

**BUSITEMA UNIVERSITY**

**FACULTY OF ENGINEERING**

**DEPARTMENT OF COMPUTER ENGINEERING**

**A MOBILE WALLET FOR MICRO SAVINGS**

**FINAL YEAR PROJECT REPORT**

**BY**

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**A project report submitted to the Department of Computer Engineering in  
Partial Fulfillment of the Requirements for the Award of a Bachelor of  
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**MAY, 20**

## **DECLARATION**

I ELAJU JOSEPH hereby declare that this project report is my original work except where explicit citation has been made and it has not been presented to any Institution of higher learning for any academic award.

Signature: .....

Date: .....

**APPROVAL**

This is to certify that the project report under the title “A mobile Wallet for Micro Savings” has been done under my supervision and is now ready for examination

Mr. Lusiba Badru

Department of Computer Engineering

Sign: .....

Date: .....

## **DEDICATION**

I dedicate this report to my Lord Jesus Christ, my blessed Mum Mrs Engongu , my siblings, my excellent supervisor Mr Lusiba Badru and all my friends

Thank you all.

## **ACKNOWLEDGEMENTS**

Great appreciation goes to my Lord Jesus Christ, for giving me Life. I greatly appreciate my parents and siblings for the support, encouragement and motivation.

I also thank Mr Lusiba Badru and the entire Department Of Computer Engineering for the technical guidance throughout the execution of this project.

## **LIST OF ACRONYMS**

GSM: Global Systems for Mobile Communication

SMS: Short Message Service

MSP: Mobile Service Provider

USSD: unstructured supplementary service data

SACCO-Savings and Credit Cooperatives

## **ABSTRACT**

The main objective of the study was to design and implement a mobile wallet for micro savings that allows a mobile user to save airtime on his/her phone and later exchange it for cash (mobile money) after a defined period of time. This report describes the design, development, implementation and testing of a mobile wallet for micro savings. First I gathered requirements, downloaded development tools, and interacted with existing mobile wallets to study how savings are done.

Thereafter, I came up with designs for the mobile wallet using Android Studios. This release was to evaluate the efficiency of the User Interface.

Due to the fact that Mobile Network Operators do not open their source code, I had to write an SMS processing API to handle mobile money payments by matching SMS data. I used regular expressions to extract the relevant data.

# TABLE OF CONTENTS

DECLARATION.....	i
APPROVAL .....	ii
DEDICATION .....	iii
ACKNOWLEDGEMENTS .....	iv
LIST OF ACRONYMS .....	v
TABLE OF CONTENTS.....	vi
LIST OF FIGURES .....	viii
CHAPTER ONE: INTRODUCTION .....	1
<b>1.1 BACKGROUND</b> .....	1
<b>1.2 PROBLEM STATEMENT</b> .....	2
<b>1.3 OBJECTIVES</b> .....	2
<b>1.3.1MAIN OBJECTIVE</b> .....	2
<b>1.3.2 SPECIFIC OBJECTIVES</b> .....	2
<b>1.4 JUSTIFICATION/SIGNIFICANCE</b> .....	3
<b>1.5 SCOPE</b> .....	3
CHAPTER TWO: LITERATURE REVIEW .....	4
<b>2.0 INTRODUCTION</b> .....	4
<b>2.1 RELATED LITERATURE</b> .....	4
<b>2.2 HOW THE RURAL RESIDENTS SAVE</b> .....	5
<b>2.2.1 SAVING AT HOME</b> .....	5
<b>2.2.2 SAVINGS CLUBS SAVINGS CLUBS</b> .....	5
<b>2.2.3 MONEY GUARDS</b> .....	5
<b>2.2.4 DEPOSIT COLLECTORS</b> .....	6
<b>2.2.5 MUNNO MAKABI</b> .....	6
<b>2.2.6 ROTATING SAVINGS AND CREDIT ASSOCIATION (ROSCA)</b> .....	6
<b>2.2.7 SAVINGS AND CREDIT CO-OPERATIVES (SACCOS) A SAVINGS AND CREDIT CO-OPERATIVE, OR A CREDIT UNION,</b> .....	7
<b>2.2.8 FORMAL BANKS</b> .....	7
<b>2.3 EXISTING SYSTEMS</b> .....	7
<b>2.3.1 MoKash</b> .....	7
<b>2.3.2 Airtel Weza.</b> .....	8



2.3.3 Airsave .....	8
2.3.4 A table showing the summary of advantages and Challenges, Limitations & Weakness for existing methods and systems. ....	9
2.4 THE IMPLEMENTED SYSTEM .....	9
CHAPTER THREE: METHODOLOGY .....	11
3.0 INTRODUCTION.....	11
3.1 DATA COLLECTION METHODS.....	11
3.1.1 INTERVIEW .....	11
3.1.2 QUESTIONNAIRE.....	11
3.1.3 REVIEW OF RELATED LITERATURES.....	11
3.2 DATA INTERPRETATION AND ANALYSIS .....	11
3.3 SYSTEM DESIGN.....	12
3.3.1 SOFTWARE TECHNOLOGIES .....	12
3.3.2 SOFTWARE EQUIPMENT AND DESIGN TOOLS .....	12
3.3.3 CONCEPTUAL DESIGN .....	13
3.4 IMPLEMENTING THE SYSTEM DESIGN.....	13
3.5 TESTING AND VALIDATION .....	13
3.5.1 TESTING.....	14
3.5.2 VALIDATION.....	14
CHAPTER FOUR: SYSTEM ANALYSIS AND DESIGN.....	15
4.0 Introduction.....	15
4.1 System Analysis.....	15
4.1.1 Functional Analysis.....	15
4.1.2Requirements Analysis .....	15
4.2 System Design.....	17
4.2.1 Entity-Relationship Diagram .....	17
4.2.2 Data Flow Diagram.....	18
4.2.3 Physical Design.....	19
CHAPTER FIVE: IMPLEMENTATION AND TESTING .....	20
5.0 Introduction.....	20
5.1 Development Tools.....	20
5.2 System Operation.....	20
5.3 System Testing.....	20

<b>5.4 Verification</b> .....	21
<b>5.5 Validation</b> .....	21
<b>CHAPTER SIX: DISCUSSIONS AND RECOMMENDATIONS</b> .....	23
<b>6.0 Introduction</b> .....	23
<b>6.1 Summary of the work</b> .....	23
<b>6.2 Critical analysis / appraisal of the app</b> .....	23
<b>6.3 Proposals / Recommendations for future work</b> .....	23
<b>6.5 Conclusion</b> .....	23
<b>References</b> .....	24
<b>APPENDICES</b> .....	<b>Error! Bookmark not defined.</b>

## **LIST OF FIGURES**

Figure 1: conceptual design of the system .....	13
Figure 2: Entity relationship diagram .....	17
Figure 3: dataflow diagram .....	18
Figure 4:physical design of the system.....	19
Figure 5:system interface when saving and withdrawing respectively .....	21
Figure 6:sign up and login screens of the system .....	26

## **CHAPTER ONE: INTRODUCTION**

### **1.1 BACKGROUND**

In developing countries over 2.5 billion people do not have bank accounts and have to rely on cash or informal financial services which are typically unsafe, inconvenient and expensive. For many of them, access to savings services at formal financial institutions is very limited resulting in low-income individuals having to find other ways to save. One study for example found that among 1,232 Ugandans who saved in kind (by investing in animals, commodities or other goods), 75% had lost some of their savings in the previous years.[1]. Moreover people on low incomes can find it hard to save cash in part because the money is always readily accessible meaning they have to continually exercise self-control. In addition to this, it is not economically viable for deposit taking institutions to collect a large number of small deposits or for customers to walk to a bank branch to make small deposits on regular basis. However over one billion of these people have access to a mobile phone which can provide a basis for extending the reach of financial services such as payments, transfers, insurance, saving and credit[2].

Mobile phones have become the most popular and widespread form of personal technology on the planet with 3.6 billion unique mobile subscribers and 7.2 billion connections globally[3]. According to the world bank, about 52 out of 100 people in Uganda had a mobile cellular subscription in 2014[4]. Another study revealed that about 58% of respondents owned a mobile phone and 79% either owned or could borrow a phone[5]

Ironically, while the mobile penetration rates continue to rise in the developing world, basic services continue to be limited. In some markets less than 1/3 of the population has access to basic utilities such as banking and education services [6]. A study by helix institute noted that the products and services offered in Uganda by mobile operators are quite limited with almost no banking services such as credit, savings and insurance. Currently in Uganda, mobile money accounts are the most common form of digital financial accounts with about 33% of Ugandan adults holding a mobile money account.[8]

According to FinScope survey, rural users of mobile money reported issues such as agents being unavailable or unable to complete transactions and rural residents had to cover on average 3 times the distance as urban dwellers and pay more for transportation to reach points of

service[9].This means that making daily savings through mobile money agents for the rural residents is difficult. There is therefore room for growth in terms of diversity of financial services that individuals can engage with. Given the wide distribution of airtime scratch cards in rural areas[10] and the possibility of converting airtime to cash[11], a comprehensive digital savings model that effectively serves the low income population in rural areas by allowing them to save their money as airtime on their phones and later convert it to money can be developed.

## **1.2 PROBLEM STATEMENT**

A majority of people in rural areas in Uganda have little savings, this is mainly due to high costs of transportation and minimum deposit requirements charged by formal institutions. Also current savings and credit cooperatives serving the unbanked have fallen victim to mismanagement. There is therefore a need to for a secure, convenient and affordable way to accumulate small sums of money overtime so as to make large purchases, investments or cope with emergencies.

## **1.3 OBJECTIVES**

### **1.3.1MAIN OBJECTIVE**

To design and implement a mobile wallet for micro savings that allows a mobile user to save airtime on his/her phone and later exchange it for cash(mobile money) after a defined period of time

### **1.3.2 SPECIFIC OBJECTIVES**

- i) To identify and analyze the requirements needed to accomplish the development of a mobile wallet for micro savings that supports airtime savings and mobile money withdrawals
- ii) To design the mobile wallet's user interface.
- iii) To implement the mobile wallet's system interface and link it to the SMS gateway and the application server
- iv) To test and validate the implemented system.

#### **1.4 JUSTIFICATION/SIGNIFICANCE**

Because airtime scratch cards are more easily accessible in rural areas, rural residents can easily buy airtime from local shops on daily basis, save it on their phones and only travel considerable distance only once to locate the mobile money agent when it is time to withdraw, rather than travel distances every time you want to save even small amounts like 500 shillings in an attempt to locate mobile money agents or banks. Besides that, this system is also secure compared to the informal methods of saving where money can easily be stolen or mismanaged. Also because the savings are made on a mobile phone it makes it convenient since one can make his/her deposits anywhere, any time. This system is also transparent since one can access all the details of his transactions on his phone.

#### **1.5 SCOPE**

The system will be used only in Uganda. The transactions will be made across the same network, I would actually like to limit my scope to Airtel mobile network. The system is intended for use by rural population where formal institutions are distant.

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