

ASHESI UNIVERSITY COLLEGE
WEB/MOBILE IT SOLUTIONS FOR MICROFINANCE
INSTITUTIONS

By

PHILIP BOYE-DOKU

Dissertation submitted to the Department of Computer Science,

Ashesi University College

In partial fulfillment of Science degree in Computer Science

APRIL 2013

Declaration Page

I hereby declare that this dissertation is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:.....

Candidate's Name:.....

Date:.....

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by Ashesi University College.

Supervisor's Signature:.....

Supervisor's Name:.....

Date.....

Acknowledgement Page

I will like to show my gratitude to my Supervisor for the patience and constructive feedbacks he gave me to be able to complete this project. I will also like to show my appreciation to my family for their support during the hard and trying moments in school. Lastly I am grateful for the support of my friends in school and for their encouraging words during difficult moments in school. Their priceless inputs made it possible for me to come this far.

Contents

Declaration Page.....	1
Acknowledgement Page.....	2
Abstract.....	5
Chapter 1.....	6
Overview.....	6
Problem.....	7
Objectives.....	8
Potential Benefits.....	9
Motivation.....	10
Overview of reports other chapters.....	10
Chapter 2.....	11
Literature Review.....	11
Review of technologies, methods and their limitations.....	12
System Architecture.....	13
Chapter 3.....	14
Software requirement.....	14
Chapter 4.....	16
Implementation.....	16
Activity Diagram.....	18
How to use Microfin.....	19
Fig A1 HOME PAGE.....	20
Fig A2 CLIENT REGISTRATION PAGE.....	21
Fig A3 DEPOSITS PAGE.....	21
Fig A4 LOANS PAGE.....	22
Fig A5 CLIENT REPORT PAGE.....	23
Fig A6 CLIENT DETAILS REPORT PAGE.....	23
Fig A7 CLIENT SUSU CONTRIBUTION REPORT PAGE.....	24
Fig A8 BAR GRAPH REPORT PAGE.....	25
Fig A9 MICROFIN MOBILE APP.....	25
Chapter 5.....	27
Testing and Result.....	27
Challenges.....	27

Conclusion	28
Appendix	29
Ajax Search	29
Bar Graph	32
Splitting SMS.....	36
Database Design.....	39
Screen Shot.....	39
Bibliography.....	47

Abstract

MicroFin is a web and mobile IT solution for microfinance companies which support the core businesses of these institutions. Over the years microfinance firms have become an essential financial instrument for alleviating poverty in order to promote sustainable economic growth in Ghana. More importantly, there is the need for IT solutions to give the industry players competitive advantage. MicroFin provides user friendly applications for susu collection, record tracking, savings and loans administration. MicroFin uses both mobile and web based applications to support the operations of microfinance companies to help them achieve their company goals and objectives.

Chapter 1

Overview

“The main goal of Ghana’s Growth and Poverty Reduction Strategy (GPRS II) is to ensure “sustainable equitable growth, accelerated poverty reduction and the protection of the vulnerable and excluded within a decentralized, democratic environment”. The intention is to eliminate widespread poverty and growing income inequality, especially among the productive poor who constitute the majority of the working population. According to the 2000 Population and Housing Census, 80% of the working population is found in the private informal sector. This group is characterized by lack of access to credit, which constrains the development and growth of that sector of the economy. The observation was stressed in the International Monetary Fund Country report on Ghana of May 2003 that “weaknesses in the financial sector that restrict financing opportunities for productive private investment are a particular impediment to business expansion in Ghana.” Microfinance perceived as a financially sustainable instrument meant to reach significant number of poor people of which most are not able to access financial services because of the lack of strong retailing financial intermediaries. Access to financial services is imperative for the development of the informal sector and also helps to mop up excess liquidity through savings that can be made available as investment capital for national development (World BankAfrica Region, 1999).

Microfinance as a sector has the potential to reduce poverty by bringing a significant improvement in the lives of the active poor who are largely

women". (Global microfinance trends) . Furthermore, an article on the Global Microfinance Trends stated that Data System (MIS) is one of the outstanding challenges of GCSCA(GHANA CO-OPERATIVE SUSU COLLECTORS' ASSOCIATION).

Also I visited one microfinance institution called AGT located at Nungua in the Greater Accra Region, according to their IT manager he is looking forward to a technology where phones will be used in the field by susu collectors to take client's payments daily. The phone's app will then be connected to a central database where client's information will be stored.

Problem

In Ghana, microfinance institutions have evolved over the years but they still have certain setbacks. One of the observations is the use of booklets to take records of receipts from clients. After they have gone round to take all the receipts, they get back to the office to enter the receipts into the system. This takes time and effort. A system/app that will allow for susu collectors to send instant information to a central database will go a long way to give competitive advantage to the industry players. Industry players who will deploy such a technology will cut down on the time and effort used to transfer data from their books to the computer. Also accountants can work on financials early without having to wait for information from the books of susu collectors that will have to be entered into the database at the close of the day.

Also savings and loans administration forms part of the offerings of microfinance institutions which also needs for technology to support such operations. Savings and loans management systems will allow

microfinance industry players to electronically manage their savings and loans records more efficiently and easily. Technology is needed to improve operations in the areas of savings and loan operations. There numerous benefits that technology will offer to the microfinance institutions such as efficient data tracking, more data control, credible data analysis, easy and fast search and most of all cost effectiveness.

Objectives

The main objectives of Microfin are:

- Enable susu collectors to be able to use their phones to send records of money received from clients to the office in real time to allow for further processing- The app will allow susu collectors to use their phones of whatever capability to record receipts using sms or installed application in real time to the office to allow for further processing. This will save time and allow other people who need the data from susu collectors to be able to work on it on time.
- Ensure security and accountability during monetary transactions- Integrity and transparency is key to any successful financial institution. The ability to ensure integrity and transparency will curb down unacceptable activities. The app will have features to ensure security and accountability. It allows for the tracking of any transaction that takes place.

- Ensure easy and effective savings and loans administration- The app supports savings and loan administration. The app gives administrators the opportunity to electronically manage saving and loans with ease as compared to using manual paper records.

Potential Benefits

- Fast transactions- Since susu collectors will use their phones to record transactions in real time, recording of receipts will be very fast and convenient.
- Fast tracking- Administrators will not have to manually search through books and files for records but use the search feature to get any information they need.
- Transparency- Clients and administrators will know what is going on because of the notification feature deployed during any transaction.
- Improved operations- Fast transaction, record tracking and transparency will improve operations which will generate more revenue for the microfinance institutions.
- Savings and loan management- Savings and loans management is a core business for microfinance institutions hence the need for improved operations. The savings and loan management features will allow administrators to monitor and evaluate savings and loans.

Motivation

The emergence of many MFI's made the author realize the economic opportunity in the microfinance industry with regards to IT solutions. The author's interest in technology and entrepreneurship also boosted his passion to undertake this project. Technology on its own does not do or mean much unless it meets a business need or human need. The application of technology to meet business/human need makes a lot of impact. This is what drives the author to carry on this project.

Overview of reports other chapters

Chapter 2 is about Literature review, Review of technologies, Methods and their limitations and System architecture. Chapter 3 is about Functional, Non-functional and System requirements. Chapter 4 is about Database design, Activity diagram, User manual and has Screen shots of microFin. Chapter 5 is about Testing and Results.

Chapter 2

Literature Review

Mambu-Is the all-in-one online microfinance software. Mambu has features that take care of savings, loans and accounting. Going through its features the author realized it is user friendly and appealing to the eyes. Also it being web based is a good platform to get more customers. It gives clients the chance to access it easily. Also updates can be done without having to install any updates. Mambu has no mobile app for susu collection.

Loan Performer 8- This is a management Information System with SMS banking, Biometric Finger Print Scanning, WAN functionality, Internet Access for account holders, Standing Orders, Multi-Currency, Poverty Assessment etc. Loan performer 8 also takes care of savings, loans and accounting. It lacks an app for susu collection.

Savings Plus- Is a Banking software that handles banking transactions (deposits, withdrawals), loans, and many other records for Microfinance (MFIs), Village Banks, Wholesale Microfinance Institutions (MFIs), Savings and Credit Co-Operatives (SACCOS) of any size. Though Saving plus has introduced sms banking it still does not have a mobile app for susu collection.

Though Microfin has some common features with the application stated above, what stands out is the fact that Microfin has a mobile app for susu collection. This mobile app comes in two forms: sms bases and web based.

Review of technologies, methods and their limitations

Net Beans is a programming tool that makes java mobile programming convenient for programmers. The j2me mobile app will be programmed on this platform.

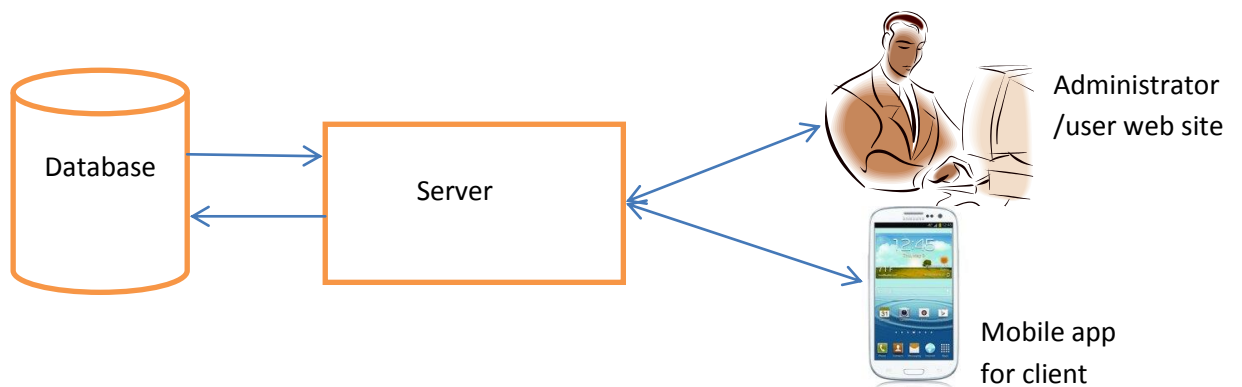
There will be a need for a server and database for the app. XAMPP will serve as the server and MySQL will be the database. PHP scripts will be used to communicate between the database server and the browser /mobile.

Mobile emulators will be used to simulate the mobile app and evaluate its performance as against requirement specifications

Notepad++ is a text editor for web developing design and development. It is one of the best tools to use for web designed.

Frontline is an sms gateway that programmers use to manage sms and use it for whatever purposes they want to. Frontline can be configured for automated sms response or used as a link to other sms gateways like SMSgh.

System Architecture



The system architecture is layered. All information is stored in a database. There is a server which hosts the database to allow the sharing of resources. Between the server and applications are php and java scripts that communicate with the server and applications. Layered architecture because it makes it easy to debug errors since the programmer organizes his methods and knows how each method functions.

Chapter 3

Software requirement

PURPOSE

This Software Requirement Specification describes the function, performance and requirements allocated to the Microfin. Microfin is an interactive web and mobile app that supports the core businesses of a microfinance institution. It has a database that stores all information and an interactive interface to facilitate the systems processes.

DISTINCT FEATURES

This app has a splendid user friendly interface both at on the website and mobile. It is carefully designed that the features behave as the user thinks. The intense security features allows no room for fraud or breach of confidentiality.

FUNCTIONAL REQUIREMENTS

WEBSITE FRONT END: Company Administrator

- An administrator shall be able to create, modify and delete user accounts.
- The user/administrator shall be able to create, modify and edit information about clients.
- The user / administrator shall be able to view information about clients.
- The user / administrator shall be able to view information about susu members.

- The user / administrator shall be able to view/track information about transactions. Thus receipts, loans and deposits.
- The user / administrator shall be able to view reports about receipts, loans and withdrawals.

MOBILE FRONT END: Susu collector

- Client shall be able to record receipts from susu members.
- Clients shall be able to logon which is a security feature.
- Clients shall be able to check balances for susu members.

SYSTEM

- The system is web based for the administrator.
- The system will also be mobile phone based for client use.
- The system has strong security features .e.g CAPTCHA and user authentications.

NON-FUNCTIONAL REQUIREMENTS

- The system cannot be used without a database
- The system cannot be used without internet connection
- Clients need feature or smart phones to use the mobile app
- Google chrome browser is most preferred

Product requirement-PHP and HTML are needed for the implementation of the system.

Chapter 4

Implementation

- Search- Ajax script and php was implemented to do the searching from the database. Despite the challenges faced during implementation, the search was very fast as compared to using a button to call search queries without the ajax script. The ajax script can be found in the appendix section under the heading AJAX SEARCH 29-32.
- Sms splitter- A split function was used to split the string that will come from the sms to be able to store the right data into the database. Various string functions in php to split the string. The php function mostly used was the substr() function. The sms splitter code can be found in the appendix section under the heading SMS SPLITTER from page 36-39.
- Frontline- Frontline is the sms gateway used to receive the sms. Frontline calls a php page which contains the functions that split and write to the database. This is the url in Frontline that is evoked when an sms is received by Frontline. The php contains functions that split up the sms and then writes the data accordingly to the database.

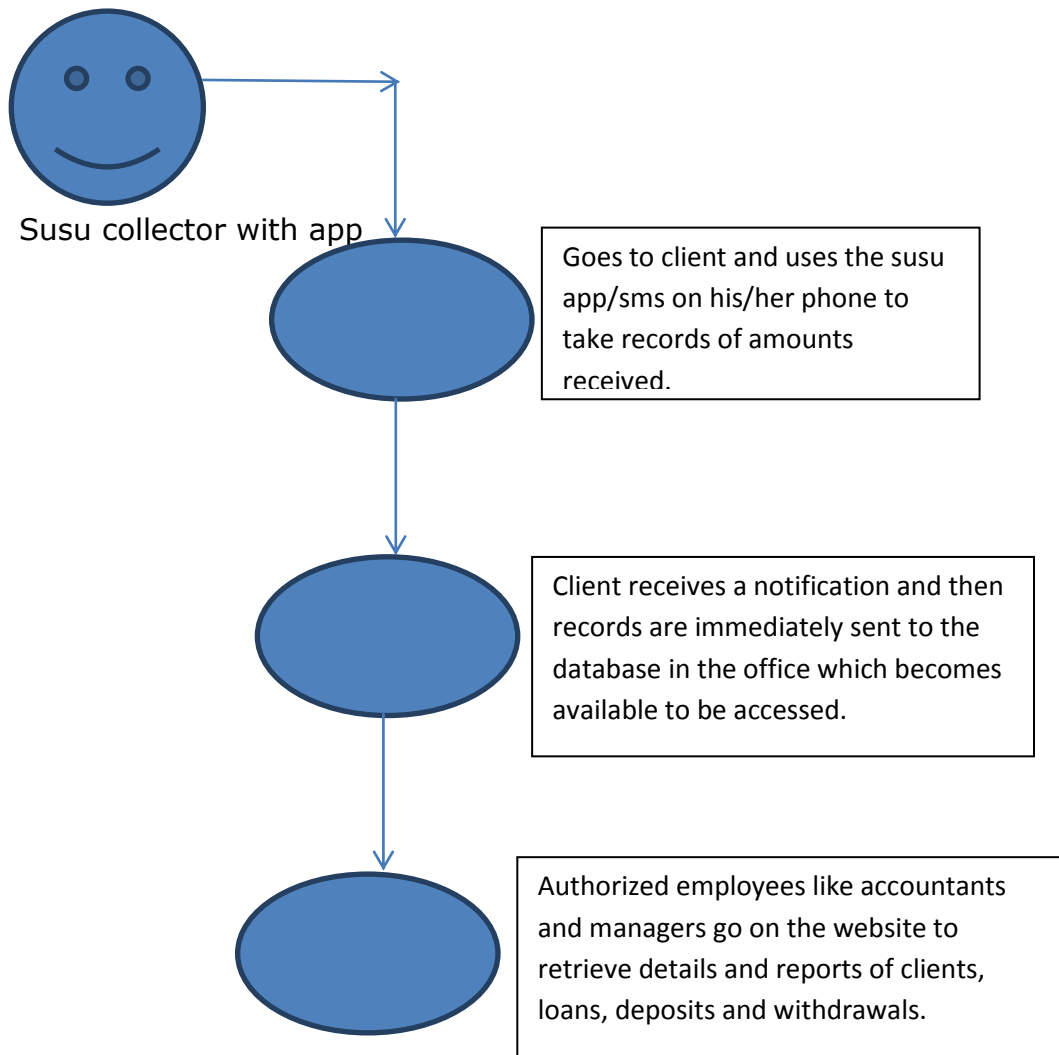
[http://localhost/microFinanceSms.php?sender=\\${sender_number}&content=\\${message_content}](http://localhost/microFinanceSms.php?sender=${sender_number}&content=${message_content})

- SMSgh API- SMSgh is another sms gateway used to send notifications to the clients whenever the system retrieves their susu contributions. This is the API from SMSgh that was used to send notifications to the clients about a transaction that has occurred.

```
$url="http://www.mytxtbox.com/smsgapi.ashx/sendmsg?api_id=123456&user={$user}&password={$password}&to={$to1}&text={$text}&from=namanquah";
```

- Bar graph- Php was used to create a dynamic bar graph in the report section of the website. This bar graph gives a graphical representation of the various revenue and cost streams. The bar graph code can be found in the appendix section under the heading 32-36.

Activity Diagram



How to use Microfin

Installation of Mobile App

User needs a phone that is compatible with java applications. The phone should be able to support java applications. Also the phone should be able to connect to the internet. After meeting all these requirements simply copy the app to the phones local storage. Locate the place where you stored it on the phone and click. Follow the various instructions and install.

Steps to using the Mobile J2me App

- Launch the app and wait for the splash screen to transition to the main form.
- Fill out the required details and press the submit button
- Wait for notification

Steps to using the Mobile sms app

- Open sms environment
- Simply type the id of the client followed by ":" and the amount e.g 1234:40 where 1234 is the client's ID, followed by ":" and 40 is the amount.
- Enter the phone number of the simcard in the Frontline modem
- Press the send button

Fetching Reports from the website

- Go to the report tab and click the group you want to fetch the reports from e.g clients
- Start typing the first name until the system finds what you are looking for
- Click and choose which type of report you want to view
- There is the option to view reports in the four financial quarters.

Fig A1 HOME PAGE



This is the Home Page of Microfin website. This the entry point to the various features that Microfin provides on the web. This serves as a simple navigation page to get the user started.

Fig A2 CLIENT REGISTRATION PAGE

The screenshot shows a web application interface with a dark navigation bar at the top containing the following menu items: HOME, CLIENT, EMPLOYEE, BRANCH, DEPOSIT, WITHDRAWALS, LOANS, and REPORTS. Below the navigation bar is a form titled 'Client Details' enclosed in a light purple border. The form contains the following fields and controls:

- First name:
- Last name:
- Client ID:
- Branch ID:
- Occupation:
- Tel:
- Date Of Birth: with a date picker icon
- Address:
- Email:
- Select photo: No file chosen
- Subscription Status: with a dropdown arrow

This is the form which is used to take the details of new clients. It is a simple and user friendly page for administrators to take details of new clients.

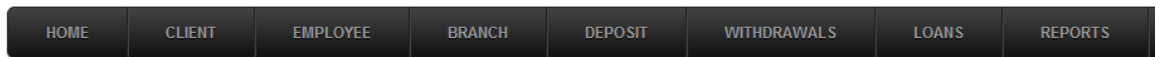
Fig A3 DEPOSITS PAGE

The screenshot shows a web application interface with a dark navigation bar at the top containing the following menu items: HOME, CLIENT, EMPLOYEE, BRANCH, DEPOSIT, WITHDRAWALS, LOANS, and REPORTS. Below the navigation bar is a form titled 'Deposit Details' enclosed in a light purple border. The form contains the following fields and controls:

- Client Live Search: with a search icon
- Search results:
 - [mana112 odoi11](#)
 - [dave boye](#)
 - [dave boye](#)
 - [karen112 davies11](#)
- Collector ID:
- Client ID:
- Amount:
-

This is the form used to take records of susu from susu members if the need arises. Microfin also offers administrators the option to use the website to record susu.

Fig A4 LOANS PAGE



Loan Acquisition Details

Client Name Search:

- manal12 odoi11
- dave boye
- dave boye
- karen112 davies11

Administratator ID:

Client ID:

Principal:

Interest:

Amount Due:

Duration:

Due Date:

This is the loan acquisition form for clients who are applying for loans. Just by typing letters the system uses the ajax search function to immediately pull out all client names that much the search criteria from the database. When the apply button is clicked it checks if all required fields have been filled out. When all conditions have been satisfied it checks again to see if the client has cleared all outstanding loans before it even submits the data from the form. It notifies the administrator/user if the client has outstanding loan payments.

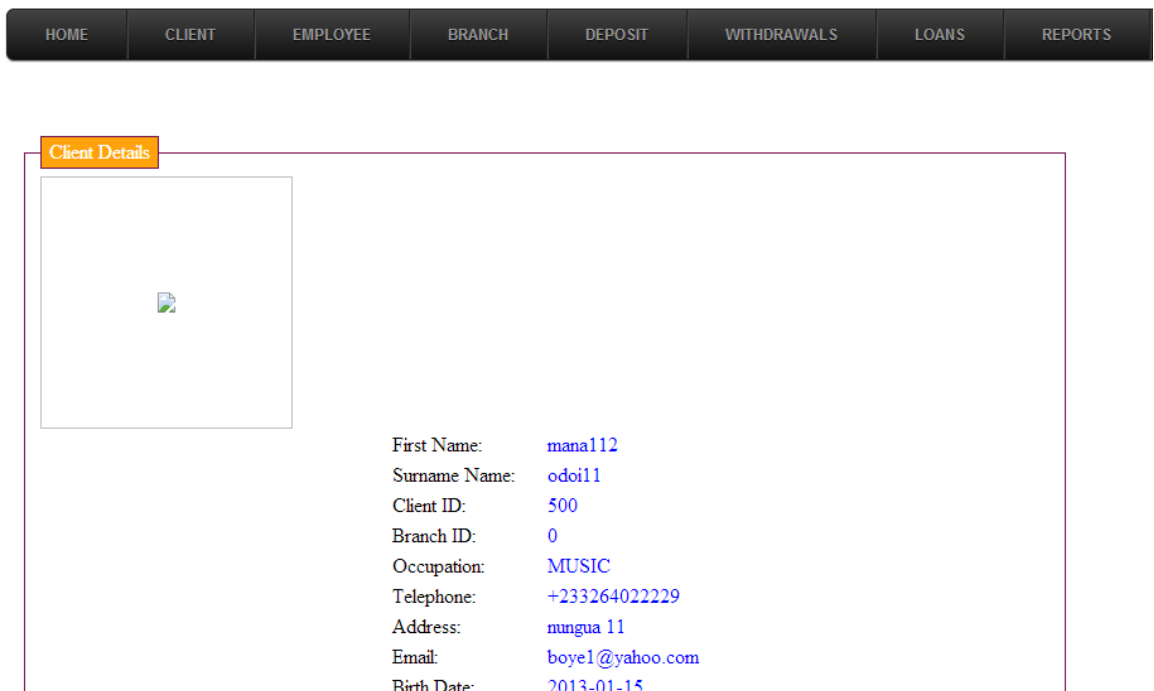
Fig A5 CLIENT REPORT PAGE

CLIENT REPORT



This is page that allows the administrator/user to view various reports of clients. Reports concerning client's personal details, susu contributions, loan acquisitions and payments and withdrawals can be viewed from the links located near the client's name. Just by typing the first letters of the client's first name, the system will pull out the names that match the search criteria and then the user can click on the link of interest.

Fig A6 CLIENT DETAILS REPORT PAGE



This is a transition page from the client report page. When the details link is clicked the system pulls out the personal details of the client and displays it.

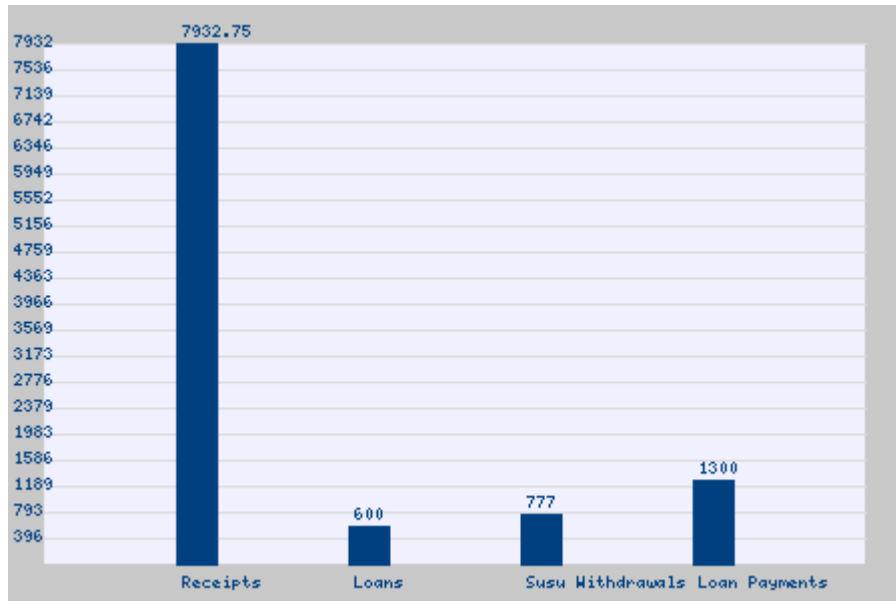
Fig A7 CLIENT SUSU CONTRIBUTION REPORT PAGE
Client Details

The screenshot shows a web application interface. At the top is a dark navigation bar with buttons for HOME, CLIENT, EMPLOYEE, BRANCH, DEPOSIT, WITHDRAWALS, LOANS, and REPORTS. Below this is a section titled "Client Details" with a search form. The form includes a "Year" field with "2013", a "Quarter" dropdown menu with "1st Quarter", and a "500" field, followed by a "search" button. Below the form is a table with the following data:

CLIENT ID	SUSU COLLECTOR ID	RECEIPT ID	AMOUNT (cedis)
500	500	52	333
500	500	51	444
		TOTAL	777

This page allows the administrator/user to view the quarterly contributions with respect to year of choice the detailed and total susu contributions of a client. This allows stakeholders to view the records of a client's susu contributions in an organized and professional way.

Fig A8 BAR GRAPH REPORT PAGE



This page shows a graphical representation of the various cost and revenue streams. It shows quantitative levels of inflows and outflows of money with respect to the current year.

Fig A9 MICROFIN MOBILE APP



This is the mobile app that susu collectors will use on the field to record susu received from susu members. When the app is launched a form appears after the splash screen fades off. This form is just like the deposit form on the website. The susu collector will fill out the details and clicked the submit button. A notification is sent both to the susu collector and member about the transaction that has taken place.

Chapter 5

Testing and Result

Test	Results
Form validation	Successful
Ajax search	Successful
Writing to the database	Successful
Fetching from database	Successful
Sms	Successful
Frontline Deployment	Successful
Bar Graph	Successful
Report Generation	Successful
Log in	Failed

Challenges

- The implementation of ajax search was quite difficult. The passing of parameters from php to java scripts was very challenging. I had to experiment many ideas for days to get it to work.
- The implementation of a graph was also another challenge. I had to search deeply to find a tutorial on how to draw a graph manually with php.
- Splitting a sms into various parts to send to the database was another struggle. I had to apply various php string functions to be able to retrieve right data needed from the sms before storing it in the database.

Conclusion

MFI's have come to stay to support the poor in Ghana by giving them access to capital and also engaging them in attractive savings schemes. Microfin will provide the IT solutions needed to improve the operations of MFI's in areas such as susu collection, loans and savings. When the operations of the core businesses of MFI's are improved, they will serve the people of Ghana better.

In future Microfin will implement the QR code and scanner in android to improve security and work output. This will ensure the susu collectors go to the clients because the QR codes which contain the client's personal details will be handed over to the clients and can only be scanned at their premise. Also, Google maps will be implemented to track destination points of susu collectors. With this feature, the manager/supervisor can know where the susu collector went.

Microfin has intelligent systems that will make help improve the operations of MFI's.

Appendix

Ajax Search

```
function liveSearch()
{
//alert("key");
var http = createRequestObject();
var url = "clientLive.php?s=";
var s = document.getElementById('s').value;
var params = "&s="+s;
http.open("GET", url+s, true);

http.setRequestHeader("Content-type", "application/x-www-form-
urlencoded");

http.setRequestHeader("Content-length", params.length);
http.setRequestHeader("Connection", "close");
http.send(params);
http.onreadystatechange = function() {
if(http.readyState == 4 && http.status != 200) {
document.getElementById('searchResults').innerHTML='<li>Loading...</li
>';
}
if(http.readyState == 4 && http.status == 200) {
document.getElementById('searchResults').innerHTML =
http.responseText;
}
}
}
```

```

}

function
showDetails(fname,sname,client_id,occu,tel,add,email,status,branch,date)
{

document.getElementById('bday').value=date;

document.getElementById('fname').value = fname;
document.getElementById('sname').value = sname;
document.getElementById('id').value = client_id;
document.getElementById('branch').value = branch;
document.getElementById('occupation').value = occu;
document.getElementById('tel').value = tel;
document.getElementById('address').value =add;
document.getElementById('email').value =email;
var s=document.getElementById('status').selectedIndex;

if(status=="Available")
{

//alert(s+"avial");
document.getElementById('status').options[0].selected = true;
}
else
{
// alert(s+"non avial");
document.getElementById('status').options[1].selected = true;
}
}

```

```

}
}
function dateTransform(date) {
    var s = (new Date(date)).toString().split(' ');
    return [s[2],s[1],s[3]].join('-');
}
function sendToSearch(str){
document.getElementById('s').value = str;
document.getElementById('searchResults').innerHTML = "";
}
</script>

```

PHP

```

<?php
require_once('connection.php');
if(isset($_REQUEST["s"]))
$s = $_REQUEST["s"];
$output = "";
$s = str_replace(" ", "%", $s);
$query = "SELECT * FROM clients WHERE fname LIKE '%" . $s . "%'";
$query = mysql_query($query);
if((mysql_num_rows($query) != 0) && ($s != "")){
while($sLookup = mysql_fetch_array($query)){
    $displayName = $sLookup["fname"]." ".$sLookup["sname"];
    $fname=$sLookup["fname"];
    $sname=$sLookup["sname"];
    $client_id=$sLookup["client_id"];
    $occu=$sLookup["occupation"];

```



```

$tel=$sLookup["tel"];
$add=$sLookup["address"];
$email=$sLookup["email"];
$sub=$sLookup["subscription_status"];
$branch=$sLookup["branch_id"];
$bday=$sLookup["birthdate"];

$output .= "<li
onclick='showDetails(\"$fname\", \"$sname\", \"$client_id\", \"$occu\", \"$t
el\", \"$add\", \"$email\", \"$sub\", \"$branch\", \"$bday\")'
style='cursor:pointer'><font color='blue'>". $displayName .
"</font></li>";

}

}

echo $output;

?>

```

Bar Graph

```
<?php
```

```

require_once('connection.php');

$query = "SELECT sum(amount) as totals FROM receipts ";
$query = mysql_query($query);
$receipts= mysql_fetch_array($query);

$query2 = "SELECT sum(principal) as totals FROM loans ";
$query2 = mysql_query($query2);
$loans= mysql_fetch_array($query2);

$query3 = "SELECT sum(amount) as totals FROM withdrawals";
$query3 = mysql_query($query3);
$with= mysql_fetch_array($query3);

$query4 = "SELECT sum(amount) as totals FROM loan_payments ";
$query4 = mysql_query($query4);
$payment= mysql_fetch_array($query4);

# ----- The graph values in the form of associative array
$values=array(
    "Receipts" =>$receipts['totals'],
    "Loans" => $loans['totals'],
    "Susu Withdrawals" => $with['totals'],
    "Loan Payments" => $payment['totals'],
    /*
    "May" => 310,
    "Jun" => 110,
    "Jul" => 190,
    "Aug" => 175,

```

```

        "Sep" => 390,
        "Oct" => 286,
        "Nov" => 150,
        "Dec" => 196
    */
);

$img_width=450;
$img_height=300;
$margins=20;

# ---- Find the size of graph by subtracting the size of borders
$graph_width=$img_width - $margins * 2;
$graph_height=$img_height - $margins * 2;
$img=imagecreate($img_width,$img_height);

$bar_width=20;
$totalBars=count($values);
$gap= ($graph_width- $totalBars * $bar_width ) / ($totalBars
+1);

# ----- Define Colors -----
$bar_color=imagecolorallocate($img,0,64,128);
$background_color=imagecolorallocate($img,240,240,255);
$border_color=imagecolorallocate($img,200,200,200);

```

```

$line_color=imagecolorallocate($img,220,220,220);

# ----- Create the border around the graph -----

imagefilledrectangle($img,1,1,$img_width-2,$img_height-
2,$border_color);

imagefilledrectangle($img,$margins,$margins,$img_width-1-
$margins,$img_height-1-$margins,$background_color);

# ----- Max value is required to adjust the scale -----

$max_value=max($values);

$ratio= $graph_height/$max_value;

# ----- Create scale and draw horizontal lines -----

$horizontal_lines=20;

$horizontal_gap=$graph_height/$horizontal_lines;

for($i=1;$i<=$horizontal_lines;$i++){
    $y=$img_height - $margins - $horizontal_gap * $i ;
    imageline($img,$margins,$y,$img_width-
$margins,$y,$line_color);
    $v=intval($horizontal_gap * $i /$ratio);
    imagestring($img,0,5,$y-5,$v,$bar_color);
}

```

```

# ----- Draw the bars here -----
for($i=0;$i< $total_bars; $i++){
    # ----- Extract key and value pair from the current pointer
position
    list($key,$value)=each($values);
    $x1= $margins + $gap + $i * ($gap+$bar_width) ;
    $x2= $x1 + $bar_width;
    $y1=$margins +$graph_height- intval($value * $ratio) ;
    $y2=$img_height-$margins;
    imagestring($img,0,$x1+3,$y1-10,$value,$bar_color);
    imagestring($img,0,$x1+3,$img_height-
15,$key,$bar_color);
    imagefilledrectangle($img,$x1,$y1,$x2,$y2,$bar_color);
}
header("Content-type:image/png");
imagepng($img);

?>

```

Splitting SMS

```
<?php
```

```

include("microFinanceClass.php");

$b = new microfinance_class("localhost","root");

$results;

$empId;

$amount;

$clientId;

$clientNo;

$empNo;

//get emp ID

$empNo=$_REQUEST['sender'];

$b->getEmpTel($empNo);

$results=$b->getRecord();

$empId= $results['empID']."</br>";

//echo $empId;


$s=$_REQUEST['content'];

$splitter= strpos($s,":");

$clientId=substr($s,0,$splitter);

$amount=substr($s,($splitter+1),strlen($s));

//echo "splitter".$splitter."</br>";

//echo "id".$id."</br>";

//echo "amount".$amount."</br>";


//enter receipt

$b->addReceipts($empId,$clientId,$amount);

```

```

//get client tel
$b->getClient($clientId);
$data=$b->getRecord();
$clientNo= $data['tel'];

// send sms to client and susu collector
$user = "namanquah";
$password = "pa55word";
$api_id = "123456";

$text = urlencode("Receipts of ".$amount." cedis has been received from
Client ID:".$clientId ." entered by EMP ID:".$empId);

$to1 = $clientNo;

$url="http://www.mytxtbox.com/smsgapi.ashx/sendmsg?api_id=12345
6&user={$user}&password={$password}&to={$to1}&text={$text}&fro
m=namanquah";

//$url="http://www.mytxtbox.com/smsgapi.ashx/sendmsg?api_id=1234
56&user={$user}&password={$password}&to={$to2}&text={$text}&fro
m=namanquah";

//echo "$url<br>";

// do call
$ret = file($url);
var_dump( $ret);

// split our response. return string is on first line of the data returned

```

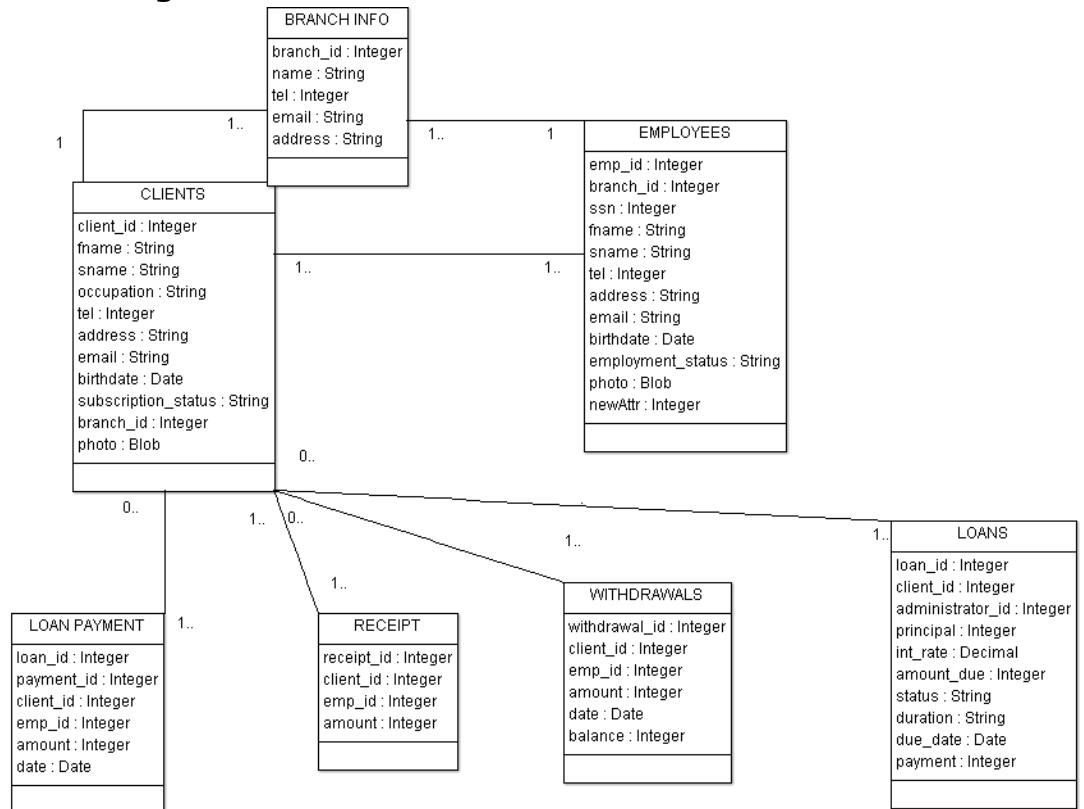
```

//$send = split(":",$ret[0]);
//if ($send[0] == "ID")
//{
    //echo "success
    //message ID: ". $send[1];
//}else
//echo "send message failed";

?>

```

Database Design



Screen Shot

Fig1

Microfinance Solutions

Navigate

- [Client Registration](#)
- [Employee Registration](#)
- [Branch Registration](#)
- [Reports](#)
- [Employee Edit Page](#)
- [Client Edit Page](#)
- [Branch Edit Page](#)
- [Deposits](#)



Copyright 2013 © TalkBiz

Fig2

HOME	CLIENT	EMPLOYEE	BRANCH	DEPOSIT	WITHDRAWALS	LOANS	REPORTS
------	--------	----------	--------	---------	-------------	-------	---------

Client Details

First name:

Last name:

Client ID:

Branch ID:

Occupation:

Tel:

Date Of Birth:

Address:

Email:

Select photo: No file chosen

Subscription Status:

Fig3

Employee Details

First name:

Last name:

EMPLOYEE ID:

Branch ID:

SSN:

Tel:

Date Of Birth:

Address:

Email:

Select photo: No file chosen

Employment Status:

Fig4

Branch Registration

Branch ID:

Branch name:

Tel:

Address:

Email:

Fig5

Loan Acquisition Details

Client Name Search:

- mana112 odoi11
- dave boye
- dave boye
- karen112 davies11

Administratrator ID:

Client ID:

Principal:

Interest:

Amount Due:

Duration:

Due Date:

Fig6

Deposit Details

Client Live Search:

- mana112 odoi11
- dave boye
- dave boye
- karen112 davies11

Collector ID:

Client ID:

Amount:

Fig7

CLIENT REPORT

HOME CLIENT EMPLOYEE BRANCH DEPOSIT WITHDRAWALS LOANS REPORTS

Client Report

Search:

mana112 odoi11 [a](#) [s](#) [ls](#) [Loans](#)

dave boye [Details](#) [Susu Receipts](#) [Susu Withdrawals](#) [Loans](#)

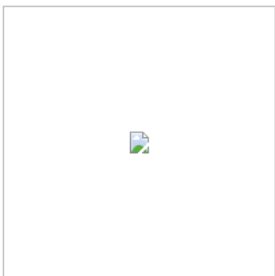
dave boye [Details](#) [Susu Receipts](#) [Susu Withdrawals](#) [Loans](#)

karen112 davies11 [Details](#) [Susu Receipts](#) [Susu Withdrawals](#) [Loans](#)

Fig8

HOME CLIENT EMPLOYEE BRANCH DEPOSIT WITHDRAWALS LOANS REPORTS

Client Details



First Name: [mana112](#)

Surname Name: [odoi11](#)

Client ID: [500](#)

Branch ID: [0](#)

Occupation: [MUSIC](#)

Telephone: [+233264022229](#)

Address: [nungua 11](#)

Email: [boye1@yahoo.com](#)

Birth Date: [2013-01-15](#)

Fig9

Client Details

HOME
CLIENT
EMPLOYEE
BRANCH
DEPOSIT
WITHDRAWALS
LOANS
REPORTS

Client Details

Year:

Quarter:

search

CLIENT ID	SUSU COLLECTOR ID	RECEIPT ID	AMOUNT (cedis)
500	500	52	333
500	500	51	444
		TOTAL	777

Fig10

HOME
CLIENT
EMPLOYEE
BRANCH
DEPOSIT
WITHDRAWALS
LOANS
REPORTS

Withdrawal Details

Year:

Quarter:

search

WITHDRAWAL ID	CLIENT LOAN ID	ADMINISTRATOR ID	AMOUNT	BALANCE	DATE
1	500	400	500	277	2013-04-12
2	500	400	277	0	2013-04-12

- Query table
- Clients
- Employee
- Bar graph

Fig11

HOME
CLIENT
EMPLOYEE
BRANCH
DEPOSIT
WITHDRAWALS
LOANS
REPORTS

Loan Details

Year:

Quarter:

search

CLIENT ID	LOAN ID	ADMIN ID	PRINCIPAL	INTEREST RATE	AMOUNT DUE	STATUS	DURATION	DUE DATE	PAYMENTS MADE
500	2	400	300	0.00	800	cleared	2+years	2013-04-22	800

- Query table
- Clients
- Employee
- Bar graph

Fig12

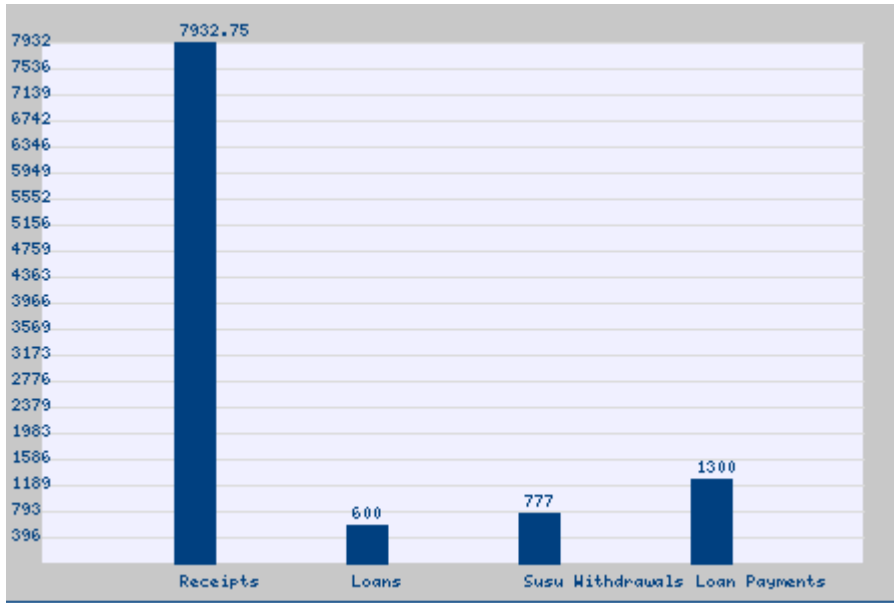


Fig13

Fig14

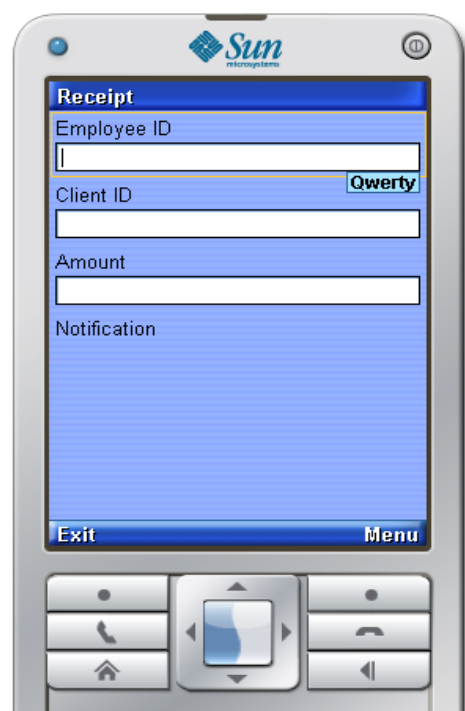
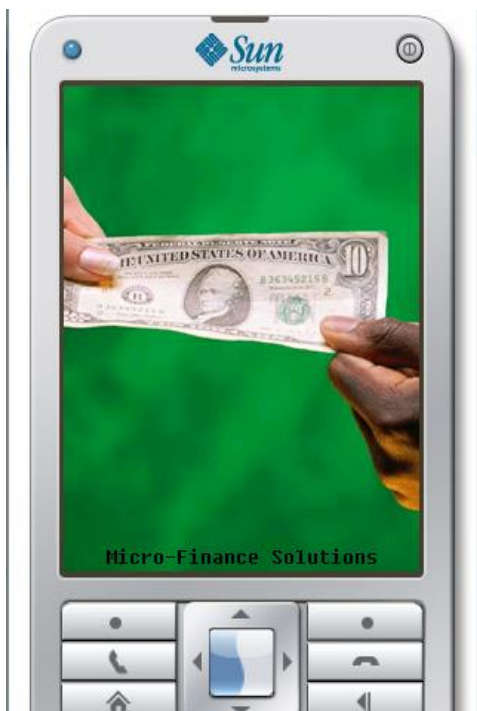
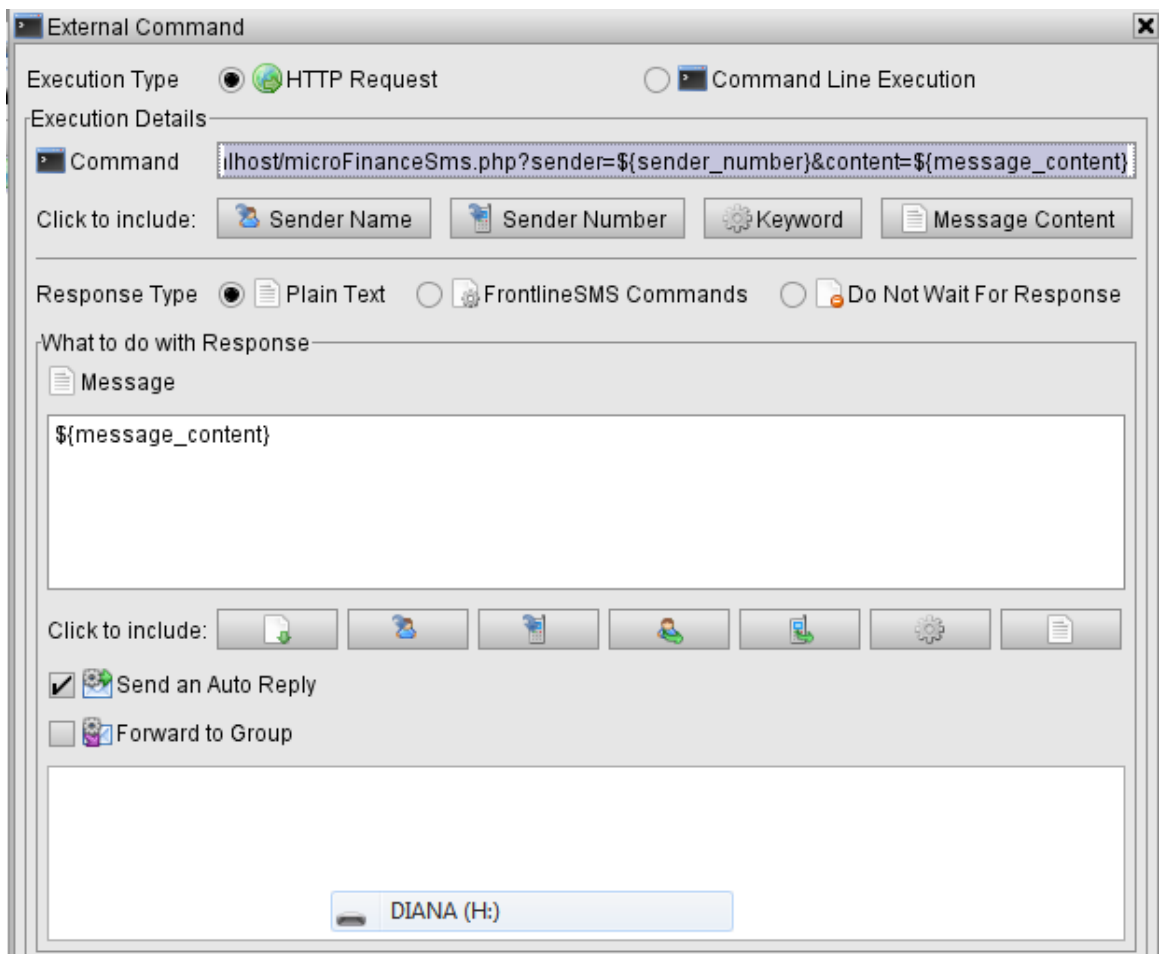


Fig15 Frontline



Bibliography

Global microfinance trends. (n.d.). Retrieved April 2, 2013, from
Ministry of finance and economic planning site:
http://www.mofep.gov.gh/sites/default/files/pages/microfinance_0.pdf