Helping Hand

An efficient Donation Procedure based on Mobile Banking

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***Abstract*—Bangladesh is one of the world's most densely populated countries with 150 million people, 26 percent of whom live below the poverty line. This is also a disaster-prone country of south Asia. Each year many people lose their property due to natural or manmade disasters like flood, landslide, etc. Those indigent people require help to back in the normal flow of life. People who want to help those needy people they have to face many problems due to the lack of proper administration and it has a bad impact on the total donation process. The donation procedure can be effective by introducing an easy and effective donation process. The aim of this paper is to propose a mobile application "Helping Hand" which will be an effective and easiest platform to donate money through mobile banking and this application will also ensure the transparency of donation process. Moreover, people might seek help for himself or other needy persons through this application. The goal is to develop a platform where people can help each other within a few minutes and also the process will be user friendly rather than other conventional donation process. This paper will also focus on the challenges of current system those have to be resolved.**

Keywords— Mobile banking; Android application; Donation procedure; Fraud prevention; Security; Helping Hand

I. INTRODUCTION

Bangladesh is an emerging country. Every year many natural disasters like Sidr, Ayla, Tsunami, Cyclone, Tornedo, Flood etc. took place in this country. At that time innumerable people require help to overcome from those disasters. There are also so many people who are suffering from immeasurable financial problems.

Besides, there are many unwanted incidents took place in Bangladesh, like garments burning, building collapse, road accident etc. There are many kind people, who wants to help those people through donation. "Helping Hand" is such an application which will help them to accomplish their donation.

"Every single time you help somebody stand up, you are helping humanity rise - Dr. Steve Maraboli".

Here, helping a single person means helping his family, society and ultimately the nation.

II. OBSTACLES OF DONATION

In this society there are too many people who are suffering from numerous problems. Only a few of them are getting help from others. Some people may present their problems through electronic and press media, but most of the distressed people cannot express their problems to others. Even some people are not getting sufficient help as they need. The drawbacks of present system are:

1. Bureaucratic complexity of Donation Process
2. Present manual procedures are time consuming
3. Formal Banking procedure is not user friendly.
4. Unavailability of Common platform for donation
5. Lack of Communication between Donor and Needy people.
6. Unavailability of the list of needy people
7. Fraud Detection & prevention procedure is very poor.
8. A large number of needy people could not express their appeal to others
9. There is no common platform for micro donation (E.g. Students).
10. Donors have to depend on the third parties, who decide how and for whom the donation will be utilized.

There are many more drawbacks of present procedure. At present the donor have to face many hassle to donate others.

III. MOBILE PHONE AS PLATFORM

In this age of technology the uses of Mobile phone is growing day by day. Figure 1 shows the growth rate of mobile phone users [1] [2] [3]. There are 106,000,000 mobile phone users (till july2013) in Bangladesh.

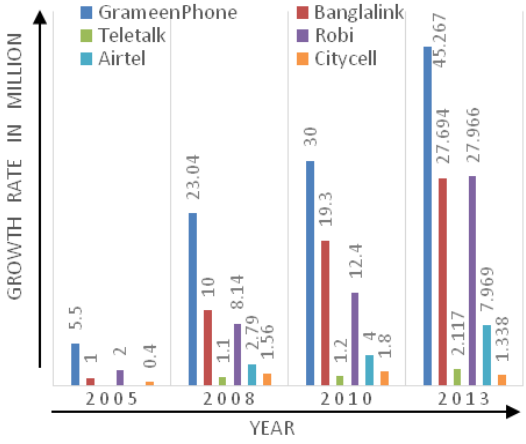

Fig. 1. Growth rate of mobile phone user.

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Mobile phone is owned by a large number of people and this can be a platform for this donation procedure. The proposed solution is designed based on Android, an open source operating system of mobile phone.

A. *Why Android*

The number of smart phone user in Bangladesh is increasing day by day. People are being interested on Android based smartphone, because it is cheap and a lots of applications are available to use on it. This popular Mobile OS is good enough to get closer to a large number of people.

IV. MOBILE APPS FOR DONATION

Most of the present issues can be solved through this Mobile Apps named "Helping Hand". The aim of this application is to provide a platform, where the donation procedure can be completed within a short time by using mobile banking.

A. *Helping Hand VS ordinary procedure*

This Helping hand is able to eradicate most of the problems of existing donation procedure. Table 1 provides a comparison of "Helping Hand" with other ordinary procedure.

TABLE I. HELPING HAND VS ORDINARY PROCEDURE

	Helping Hand	Ordinary Procedure
Time consuming	No	Yes
Anytime from anywhere to any Needy people	Yes	No
Multiple payment option?	Yes	No
Can choose any applicants	Yes	No
Applicant's post condition	Yes	No
User Friendly	Yes	No
List of Needy people's application	Yes	No
Amount of donation is Flexible	Yes	No
Fraud Detection	Yes	No
Can apply for own/other?	Yes	No

B. *Payment Gateway*

Some popular payment methods are Formal banking, Online Banking, Mobile Banking, Mobile balance Transfer. Interaction of those payment methods are essential for an integrated payment gateway. Integration of available payment method will ensure the efficiency of this apps. A large number of people use mobile and that is why mobile banking is gaining popularity day by day.

1. *Mobile Balance to Bank Account*

Anyone who is willing to donate to an applicant will have to simply send a SMS with few information of applicants and amount of money through this application. This money will be deducted from Donor's mobile balance and will transferred to a bank account of HOST [4].

Here the host will manage the further steps of donation. Donor may get feedback from applicant and also from Host.

2. *Mobile Banking*

Mobile Banking is the process of sending money from a bank account to another through mobile phone.There are many Mobile banking service providers like B-Kash, DBBL Money Transfer, U-cash etc. [5]. People are using mobile banking, because it offers easy access , good security, and mobility [6].

V. PROJECT ARCHITECTURE

The efficiency of Helping Hand largely depends on well inter-networked organization of Host.The core of this architecture includes mobile banking as platform, mobile phone operators, list of needy people and the donor [7]. Figure 3 shows the project architecture.

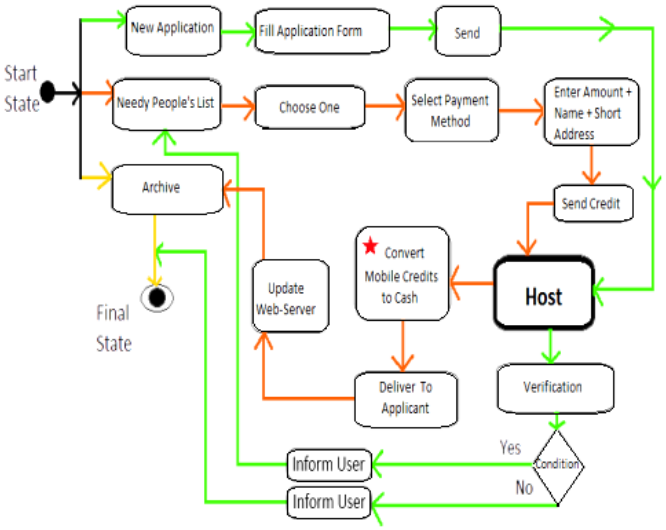

Fig. 2. Data flow diagram

A. *User Interface*

The user interfaces have been simulated based on Open source mobile OS "Android". Some user interface with short description are as follows,

1. At First the applicant (needy people) has to submit his/her application for help through this application. Anyone can submit application for himself or for other.

Fig. 3. Appllication Process

2. Applicants have to provide some information and that information will be checked by the agent of host. Approved applicants will be available on the list.

→Host →Approval → List of Needy People

3. Donor may choose a specific person's or a category from the list and donate by selecting any of the mentioned payment method.

→Donor →Choose a category / Needy People→ Choose a Payment Method→ Donate

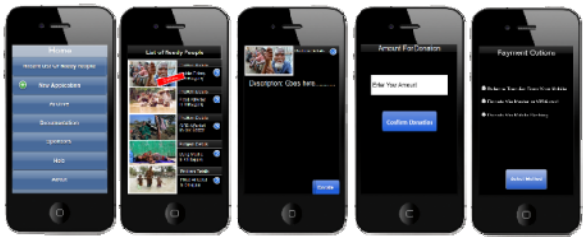

Fig. 4. Donation procedure

4. The Host is responsible to deliver the donated money to the needy people. Host is also responsible to update the applicant's improvement.

5. Donor may also inquiry about their donation

→Helping hand → Archive→ List of donation and donors

Fig. 5. Archive of Helping hand

B. Cash Flow Diagram

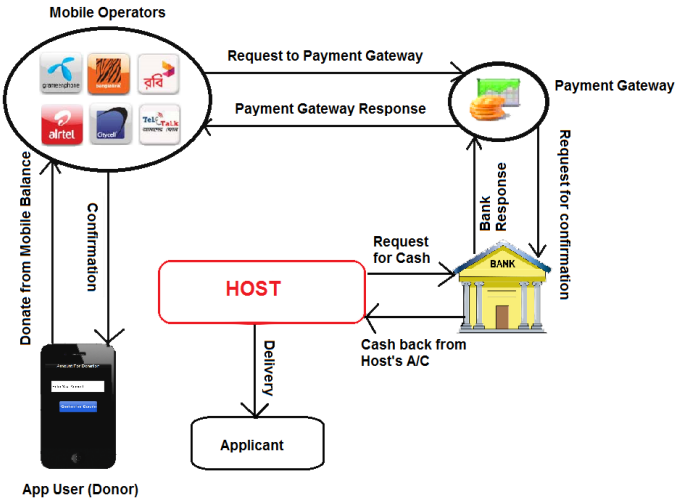

Fig. 6. Cash Flow diagram

VI. Scope of Helping Hand

Helping Hand could change the current donation procedure and will encourage others to donate. This application can be used to solve many social, economical, educational, and environmental issues.

A. Social Development

By using this application people those are poor, blind, cancer patients, disaster affected, shelter-less, landless, poor student, street children's, wounded freedom fighters and so on may get help from other.

It can also help the organizations which works for helpless people. Like "orphanage" where the children need food, shelter, education, medical treatment etc. By helping those people, ultimately developing this nation.

B. Business Values

The Organizations which will provide this service will also be benefited. Such as-

1. Publicity of host, Banks, Mobile operators and others related organizations.
2. Mobile operators and banks will get charge for every transaction.
3. Organizations or donor may get direct interactions with Needy people.
4. Charity organizations can collect a decent figure through this platform to run their activity.

VII. Security and Reliability

The main advantages of Mobile applications are the simplicity and user friendliness. But mobile banking through SMS is not secured enough for banking. That is why the privacy, integrity and security are become the main issues of mobile banking [6] [8].

This project consists of telecommunication network, payment gateway, and host's network.

Telecommunication means the mobile network is the back bone of this project. Most of the security issues are related with this.

Next is the payment gateway. The organization that provides this service must have the security policy for their network.

Finally, the Host's network. Applicant's information, Donor's information, archiving list & donor's list and few more sensitive data of this project are saved on the host's server. So, the host must ensure their network security from unauthorized people, resources, processes and any kind of security attacks.

A. *Security issues of Mobile banking*

Popularity of mobile banking is in threat because of some attacks and lacking on its proper implementation. Some of these are listed below.

1. Forging Originator's Address: This is the Security Problem with SMS. SMS spoofing is the attack that involves a third party sending out SMS messages that appear to be from a legitimate sender. It is possible to alter the originator s address field in the SMS header to another alpha-numerical string. It hides the original sender's address and the sender can send out hoax messages and performs masquerading attacks [9][10].
2. Spyware Flexispy: In an SMS based m-payment system such malware could seriously impact the privacy of the user because a malicious attacker could make minor modifications to such spyware and track all the transactions carried out by a user[11].
3. Spyware PbStealer: It's capable of stealing all the entries in the user's phonebook. This spyware masquerades as a utility program and is capable of compressing the phonebook to save memory space. However, instead of compressing the phonebook, it copies all the entries to a text file and sends this file to any Bluetooth device in range. A malicious attacker could modify this spyware to steal sensitive data from the user's phone[11].
4. Trojan Viver (2007): is capable of sending SMS messages to premium phone numbers without the user's approval and thereby causes financial damages to the user. Such Trojans could have severe impact on the security of m-payments systems like (Fong & Lai, 2005) which use SMS messages to initiate and authorize a transaction[11].
5. Key loggers: These are an extremely notorious species of computer spyware used extensively to capture the keys pressed by a user. The captured data can then be sent to the author of the spyware using a TCP/IP connection. An intelligent hacker would then be able to accurately guess the passwords of the user's e-mail or bank accounts by doing a careful analysis of the captured data[11].
6. SMS encryption: As default data format for SMS is plaintext. Currently end to end encryption is not available. The only encryption involved at base transceiver station and SMS bank server during transmission. The encryption algorithm used is A5 which is proven to be defenseless [9].
7. SMS Spoofing Attack: The most dangerous attack in SMS banking is spoofing attack where attacker can send messages on network by manipulating sender's number. Due to spoofing attack, most of the organizations are not adopting mobile banking through SMS [9][10].
8. Virus Attacks in mobile banking: There are more than fifty thousand different types of computer viruses, internet malicious program and Trojans. Software like Trojan horses can easily take up passwords from the web browser or any cached information of an operating system. Malicious codes are written for remote communication. Zeus Trojan targeted mobile bank users. Zitmo has been used by attackers to defect SMS banking. Zeus is commonly used to steal mobile transaction authentication number or password [9].

B. *Proposed solution to mitigate those attacks*

Actually there is no system which is 100% secured. But we can mitigate the attacks by using some techniques.

1. A few apps (less than 20%) did not have Position Independent Executable (PIE) and Stack Smashing Protection enabled. This could help to mitigate the risk of memory corruption attacks[12].
2. 40% of the audited apps did not validate the authenticity of SSL certificates presented. This makes them susceptible to Man in The Middle (MiTM) attacks[12].
3. 90% [of the apps] contained several non-SSL links throughout the application. This allows an attacker to intercept the traffic and inject arbitrary JavaScript/HTML code in an attempt to create a fake login prompt or similar scam[12].
4. Using secure SMS protocol[10].
5. Improving existing algorithm or using its alternative[10].

Besides there are few more security issues that need to be resolved by the service provider and Host.

C. *Privacy & Informed permission*

Sometimes the donor may request to hide their information. It has to be maintained by the host. But each transaction has to be tracked and it could be accessible authorized persons.

D. *Fraud Prevention, detection and Authentication*

Host is the main fragment of this project. Host must be a reliable, socially well-known (e.g.-Government organizations, any social worker organizations, well reputed organization etc.). Host must have a stable network and manpower. Because, to detect fraudulent applicant, host have to check all provided information.

To prevent fraud, Host *must* check all the application properly in first level. If any applicant fails to fulfill the requirements will be rejected.

After completing 1st level, Host has to check all the information given by the applicant. Applicants have to provide some information including National ID. That information will be checked by an agent of Host. Moreover, the agents of host must visit and verify the genuineness of each initially selected applicant. That is why, the Host must have a strong network throughout the country.

After completing 2nd level, if any applicants pass all of those validation standards, then that applicant will be listed in the needy people's list.

This authentication process will help to detect and prevent fraud [13].

VIII. LIMITATIONS

A. *Virtual Money*

If the money is being transferred from mobile balance to bank account, then the mobile operator is responsible to provide that virtual money [14].

B. *Payment Gateway*

Money transaction is the most important part of this project. The success of this project depends on a strong payment gateway. [14] At present the government of Bangladesh does not support international payment gateway. The integration of existing payment gateway is one of major milestone for the success of this project.

IX. FUTURE WORK

Integration of all payment gateways that will include online banking, Mobile Banking, Manual Banking, International payment gateway and so on.

X. CONCLUSION

The impact of donation on socioeconomic is enormous. With the help of "Helping Hand" the donation procedure will be more popular, easier, faster and effective than ever. In most of the case the security of this application depends on internet and mobile banking. A Strong network of Host is required to ensure the efficiency of fraud detection and prevention. This mobile application with the help of mobile banking will change the concept of formal donation procedure.

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