**LOCKMINDS COMPANY LIMITED**

19

**USSD LOAN PROJECTS**

**USSD DOCUMENTATION BY**

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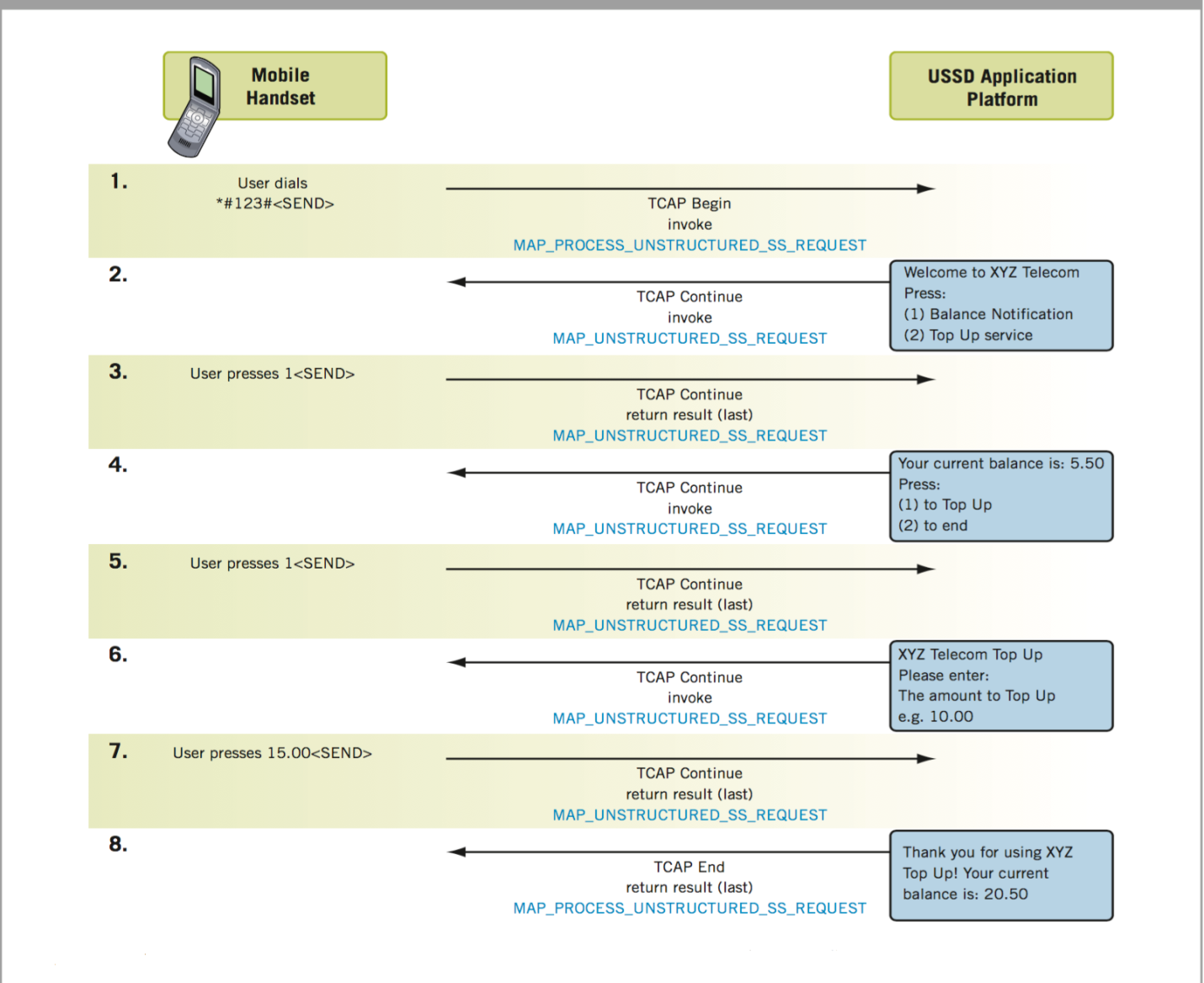
**USSD PROJECT**

USSD stands for Unstructured Supplementary Service Data which is a global system for mobile to communicate directly with a program sitting on the service providers (Vodacom, Airtel, Halotel ) computers.

Example.. such as \*123\*45#

So basically what happens is this:

* User dials the provided USSD code.
* The request is forwarded to the mobile service provider.
* The provider routes the request through a gateway to the machine hosting the application.
* The application processes the requests it receives and sends back feedback.
* The feedback is processed by the provider and sent back to the mobile phone.



To develop for USSD there are key things you need to understand. Some of them are basic programming skills which include conditional statements, Switch statements.

The USSD Application can be tested without connecting to any mobile network operator by setting up a simulator which you can see how your application works like before launching it.

\*Shared USSD code and Dedicated USSD code\*

 USSD application use of the keyword CON and END.

CON keyword is used when implying to a continuous request. For example when you expect a user to enter an answer.

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END is used to terminate the USSD session.

**APPLICATION CATEGORIES**

### Static

-All menus already prepared.

-All menus have less than 160 characters.

-It consist about 50 menus maximum.

-Forward and backward navigation

-It can run to any mobile phone

-Lockminds Team will give support after lunch for three (3) months

NOTE: **To full develop a static USSD Application it takes about 1 and ½ months.**

Dynamic

-All menus already prepared.

-Menus can have info. Placeholders

-Menus can have 160+ characters.

-It consist about 120 menus maximum.

-It can run to any mobile phone

-Lockminds Team will give support after lunch for three (3) months

NOTE: **To full develop a dynamic USSD Application it takes about 2 and ½ months.**

Dynamic + Integrated

-USSD App which is dynamic.

-It consist about 150 menus maximum.

-It can run to any mobile phone

-USSD App Integrated to another system(s). It integrated to another system for registration, billing, payment etc.

-Lockminds Team will give support after lunch for three 1 year.

NOTE: **To full develop a dynamic USSD Application it takes about 4 months and more.**

The application will be programmed in PHP and will be interacting with a MySQL database for data storage. Below are the steps that we usually take when programming a USSD application that will be taken?

**STEPS TO BE**

Step 1: Model the menu flow. You have to choose your tool of preference.

Step 2: Design the deployment diagram. The diagram basically shows the traffic flow between the different elements involved.

Step 3: DB Design and definition of details to be kept in the configuration file.

The configuration file of PHP will have the code like this:

<?php

define("DB\_HOST", "27.0.0.1");

define("DB\_USERNAME", "username");

define("DB\_PASSWORD", "password");

define("DB\_NAME", "ussd\_app");

define("MAX\_PROFILE\_PER\_MSISDN", 3);

And the configuration file for (JSON) will have the code like this:

{

"menu\_1":"Welcome to USSD app:\n1. Register\n2. Save\n3. Withdraw\n4. Loan\n5. My wallet\n6. Other services\n7. Terms and condition",

"1.1":"Register:\n1. Personal account\n2. Group account\n99. Back ",

"1.2":"Save:\n1. Personal account\n2. Group account\n3. Fixed account\n4. Wallet\n99. Back ",

"1.3":" Withdraw:\n1. Personal account\n2. Group account\n3. Wallet\n99. Back ",

"1.4":"Loan:\n1. Personal loan request\n2. Group loan request\n3. Loan payment\n4. Loan history\n99. Back ",

"1.5":"My wallet:\n1. Balance\n2. Send money\n3. Withdraw from wallet\n99. Back ",

"1.6":"Other services:\n1. Buy credit\n2. Help\n99. Back ",

"1.7":"The terms and condition for this app is:\n1. Exit\n00. Back"

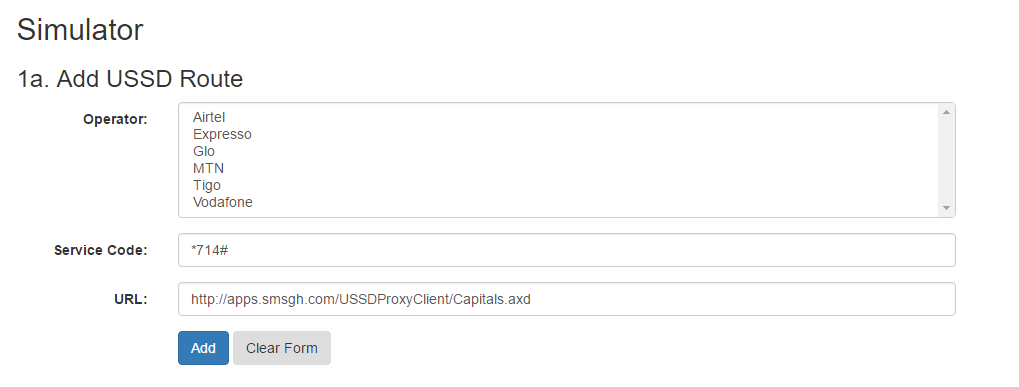
}

Step 4: Setup the Simulator.

This is the most important task to perform during USSD application development is to test the application before deployment.

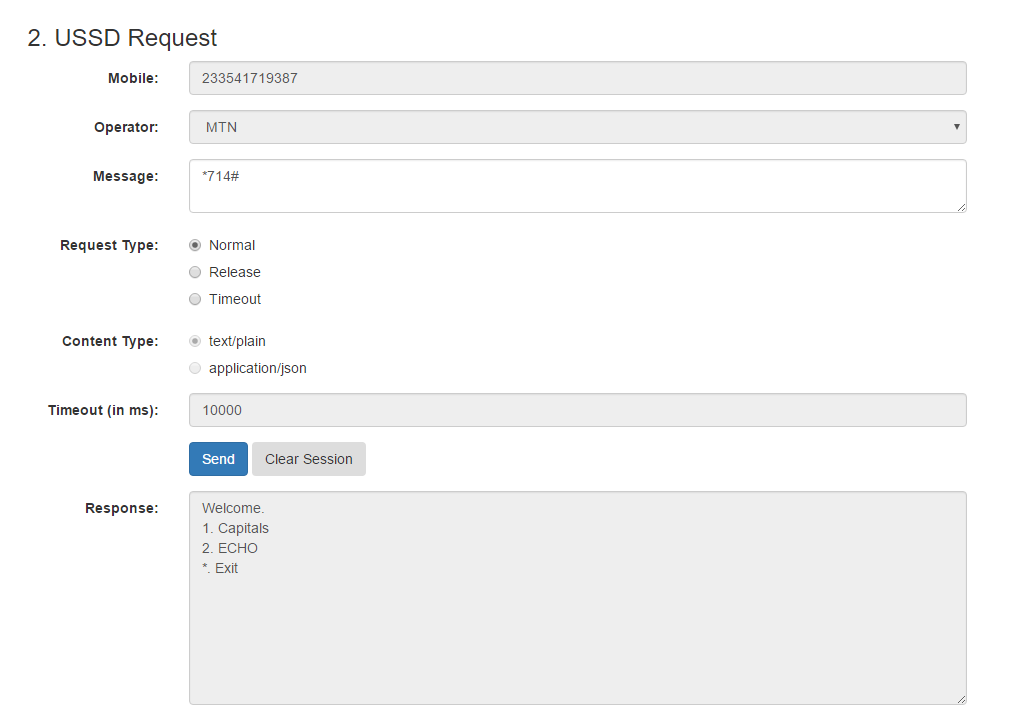
* Set USSD routes.

Setting the USSD routes requires you to select the various Mobile Network operators you would be testing on.



1. Make a multiple selection of the available Mobile Network Operators,
2. Enter a test USSD Service Code. Example \*123\*45#
3. Provide your USSD application URL. (http://localhost/ussd-app/test.php).
4. Click on Add to add the selected routes for testing.

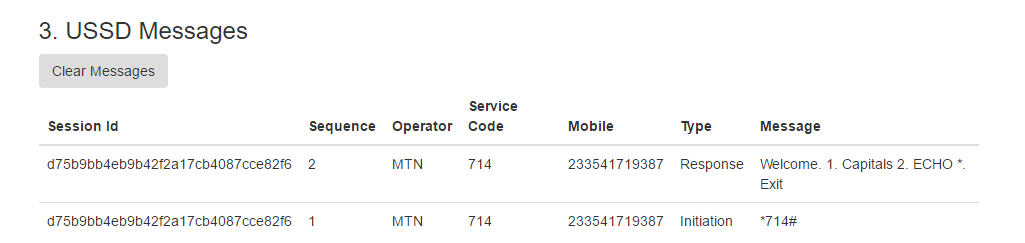
* Make USSD request



1. Enter a test mobile number.
2. Select the operator.
3. Enter your test USSD service code selected in 1a. In this case, \*123\*45#.
4. You can leave the rest in their default state.
5. Click on send to make your initial request.

* View USSD request and responses

The USSD response that would be displayed as a menu on your mobile device would display in the Response textbox.



NB: This is the sample code required just for testing. You are advised to remove headers before going live for security reasons.

//Needed for CORS implementation on PHP

header("Access-Control-Allow-Origin: \*");

header("Access-Control-Allow-Methods: OPTIONS, GET, POST");

header('Content-type: application/json; charset=utf-8');

header('Content-type: application/json; charset=utf-8');

$ussdRequest = json\_decode(@file\_get\_contents('php://input'));

// Check if no errors occured.

if ($ussdRequest != NULL) {

// Create a response object.

$ussdResponse = new stdClass;

// Set the message to display.

$ussdResponse->Message = "Hello world";

// Set the type of this response.

$ussdResponse->Type = "Release";

// Encode the response object as JSON and send.

echo json\_encode($ussdResponse);

// E.g. $ussdRequest->Message,

//$ussdRequest->SessionId, etc.

}

Step 5: Implement the first page of the application.

The critical part of USSD applications is menus tracking and knowing how to decode the USSD Gateway request message, also how to respond with the response it understands. Knowing what menu you sent to the user so that when they select an option, the application acts accordingly. When the user initiates a request to the USSD gateway, the USSD gateway gives the user a session id which it uses to track the user session. This session ID is also shared with the application. On the application side, we have to use the USSD Gateway session ID + the user mobile number as the session ID, so that we can also track the user session at the application end.

Step 6: Implement the full application.

NOTE: Check the different gateways and how you can make the application talk to them and approaches you can adopt to handle heavy traffic and also to handle heavy processing without timing out.

**COST ESTIMATION**

System designing and development : Tsh 10,000,000/= Tsh

The interface for end user will have about 40 screens design for Front-End.

The Backend for server side scripting for processing by querying the user input data and responding for the output (PHP scripting language)

A shared USSD code on Airtel,Tigo and Vodacom and attract an overall monthly maintenance fee of $110

A compulsory deposit of Tsh 150,000 is required for the session cost.

**INTERGRATION COST**

|  |  |  |
| --- | --- | --- |
| **Mobile Operator** | **Annual Fee** | **Set up** |
| Airtel | $2300 | $200 |
| Tigo | **free** | $50 |
| Vodacom | **free** | $50 |

**SYSTEM REQUIREMENTS**

Hardware specification

* Computer
* Mobile phone
* Server about (2 TB) space

Software specification

* Operating system (window 7,10. etc)
* Text editors and IDE’s
* Mysql database

**USSD CODE REGISTRATION**

**Register USSD Short Code**

The Government through e-Government Agency is improving Public Access to e-services by institutionalizing and facilitating mobile solutions and e-services across the Government. Thus, Public Institutions that need to use Mobile Services in delivering services to citizens via mobile devices need a short code for Short Message Service (SMS) and Unstructured Supplementary Service Data (USSD).  So, eGA is responsible for facilitating the allocation of the short codes from the Government reserved blocks of the mobile short codes;

**Requirements:**

1.  Duly filled FORM-1 - Ongoing and Planned Projects

2. Project Write-up/Concept Note

**Procedures:**

1. Fill and submit FORM1 for Ongoing and Planned Projects.

2. Submit signed Application Letter

3. Attach Project Concept Note/Project Write-up.

***Situational Analysis***

***mention and elaborate the key elements of the project, which include:***

* Project Aim
* Project Objective (should align with  Institutional Strategic Plan)
* Project Scope, Project Deliverables by mentioning and elaborating key elements of cost, like source and value of implementation cost
* source and value of operational cost which include a clear plan on how Stakeholders (at least primary stakeholders) are going to be involved on the project,
* The risks involved in the project and the mitigation plan and lastly include
* Implementation and Operation Plan for its Sustainability.

 Note: The Public Institution should first be allocated a short code by eGA, and then proceed with application of the CERTIFICATE OF NUMBERING RESOURCE ASSIGNMENT from TCRA  before rendering the intended services.

SCREEN DESIGN

Dial \*123\*45#

Welcome to loan app

1. Register
2. Save
3. Withdraw
4. Loan
5. My wallet
6. Other services
7. Terms and condition

Cancel submit

Step 1:

* 1. Register

Register

1. Personal account
2. Group account
3. Back

Cancel Submit

* 1. Save

Saving

1. Personal account

2. Group account

3. Fixed account

4. Wallet

99. Back

Cancel Submit

Cancel Submit

* 1. Withdraw

Withdraw

1. Personal account

2. Group account

3. Wallet

99. Back

Cancel Submit

Cancel Submit

* 1. Loan

Withdraw

1. Personal loan request

2. Group loan request

3. Loan payment

4. Loan Limit

5. Loan history

6. Pending loan

99. Back

Cancel Submit

* 1. My wallet

My wallet

1. Balance

2. Withdraw from wallet

3. Send Money

99. Back

Cancel Submit

* 1. Other services

Other service

1. Buy credit

2. Help

99. Back

Cancel Submit

* 1. Terms and conditions

Terms and condition

1. Term one

2. Term two

3. Term three

4. Term four

5. More

99. Back

Cancel Submit

DATA FLOW MODEL

Take long time terminate

Take long time terminate

Welcome to USSD APP

1. Save
2. Withdraw
3. Loan
4. My wallet
5. Other services
6. Terms and conditions

Personal account

1. amount

2. Purpose

3. Back

00. Main menu

Save

1.personal account

2.Group account

99. Back

Register

1. Personal account
2. Group account

99. Back

Enter name

Welcome to USSD APP

1. Register
2. Save
3. Withdraw
4. Loan
5. My wallet
6. Other services
7. Terms and condition

If number have user profile associated

If number does not have user profile associated

\*123\*45#