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UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING & INFORMATICS

**MOTOR VEHICLE CLAIMS CHALLENGES IN KENYA AND DEVELOPMENT OF A
CLAIMS BOT APPLICATION PROTOTYPE**

By

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**This project is submitted in partial fulfillment of the requirement for the award of
Master of Science in Information Technology Management of the University of
Nairobi**

July, 2021

DECLARATION

This research project is my original work and has not been presented before any other examination body or any research institution or University.



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This research project has been submitted for examination with my approval as university supervisor.



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DEDICATION

To my lovely family, who have been so patient with me during my academic path. Your unwavering support and prayers were critical to successfully completing this course. Many thanks to all of my colleagues who assisted me in several ways throughout this course. And may God continue to bless you! You are blessed by God!

ACKNOWLEDGMENT

We would like to express our gratitude to Professor Daniel Orwa, my supervisor, for his careful reading and insightful comments. Given the duration of this method, he was very patient, and throughout, he gave regular direction, criticism, and good suggestions.

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DEFINITION OF TERMS

Adoption: Adoption is the carrying out, execution, or practice of a plan, a method, or any design for doing something.

Claimant: means a person who has a right to a settlement arising from a contract of insurance.

Hardware: Hardware Refers to physical or tangible components of a computer including computer motherboard and its accessories.

Vehicle: A machine that is used to carry people or goods from one place to another, it could be a bicycle, motorcycle or three and above wheeled machine.

Minor Motor Vehicle Accident: This is an accident with no injuries to persons but damage to the Motor vehicle/s

Road Traffic Accident (RTA): A collision between vehicles; between vehicles and pedestrians; between vehicles and animals; or between vehicles and fixed obstacles.

Insurance: This is the contractual agreement between two parties, the insured and insurer. At an agreed fee (premium), the insured transfers their risk to a third party, the insurer/underwriter. The contract between the two parties is binding. Once the contract is bound, the insured is covered (indemnified) in the event of a loss (Chartered Insurance Institute, 2014).

Service Provider: means any person appointed to provide a service in facilitating a claim process

Insured: Person buying protection whose details are shown on an insurance certificate. Insurance cannot be transferred to third parties (Chartered Insurance Institute, 2014)

Software: Software is a program that instructs a computer to process data. Software's can be categorized into open source and proprietary.

Road: Every public road system: state, regional or local road, or city street.

Insurer: The provider of protection; the risk carrier (AKI, 2019)

ABBREVIATION

GDP:	Gross Domestic Product
AKI:	Association of Kenyan Insurers
IRA:	Insurance Regulatory Authority
ICT:	Information and Communication Technology
IT:	Information Technology
Kes:	Kenyan Shillings
PCs	Personal Computers
SMS	Short Messaging Service
GPS	Global Positioning System
AIBK	Association of Insurance Brokers of Kenya
AKR	Association of Kenya Reinsurers
AKIIA	Association of Kenya Independent Insurance Agents
IIK	Insurance Institute of Kenya

ABSTRACT

A customer's uncomfortable and emotionally taxing surroundings can now be modified through the use of a smartphone. We were able to identify challenges with motor vehicle claims in Kenya and design a mobile app prototype for claims through our research. Claim management is thus a critical issue in the insurance industry, owing to its ability to influence company success. As a result, insurance companies are employing novel strategies to improve the efficiency of their operations and procedures in terms of time and cost.

This study will benefit claims managers at general insurance businesses seeking to increase operational efficiency, as well as the general public and policymakers involved in general insurance. Customer dissatisfaction is a result of time-consuming and error-prone claim processing.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The Insurance Regulatory Authority of Kenya requires motor vehicle insurance holders to obtain specific information at the scene of an accident, including driver addresses and names, insurance and certificates from a third-party driver, vehicle registration numbers, and the make and model of the car involved in the accident. All insurance companies now require this information in order to process vehicle insurance claims.

Insurance companies and law enforcement organizations should notify policyholders of accidents. To begin, you must provide the insurance with paperwork, including a police summary report, a driver's license, and a loss statement (Insurance Regulation Authority, 2020). The vehicle can then

be taken to a repair shop for evaluation and approval by the insurance provider (Insurance Regulation Authority, 2020).

A mobile application is software that is designed for mobile devices and users that perform comparable operations to those found on PCs (Swanson & Taylor, 201

7). The number of "apps" (mobile telephone programs) that Bohmer et al. report are available on the market currently (2018). With the marriage of mobile phones and applications, a new trend in the mobile consumer market has formed. However, for these applications to be useful, they must be adapted to the users' needs, preferences, and usage scenarios (Arhippainen, 2019).

There are more people who possess mobile phones, which can give individualized information to individual owners quickly and conveniently, are less expensive to install, and offer extra services such as voice communication. The majority of mobile applications are also capable of being replicated across a variety of mobile interfaces and platforms, including SMS, mobile browsers, smartphones, and tablets. Mobile applications are designed to inform, entertain, and assist users with daily tasks.

Software that is optimized for use on a certain platform or device. Apps developed for a particular platform have an interface and make use of the operating system and other software that is usually installed on the platform. This means that they may make use of device hardware or software if they were designed for a particular device or operating system. Mobile devices are equipped with GPS and cameras to enable native programs to make advantage of these features. As a result, native applications have a significant advantage over online applications or mobile cloud applications. The term "native app" is frequently used in mobile computing, as mobile applications are frequently designed to function on a single device platform.

This application is installed directly on a mobile device, and distinct versions of the software are created for each device. The native program can be downloaded and installed from a public or private application store. Although data can be stored and retrieved remotely via the native app, the native app's data is also preserved on your device. Internet access may not be required depending on the nature of the native software (Margaret, 2016).

Businesses utilize mobile applications to educate clients about their services and products via mobile devices and a Wi-Fi connection. Until mobile technology matures, it will be difficult to

discover mobile applications. This research is described as computer software or a computer application that may be downloaded and installed on portable mobile devices. Mobile insurance applications are still not widely recognized as a new trend in Kenya.

1.1.1 The Kenyan Insurance Industry

As part of the financial services sector, Kenya has an insurance firm. Kenya, according to the Insurance Regulatory Authority, has 55 insurance companies, 198 insurance brokers, and 5,555 insurance officers. Kenya has an insurance rate of 2.73 percent, which is more than three times lower than the global average of 6.28 percent. (2019, IRA). Insurance companies earned a total of Kes 142.1 billion, with a profit of Kes 16.5 billion, or 12.7 percent of total revenue (IRA, 2018). Numerous people in Kenya are unaware of the value and benefits of insurance products, which is a major problem. This is due to their complexity, which includes how to obtain them, how they are paid in the event of a claim, and what happens if a claim is not paid on time. In 2018, a gross direct premium of Sh185,2 billion was added to Kenya's GDP. [IRA, April 2019].

Insurance has advanced tremendously over the last decade. While insurance prices have climbed significantly as wages have increased, insurance required knowledge and penetration have remained low. The industry's image has deteriorated during the last five years as a result of the collapse of at least five insurance enterprises (Standard Investment Bank, 2014).

IRA is responsible for overseeing Kenya's insurance business in accordance with the Cap 486 Insurance Act, which was enacted in 1988 and has been amended from time to time. The Kenya Association of Insurers, the Association of Insurance Brokers, and the Kenya Association of Insurers represent the insurance industry in Kenya.

1.1.2 Insurance Claims

Following a claim, the Kenya Insurance Regulatory Authority specifies that many actions must be taken. It is critical to notify your insurance carrier immediately of any loss or damage and to submit all needed documentation. Collaborate with your insurance company to expedite the processing of your claim. The year is 2018. However, the claims manager must first determine if the claim is payable and, if so, the amount.

The way an insurance business handles claims establishes its reputation. According to the Insurance Act, insurers are required to make claims within 90 days of the establishment of guilt (Cap 497). In the event of non-compliance, the Insurance Regulatory Authority assesses a 5% tax on outstanding funds (IRA).

A typical claim process is comprised of five key components, as specified in the Cap 479 Insurance Act.

- i. Claim notification
- ii. Claim Review
- iii. Response to Claimant
- iv. Claim Investigation
- v. Claim settlement
- vi. Claim recoveries
- vii. Review of performance
- viii. Litigation

1.2 Problem Statement

Because claims management may have a significant impact on a business's success, the insurance industry in Kenya is critical. The utilization of effective procedures, protocols, and a rapid response time are all components of insurance claim settlement tactics.

In the third quarter of 2019, Kenya's general insurance claim settlement ratio was 71.4 percent. (The IRA's 2018 annual report) In developing countries, the total number of people using mobile services has surpassed 5 billion, including 3.7 billion in Africa. By the end of 2017, almost two-thirds of the world's population had subscribed to a mobile service. In 2015, the United Kingdom's Financial Conduct Authority performed study on mobile phone insurance. With mobile phone insurance, the claim rate jumped from 60% to 80%.

Insurance fraud is widespread in Africa, according to a recent research on the African insurance market (KPMG 2019). According to the Kenyan National Transport and Safety Authority, road collisions account for 5.6 percent of Kenya's GDP, or 400 billion Kenya shillings. Automobile owners should thus have access to a platform for accurate accident data gathered by insurance companies for the purpose of processing claims. This information is gathered using the proposed

mobile smartphone application with the purpose of increasing efficiency and avoiding fraud in automobile insurance claims. This application will streamline the review process by verifying the claim's details.

Numerous studies have been done to examine the challenges associated with insurance claims. Baecker and Ackermann (2017) conducted study on mobile claim handling in vehicle insurance using smartphone applications. In accordance with the findings. There were mobile insurance claims applications available, but they were not sufficiently linked with major company claims administration systems. Baecker and Ackermann designed an integration architecture to address this gap. As part of her research in Kenya, she developed a prototype smartphone application (Angela, 2016).

In Kenya (Kiana 2018), challenges in the administration of general insurance claims have revealed that claim payments have been delayed owing to reporting requirements and staff overload. This is consistent with AKI's June 2019 research. According to the most recent data from December 2019, 89.7 percent of Kenyans have access to the internet, while 99 percent have access through a mobile phone.

Apart from examining a variety of issues relating to insurance claims and mobile applications, none of these studies focuses on the difficulties associated with electronically filing insurance claims in order to develop a prototype for overcoming the obstacles confronting the Kenyan insurance sector. This research will address issues such as: What are the various methods for electronically filing insurance claims? What are the issues with motor vehicle claims in Kenya?

1.3 General Objective

Motor vehicle claims challenges in Kenya and development of a claims mobile application prototype

1.3 Objectives of the Study

- i. Identify modes available for electronic claims in Kenya's insurance industry
- ii. Challenges in making insurance claims electronically in Kenya
- iii. Develop a claims bot application prototype for making insurance claims

1.5 Research Questions

- i. Are there means for making Insurance claims electronically?
- ii. What are the Challenges for making insurance claims electronically in Kenya
- iii. What Challenges can be resolved by a development of a claims Bot Application

1.6 Significance of the Study

The study would be useful to Claims Managers of General Insurance Companies who seek to improve their operational efficiency. Claims processing is a highly manual and time-consuming process that is extremely error prone, and this makes for unhappy customers.

It would also be useful to Chief Executives of General Insurance Companies who might be seeking to use claims management as a source of competitive advantage in the industry. Minor motor vehicle insurance claims can be automated through mobile app technology thus measuring its contribution to customer satisfaction, reduced turnaround time in filling for claims and low cost of claims.

Academics and scholars would also find it valuable in enriching their knowledge of management of General Insurance claims.

1.7 Limitations of the Study

1.7.1 Confidentiality

Due to the classified nature of the content, respondents were hesitant to provide some information requested by the researcher. To avoid this, researchers ensured that surveys did not include respondents' names or other personally identifiable information.

1.7.2 Respondents Trust

The researcher was unable to win the complete sample population's trust. To solve this, the researcher received a letter from the institution to help earn the respondents' trust and, if necessary, enlisted the support of already trained research assistants.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The public has a low level of trust in insurance companies. This is particularly true when it comes to claims management. This chapter reviews the literature on barriers to the use of mobile apps for minor motor vehicle accidents in Kenya. To accomplish this goal, the research conducted an empirical evaluation of each variable.

2.2 Mobile Internet penetration in Kenya

According to the Communications Authority of Kenya's First Quarter Sector Statistics Report for Fiscal Year 2020/2021, With the COVID-19 epidemic altering how we live, work, and

communicate with one another, becoming digital is more vital than ever. The availability of low-cost smartphones in the nation is likely to increase demand for mobile services.

Kenya has the greatest proportion of internet usage via mobile phones compared to PCs globally. Internet availability through mobile phone in the nation has reached 83 percent, surpassing Nigeria. Jumia Kenya, a Kenyan online store, stated that mobile phones accounted for 70% of their traffic and 50% of their payments.

Social media usage has also led to increasing smartphone purchases, with 8.3 million Kenyans using social media. Kenyan users spend over three hours each day on social media, with Twitter (60 percent), WhatsApp (86 percent), and Facebook (83 percent), being the most popular sites, according to user-reported activity. According to the Communications Authority of Kenya, the Internet/data market saw good growth at the conclusion of the first quarter of the 2020/21 fiscal year, with increasing reliance on digital platforms for work, learning, healthcare, commerce, and entertainment. Overall data/Internet subscribers increased by 6 percent to 55.2 million, up from 44.5 million in the same quarter last year, with mobile data subscriptions accounting for 98.5 percent of total subscriptions.

Table 2: 1 Data/Internet Subscriptions

Table 13: Data/Internet Subscriptions

<i>Indicator/Period</i>	<i>Jul-Sep 20</i>	<i>Apr-Jun 20</i>	<i>Quarterly Variation (%)</i>
Total Wireless Subscriptions	42,899,145	40,922,499	4.8
<i>Mobile Data Subscriptions</i>	42,806,044	40,832,642	4.8
<i>Terrestrial Wireless Data Subscribers</i>	91,826	88,159	4.2
<i>Satellite Data Subscribers</i>	1,275	1,698	-24.9
Total Fixed (Wired) Subscriptions	551,715	529,722	4.2
<i>Fixed DSL Data Subscribers (Copper)</i>	995	997	-0.2
<i>Fixed Fibre Optic Data Subscribers</i>	373,835	351,332	6.4
<i>Fixed Cable Modem Subscribers</i>	176,081	176,589	-0.3
<i>Other Fixed Data Subscribers (e.g. Radio)</i>	804	804	0.0
Total Subscriptions	43,450,860	41,452,221	4.8

Source: CA, Operators' Returns, Provisional data for Jamii Telkom

Internet subscriptions in Kenya

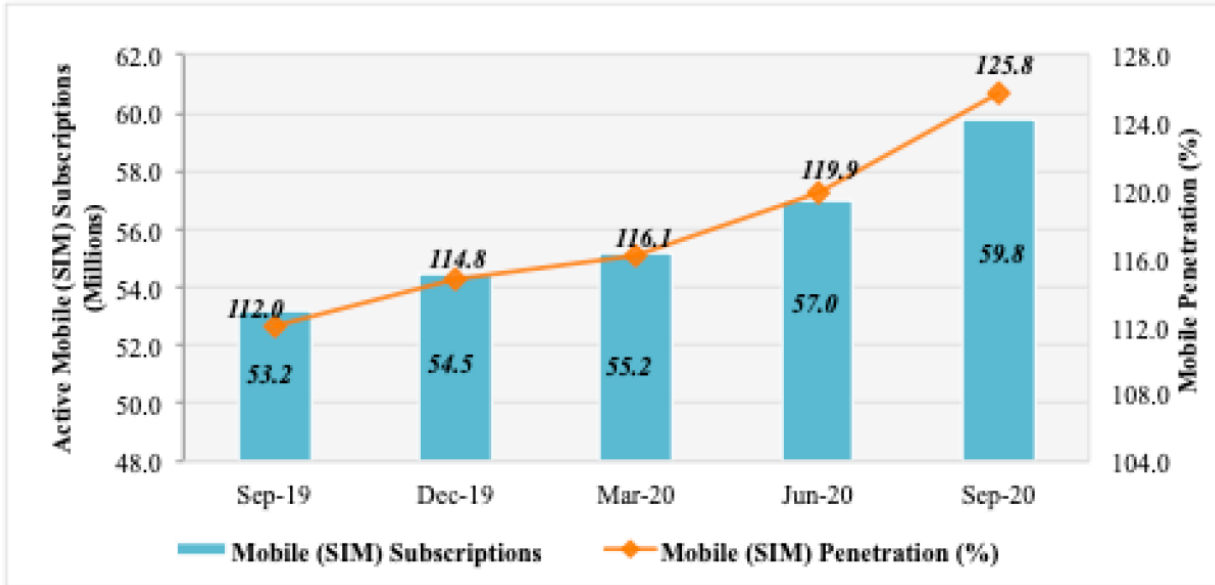
According to a report by KPMG 2014 on the African Insurance Market at a glance some of the key trends impacting the insurance business are high incidences of fraud which provide opportunities to improve claims and Weak IT environment (KPMG 2014). This Challenges the Industry to come up with ways to improve the Claim Ration and minimize fraud through technology

The Insurance penetration in Kenya stands at 3% (AKI 2017) compared to the global rate of 6.3 %.This is mainly attributed to People Culture and Lack of Investments in technology “Conducting insurance the Traditional way” According to Dr. James Mwangi of Equity Bank (AKI June 2017). The underwriting process should be made fast and easy through mobile apps (AKI June 2017)

According to a report by Ernst & Young on the Global insurance trends analysis dated June 2018 the Insurance Penetration Globally stands at 6.3 % (EY 2018). Given the high rate of mobile Smartphone penetration and usage if internet on the Smartphone by the Kenyan population the researcher

2.3: Insurance and Mobile Internet Penetration in Kenya

Kenya's ICT sector has continued to grow in recent years as a result of the introduction of COVID-19, which increased demand for ICT services. There are 59.8 million active mobile subscriptions (SIM cards) as of 31 September 2020, up from 58.0 million in June. Finally, throughout the entire assessment period, the penetration rate for mobile devices was 135.8 percent.



Source: CA, Operators' Returns

Figure 2: 1 Trends in mobile subscriptions and penetration levels (%)

The current market of insurance services largely consists of the more educated people in Kenya. FinAccess 2019 Report showed the highest levels of use of insurance products are in those with tertiary education over 6 in 10 (Figure 2.2) of them have an insurance product (Financial Sector Deepening, 2013).

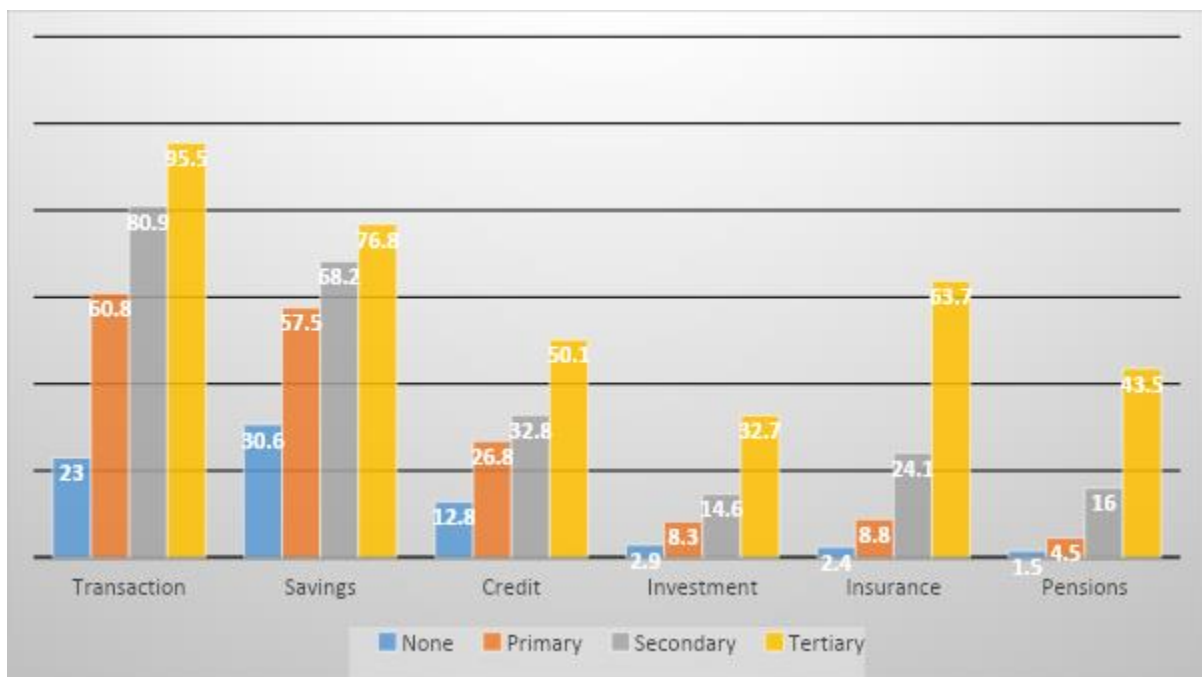


Figure 2: 2 Use Of Financial Services By Education And Age Groups

This information provides useful insight on the target market, which is insurance policy holders. The information provided shows that most insurance policy holders are educated and thus can be able to use a mobile application for filing insurance claims. It also shows that mobile phone owners use the internet on their mobile phone thus giving them the ability to submit claims using their mobile phones.

2.4: Revenue Growth in Insurance Companies

According to a survey carried out by Interim Partners', it was found that "a third (33%) of senior Insurance executives surveyed said that spending more on technology would boost profitability". The same survey reported that the use of technologies increases efficiency and provides a wider range for information analysis in terms of product pricing and strategy (Interim Partners, 2015). The mentioned survey was carried out in the western markets where technology in insurance services has been in use for quite a while, and more specifically the use of mobile and web applications in insurance processes such as underwriting and claims processing. The analysis of the data gathered through the applications has a potential of guiding business decisions made by the insurance companies which would lead to better service delivery and higher profits.

In Kenya, Insurance Regulatory Authority data released in 2018 showing some insurance companies reported a total underwriting loss of Sh480.2 million in the period. This type of loss means that the insurance companies paid out more in claims and expenses than the premiums collected during the respective period (Herbling, 2019). The loss was attributed to price mismatch and inadequate management of claims to ensure the claims were not fraudulent or exaggerated. With constant improvement in mobile technology and data networks, mobile applications should be adopted by insurance companies to save money, mitigate risk and increase productivity (Frost and Sullivan, 2019). Mobile technology has a high potential of improving Insurance processes such as claims, underwriting and analysis of data gathered from the applications to improve company performance.

2.5 Insurance Claims Analysis

Most insurance companies in Kenya follow the same process when handling filed claims sometimes with slight variations to the process. The process (Figure 2.4) below is an example of the process followed;

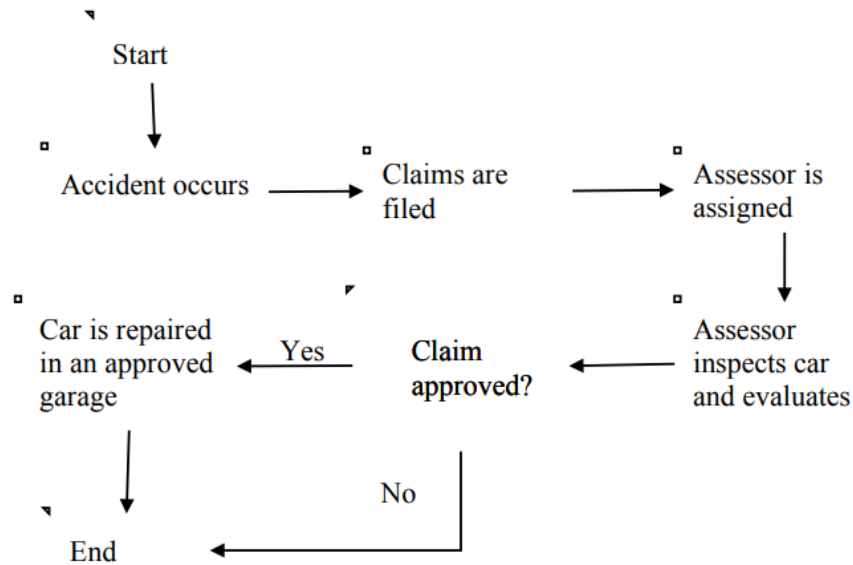


Figure 2: 3 Motor Insurance Claims Process

Insurance analysis is one method for amassing critical data for successful decision-making. Even while business decisions require a certain amount of creativity and intuition, it is critical to have all the facts available to make the best choices. Analytics enables crucial decisions such as new product development and marketing activities to be made.

They are now conducting research on architectural solutions for mobile insurance claim apps.

2.7 N-tier Architecture Model

The introduction of N-tier architectural solutions significantly improved the fault tolerance, scalability, and reliability of applications. Currently, this is the most common design. There are three layers of architecture in mobile and web applications (B'far 2015). Storage, business logic, and consumer data visualization are the three architectural layers. As seen in Figure 2.5, the hardware in such a system represents multiple layers, particularly for mobile applications. Presentation, application, and data are the three layers. The client is unaware of this storing because it is performed on the server side.

The Presentation Tier displays information about services that are available via a client device such as a mobile phone or a desktop computer. This layer is connected to the other layers through a network. Apart from the application level, it is commonly referred to as the intermediate level or

business logic layer. It regulates the application's operation as a result of its thorough inspection. Database servers are placed in the Data Layer - the last level. To avoid data leakage, this level of data is kept isolated from application servers and business logic. The researcher's objective was to create a three-stage mobile request for claim submission and analysis. This occurred as a result of the architecture's capacity to create scalable and reliable systems. The three-tier architecture optimizes the system user experience and wireless data performance by using improved 3G Internet infrastructure and mobile data services.

2.8 Model-View-Control Architecture

The Model-View-Control paradigm is frequently employed in interactive applications to facilitate rapid interface modifications. The illustration depicts a typical MVC architectural interaction (Figure 2.6). Mobile and web applications frequently use this design, although more so than others, platforms/frameworks such as iOS, Yi and others. Additionally, it was changed for use on systems that do not often utilize the architecture.

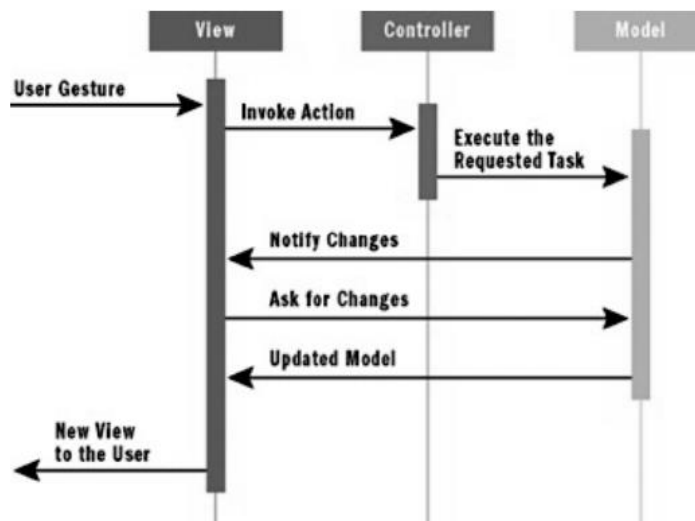


Figure 2: 4: Standard MVC Interaction

A model is a class or set of classes that includes data and methods for manipulating that data. The user interacts with the software component referred to as the User Interface. Finally, the model data is displayed on the display using pictures, text boxes, and other components. When a user entry modifies a model's behavior, a controller notifies the model to make the necessary

modifications (Alessi, 2021). The research made extensive use of the MVC paradigm, notably the web backend, to process claims via the mobile app. The MVC pattern facilitates the use of classes for specific purposes in application development.

2.9 Unified Analytics Platform Architecture

To thrive on the Unified Analytics Platform, it is critical to make data integration from disparate sources as simple as possible. The following factors are considered in this design:

- i. Data is gathered in various formats such as text, audio, video and so on.
- ii. Data is also collected from heterogeneous sources, such as social media, mobile, cloud and so on.
- iii. This data can be structured, semi-structured or unstructured.
- iv. And the data is collected in real-time or near real-time.

. As a result of the difficulties associated with integrating many sources, many stakeholders are unable to obtain critical data from a single platform. The Unified Analytics Platform enables the creation of descriptive, predictive, and prescriptive analytics (Serendio, 2016). The insurance claim analytics system utilizes a Unified Analytics Platform architecture, as seen in Figure 1. This is an excellent concept, in addition to offering comprehensive analysis, because it provides stakeholders and management with critical information that will assist them in improving their service.

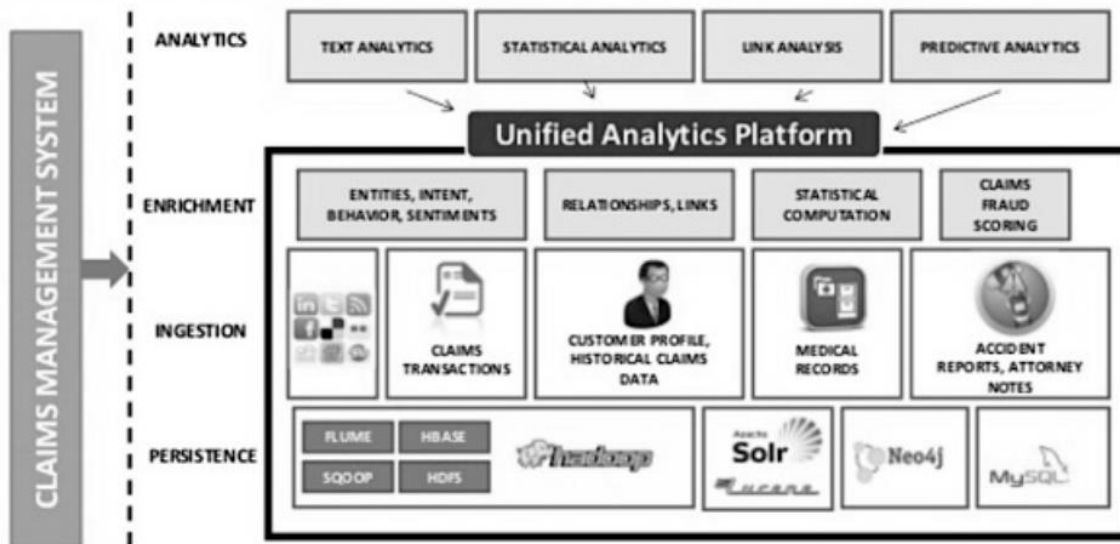


Figure 2: 5 Insurance Claims Analytics (Serendio, 2015)

The Model-View-Control Architecture was Chosen for the System development over the N-tier Architecture and Unified Analytics Platform Architecture

1.Support for Asynchronous Technique

The MVC architecture can integrate with the JavaScript Framework so applications can be made to work even with PDF files, site-specific browsers, and also with desktop widgets. This helps developers to develop an application that loads very fast

2. The Modification Does Not Affect the Entire Model

In system development the user interface tends to change more. When you make frequent changes in your web application like changing colors, fonts, screen layouts, and adding new device support for mobile phones or tablets it's very easy in the MVC pattern because the Model part does not depend on the views part. Therefore, any changes in the Model will not affect the entire architecture

3. Faster Development Process

MVC supports rapid and parallel development. If an MVC model is used to develop any particular web application then it is possible to work on different view at the same time to create the business logic of the web application. Hence this way, the application developed using the MVC model can be completed three times faster than applications that are developed using other development patterns.

4. Ability To Provide Multiple Views

You can create multiple views using the MVC with increasing demand for new ways to access your application MVC development is certainly a great solution. Code duplication is very limited because it separates data and business logic from the display

2.11 Conceptual Framework

The architecture system will break down into its many components and explain how they interact.

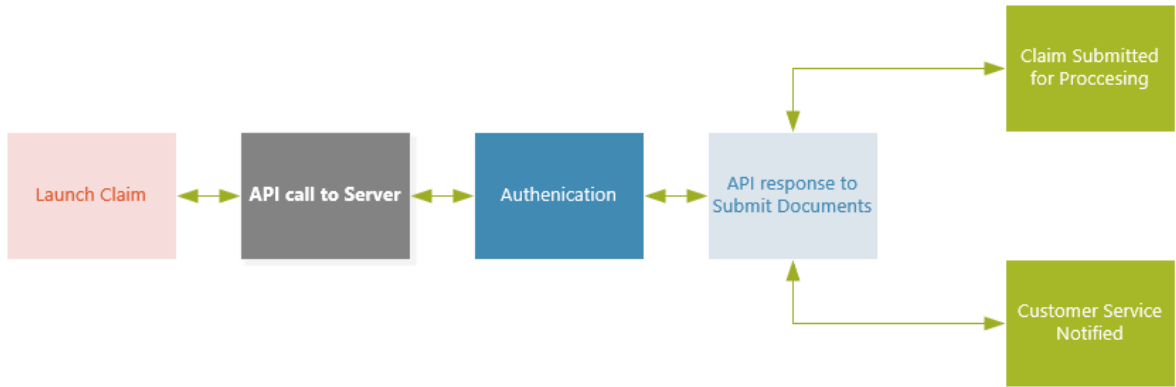


Figure 2: 6 Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.1: Introduction

This research employed a descriptive research design. This research was conducted to examine the motor vehicle problem in Kenya and to develop a prototype for a bot application claim. The purpose of this study is to conduct a case study of the Kenyan insurance sector in order to ascertain the types of electronic claims available in Kenya. As a consequence of the study, a prototype of a bot application was created in order to identify difficulties and solutions for enhancing existing motor insurance claim procedures.

3.2 Target Population of the Study

The population is the subject of statistics. The population, as described by (Ngechu, 2018), is a well-defined or collected collection of people or items under examination. As a result of this definition, the population in question is homogeneous. In terms of "population," the researcher suggests a thorough census of the sample frames.

The Insurance Regulatory Authority of Kenya classifies the population into two categories: all 55 insurance businesses in Kenya and the general public (IRA 2019). Following that is a second category of individuals who have Third Party insurance and complete automobile insurance. When it came to dealing with auto insurance claims, a top management team, senior IT managers, and corporate managers were all considered as critical decision-makers inside their respective firms. In Kenya, the target audience was all 56 IT managers, high-level executives, and operational managers of insurance businesses.

Table 3: 1 Target Population

Target Population	Target Population
Top level management	55
Senior IT managers	55
Operations/Business Managers	55
Total	165

Second Group:Nairobi County was intentionally chosen due to the presence of insurance businesses in the area. Nairobi County has a sizable insurance population due to its urban location. Nairobi County has a population of 5,397 million people National Statistical Bureau of Kenya, 2020), and 67,6 percent of adults utilize formal financial services in some capacity (Financial Sector Deepening, 2014). 35.9 percent of the 66.7 percent have acquired insurance policies (Financial Sector Deepening, 2013).

3.3.5 Sample Size and Sampling Procedure

While the size of the sample is specified, it refers to the total number of population units taken into account when selecting the sample (Cooper, 2018). As the name implies, the target population is physically represented and includes all possible units in a sample. Participants are selected from a pool of 165 managers (Top level management, Senior IT managers and Business Managers). Cooper and Schindler feel that properly chosen samples of between 15% and 35% of the population are reliable.

The Cochran method may be used to find the optimal sample size for a particular level of precision, desired level of trust, and projected population percentage.

The Cochran formula is:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where:

e is the desired level of precision (i.e. the margin of error),

p is the (estimated) proportion of the population which has the attribute in question,

q is 1 – p.

The z-value is found in a Z table.

Assuming that 70 % of the target population know about Mobile app Technology then n0

$$N_0 = \frac{(1.96)^2 (0.7)(0.3)}{(0.05)^2} = 322$$

In Smaller Populations Modification for the Cochran Formula for the Sample Size is calculated by using this equation

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Here n_0 is Cochran's sample size recommendation, N is the population size, and n is the new, adjusted sample size. Thus for the first group

$$322 / (1 + (321 / 165)) = 108$$

The sample size is split into three categories: top management, senior IT managers, and business managers. Kothari & Garg (2014) recommend using simple random stratified sampling because it is trustworthy, generally available, and can be divided into appropriate strata, as well as because it increases comparability and representation across strata. Due to stratified sampling, it is possible for the sample to contain subgroups that would otherwise be totally overlooked due to their small population size under other sampling methods. Table 3.2 details the sample size.

Table 3: 2 Sample Size

Sample Size	Sample Size
Top level management	36
Senior IT managers	36
Business Managers	36
Total	108

The second group the precision level that was selected is 10 meaning that the researcher can be sure that if the same questions are asked to the entire population ± 10 percent was chosen for that

answer. For this research the confidence level used will be 95%. As this research is working with a large population of motor insurance policy holders, the sample formula developed by Cochran (1977) to yield a representative sample for proportions was used as per previous group.

Using the online sample size calculator this yielded a sample of 97 based on Cochran's formula. To identify the individuals to be interviewed the researcher will choose a purposive sampling method called a respondent-driven sampling

This means that the respondents were obtained through referrals made by other respondents, which is a network based method. This technique was used because it is a low cost method of finding respondents who fit the criteria used in selecting the individuals to question (respondents to be motor insurance policy holders who have been in a vehicle accident and had attempted to file for insurance claims).

3.3.6 Sampling Techniques

Because each member of the population is equally likely to participate in the sample, the researcher employed a basic random sampling method and a purposeful sampling technique known as respondent-led sampling.

As a precaution, the questionnaire will be distributed to a large number of respondents based on their insurance companies, and some respondents in public areas will be sought to ensure that the survey covers a diverse range of businesses.

3.5 Data collection

3.5.1 Research Instrument

A questionnaire served as the researcher's primary data gathering technique. As an alternative to verbal or telephone surveys, questionnaires are being explored since they are less expensive and may feature predefined responses that simplify data collection. It was created and distributed to all insurers that replied to the survey. To collect data, several sections of the questionnaire were employed. It was separated into two portions, one devoted to the background information of respondents and another to the research aspects. According to Sekaran, "questionnaires" may be utilized for both descriptive and explanatory research (2011) This descriptive research employs an attitude and opinion questionnaire as well as a questionnaire on organizational procedures to discover and characterize diversity in a variety of scenarios. To develop and execute the social

media prototype, it is critical to collect data via these means since they give a more complete picture of the reaction required of the research subject.

3.5.2 Pilot testing

The researcher conducted a pilot test to discover design and equipment problems and to provide proxy data for the probability sample selection process. To evaluate the study equipment, the researcher selected a six-person pilot group from the 0.9 percent target population. The most critical factor affecting validity and reliability was the data collection equipment.

3.5.3 Validity of the instruments

Validity is a term that relates to the degree to which test items correctly represent the test's content. According to Somekh (2006), 'content validity' refers to the degree to which data obtained by an instrument accurately reflects a certain topic or idea. It was decided that expert help would be sought based on the representativeness and relevance of the questions and the suggestions for improving the design of the research instruments. The researcher will consult with experts in the field to determine the study instrument's validity. As a result, the data obtained will have a higher degree of content validity. Finally, it aided in the revision and modification of the research instrument, therefore increasing its validity.

3.5.4 Reliability of the instruments

To increase a measure's dependability, it is important to incorporate a large number of relevant variables, to assess a large number of people, and to employ well-known test procedures. The researchers recruited a pilot group of six members of the target population to assess the study instruments' reliability. The instrument's dependability was determined using internal coherence criteria such as Cronbach's Alpha. The alpha value increases as the amount of reliability increases. A reliability rating of 0.7 to 0.8 is typically accepted as a realistic guideline, whereas 0.9 or above is regarded exceptional. The pilot data were not included in the main study effort because they were deemed preliminary.

3.5.5 Data collection procedure

As a result, the researchers sent questionnaires to insurance brokers and policyholders. Research assistants supported the researcher in collecting data. During training, research assistants were acquainted with and anticipated the study's objectives. Throughout their training, the research assistants learned about the various components of the questionnaire and how to engage with respondents. Respondents can complete self-administered surveys at their own speed. By providing respondents time to consider their responses, they alleviate some of the burden on responders (Monsen , 2019).

3.6 Data Analysis and Presentation

The questions were extensively checked prior to being coded and loaded into the program (Statistical Package for Social Sciences). The study gathered both qualitative and quantitative data. Description statistics were used to examine both quantitative and qualitative data. To generate descriptive statistics from survey data, the computer program SPSS 21.0 (Statistical Package for Social Sciences) was used. This program provides extensive data handling capabilities and a variety of statistical analysis approaches for analyzing small to extremely large amounts of data (Bell,2018). Central trends and variability can be more easily calculated using descriptive statistics (Bell, 2018). Descriptive analyses are critical as the foundation for correlational and experimental research, since they provide topics for future investigation. Qualitative data were analyzed using content analysis.

They then showed quantitative data results as frequency tables, diagrams, and bar graphs since they are user-friendly and provide a graphical representation of the numerous responses supplied by respondents. Qualitative data were analyzed and presented in a descriptive manner.

3.3.7 Data Collection Methods

The data collection methods selected were interviews, mail questionnaires and document reviews. Personal interviews will be conducted while speaking to the insurance staff and the police officer, while mail questionnaires will be sent to insurance policy holders along with the mobile application by email. Document reviews were also carried out to investigate the motor insurance claim requirements by various insurance companies. The data collected through the above methods

is vital for the design and implementation for the claims Mobile application Prototype since it provides a better picture of the solution needed for the research problem.

3.8 System Analysis and Design

SAD is a key step in the software development lifecycle. The analysis and design processes were carried out using an object-oriented methodology. After conducting an in-depth analysis of present operations and determining system requirements, a functional system model was developed. It was used to develop a working model of the real-world system that was used to implement it. The software development technologies, the overall structure, and the product specifications were all developed during this stage.

Numerous tools, techniques, and models were used to document and evaluate existing operations and new user demands in order to establish a format for the new system (Bhushan, 2019). It was agreed upon during the system design process in terms of hardware and software, network infrastructure, and user interface. System analysis offers critical information on how the system operates in accordance with the requirements (Bhushan, 2019). The primary tools for system analysis and design are as follows:

- i. Use Case diagram and Context Diagram.
- ii. Data Flow Diagram (DFD).
- iii. Entity relationship diagram (ERD).

3.8.1 Use Case Design

The use-case diagrams depicted the interactions between a software application system and the end user, as well as any other system that interacts with the program. This case diagram is used to define and grasp changes in the requirements for the software application system. These case diagrams are a critical component of any research or design of object-oriented systems (Dennis et al., 2015).

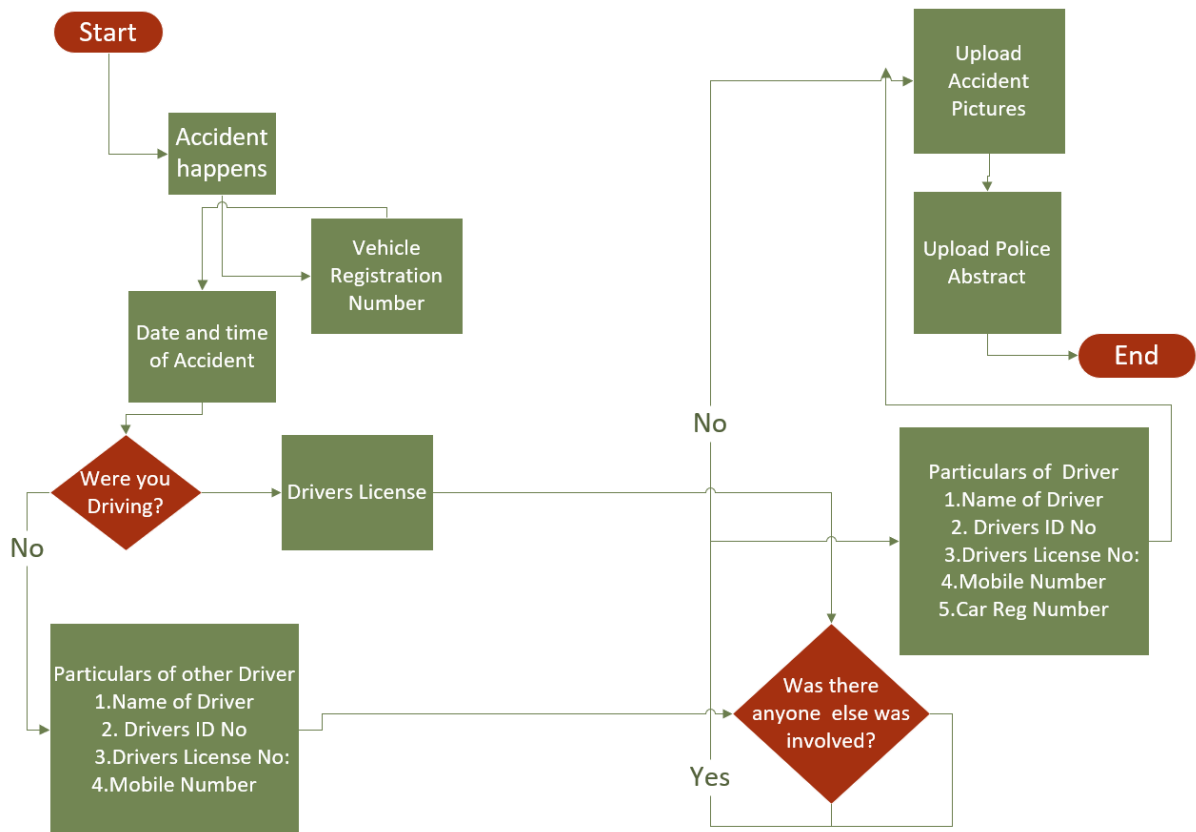


Figure 3: 1 Case Design

3.8.2 Design Class Diagram

Design class diagrams are used to create a vocabulary to be used by both the researcher and users. These design class diagrams normally represent the things, ideas or concepts that are contained in the application (Dennis, Wixom, & Tegarden, 2015). In this case for example, the design class diagram contained classes that represent things such as policy holders, claims, witnesses, vehicles and so on. The class diagram also describes the relationships among the classes.

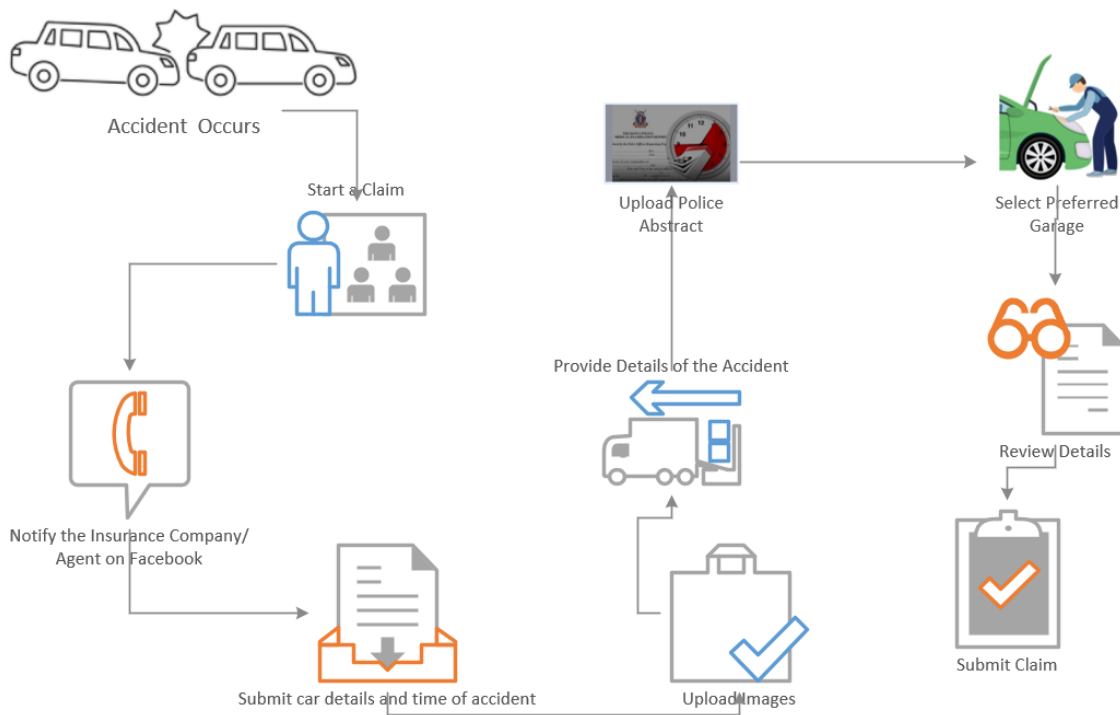


Figure 3: 2 Design Class Diagram

3.8.3 Entity Relationship Diagram

Entity Relationship Diagram was used to provide a pictorial representation of the database design. Entities and attributes that will be needed to initiate motor insurance claims using the mobile application database will be established to produce the entity relationship diagram. The diagram will also demonstrate the maximum and minimum times that an entity occurrence can exist in a relationship, for example, a policy holder can submit zero or more claims (Ward & Dafoulas, 2016).

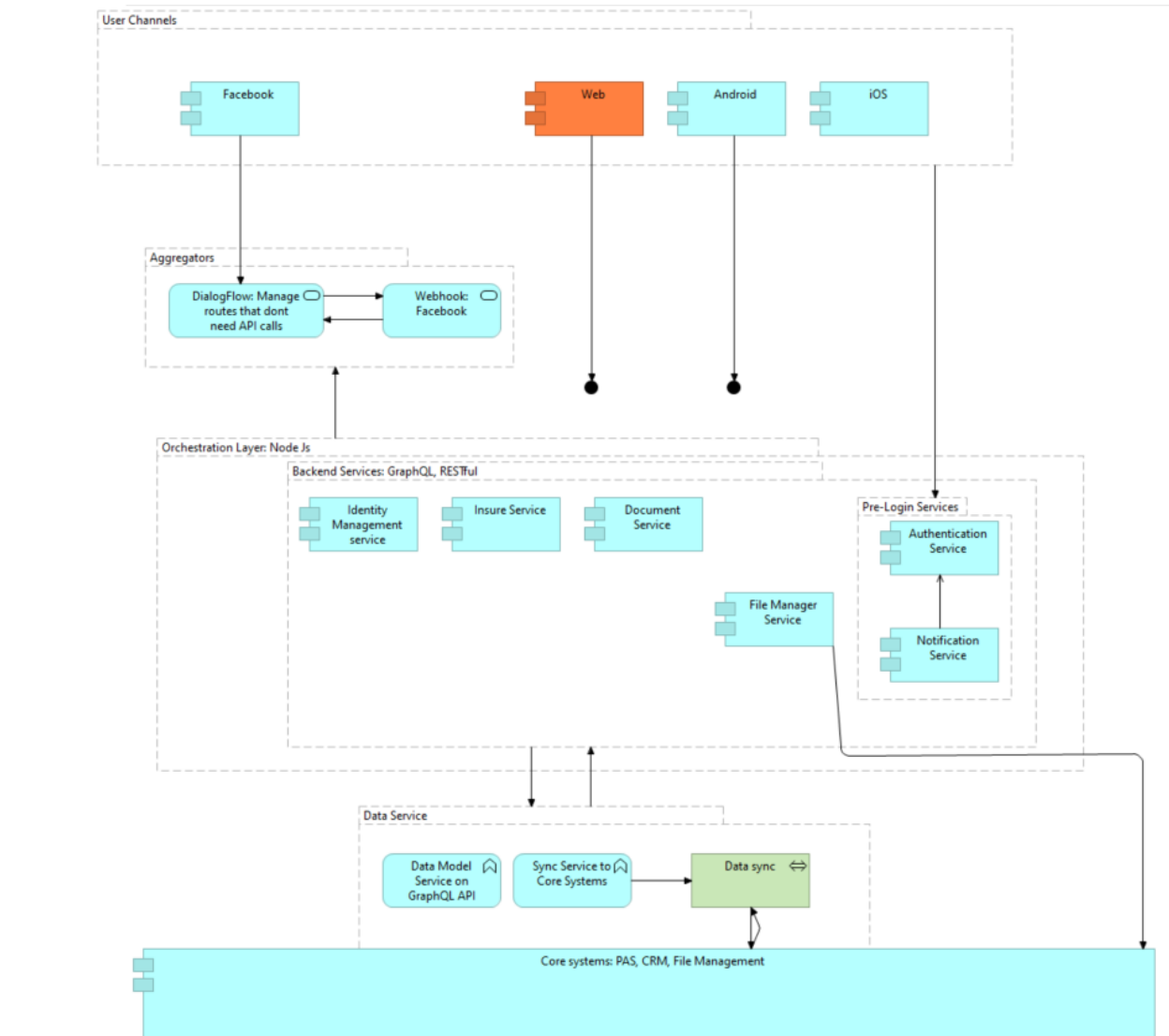


Figure 3: 3 Entity Relationship Diagram

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

Additionally, this chapter includes field data, analysis, and final interpretation of motor vehicle claim findings in Kenya, as well as the creation of a prototype claims system for mobile applications. Visual appeal is achieved by the use of tables, graphs, and diagrams.

4.2 Response Rate

(88 percent) of the 205 respondents completed the questionnaires in the study. Although the response rate is high, Mugenda & Mugenda (2003) define acceptable as 50% of analyses and reports, good as 60%, and noteworthy as 70% or higher. This was a reasonable and representative pricing. The following is an illustration of the study response rate in the form of a pie chart:

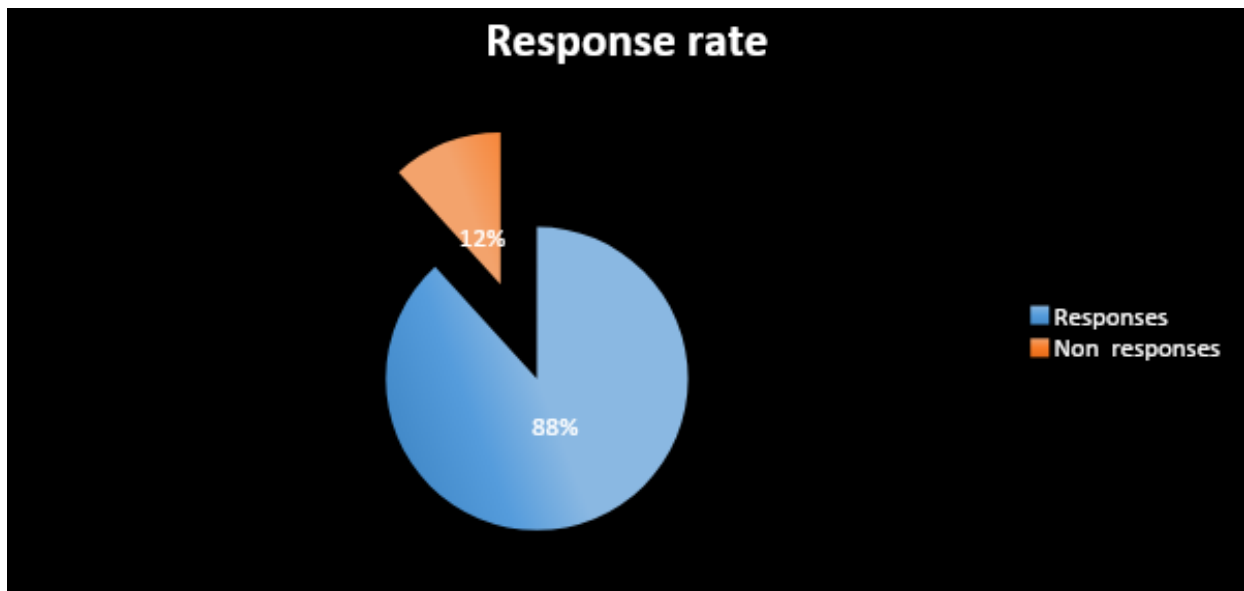


Figure 4: 1 Response Rate

4.3. Background information of the Respondents

The goal of the study was to evaluate the population of all respondents who were selected to contribute in the survey..

Table 4: 1 Background Information of the Respondents

	Frequency	Percent
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Gender		
---------------	--	--

Male	101	53%
Female	89	47%
Total	190	100

Age		
------------	--	--

Below 25	2	1%
26 – 30	5	3%
31– 35	29	15%
36 – 40	42	22%
41– 45	81	43%
Above 50	31	16%
Total	190	100%

Level of Education		
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	Frequency	Percent
O- Level	11	6%
Certificate holder	34	18%
Diploma holder	76	40%
Undergraduate First Degree	47	25%
Postgraduate Degree	22	12%
Total	190	100%

Job title		
------------------	--	--

	Frequency	Percent
Business manager	23	25%
Senior IT manager	49	53%
Top level manager	21	23%
Total	93	100%

Length of time worked		
	Frequency	Percent
Up to 1 yr	4	4%
1 – 5	13	14%
6 – 10	52	56%
11– 15	17	18%
Over 15 years	7	8%
Total	93	100%

According to the statistics above, 47% of those surveyed were female, while 53% were male. Despite the majority of respondents being men, there was no evidence of sexual prejudice.

1% of respondents were under the age of 25, 3% were between the ages of 26 and 30, 16% were between the ages of 31 and 35, 15% were between the ages of 36 and 40, the majority (43%) were between the ages of 41 and 45, and 16% were over the age of 51. Because all relevant employees were invited to participate, a representative sample of opinions was obtained. According to the study, 40% of respondents held a diploma, while 25% held a bachelor's degree. Approximately one-eighth of those surveyed were certified, and approximately one-twelfth completed the survey. This means that all respondents' perspectives, regardless of their educational background, were considered. The respondents had an average tenure of six years in the insurance industry in Kenya. In the industry, 4% were under the age of one, 14% were between the ages of one and five, 56%

were between the ages of six and ten, and 18% were between the ages of eleven and fifteen. There were 53% of people in high-level IT jobs, 25% in management positions, and the remainder in top-level management positions (23 percent). As a result of their job title and responsibilities, the majority of respondents were able to respond to the study's questions.

4.4 Feedback from Insurance customers

The answers to these questions represent the amount of time and kind of insurance covered by the responders. In order to determine if insurance firms have an electronic system for claim filing, the researcher examined the effectiveness of the electronic system in processing claims. This was followed by an examination of consumer strategies for submitting claims on the basis of average and standard deviation following an accident.

4.4.1 Length of Time Held an Insurance Cover

The study sought to find out the length of time the respondents have held an insurance cover (in years)?

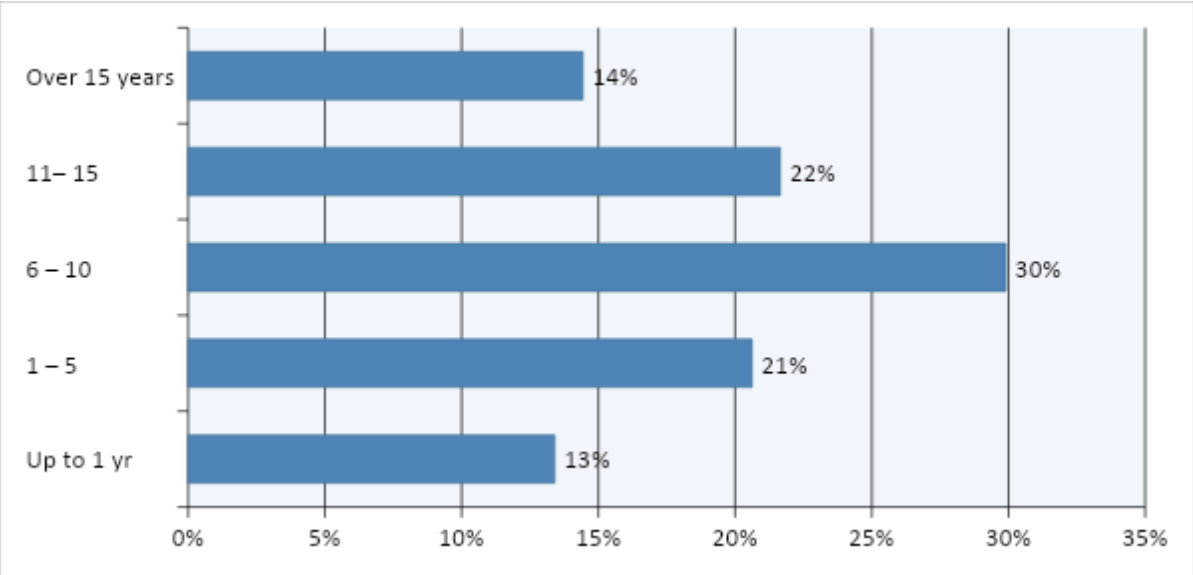


Figure 4: 2 Length of Time Held an Insurance Cover

An insurance policy has been kept by 13 percent of respondents for less than a year, 21 percent for one to five years, 30 percent from six to ten years, 22 percent from eleven to fifteen years, and 14 % for more than fifteen years.

4.4.2 Type of insurance cover

The study further asked the respondents to describe their insurance cover.

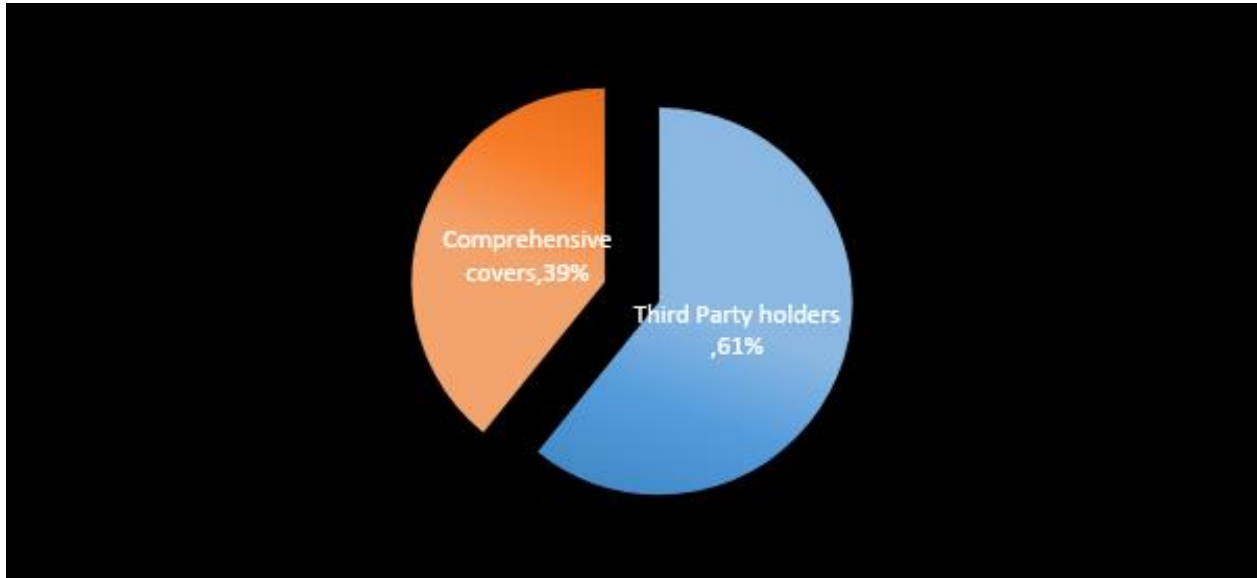


Figure 4: 3 Type of insurance cover

4.4.3 Electronic claims processing modes

The majority (61% of respondents) had coverage from a third party, while 39% had complete coverage. Perhaps because it's cheaper than complete coverage

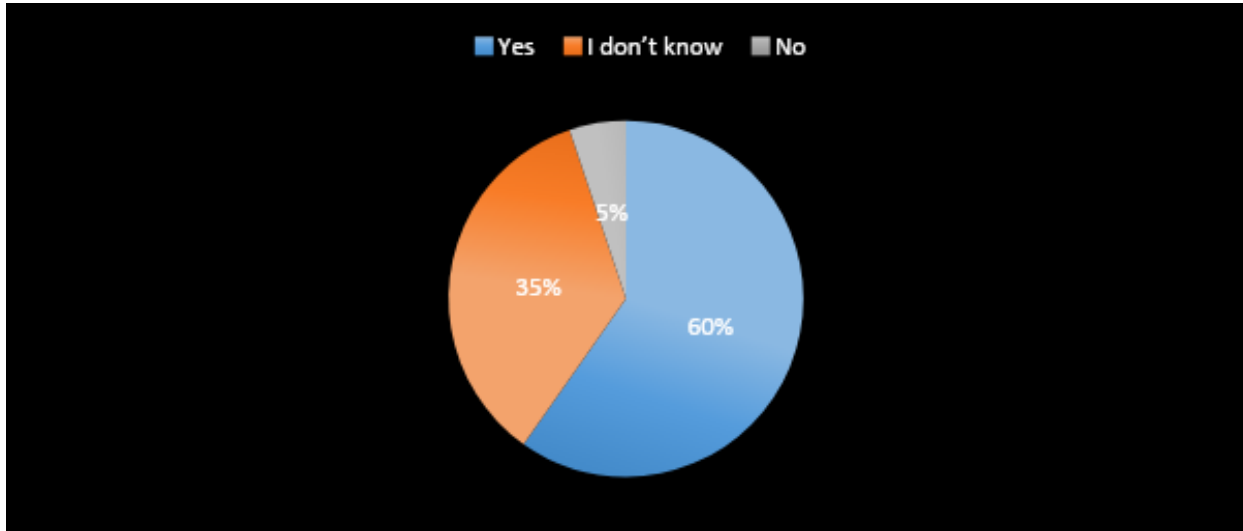


Figure 4: 4 Electronic claims processing modes

The bulk of insurance firms (60 percent) process claims electronically. 35% of respondents were unaware that their insurance carrier offered e-claims, while the remaining 5% said that e-claims was not accessible. Additionally, respondents were asked to choose their preferred electronic means.

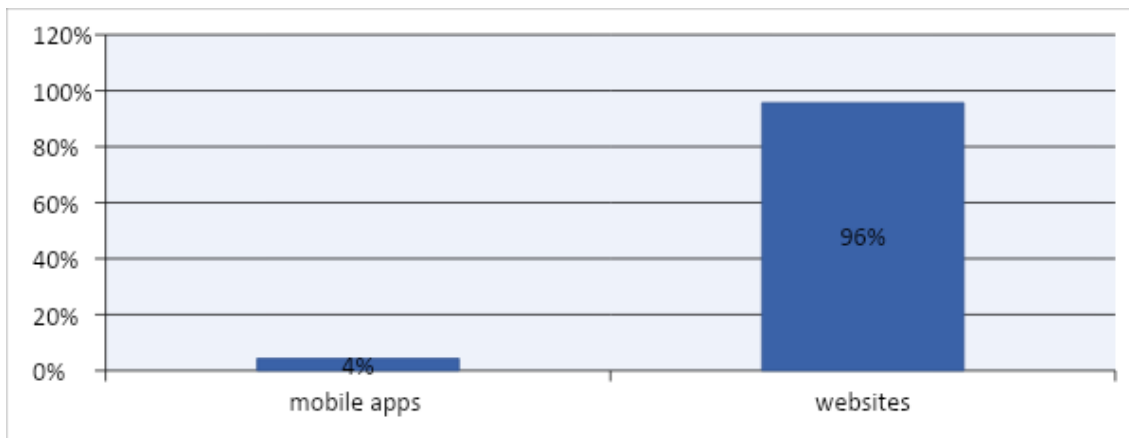


Figure 4: 5 Available Electronic Means

96 percent of respondents indicated that websites were an accessible electronic claim processing approach, whereas 4% indicated that mobile applications were an accessible electronic claim

processing methodology. As a result, the insurance industry's battle to become digital is intensifying.

4.4.4 Effectiveness of electronic systems

The respondents were further asked to rank the electronic system effectiveness, in terms of claims processing.

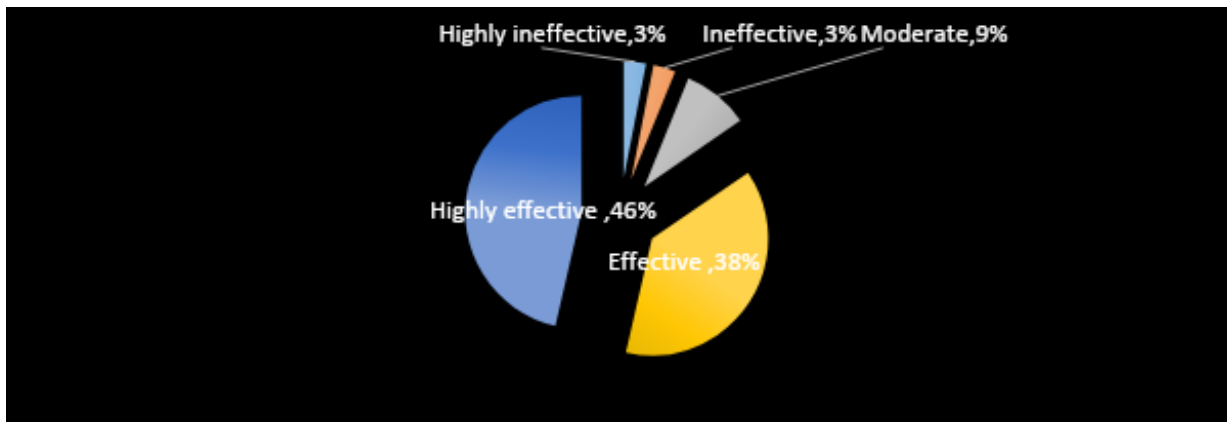


Figure 4: 6 Effectiveness Of Electronic Systems

Concerning how the respondents would rank the electronic system provided by their insurance companies in terms of claims processing, 47% of the respondents ranked the system as highly effective, 38% of the respondents ranked the system as effective, 9% of the respondents ranked the system as moderate, 3% of the respondents ranked the system as ineffective, while as another 3% of the respondents ranked the system as highly ineffective.

The above findings clearly show that most insurance companies have an effective electronic system for claims processing. It is therefore possible that the computer systems are not optimally used. If this is the case, the systems should assist claims staff to expeditiously process and settle claims.

4.4.5 How to Submit Claims after an Accident

The study sought to establish where the respondents get information about how to submit claims after an accident.

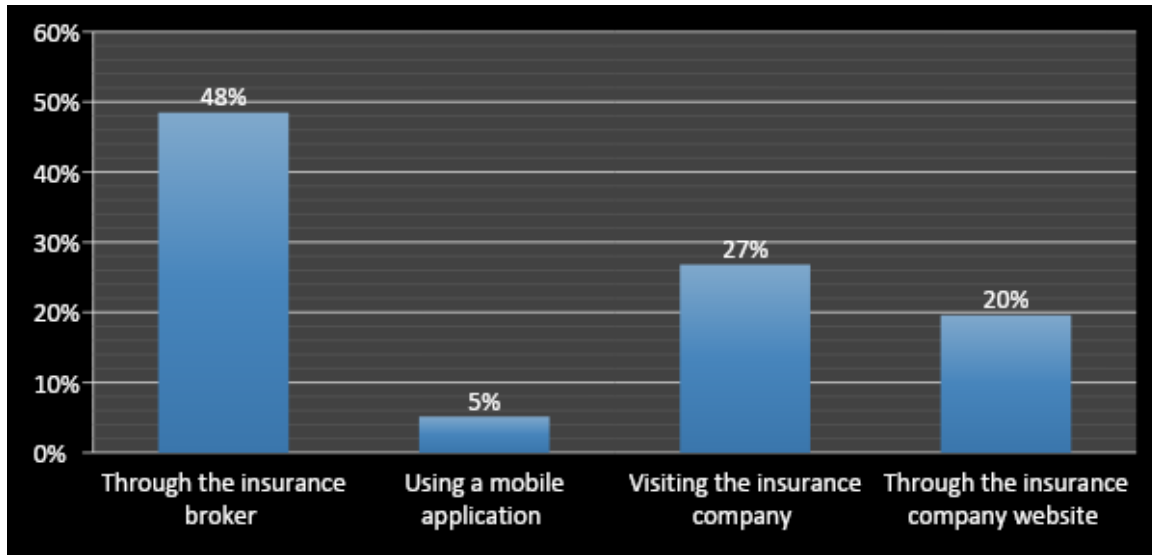


Figure 4: 7 How to Submit Claims after an Accident

From the study findings majority (48%) of the customers get information about how to submit claims after an accident through the insurance broker, 5% of the customers get information about how to submit claims after an accident by Using a mobile application, 20% Through the insurance company website and 27% by visiting the insurance company.

With the continued increase in mobile penetration in Kenya, now at a level of 88.1 percent (Communication Authority of Kenya, 2015), financial institutions, including insurance companies, have taken the opportunity to provide some of their services via mobile applications. This gives them a marketing platform and provides their customers with easier access to their services. The use of mobile phones to handle transactions improves the efficiency of service delivery by these institutions and gives them a good reputation in the market (American Telephone & Telegraph, 2009).

4.4.6 Social Media Integrated Mobile Application Option

The investigation was done to see whether they could submit insurance claims using their social media platform..

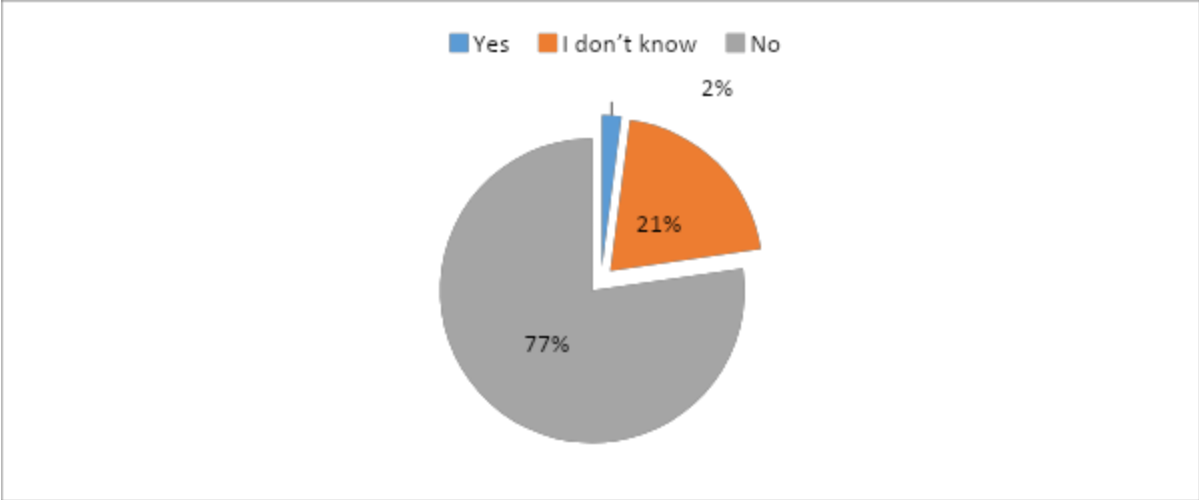


Figure 4: 8 Social Media Integrated Mobile Application Option

Only 2 percent of respondents said they had a way to make insurance claims via social media, while 77percent said they did not. Another 21percent didn't know whether they had an option.

Their social media profiles can be linked with their claims if they so want.83% Yes 12% No 5% it Doesn't matter

The study sought to establish whether the respondents would like to have claims integrated through their social media accounts.

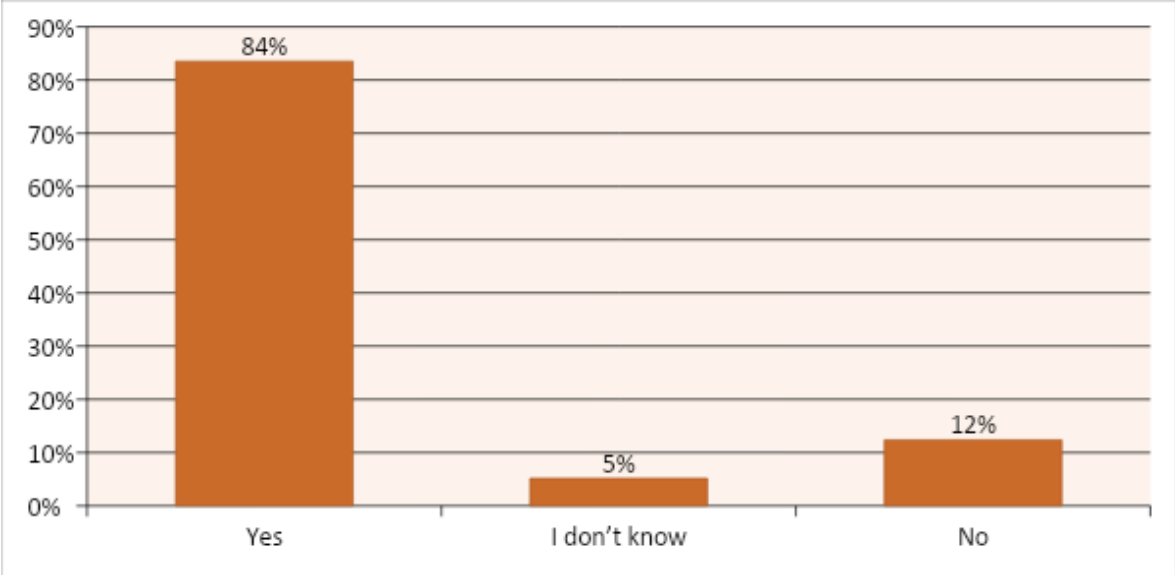


Figure 4: 9 Claims Integrated Through Their Social Media Accounts

It was established from the study that the majority of the respondents (83%) would consider using a social media Integrated application to submit their motor vehicle claim, 12% of the respondents indicated would not consider using a social media Integrated application to submit their motor vehicle claim, while as 5% of the respondents did not know whether they would like to have claims integrated through their social media accounts or not . When asked why they indicated that a mobile application would make the process timesaving, more efficient, more convenient, and less tedious. Some also stated that the use of a mobile application would improve the accuracy of the information provided regarding the accident.

4.5 Feedback from the Insurance Companies

4.5.1 Electronic claims processing modes

The purpose of the study was to determine the availability of electronic claims processing options in insurance firms.

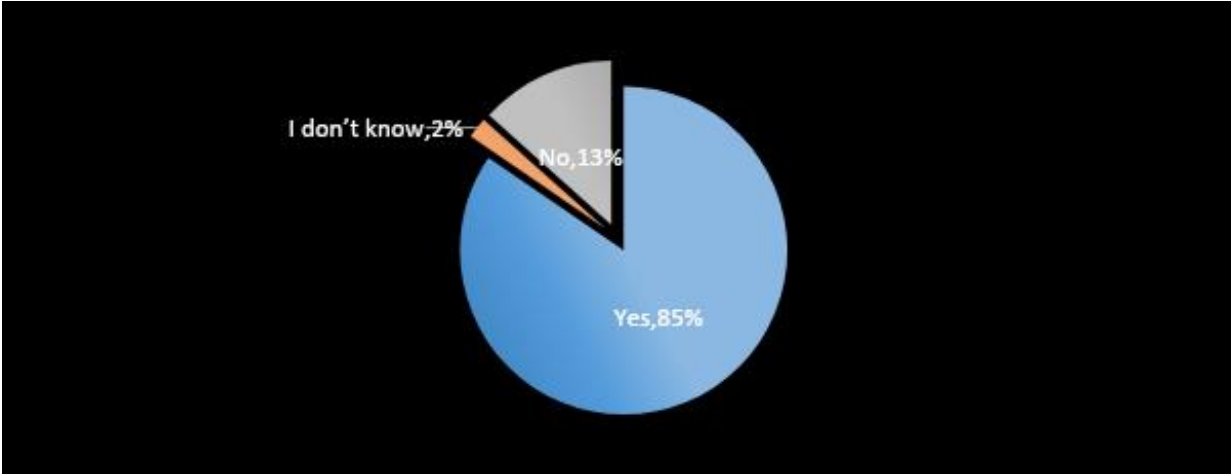


Figure 4: 10 Electronic Claims Processing Modes

The poll found that the majority of insurance companies’ 85 percent have established online insurance claims for motor vehicles, while 13percent have not yet done so. According to research, their customers have a variety of options when filing insurance claims, as seen in the figure below.

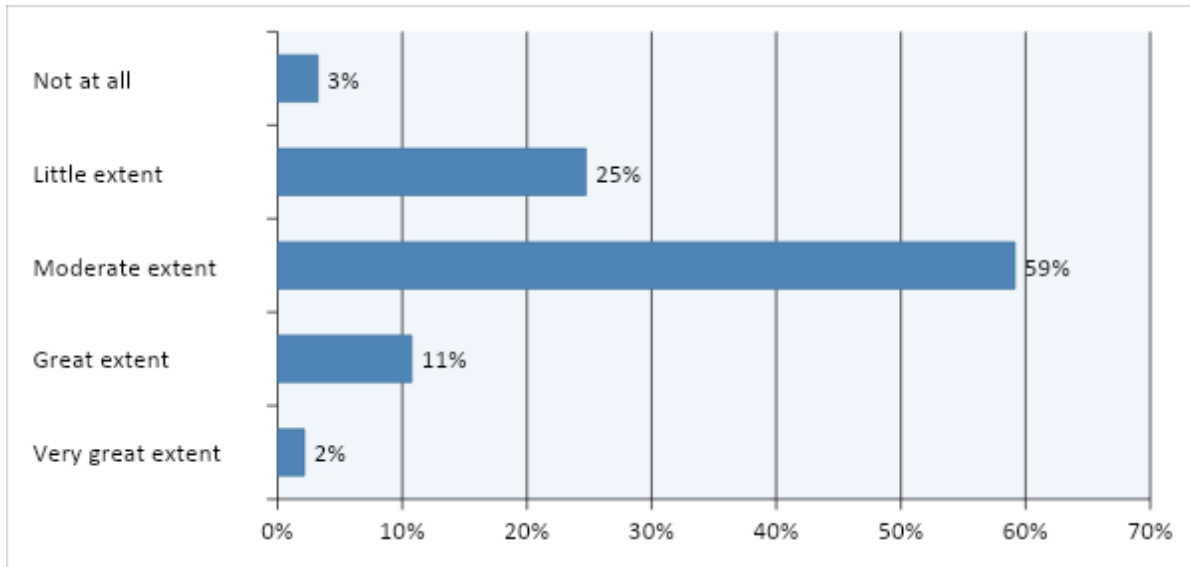


Figure 4: 11 Extent To Which Their Customers Make Use Of The Available Modes

The majority (58 percent) stated that their clients submit motor vehicle insurance claims electronically.

4.5.2 Existence of Electronic modes integrated with the Social media Platforms

The study sought to find out whether the existing electronic modes of making motor vehicle insurance claims are integrated with the Social media Platforms

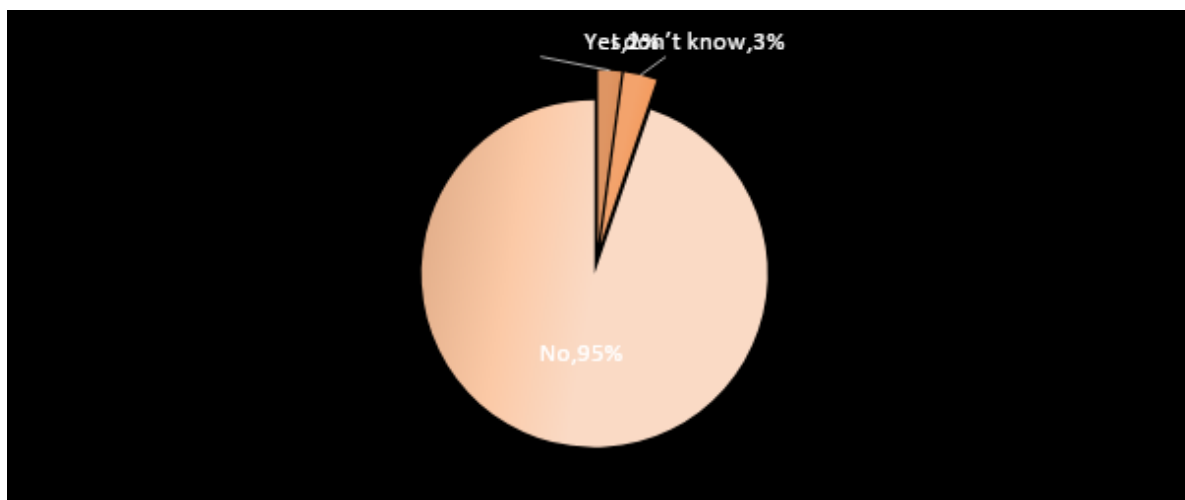


Figure 4: 12 Existence of Electronic modes integrated with the Social media Platforms

The poll found that just 2% of respondents believed that motor vehicle insurance claims could be submitted electronically via Social Media Platforms. According to the great majority of respondents (95 percent), motor vehicle insurance claims can't be submitted electronically using Social Media Platforms.

4.5.3 Effectiveness Social Media Integrated Mobile Application Option

The study sought to establish how effective a social media integrated mobile application would be in terms of submitting their motor vehicle claim.

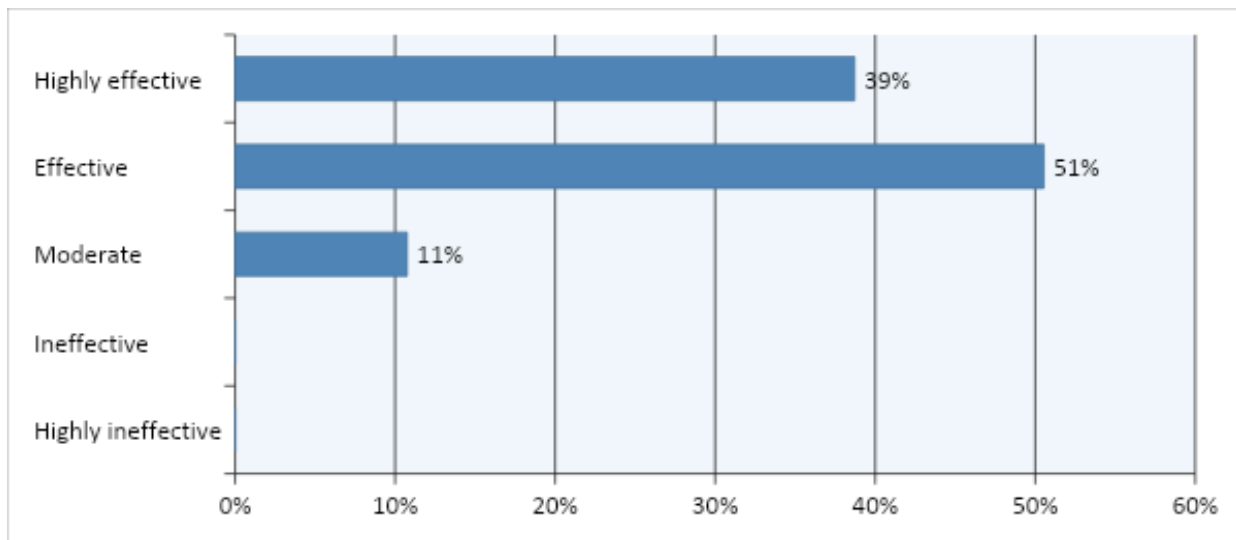


Figure 4: 13 Effectiveness Social Media Integrated Mobile Application Option

For insurance companies, 39 percent said it was highly successful, 51 percent said it was effective, and 11 percent said it was moderate in terms of producing sufficient claims using the suggested social media integrated mobile application.

4.5.4 Challenges in making insurance claims electronically in Kenya

The study computed the mean and standard deviation to rate the extent to which the respondents' face the stated challenges when making insurance claims electronically in their insurance companies. (where 5= Very great extent, 4= Great extent, 3= Moderate extent, 2= Low extent and 1= No extent at all)

Table 4: 2 Challenges in making insurance claims electronically in Kenya

Challenges	Mean	Std Dev
Very Many different apps for making motor insurance Claims	3.419	1.60

Limited existing means to Launching claims via Social media Platforms	4.726	1.14
Insurance Culture in Kenya does not support innovation	2.904	1.69
No responses and tracking from Insurance Companies when making the claims	2.137	0.97
Time taken to fill the claims	4.304	1.42
Remember Logins to the different Insurance Applications	3.811	1.06
System Availability	3.294	0.55
Complex process user experience and Perception	3.419	1.82
System integration to backend systems	3.726	1.20
Inclusion of Public Opinion or comments while making the motor insurance claim	2.904	1.08

As seen by the respondents' mean score of 3,419, they agreed that a car insurance claim may be submitted in a variety of various ways. As indicated by an average of 4,726 out of 10, the majority of respondents agreed that there are few sought options via social media sites. With an average score of 2.904, respondents agreed to a considerable extent that the insurance culture in Kenya discourages innovation and that sales and business teams are antagonistic. When asked whether insurance firms failed to react to or comply with claims, respondents agreed to a low degree, averaging 2.135 out of 100. As evidenced by a mean score of 4,304, respondents felt that the customer takes an excessive amount of time to resolve disputes. According to a mean of 3,811, respondents said that recalling links to multiple insurance applications was very tough. Due to the high degree of agreement, the average score for system availability was 3,294. The respondents concurred on a high level of experience and impression of difficult processes, as evidenced by the median score of 3.419. Participants in the survey agreed on the importance of system integration with backend systems, as shown by an average score of 3,726 out of 10. A mean of 2.904 indicates that respondents strongly agreed that public opinion or statements should be included in a car insurance claim.

4.5.4 Challenges that can be resolved by the Integration social media platform

The research attempted to identify the problems to be overcome through the integration of social media platforms.

Table 4: 3 Challenges That Can Be Resolved By The Integration Social Media Platform

	F	%
Limited existing means to Launching claims via Social media Platforms	72	74%
No responses and tracking from Insurance Companies when making the claims	68	70%
Very Many different apps for making motor insurance Claims	70	72%
System accessibility	83	86%
Remember Logins to the different Insurance Applications	59	61%

74 percent of respondents believe that social media integration would resolve the issue of restricted means of making claims on social media platforms. 70percent of respondents indicated that integrating with social media platforms resolved the issue of insurance businesses failing to respond to or track claims, and 72percent stated that integrating with social media platforms resolved the issue of several separate applications for vehicle insurance claims. 94 percent of respondents indicated that integrating with a social media platform would resolve the issue of missing or lost claim documents; 86 percent indicated that integrating with a social media platform would resolve a system-accessibility challenge; and 61percent indicated that integrating with a social media platform would resolve a system-accessibility challenge.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

Numerous unique applications are identified as key issues in Kenya's motor vehicle claims industry. Among these are a dearth of existing mechanisms for initiating claims via social media platforms, as well as a dearth of responses and tracking from insurance carriers.

To demonstrate its efficacy, a social media conversation bot was created and connected to the insurance firms verified social media platforms. According to the research findings, an insurance company's reputation is determined by how they handle claims.

The project's applicability has been established through the development and integration of a Social Media Chat Bot with the insurance company's social media platform. This study has practical implications for insurance firms operating in Kenya, particularly operations and claims managers responsible for preserving their brand image through appropriate claim processing. To automate the claim process, bot software would need to communicate with the automobile's cameras and sensors, which would involve more effort. If this commission continues in this direction, it may establish rules that encourage the adoption of social media-integrated claim management systems.

APPENDICES

Appendix i: Letter of Introduction to Respondents

Antony Nderitu Kaguthai

(P54/6593/2017)

To whom it may concern,

Dear Sir/Madam

REF: REQUEST FOR RESEARCH DATA

Students at Nairobi University, including me, are pursuing an MSITM degree. I count myself among them. Your firm has been selected to participate as a result of my research on "Kenya's difficulty with motor vehicle claims and the development of a prototype of bot request claims." To assist with data gathering for this project, please locate an attached questionnaire. Each piece of information you give will be kept completely confidential as part of this study. Your identity will be omitted from the final report. On request, you will receive a copy of the thesis. We appreciate your assistance, cooperation, and candid responses in advance.

Yours faithfully,

.....

Antony Nderitu Kaguthai

Appendix iv: List Of Insurance Companies In Kenya.

- 1 AAR Insurance Company Limited
- 2 Africa Merchant Assurance Company Limited
- 3 AIG Kenya Insurance Company Limited
- 4 Allianz Insurance Company of Kenya Limited
- 5 APA Insurance Limited
- 6 APA Life Assurance Company Limited
- 7 Barclays Life Assurance Kenya Limited
- 8 Britam General Insurance Company (K) Limited
- 9 Britam Life Assurance Company (K) Limited
- 10 Metropolitan Cannon General Insurance Company Limited
- 11 Capex Life Assurance Company Limited
- 12 CIC General Insurance Company Limited
- 13 CIC Life Assurance Company Limited
- 14 Corporate Insurance Company Limited
- 15 Directline Assurance Company Limited
- 16 Fidelity Shield Insurance Company Limited
- 17 First Assurance Company Limited
- 18 GA Insurance Limited
- 19 GA Life Assurance Limited
- 20 Geminia Insurance Company Limited
- 21 ICEA LION General Insurance Company Limited
- 22 ICEA LION Life Assurance Company Limited
- 23 Intra Africa Assurance Company Limited
- 24 Invesco Assurance Company Limited
- 25 Kenindia Assurance Company Limited
- 26 Kenya Orient Insurance Limited
- 27 Kenya Orient Life Assurance Limited
- 28 KUSCCO Mutual Assurance Limited
- 29 Liberty Life Assurance Kenya Limited
- 30 Madison Insurance Company Kenya Limited
- 31 Madison General Insurance Kenya Limited
- 32 Mayfair Insurance Company Limited
- 33 Metropolitan Cannon Life Assurance Limited
- 34 Occidental Insurance Company Limited
- 35 Old Mutual Assurance Company Limited
- 36 Pacis Insurance Company Limited
- 37 MUA Insurance (Kenya) Limited
- 38 Pioneer General Insurance Company Limited
- 39 Pioneer Assurance Company Limited
- 40 Prudential Life Assurance Company Limited

- 41 Resolution Insurance Company Limited
- 42 Saham Assurance Company Kenya Limited
- 43 Sanlam General Insurance Company Limited
- 44 Sanlam Life Insurance Company Limited
- 45 Takaful Insurance of Africa Limited
- 46 Tausi Assurance Company Limited
- 47 The Heritage Insurance Company Limited
- 48 The Jubilee Insurance Company of Kenya Limited
- 49 The Kenyan Alliance Insurance Company Limited
- 50 The Monarch Insurance Company Limited
- 51 The Monarch Assurance Company Limited
- 52 UAP Insurance Company Limited
- 53 UAP Insurance Company Limited
- 54 UAP Life Assurance Limited
- 55 Xplico Insurance Company Limited

Source: (Insurance Regulatory Authority of Kenya 2019)