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DIRECTORATE OF GRADUATE STUDIES, RESEARCH AND INNOVATIONS

A Digital Forensic Framework of Fraud Investigation and Prevention for Mobile Financial Services

A CASE OF MOBILE MONEY SERVICE IN UGANDA

BY

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A RESEARCH SUBMITTED TO THE DIRECTORATE OF GRADUATE STUDIES, RESEARCH AND INNOVATIONS IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF A MASTERS DEGREE IN COMPUTER FORENSICS,

MAY, 2022

DECLARATION

I Mukama Gerald, affirm that this research is my original work, except where due acknowledgement has been made. I declare that this work has never been presented to this university or to any other institution for funding/ for partial fulfillment for any award.

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SUPERVISOR(S) APPROVAL

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DEDICATION

Dedicated to my beloved parents **BASUTA PATRICK (RIP), NANDEGOH IRENE** then my late supervisor **MR: BWIRE FELIX (RIP)** and all my family members for inspirational insights towards the accomplishment of my MCF program.

ACKNOWLEDGMENT

My acknowledgement goes to the writer mentioned in this research who dedicated their effort and time to make sure that their items are published that really influence the improvement and finalization of this research.

I stretch my sincere appreciation to all those who provided constructive critique and help during the preparation of the research; more especially **Dr. Nibikora Ildephonse Dr. Gilbert Gilibrays Ocen,** and Late Mr. **Bwire Felix** (RIP) upon their wonderful supervision whose outcomes are seen in the research.

My special appreciation goes to all those who provided material and financial support towards my education more especially: all my lecturers, my late daddy Mr. Basuta Partick (RIP) and Management of Busitema University, Post Graduate Directorate

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ACRONYMS AND ABBREVIATIONS

AI:	Artificial Intelligence
AML:	Anti- Money Laundering
CFT:	Countering the Financing of Terrorism
DFF:	Digital Forensics Framework
DFS:	Digital Financial Services
DLL:	Dynamic Link Library
E.G:	For example.
FTK:	Forensic Toolkit
ISP:	Internet Service Providers
KYC:	Knowing Your Customer
KB:	Knowledge Base
MFS:	Mobile Financial Services
PC:	Computer
POS:	Point-of-Sale
SWGDE:	Scientific Working Group on Digital Evidence
SSD:	Solid State Drive
TAM:	Technology Adaption Model

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Abstract

This study proposed a digital forensic framework of fraud investigation and prevention for mobile financial services, a case of mobile money services in Uganda.

This study reviewed existing literature interviews, were carried and questionnaire distributed to gain insight on how the current mobile financial services are managed and how security is controlled. It was noticed that the detection and prevention of fraud in mobile financial services was lacking and more was desired. Furthermore the study employed the case study strategy that was seeking to grasp the problem being investigated which provided the chance to ask infiltrating questions. Having considered a case study strategy, mixed methods was adapted whereby both quantitative and qualitative methods were adapted. This was though the use of NVivo software to create clouds and relationships in the collected data. SPSS software was used to carry out quantitative analysis. This method employed techniques like observations, interviews, sound recording, and taking of notes amongst others. Furthermore the study employed design science. This focused on the development and performance of artifacts. This framework was designed based on fraud management framework and integrated the use of Data mining and machine learning techniques.

The results of assessing and testing usefulness of the proposed framework shows that the framework can identify some necessary steps and information about fraud detection and prevention so once implemented solutions can be achieved.

CHAPTER ONE
INTRODUCTION

1.0 Introduction

For decades, financial inclusion and safety was a foremost challenge worldwide, because of high costs occupied. In order to put forward financial services, premises had to be built, new workers take on and important capital investments completed. Financial organizations like banks focused on the high value customers that harvested bigger returns and greatly eliminated the mainstream of the population. The establishment of mobile money services (MMS) because of the rising number of mobile phones in the country on dissimilar telecommunication networks like MTN, AIRTEL, ETC to give financial services altered the dynamics of the industry, getting financial services nearer to the community through present merchant infrastructure within local societies. Aron (2017) wrote that the success of M-PESA since its launch in Kenya in 2007, Mtn in March 2009 in Uganda improved the hunger for mobile financial service operations mainly in rising countries. Financial institutions for instance banks and microfinance organizations are also investing in the provision of mobile financial services which has altered many people's lives due to high rate of adoption of the system.

On the other hand the system has affected many people negatively and loss have been incurred in the business field due to lack of strict and stiff terms to govern the mobile money services by the government and since any person can run it there is a lot of fraud during transactions.

1.1 Background of the study

Fraud investigation and prevention in mobile transactions remains a challenge in which fraudsters steal and go unnoticed. The current reactive fraud management way outs employed by most financial organizations rely upon post transactional data making it hard to detect real time fraud. This affects the service end users and Mobile Financial Service (MFS) providers. Ngoyo (2015) says that Research showed that 53 percent and 42 percent of mobile money agents in Uganda and Tanzania, correspondingly, had been subjected to fraud, thus affecting the income and reputation of MFS providers. Therefore, there is need for an investigation on fraud detection and prevention in mobile transactions leading to the design of a digital forensic framework of fraud detection and prevention for mobile financial services.

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