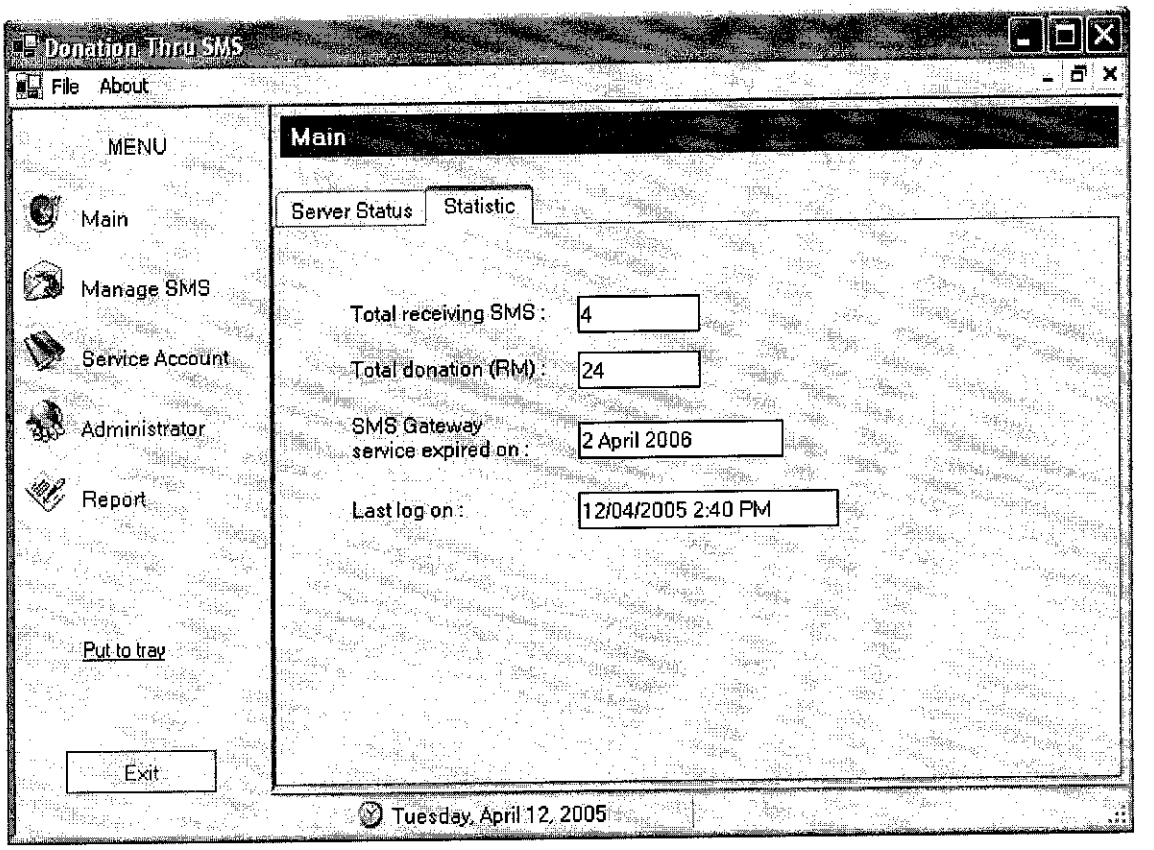


Figure A4: Main menu of SMS server

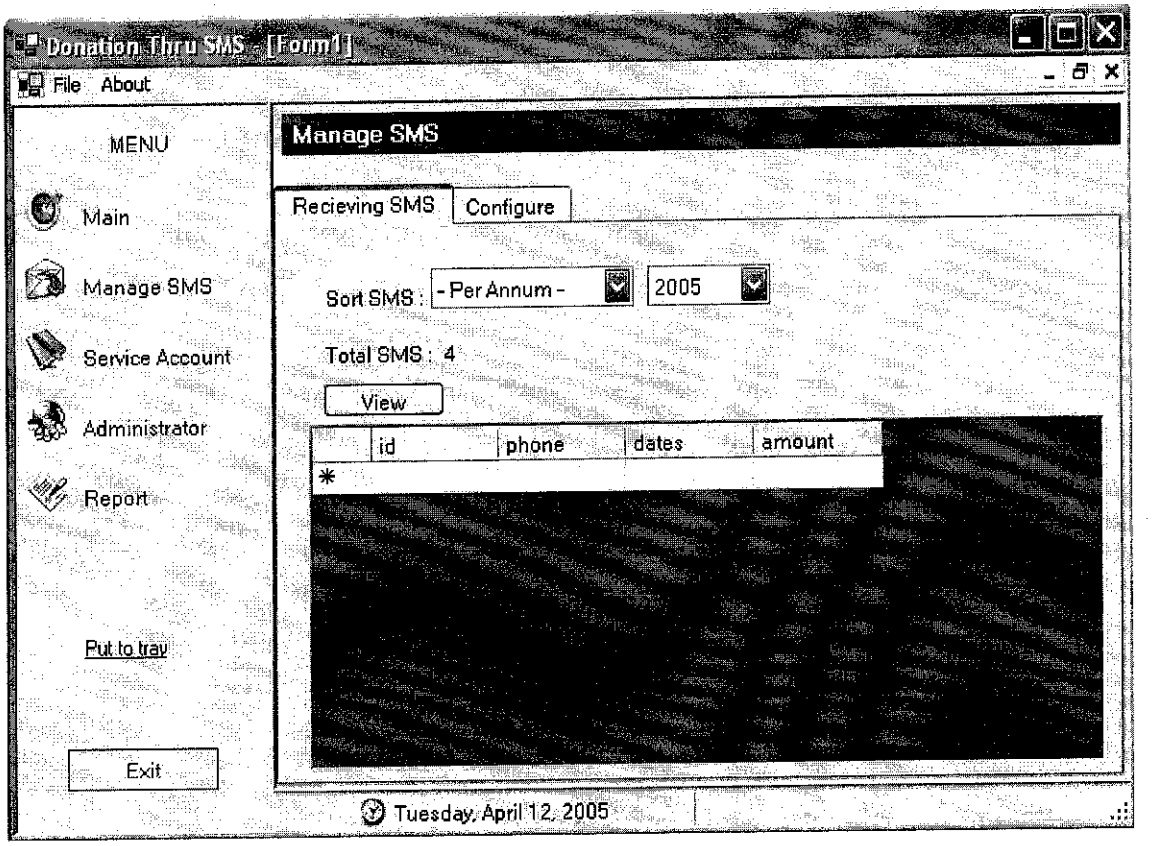


Figure A5: Manage SMS page

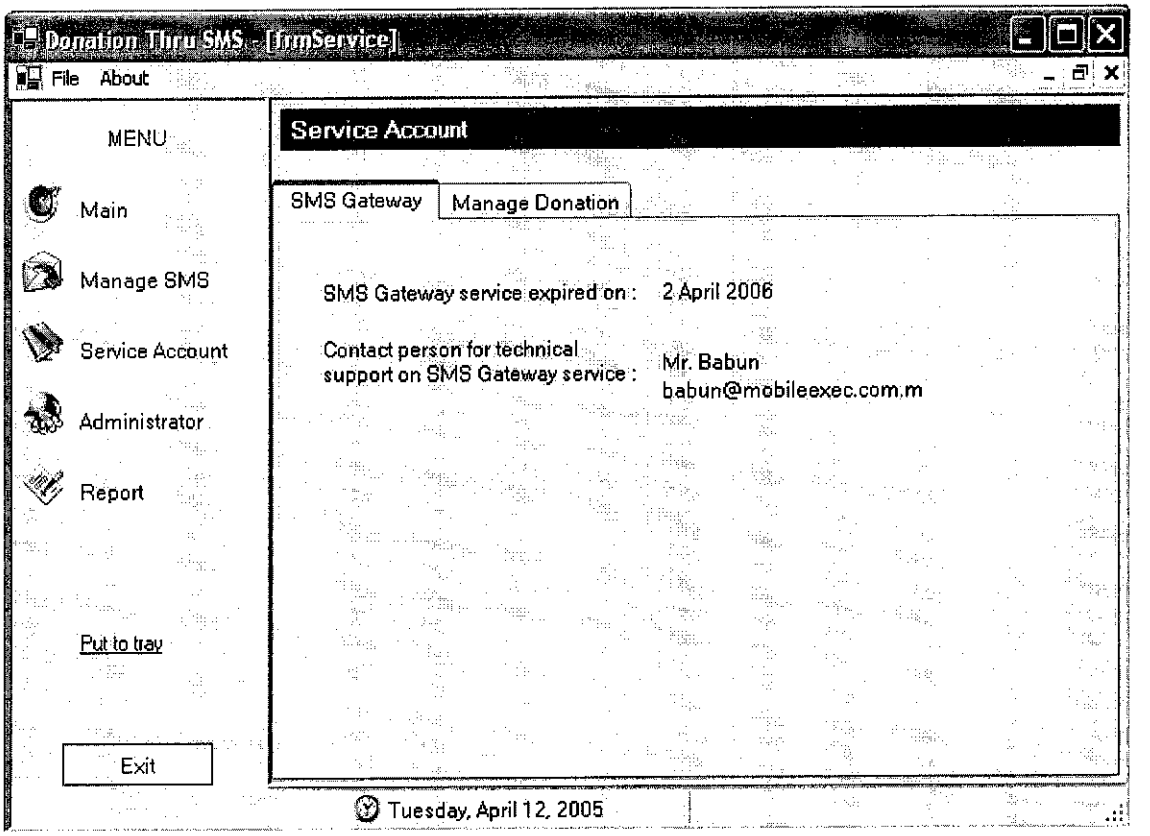


Figure A6: Service account page

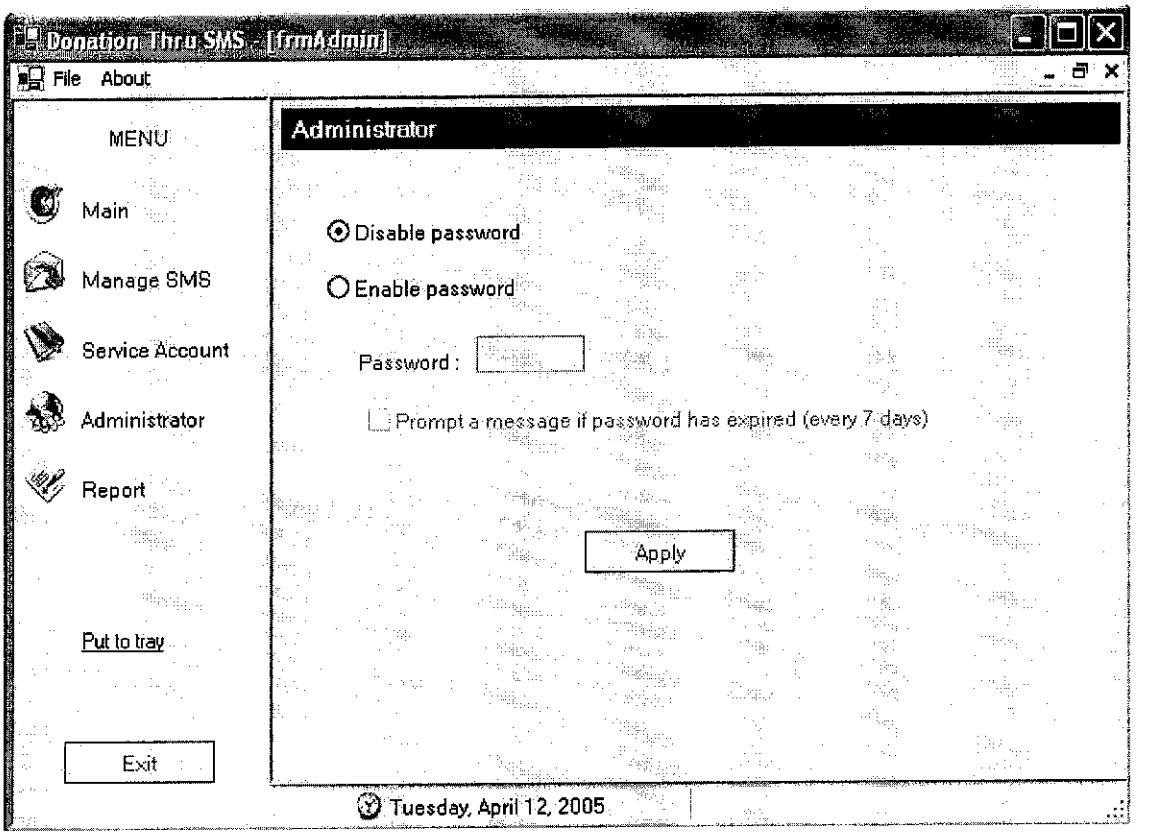


Figure A7: Administrator page

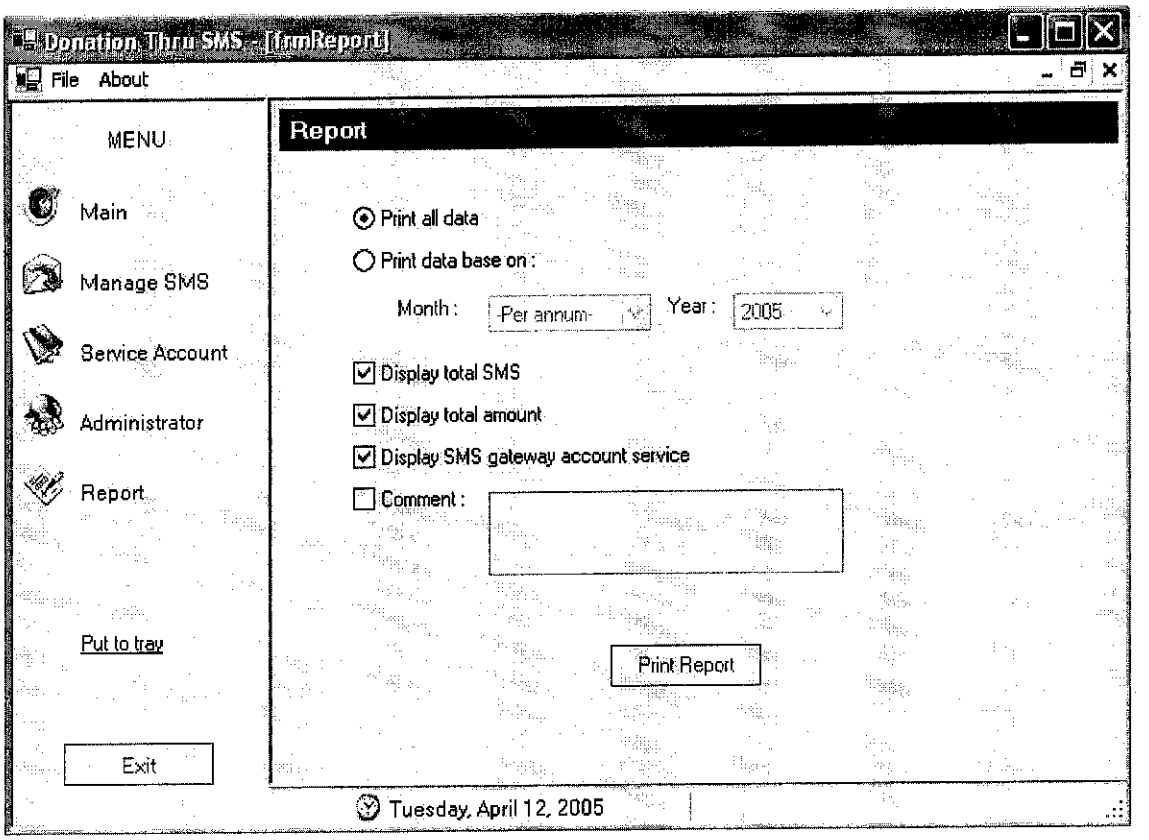


Figure A8: Report page

Website Interface

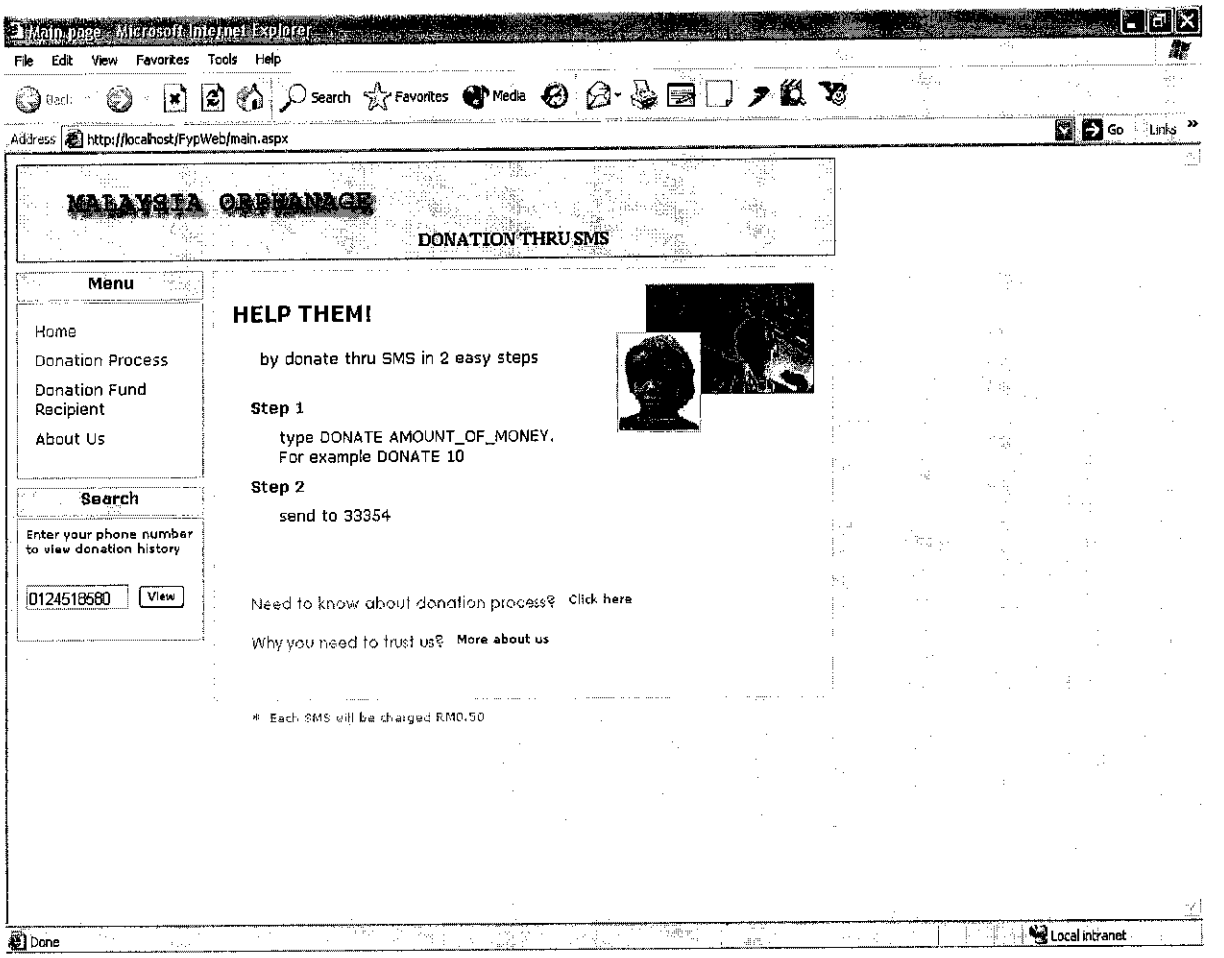


Figure A9: Main menu of the website

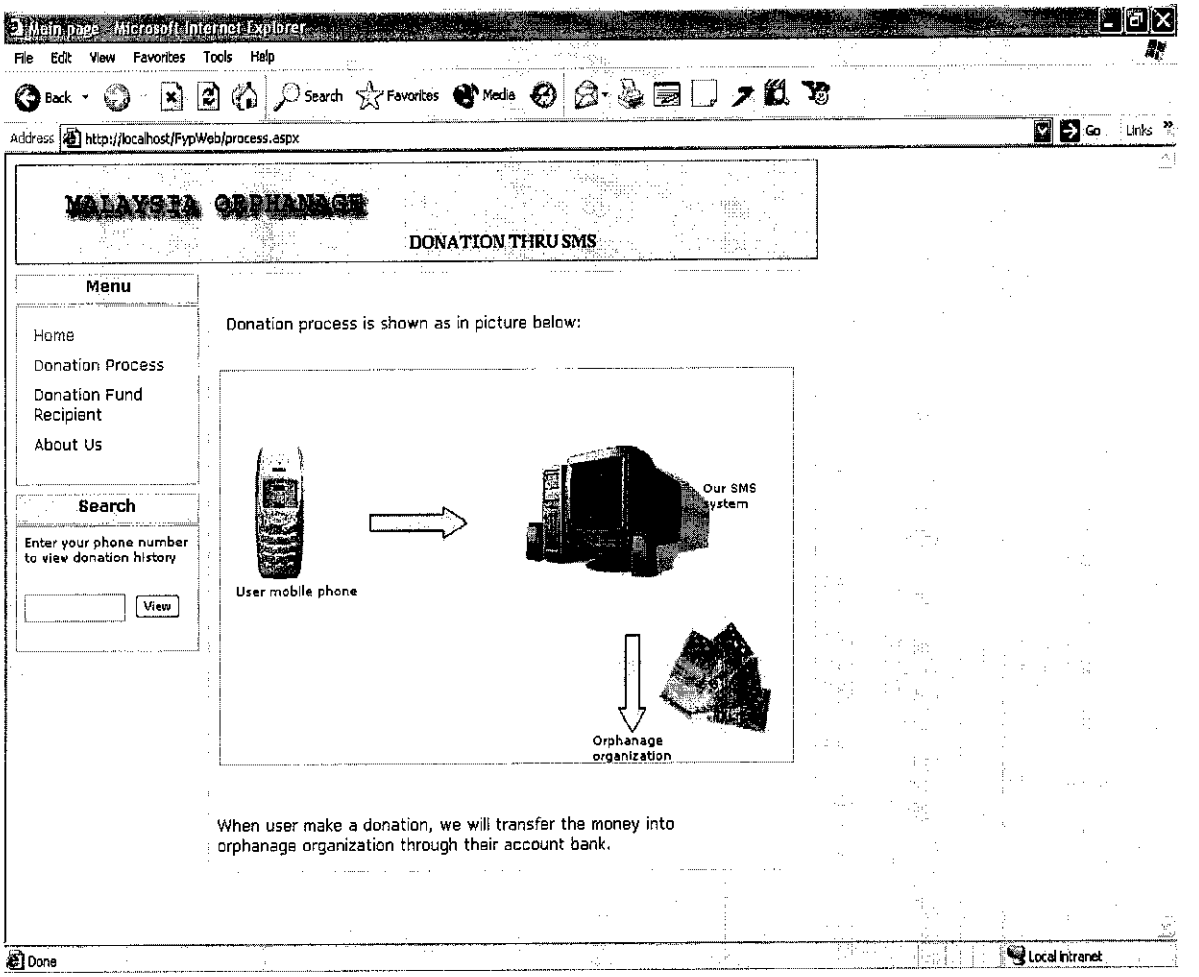


Figure A10: Donation process page

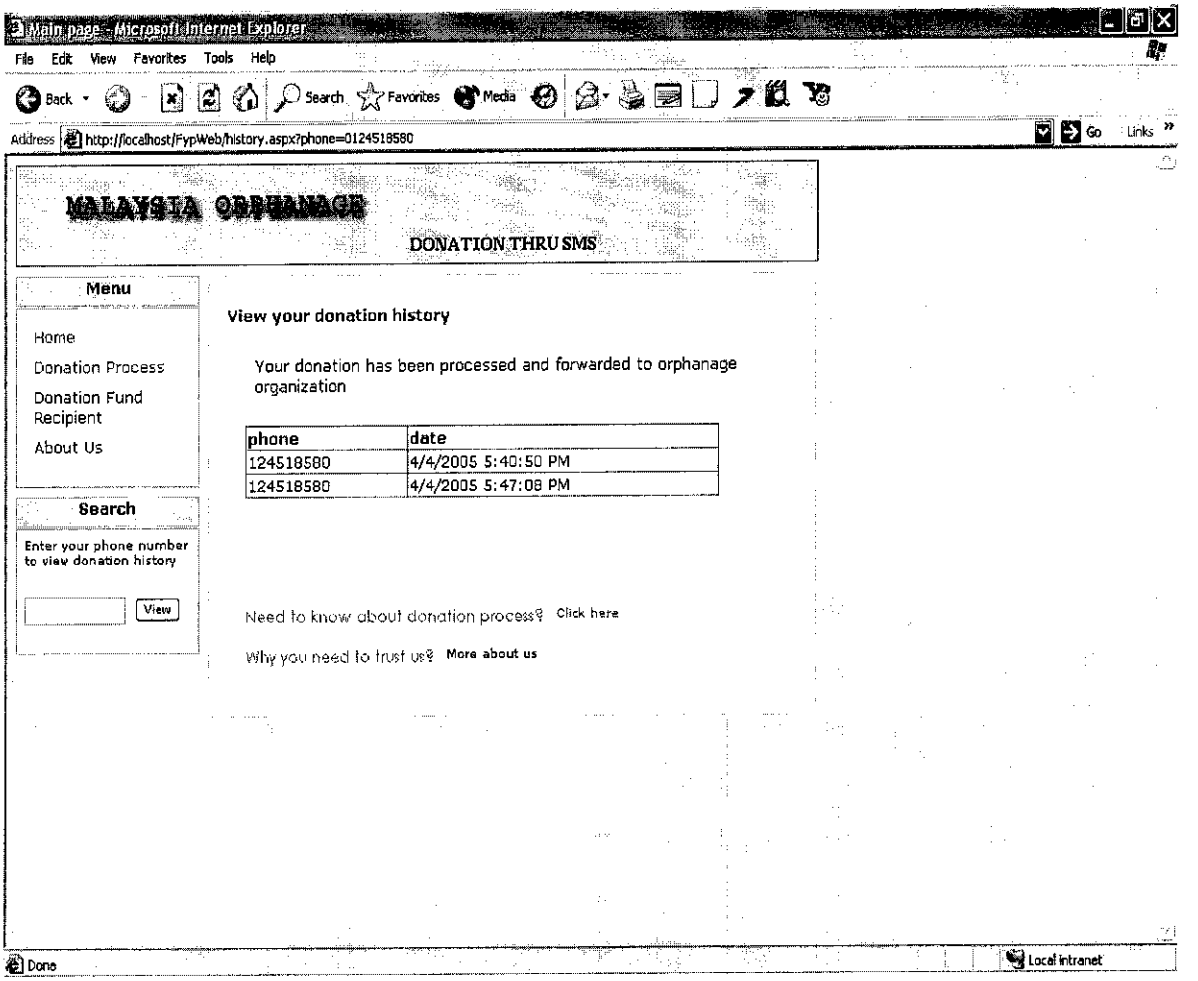


Figure A11: Donation record page

Sample of Evaluation

DONATION THRU SMS
(Evaluation form)

Evaluator name: _____

Matrix ID : _____

Course : _____

Date of evaluation: _____

Introduction

The goal of this evaluation is to find the usability problems in the design so that they can be attended to as part of an iterative design process.

Brief description of the system

The SMS server interface is to manage the receiving of SMS and the amount of money. These data will be stored in database and can be displayed accordingly on the page. This SMS server could be classified as the administrative interface to manage donation thru SMS by using mobile phone.

Severity

1 - Don't agree that this is a usability problem

2 - Cosmetic problem

3 - Minor usability problem

4 - Major usability problem; important to fix

5 - Usability catastrophe; imperative to fix

Good Worse

1 ⟷ 5

Criterion

1. **Visibility of System Status**

   1.1 Does every display begin with a title or header that describes screen contents?

   1 2 3 4 5
   ○ ○ ○ ○ ○

   1.2 Is a single, selected icon clearly visible when surrounded by unselected icons?

   1 2 3 4 5
   ○ ○ ○ ○ ○

2. **Match Between the System and the Real World**

   2.1. Are icons concrete and familiar?

   1 2 3 4 5
   ○ ○ ○ ○ ○

   2.2. Do the selected colors correspond to common expectations about color codes?

   1 2 3 4 5
   ○ ○ ○ ○ ○

3. **User Control and Freedom**

   3.1. In systems that use overlapping windows, is it easy for users to rearrange windows on the screen?

   1 2 3 4 5
   ○ ○ ○ ○ ○

   3.2. Are users prompted to confirm commands that have drastic, destructive consequences?

1 2 3 4 5

○ ○ ○ ○ ○

4. **Consistency and Standards**

4.1. Has a heavy use of all uppercase letters on a screen been avoided?

1 2 3 4 5

○ ○ ○ ○ ○

4.2. Are vertical and horizontal scrolling possible in each window?

1 2 3 4 5

○ ○ ○ ○ ○

5. **Error Prevention**

5.1. Does the system prevent users from making errors whenever possible?

1 2 3 4 5

○ ○ ○ ○ ○

5.2. Does the system warn users if they are about to make a potentially serious error?

1 2 3 4 5

○ ○ ○ ○ ○

6. **Recognition Rather than Recall**

6.1. Does the data display start in the upper-left corner of the screen?

1 2 3 4 5

○ ○ ○ ○ ○

6.2. Have items been grouped into logical zones, and have headings been used to distinguish between zones?

1 2 3 4 5

○ ○ ○ ○ ○

7. **Flexibility and Ease of Use**

7.1. If the system uses a pointing device, do users have the option of either clicking on fields or using a keyboard shortcut?

1	2	3	4	5
○	○	○	○	○

7.2. On menus, do users have the option of either clicking directly on a menu item or using a keyboard shortcut?

1	2	3	4	5
○	○	○	○	○

8. **Aesthetic and Minimalist Design**

8.1. Are all icons in a set visually and conceptually distinct?

1	2	3	4	5
○	○	○	○	○

8.2. Are field labels brief, familiar, and descriptive?

1	2	3	4	5
○	○	○	○	○

9. **Help Users Recognize, Diagnose, and Recover from Errors**

9.1. Are prompts brief and unambiguous?

1	2	3	4	5
○	○	○	○	○

9.2. If an error is detected in a data entry field, does the system place the cursor in that field or highlight the error?

1	2	3	4	5
○	○	○	○	○

10. **Help and Documentation**

10.1 Is the help function visible; for example, a key labeled HELP or a special menu?

1	2	3	4	5
○	○	○	○	○

10.2. Presentation: Is the visual layout well designed?

1	2	3	4	5
○	○	○	○	○

Source Code of Program that Handle Incoming message to SMS server

```
Imports MySql.Data.MySqlClient

Public Class frmMDI
    Inherits System.Windows.Forms.Form
    Private mSmsBox As MFBUS15.FBSmsBox
    Protected mstrConn As String = "server=localhost;" _
                    & "user id=root;" _
                    & "password=abdhal;" _
                    & "database=test"


Private Sub Form1_Load(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles MyBase.Load
        'busFyp.Connect("COM1")
        'Dim frmMain As New frmMain
        'frmMain.Show()
        'frmMain.MdiParent = Me
        stbTime.Text = Format(Now, "Medium Date")
        ntfSystemInfo.Visible = False
        'Timer1.Enabled = True
        Timer1.Interval = 10000
    End Sub

    Private Sub Timer1_Tick(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Timer1.Tick
        Dim strMsg, strSender, strAmount As String
        Dim strSQL, strCommand As String
        Dim InStrSpace As Integer, i As Integer

        busFyp.SMS.Refresh()
        mSmsBox = busFyp.SMS.Inbox
        For i = 1 To mSmsBox.Count
            strMsg = UCase(mSmsBox(i).Text)
            strSender = mSmsBox(i).Sender
            InStrSpace = InStr(strMsg, " ")
            strCommand = Microsoft.VisualBasic.Left(strMsg, InStrSpace - 1)
            If strCommand = "DONATE" Then
                strAmount = Microsoft.VisualBasic.Right(strMsg, Len(strMsg) -
InStrSpace)
                Dim conn As New MySqlConnection
                Dim myCommand As New MySqlCommand
                conn.ConnectionString = mstrConn
                myCommand.Connection = conn
                Dim strDate As String
                strDate = Format(Now(), "dd/MM/yyy h:m tt")
                myCommand.CommandText = "INSERT INTO ins(phone,dates,amount)
VALUES('" & strSender & "', '" & strDate & "','" & strAmount & "')"
                conn.Open()
                myCommand.ExecuteNonQuery()
                conn.Close()
                busFyp.SMS.SendMessage(strSender, "You donation has been
succesfully received. It will be inserted to orphanage organization bank
account expectedly. Thanks you.", MFBUS15.fbSmsClass.fbSmsClassNormal)
                mSmsBox(i).Delete()
            Else
```

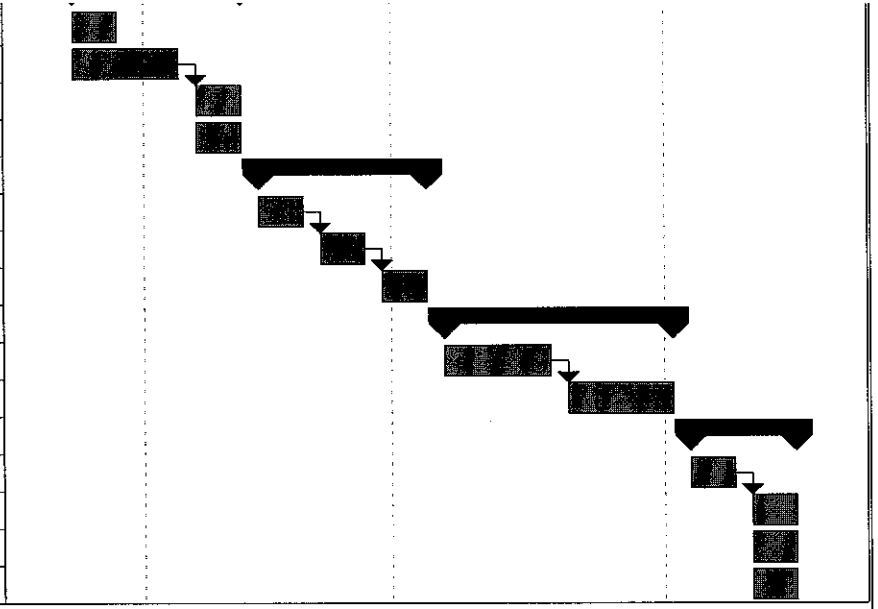
```
                busFyp.SMS.SendMessage(strSender, "Incorrect message text.
Please type donation<sapace>amount of money. E.g. donate 10",
MFBUS15.fbSmsClass.fbSmsClassNormal)
            End If
        Next i
    End Sub


Private Sub closer()
        Dim conn As New MySqlConnection
        Dim myCommand As New MySqlCommand

        conn.ConnectionString = mstrConn
        myCommand.Connection = conn
        Dim strDate As String
        strDate = Format(Now(), "dd/MM/yyy h:m tt")
        myCommand.CommandText = "UPDATE logon SET date = '" & strDate & "'"
        conn.Open()
        myCommand.ExecuteNonQuery()
        conn.Close()

        busFyp.Dispose()
        End
    End Sub
End Class
```

2		Define objective, scope	5 days	Mon 1/24/05	Fri 1/28/05
3		Preliminary report	10 days	Mon 1/24/05	Fri 2/4/05
4		Define functionality	5 days	Mon 2/7/05	Fri 2/11/05
5		Develop project plan	5 days	Mon 2/7/05	Fri 2/11/05
6		**Design**	**15 days**	**Mon 2/14/05**	**Fri 3/4/05**
7		Review outcomes from Requirements P	5 days	Mon 2/14/05	Fri 2/18/05
8		Initial design (prototyping)	5 days	Mon 2/21/05	Fri 2/25/05
9		Design user interface	5 days	Mon 2/28/05	Fri 3/4/05
10		**Construction**	**20 days**	**Mon 3/7/05**	**Fri 4/1/05**
11		Build system	10 days	Mon 3/7/05	Fri 3/18/05
12		tests and adjustments	10 days	Mon 3/21/05	Fri 4/1/05
13		**Cutover**	**10 days**	**Mon 4/4/05**	**Fri 4/15/05**
14		Develop conversion data and system	5 days	Mon 4/4/05	Fri 4/8/05
15		Fully test system	5 days	Mon 4/11/05	Fri 4/15/05
16		Prepare final documentation	5 days	Mon 4/11/05	Fri 4/15/05
17		Plan and implement cutover	5 days	Mon 4/11/05	Fri 4/15/05



Project: gannt-update
Date: Tue 6/7/05

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline