AN INVESTIGATION ON CLAIMS HANDLING PROCESSES:

A CASE OF ZAMBIAN INSURANCE COMPANIES

by

KARLOS BUSIKU JERE

A DISSERTATION SUBMITTED TO THE UNIVERSITY OF ZAMBIA IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE DEGREE OF MASTER OF ENGINEERING DEGREE IN INFORMATION COMMUNICATION TECHNOLOGY SECURITY.

UNIVERSITY OF ZAMBIA

LUSAKA

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DECLARATION

I, **KARLOS BUSIKU JERE**, do hereby solemnly declare that, with exception of quotations and works of others which has been duly referenced and acknowledged herein, this dissertation is as a result of my own work. I further declare that it has never been previously submitted for the award of a degree at any other university.

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CERTIFICATE OF APPROVAL

This dissertation of KARLOS BUSIKU JERE is hereby approved as fulfilling the requirements of the award of the Degree of Master of Engineering in Information and Communications Technology Security by the University of Zambia.

Name	**Signature**	**Date**
……	……	……..
Internal Examiner [1]		
……	……	……..
Internal Examiner [2]		
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Internal Examiner [3]		
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Chairperson of the Board of Examiners		

ABSTRACT

Insurance is a contract of reimbursement against specified risks such as fire, earthquakes, floods, theft. (Mayer 2010). The Zambian Insurance industry has over 40 General Insurance providers, offering Insurance products and services to only 2.8% of the population (I.A.Z, 2018). However, in their efforts to improve on service delivery, Insurance Companies have turned to the use of Internet and Communications Technologies and ecommerce platforms. Despite these initiatives, Insurance Companies are still having challenges with insurance fraud, as it raises their paid out claims budget, resulting in reduced profitability. Other associated negatives are threats to brand loyalty, reputation and customer service. This dissertation sought to investigate the insurance claims management systems and develop a web based application for Insurance Claims Management. A baseline study was conducted, targeting the top 10 Insurance companies and their Clients within the district of Lusaka. The study identified security weaknesses in the insurance claims cycle, primarily, the claims notification, document submission and initial claims processing phases. Given the weaknesses identified by the study, it is not surprising that fraud is prevalent in the industry, as it is a product of inherent security weaknesses in the Insurance claims cycle processes. The researcher sought to address the identified challenges by way of developing a web based application called INSUR AID, to help improve Insurance Claims handling. Results from the study were used to draw up the Systems Requirements Specifications document, upon which INSUR AID Prototype was developed. The study results were peer reviewed by the International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET) and published in the June 2019, publication. (Jere and Banda, 2019).

CERTIFICATION

I hereby certify that the research paper titled: **"AN INVESTIGATION ON CLAIMS HANDLING PROCESSES: A CASE OF ZAMBIAN INSURANCE COMPANIES"** is the original and individual work of KARLOS BUSIKU JERE**.** This has been done under my supervision and is ready for submission for the award of a Degree of Master of Engineering in Information and Communications Technology Security by the University of Zambia.

Signed: _____

Dr. Dani. E. Banda **(**Project Supervisor)

DEDICATION

I dedicate this master's thesis to Jehovah God for giving me the grace to complete it, my dearly cherished wife Mrs. Claire Banda Jere, sons' Karlos Jr and Sylvester. Finally, my parents, Mr & Mrs. Jere, siblings Madaliso, Chipo and Erik for their inspiration and encouragement through the course of the research.

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ACRONYMS AND ABBREVIATIONS

ZISR	Zambia Insurance Sector Report
ZISC	Zambia State Insurance Corporation
PIA	Pensions and Insurance Authority
IAZ	Insurance Association of Zambia
OECD	Organization for Economic Co-operation and Development.
DEC	Drug Enforcement Commission of Zambia
ACC	Anti-Corruption Commission of Zambia
ZP	Zambia Police Service
GDP	Gross Domestic Product
GWP	Gross Written Premium
CEI	Customer Experience Index
MFI	Micro Finance Institutions
CSO	Central Statists Office
ISO	International Organization for Standardization
ZABS	Zambia Bureau of Standards
ERP	Enterprise Resource Planning

CHAPTER ONE

1.0 Introduction

Insurance is a contract of reimbursement against specified risks such as fire, earthquakes, floods, theft. (Mayer 2010). It is the desire of every business, irrespective of service type to offer clients, products and services that are high in quality, having a high degree of customer acceptance and satisfaction and very efficient in resource utilization. In an effort to improve on service delivery, Insurance Companies have turned to the use of Internet and Communications Technology and Ecommerce platforms and International Standards (Karapetrovic and Willborn 2012). By definition, International standards are simply technical standards or guidelines, developed by international organizations, such as the World Health Organization Guidelines in health, or ITU Recommendations in ICT. These guidelines are available free of charge, for consideration and use worldwide. Standards are aimed at equipping society with tools to bring about efficiency in operations, safety, create and provide high quality goods and services, with high customer acceptance (Wang Ping, 2011).

1.1 Background to the study

The Insurance Industry faces a number of challenges which have compelled Insurance companies to turn to ICT and E-Commerce platforms in mitigation (Jere and Banda, 2019). However, despite adoption of these platforms, insurance companies are still having challenges with fraud. Traditionally, Insurance processes are heavily dependent on human input and characterized by a lot of paper work. This in itself is a major weakness as it is a source of data inconsistencies, and translates to increased operational costs, long claims turnaround times, bad customer service and fraud (Breitmeyer 2015). Insurance is a risk transfer mechanism where the insurer promises to compensate the insured or assured following a financial loss (Twaambo 2014). It is a contract of reimbursement against specified risks such as fire, earthquakes, floods, theft. An Insurer can be defined as a company or person who promises to reimburse.it is a legally binding document, signed between Insurance Company (insurer) and the Policy Holder (insured). It involves the collection of premiums or funds from people that wish to buy insurance policies or packages from Insurance service providers and depositing them into a common pool, to pay off claims. The insured parties are therefore insulated from risk for a fee, with the fee being dependent upon the frequency and

severity of the event occurring, (Grundl et el 2016).There are a number of insurance services being offered such as travel insurance, fire insurance, life insurance, mortgage insurance, health insurance, motor vehicle insurance etc. the policy holder pays premium to the insurance company for relief in times of incidences for which one is insured against e.g. car accidents, fires. (Mayer 2010)

The industry has evolved from the basic batter trading systems of 14th century (Alborn, Timothy 2009), to the more sophisticated systems that we have today. Over the years, the industry has been revolutionized by way of adoption of international standards or quality management approaches, such as Lean management, Six Sigma, Lean Six Sigma, Total Quality Management (TQM), ISO 9001 and ISO 27001, in their business functions (Corbett et el .2010). However, despite these advancements in technology, insurance fraud, bad customer service and high operating costs, characterize the industry (PwC 2018 report). Globally, the insurance sector contributes significantly to countries GDPs. According to (Nayak ET el 2014), the world insurance markets are characterized by annual premiums, insurance concentrations and densities. From revenue perspectives, worldwide insurance premiums were pegged at $3.7 bn. The top five countries i.e. the United Kingdom, France, Germany, Japan and the United States are characterized by high insurance concentrations representing 67.3% of the world premiums. The world reinsurance market is also concentrated with eight countries, namely; Germany, France, Japan, Bermuda, Ireland, United Kingdom and United States representing 89% of global reinsurance premiums. Gross premiums grew on average in both the life and non-life insurance sectors in real terms in 2016. In 2016, gross premiums increased on average by 3.7% in the life sector and 2.0% in the non-life sector among 40 reporting countries (Figure 3). A growth of gross premiums occurred in both life and non-life sectors in 14 of these countries, mainly located in Latin America, North America and Asia (OECD,2017).

The baseline study identified stages in the insurance claim lifecycle were breaches occur and give way to fraud. Insurance fraud can be defined as a deliberate act committed against an insurer or an insurance broker with a view to obtaining a financial benefit and losses are in excess of $40billion, per year (FBI,2018). Insurance fraud is prevalent largely due to inadequate staff training, inadequate control mechanisms in operating structures and processes (Kutemba Chinyemba 2017). Typical examples of Insurance fraud include Premium Diversion, Fee Churning, Asset Diversion,

Car Insurance Fraud, Stolen Car fraud, Accident fraud, Health Insurance Fraud and Staged Home Fires. Anti-fraud section of the Zambia police is in charge of investigations of fraud. In the Zambian context, insurance is characterized by the traditional short term insurance products namely; fire, motor, construction, liability insurance to mention a few areas. Modern insurance in Zambia began around 1968 with the formation of Zambia State Insurance Corporation (ZSIC). Prior to l991, ZSIC enjoyed monopoly in the insurance industry. This was known as Nationalization and it came with its own challenges of human capital lucking technological knowhow. After change of government in 1991, MMD liberalized the economy and ZSIC lost its monopoly.1997 saw the enactment of the Insurance Act, which led to the establishment of the Pensions and Insurance Authority as the regulator. In 2005, the Insurance (Amendment) Act No 26 was passed. That statute gave rise to the to the formation of over 34 general insurance providers offering both life and non-life products. Examples of which include Madison, NICO, PICZ, Goldman, African Grey to mention but a few. Regulation of the Insurance sector in Zambia is done by the PIA (Pensions and Insurance Authority Zambia). The P.I.A was brought into being by an act of Parliament - The Pension Scheme Regulation Act No. 28 of 1996. This piece of legislation, empowers the P.I. A to regulate Insurance companies and their intermediaries such as fund managers, fund administrators, fund custodians, insurance agents, insurance brokers, claims agents or loss adjustors (P.I. A). The P.I.A is also responsible for issuing of guidelines and standards and ensuring that the country's legal environment for the insurance industry is conducive. It is also responsible for sensitizing its staff to adequately deal with financial irregularities such as money laundering, terrorist financing and other serious financial crimes. To adequately deal with financial irregularities, the P.I.A is empowered under the Financial Intelligence Centre Act, No. 46 of 2010. Zambia Bureau of Standards is the only institution in Zambia that provides Standards Certification to industries in Zambia. It gets its mandate from a statutory instrument, namely; the standards Act No.4 of 2017 [ZambiaLII, 2019]. ZABS also provides training to promote awareness, and the advancement of quality management practices to industry based on local and international standards. Standards are technical documents detailing requirements needs to ensure that a product, service or procedure is fit for purpose [ZABS, 2019].

1.2 Statement of the Problem

Insurance is an industry dealing with compensation. The Zambian Insurance industry has over 40 General Insurance providers, offering Insurance products and services to only 2.8% of the population (IAZ). The general perception in Zambia is that the sector is marred with fraud, especially in the claims dispensation processes. Despite most Insurers embracing use of ICT and Ecommerce platforms and adoption of international standards to improve service delivery and address the security weaknesses identified by the study, insurance fraud remains a challenge. A typical insurance transaction involves policy holders or applicants of an insurance service, third party claimants and insurers. Fraud can be committed by any one of the parties involved in a transaction. Examples include inflating of claims, falsifying insurance applications, backing up a claim with fake evidence etc. (I.I.I). The Policy holder will have a bad customer experience. This may come as a result of costs associated with time and monetary loses. It may also be as a result of a valid claim being invalidated by the insurer due to negligence on their part in failing to undertake comprehensive investigations due to inadequate process controls. It may also be as a result of unreasonable delays from the insurer in discharging a claim [Kumar, 2013]. The Insurer faces reputational risks by way of litigations from disgruntled policy holders, loss of business and reduced bottom lines. Customer retention in the insurance industry is hard to achieve, with statistics showing that at least 10 percent of the customers leaving each year due to poor services or cheaper premiums. It costs, on average, five times more to acquire a customer than to retain an existing one. (IMS, 2019) However, despite the industry being well established, there have been few studies undertaken to investigate claims handling in the insurance sector in Zambia and how adoption of international standards can impact those systems.

1.3 Research Objectives

i) To investigate Insurance claims management processes.

ii) To analyze insurance claims management systems and standards used to 1develop their development.

iii) To develop an enhanced claims management process based on international Standards.

1.4 Research Questions.

i) How does Insurance operate and how are Insurance claims handled?
ii) What international standards are used in the development of systems?
iii) What secure ICT model can be developed to enhance insurance claims systems.
iv) To design an enhanced insurance claims process based on international standards?

1.5 Aim

The study is aimed at investigating Insurance Claims processes and developing a prototype for Insurance Claims Management in Zambia, based on ISO 27001 AND ISO 9000 standards

1.6 Significance of the study

The study is of great significance to Insurance companies, as it aims to address the security weaknesses inherent in most Claims Management Systems. The end product of the research will be a web-based Insurance Claims Management prototype.

1.7 Study Delimitations and Limitations

The study was confined to Lusaka, due to logistical constraints. Due to time constraints, the research project was primarily targeted at processes in the claims department and did not deal with other processes in the sector such as underwriting, accounts etc.

The major limitation on the study was the inability to get information from some Insurers Heads of Departments. Conducting interviews was a challenge, especially with Insurance Association Zambia and Pensions Insurance Authority personnel.

1.8 Organization of Dissertation

The dissertation is organized in five (5) chapters. Chapter one (1) introduces the subject matter, covering background to Study, Problem statement, Purpose of the study, Objectives, Research questions, Significance, Limitations, Delimitations, and Thesis disposition.

Chapter two (2) provides an over view of the different literature referenced on the subject of Insurance operations, Insurance Claims handling and models used in development of Insurance systems. Information was gathered from various sources like: journals, conference papers, reports, text books, government documents coupled with selected items from the internet. The literature review will give the theoretical basis of the study by evaluating previous work from other scholars in the field of study. Chapter three (3) discusses the methodology employed in coming up with the solution.it provides details of how the study was actually carried out in order to provide answers to the research questions. data collection, population sampling and research instruments are all tackled here. Chapter four (4) presents the Research Findings and Discussions. It describes how the data was collected, prepared and analyzed. It also interprets the findings in light of the research problem. Finally, Chapter five (5) gives a summary, conclusions and recommendations for further research. This chapter concludes the research and highlights all ideas from the findings. It also makes recommendations for further research.

1.9 Ethical considerations

Owing to the sensitive nature of respondent's bio data, the researcher conducted his study in conformity with the guidelines given by the regulators which were aimed at maintaining the respondent's privacy. permission was sought from UNZA and subsequently granted by the ethics committee. All respondents remained anonymous as there was no identity tied to the research instruments. During the course of the study, respondents were treated with respect and confidentiality. The researcher recognized the rights and privacy of respondents and conducted his activities with the highest respect for the participant and no respondent was forced into participating.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction.

This section contains different literature reviewed from various sources like: journals, conference papers, reports, text books, government documents coupled with selected items from the internet.

2.1 Insurance History

Insurance origins can be traced back to 4000-3000 BCE when the Babylonian merchants, entered into BOTTOMRY contracts. BOTTOMRY was also practiced by the Hindus in 600 BCE, and the Greeks as early as the 4th century BCE. These BOTTOMRY contracts, stipulated that loans were granted to merchants with the provision that if the shipment was lost at sea, there would be no recourse to the borrower. The interest on the loan covered the insurance risk. BOTTOMRY was also recognized in Ancient Roman law by recognizing articles of agreement for loans and funds were deposited with a money changer. Marine insurance became highly developed in the 15th century. Fire insurance can be traced back to England, in 1711 due to the Great Fire of London in 1666. A number of insurance companies were started in England after 1711, during the so-called bubble era. The Romans practiced burial societies that paid funeral costs of their members out of monthly dues. Life has its origins in the colonies, by the Presbyterian Ministers' Fund, organized in 1759. By 1820 there were 17 stock life insurance companies in the state of New York alone. (https://www.britannica.com/topic/insurance/Historical-development-of-insurance, accessed on 6.3.2019) The first known insurance contract can be traced back to 1347 BC in GENOA (Pearson 2010) and was subsequently refined in the centuries that followed. The ancient world had two types of economies i.e. monetary and non-monetary. Non-monetary, also known as barter trading involved the exchange of goods as trading mechanisms. Monetary economies can be traced back to the 1700 BC, were the Chinese and Babylonian traders in the 3rd and 2nd millennia BC, traded using currency. Chinese merchants would mitigate loses by distributing their cargo across many vessels so that should one vessel capsized. In 1750, the Babylonians developed a system that was recorded in the code of Hammurabi, which was basically a collection of Babylonian laws governing justice, merchandising etc. it is based known for helping

manage risk the code of Hammurabi was practiced by Mediterranean sailing merchants to protect themselves from economic loss. Back then, a merchant would get a loan to finance a voyage but would mitigate loss by getting a guarantee from the lender that should the shipment be stolen or lost at sea, the loan would be cancelled. This was done by way of paying an additional sum in exchange for the lender's guarantee. With the passage of time, insurance became more sophisticated as it took up a number of variations. Property insurance can be traced back to the year 1676 when Hamburger Feuerkasse, a company set up in Hamburg, to sell fire insurance to the public. In 1666, the Great Fire of London, destroyed more than 13,000 houses. This development propelled the establishment of a number of insurance firms, notable was "Insurance Office for Houses", setup in 1681, to insure 5,000 homes. Earliest forms of Business insurance can be traced back to 17th century, as London took center stage in the disbursement of marine insurance. Lloyd's of London and several related shipping and insurance businesses were setup to underwrite voyages. Life insurance came on the scene in the 18th century. In London, Amicable Society for a Perpetual Assurance Office, was setup to offer life sell life insurance policies. The Americans setup Corporation for Relief of Poor and Distressed Widows and Children of Presbyterian Ministers in 1759, to offer life insurance policies to the public. Accident insurance has its origins in the 19th century with the establishment of the Railway Passengers Assurance Company, formed in 1848 in England to insure against the rising number of fatalities on the nascent railway system. The policies offered relief to the commuters in cases of fatalities resulting from use of the trains. [www.history.com, accessed on 5.10.2017].

In our time, a typical an insurance transaction involves a policy holder and the insurer (I.I.I). Insurance risk is defined as a potential threat that may not have yet been fully understood or allowed for in insurance terms (Njore (2018).

Some other characteristics of Insurance Risk, include the following: -

Not well understood – a risk which has not been fully researched and for which no proper guidelines exist;

a) Difficult to quantify – a risk which has very little tangible deliverables, very difficult to measure;

b) Ambiguous implications and consequences – a risk whose effects are not clear;

c) Complex interactions with other risks – a risk that rides on other risks;

d) Outside organizational structure – a risk that doesn't affect the organizations structure;

e) Geographical – a risk that whose prevalence is tied to locations e.g. earth quakes occur along fault lines. So any areas located on the fault lines are at high risk;
f) Societal – a risk that is tied to social inclinations e.g. vandalism is high in rural suburbs than it is in other areas;
g) Economic – a risk that follows the economic status of the client e.g. the risk of a company or country defaulting on its loans is dependent on its economic standings;
h) Technological - a risk tied to the technical know-how or skill sets of the client e.g. in project financing, a project can collapse owing to lack of technical skills and
i) Environmental – risk posed to the environment e.g. when setting up a mine;

Risk management has been identified to play a pivotal role, in the survival of insurance companies. Some scholars argue that underwriting losses can be reduced by Insurers investing in risk management strategies and not automation of the claims handling processes. A well implemented risk portfolio leads to an increase in the insurance penetration. Companies are then able to sell more products and services. Holistically, the wider the insurance penetration, the more growth the economy recorded (Akotey and Abor 2013),

Other risk categorizations are summarized in the Table 1.

Table 1: Definitions of Insurance Risk (Source: Tremblay and Wiebe 2008)

Risk	**Definition**	**Examples**
Competitive Risk	Threat posed by other players in the market	When rivals introduce new products
Regulatory Risk	Risk posed by statues of the land	Changes in the government
Reputational Risk	Risk posed by negative publicity	Smear campaigns, litigation
Market Risk	Risk posed by market volatility	Interest rates
Underwriting Risk	Risk posed by specific risk	Mortality
Operational risk	Risk posed by failed processes	Administrative lapses
Liquidity risk	Risk posed by insolvency	Inability to execute a contract

In contrast, the 2017 Global Risk Management Survey conducted by AON, one of the worlds' largest insurance companies, brings to the fore, that despite the advances in ICT, companies are less prepared to handle emerging risks. Risks such as cybercrime and E-commerce have raised the risk profile of many companies. Data integrity, customer confidentiality, security cannot be guaranteed unless insurers invests heavily in security systems. The old systems are proving to be more secure. The digital age has revolutionized the way business is being conducted. The push towards automation has brought about technological advancements in Internet and Communications Technology (ICT), which have also created a gap in the insurer/insured relationship which was a key factor in locking in customers. It has further raised the risk profile due to the dangers posed by ecommerce and cyber space. (Mennati 2010). Internet and Communications Technology (ICT) has had a negative impact on Insurance companies, owing to the colossal financial investments that go with automation, the security threats from viruses, cybercrime and the technological complexities (Ganesh ET el 2014). When one brings up the topic of insurance, the perception out there is that the claims handling procedures are marred with fraud and corruption. In as much as insurers are embracing new ways of doing business, the risk profiles also get increased. Insurers therefore need to invest more money in systems that will mitigate the challenges posed by cybercrime on the claims handling processes from data collection to settlement. (Ndiritu 2017)

2.2 Global Trends

Globally, the insurance sector contributes significantly to countries GDPs. According to (Nayak ET el 2014), the world insurance markets are characterized by annual premiums, insurance concentrations and densities. From revenue perspectives, worldwide insurance premiums were pegged at $3.7 bn. The top five countries i.e. the United Kingdom, France, Germany, Japan and the United States are characterized by high insurance concentrations representing 67.3% of the world premiums. The world reinsurance market is also concentrated with eight countries, namely; Germany, France, Japan, Bermuda, Ireland, United Kingdom and United States representing 89% of global reinsurance premiums.

Gross premiums grew on average in both the life and non-life insurance sectors in real terms in 2016. In 2016, gross premiums increased on average by 3.7% in the life sector and 2.0% in the

non-life sector among 40 reporting countries (Figure 3). A growth of gross premiums occurred in both life and non-life sectors in 14 of these countries, mainly located in Latin America, North America and Asia. (OECD,2017). The United States of America recorded approximately 104,600 structural fires which translated to an estimate of $2.7 billion in property damage. (Boggs 2017)

Table 2: 2017 global incidences with associated costs (source: IIS 2018)

Event	**No. of Incidents**	**Deaths**	**Insured Loss ($ m)**
Storms	82	1,642	111,475
Drought, bush fires, heat waves	14	435	14,237
Hail	8	0	7,549
Floods	55	3,515	2,144
Earthquakes	12	1,184	1,615
Cold, frost	5	153	1,038
Other natural catastrophes	7	1,541	0
Total natural catastrophes	183	8,470	138,057
Man-made disasters	118	2934	6,246
All catastrophes (1)	301	11,404	144,303

(1) Based on events classified by Swiss Re as a catastrophe. The threshold is $20.3 million in insured losses for maritime disasters, $40.7 million for aviation disasters and $50.5 million for other losses or $101.0 million in total economic losses; or at least 20 dead or missing, 50 injured or 2,000 made homeless. (Source: Swiss Re, sigma, 1/2018).

2.3 Insurance in Zambia.

Insurance in Zambia is characterized by the traditional short-term insurance products namely; fire, motor, construction, liability insurance to mention a few areas. Modern insurance in Zambia began around 1968 with the formation of Zambia State Insurance Corporation (ZSIC). Prior to l991, ZSIC enjoyed monopoly in the insurance industry. This was known as Nationalization and it came with its own challenges of human capital lucking technological knowhow. The work around was for ZSIC to look outside. Foreign companies were then contracted by ZSIC Management, to offer training to Zambians. The end result was the formation of what is now called the Zambia Insurance Business College Trust (ZIBCT). After change of government in 1991, MMD liberalized the economy and ZSIC lost its monopoly.1997 saw the enactment of the Insurance Act, which led to the establishment of the Pensions and Insurance Authority as the regulator. In 2005, the Insurance (Amendment) Act No 26 was passed. This resulted in Insurance Companies categorizing their products into short- and long-term businesses. ZSIC then underwent a re-structuring exercise aimed at making it more competitive and responsive to customer demands. The result of the exercise was ZSIC being unbundled into three separate entities namely; ZSIC Limited, the Holding company, ZSIC General Insurance for short term business and ZSIC Life to handle the long-term business. (Chungu Katotobwe 2016). The Zambia Insurance Industry plays a significant role in the Zambian economy. It provides social and economic benefits. (Haufler 2013) describes insurance as a growth stimulant in a country's economy. The sector makes significant contributions towards the country's economy. During a speech delivered at the official opening of the 2017 insurance conference in Livingstone, the Finance minister at the time, Mr. Felix Mutati, disclosed that the insurance sector in Zambia contributed close to 1.5 % to the country's GDP (Mutati 2017). The importance of security cannot be overstated, more so, when it comes to insurance. With the core business being that of providing financial support by way of compensation for loses, and reducing uncertainties in the lives of customers, it is paramount that systems be protected against threats both internal and external. Internal threats may come via malicious alterations to data, sabotage etc. whereas external threats can come via cybercrimes (KPMG 2017). One of the ways in which insurance firms can secure their systems is by way of adopting international standards when under taking system development. Examples of such standards are the ISO/IEC 27000 family of standards which delivers information security. This then enforces controls that prevent breaches in the system and ultimately mitigates fraud. In the

Zambian context, there has been very little research done to determine the impact of international standards on insurance claims processes and this was the basis upon on which this study was designed.

2.4 Types of Insurance Segments

Insurance operations can be further broken down into smaller business segments. Property insurance deals with real estate such houses, shops, buildings and other non-movable assets.

Marine insurance deals with perils at sea, for instance, insuring containers being transported over oceans or seas in the event that the vessels capsize or get stolen by pirates.

Motor vehicle insurance deals with cars. This form of insurance is the riskiest and attracts the highest number of claims. Accident insurance, as the name depicts, provides relief against unforeseen incidents such as loss of life when a plane crashes, when accidently shot at etc.

The diagram below is an excerpt from the Pensions and Insurance Authority`s 2015 Annual Report, detailing summaries of the performances of the different units. (P.I.A, 2015)

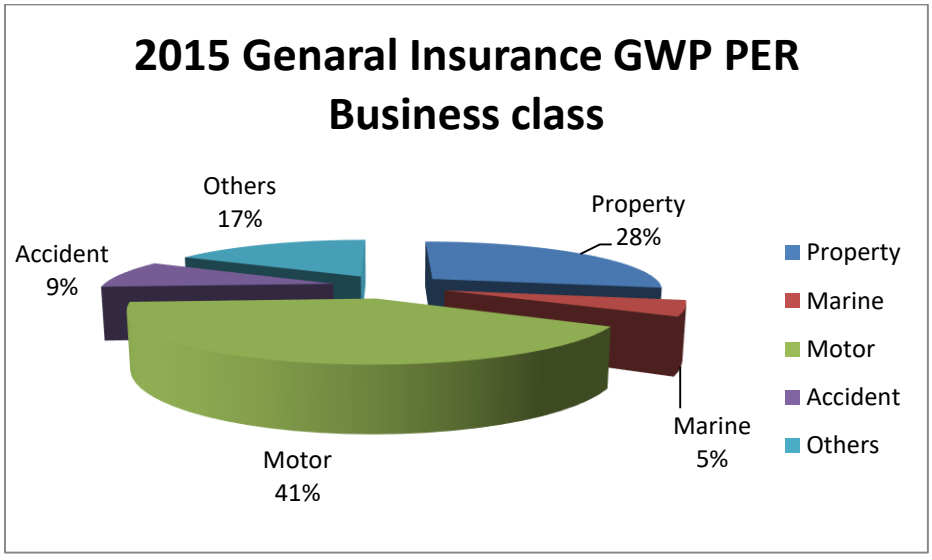

Figure 1: Insurance Segments Market Share by GWP (Source: PIA, 2015)

Figure 2 another excerpt from the Pensions and Insurance Authority`s 2015 Annual Report, detailing summaries of the performances of the major insurance players on the market.

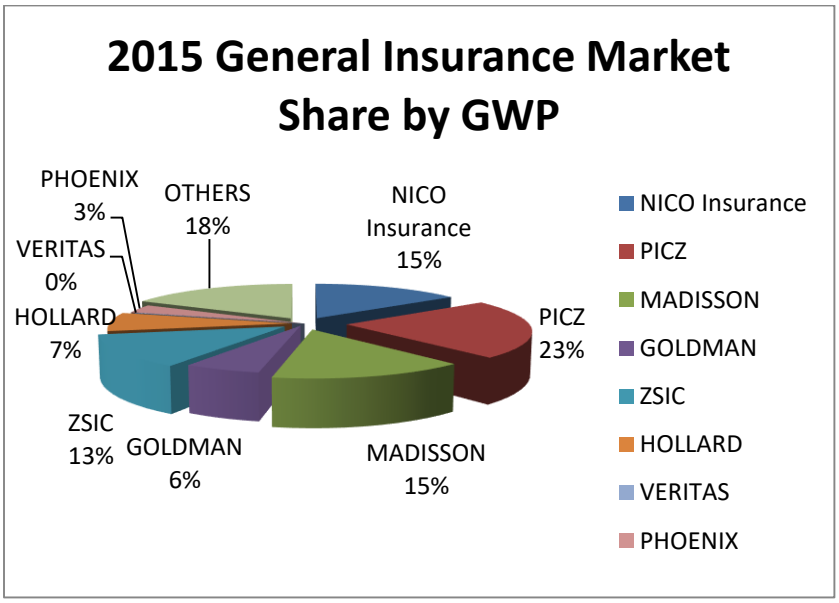

Figure 2: Insurance Companies Market share by GWP (Source: PIA, 2015)

2.5 Importance of the Insurance Sector

Insurance is a growth stimulant in a country's economy. (Haufler, 2013) The sector makes significant contributions towards the country's economy. Taking Zambia as an example, the sector contributed 1.5 % to the country's GDP (Mutati 2017). The P.I.A summarized the Insurance Industry's 2017 performances as follows: - 'The insurance industry registered a steady growth in 2018. The industry had a total of 342 players licensed by the Authority in 2018.The Gross Written Premium (GWP) for the industry as at 30th September 2018, stood at K739.36 million compared to K696.09million recorded in 2017 during the same period. In terms of general insurance market share based on GWP, PICZ had the highest with 26%, followed by Madison General with 16%, ZSIC General and Holland General at 10% each. NICO insurance was at 9% while Goldman was at 5% with Mayfair and Advantage at 4%. Diamond insurance market share was at 3% with Mean wood, Phoenix and African Grey at 2% each. The rest of the players accounted for an aggregated share of 4%. In terms of long term insurance market share, Sanlam had the largest share in terms of GWP with 24%, followed by ZSIC Life with 16%, SES with 15%,

Madison Life and Prudential Life with 14% each. Liberty Life and Barclays Life had 6% each (PIA,2018). According to the 2017 Labor Force Survey (LFS) report, the country has 5 million persons in active employment and the Insurance sector provides employment to about 15% of the 5 million. By implication, the 15% pay taxes and subscribe to the mandatory pension scheme offered by NAPSA (NAPSA,2019) which provide benefits to retirees. Insurance is now being considered as an alternative option for long term financing. In the past investors would look to banks and capital markets for project financing. However, with increases in lending costs and stringent regulatory requirements meant that the equity markets could no longer satisfy the market. Bayport Financial services, is a company that offers long and short term loans to individuals. Investors get periodic returns on their investments. The Zambian government uses Treasury bills to raise funds for its capital investments. Investors can also invest in treasury bills which will give them high returns. (Grundl ET el 2013)

2.6 Fraud

Insurance fraud can be defined as a deliberate act committed against an insurer or an insurance broker with a view to obtaining a financial benefit. It can be committed by any one of the parties involved in a transaction i.e. policy holders or applicants of an insurance service, third party claimants and insurers (the professionals that actually give the service). Examples of fraud may include; inflating of claims, falsifying insurance applications, backing up a claim with fake evidence etc. (Zalma, 2014). 45 % of Zambians have experienced some form of economic crime and Insurance fraud is high on the list - PwC's 2014 Global Economic Crime Survey – Zambia Report (PwC,2014).*2 in 3 of Zambia respondents reported having experienced at least one form of economic crime in the past two years. The high incidence rate could be an indication of either a high prevalence or a high awareness of economic crimes*'- **PwC** 2018 Global Economic Crime and Fraud Survey: Zambia Report (PwC,2018). The report goes further to state that the high prevalence rates are indicative of increased awareness on the subject of fraud. Mitigation efforts have become central to an Organizations strategic plan as they set out to prevent and control fraud. Fraud does not only eat away at a Company's profits but it also erodes the moral fiber of the employees. It has cost the Insurance Industry colossal sums of money, in excess of $40 billion per year (FBI,2018). Insurance fraud is prevalent largely due to inadequate staff training, inadequate control mechanisms in operating structures and processes. It can however be mitigated by adequate

training, organizations allocating sufficient budgetary provisions to aid the fight and investing in quality systems (Jere and Banda, 2019).

In Kenya, During Q1 2019, 30 fraud cases were reported to the Insurance Fraud Investigation Unit (IFIU). 27 cases were pending investigation, 2 cases were pending before court and 1 was pending arrest of known accused. (IRA,2019).

Tanzania, like many other countries is also facing the similar challenges resulting into financial loses in millions of dollars (Sebahene,2020). Similarly, 32% of insurance claims in South Africa are fraudulent (Garth de Klerk,2018).

Figure 3 - Insurance Fraud Triangle (Source: Donald Cresse)

Insurance fraud can take the form of one of the following: -

a) Fee Churning – also another variant of premium diversion with the difference being that the agent is not authorized by the insurer. The perpetrator somehow fraudulently gets hold of policy documents from an insurer and pretends to be their representative and sells a product or service;

b) Premium Diversion – which is in a layman's terms refers to diversion of insurance premiums by an authorized agent;

c)Asset Diversion - Asset diversion is the theft of this is a form of corporate. An I insurance company's assets are taken over fraudulently in an acquisition or merger of an existing insurance company. The takeover is financed using borrowed funds and once successful, the subject uses the assets of the acquired company to pay off the debt. The remaining assets can then be diverted to the subject;

d)Car Insurance Fraud – this is where a policy holder exaggerates damages to a vehicle from an accident. After being paid by the insurer, the policy holder diverts the money and never repairs the car;

e) Stolen Car fraud – usually involves the policy holder and garage working together to defraud the insurer. A vehicle is reported stolen by the policy holder and later sold to a garage;

f) Accident fraud – this is where an accident is staged;

g) Health Insurance Fraud – this is where the health practitioner inflates patient bills by performing unnecessary medical procedures in order to reap of insurance companies and

h) Stage Home Fires – where policy holders deliberately set off fires in order to make huge claims on their policies. (SURRANO INSURANCE, 2017)

2.7 Challenges in Fraud Mitigation

2.7.1 Regulation

The legislation that mandates the Pensions and Insurance Authority to supervise and regulate the Insurance Industry in Zambia is the Insurance Act No. 28 of 1996 (amended by Act N0 27 of 2005), Insurance Act N0 27 of 1997 and Internet and communication Act, 2009. It was enacted by the Parliament of Zambia in 1997 and came into operation in 1998.

The Act empowers the Registrar of Pensions and Insurance in Zambia (PIA) to conduct registration and licensing of members in the industry.it also formulates and enforces standards in the insurance sector. The registrar reports into the Ministers of Finance and makes recommendations to the Minister on any matter affecting the insurance industry. The Authority protects the rights, benefits and other interests of policy holders. The prime objective of the Authority is to advise the Government on how to protect national assets and properties.

In carrying out its mandate, the Authority supervises insurers, reinsurers, brokers, assessors, loss adjusters and claims agents whilst the insurance agents are supervised indirectly through insurance companies. Insurers, reinsurers and brokers are required to regularly submit statutory returns and audited financial statements to the Registrar (P.I.A) However, the regulator faces challenges in discharging its mandate owing to ambiguities inherent in the Insurance ACT. Notably, the ACT makes no mention of medical or health insurance**.** The ACT has inherent Legal ambiguities, such as such as the lack of clarity on the definitions of short-term life insurance, there is no mention of health insurance, it lacks clarity on the definition of short term life insurance which in itself creates problems in times of litigations and restrictions on the CEO position and Insurance Agents (Mulenga 2015).

Table 3: Insurance Industry Zambia (Source: PIA, 2015)

Category	**No of Companies**
Reinsurance Companies	3
Reinsurance Brokers	2
General Insurance Companies	22
Long term Insurance Companies	12
Insurance Brokers	45
Insurance Agents	223
Claims Agents	10
Motor Assessors	11
Loss Adjustors	8
Risk Assessors	1
Total	**337**

The Zambian government through its Finance minister, Mr. Alexander Chikwanda, signed a statutory instrument 71 of 2015 on October 2. The SI in essence revised the minimum capital requirements for insurance companies from k1m to k10m for short term insurers, k1m to k12m for long term insurers. Reinsurance firms now need a minimum capitalization of k20m from the previous k1m while broking firms now required k100, 000 from the previous k40, 000, to set up. The Regulatory Authority – PIA was then mandated to enforce the new law. The new capital requirements therefore meant that insurance firms no longer had the budget to embark on costly automation projects. (Twaambo, 2016). Regulatory reforms impact Insurance businesses in the following ways;

i)Governance – The regime governing the country plays a big role in the economy. A hostile regime like the one that was ousted in Zimbabwe, stifled growth in the economy by killing investor confidence, which in turn leads to capital flight.

ii)Conduct of business – The regulator creates an even playing field by giving guidelines to players on the best way to conduct business in the sector. In Zambia, the pensions and insurance authority has been mandated to provide that crucial role.

iii)Compliance – the amount of paid up capital is determined by regulatory policy. In Zambia for instance, Statutory instrument (SI) number 71 was signed in 2015 compelling insurance companies to increase the minimum paid up capital to K20 million from K1 million, long term and general insurers to K12 million from K1 million. (P.I.A,2019)

iv)Economic development – The bigger the country's economy, the more people will afford insurance products. Insurance growth also increases with increase in the economy and vice versa. By providing financial support and reducing uncertainties in business and human life, Insurance provides safety and security against risk. Funds collected from premiums are invested in government securities and stock. This, spurs industrial development of a country. This bolsters employment opportunities, as investors begin to invest in the economy. Insurance can also be used as an investment channel (Nkwale, 2018).

2.7.2 Technology

Fraudsters are now using sophisticated methods to gain unauthorized access into systems. Examples of such methods include: -

a) Phishing – using fake email messages to dupe internet users into giving up personal information;

b) Identity Theft – misuse of someone else's personal information;

c) Hacking – getting illegal access to systems for malicious purposes;

d) Spreading hate and terrorism and

e) Cyber Attacks – examples include the recent WannaCry epidemic (Kaspersky,2019)

In order to effectively mitigate fraud, companies need to invest in technology so as to keep abreast with cyber criminals**.** The digital age has revolutionized the way business are conducted, products and services are no longer tied to geographic locations but are now having global reaches. We now live in a world without borders. In the wake of new trends and technologies, insurance companies need to investigate ways of improving efficiency whilst still being able to meet customer expectations. (Kumar 2013). Liquidity also a great bearing on fraud mitigation initiatives. NICO Zambia Limited, which happens to be Zambia's third largest insurer, recently purchased an insurance software solution from an Indian company called 3i InfoTech to the tune of K18m (NICO). A company has to invest in both staff and tools to identify and mitigate incidents. To make such investments, a company's liquidity needs to be sound (Malik 2011). Data protection and privacy involves putting in place mechanisms that safe guard collection of data, storage and sharing. Keeping customers' data safe is paramount in view of damages that may result from misuse i.e. identity theft, unsolicited offers and fraudulent claims. However, there is very little legislation that covers data protection and privacy currently. The emergence. of the Internet and cloud storage services, has presented insurers with challenges of keeping customer data secure and confidential. (Jere and Banda 2019).

2.7.3 Roles in an Insurance Transaction

Table 4 Insurance Players and Roles (Source: PIA, 2015)

INSURANCE PLAYER	ROLE
Insurance Mediator	This is a broker or agent appointed by an insurer sale its products. He or she can be an individual or a company that represents an insurer. They are responsible for selling and interpreting insurance policies to the customer and representing the customer when a risk for which they are insured for has occurred.
Insurer	A company that offers insurance products and services to the public at a premium. Loss adjusters, underwriters, assessors are examples of the job functions that can be found here.
Re-Insurer	A reinsurer is a company that provides financial protection to insurance companies. Reinsurers handle risks that are too large for insurance companies to handle on their own and make it possible for insurers to obtain more business.
Policy Holder	An individual or a company that pays premiums to an Insurance company for cover against risks, such as fire, motor vehicle accidents, force majeure etc. (www.clements.com, accessed on December 27,2018)

2.8.1 Insurance Claims Management Cycle

The diagram below highlights the flow in settlement of insurance claims

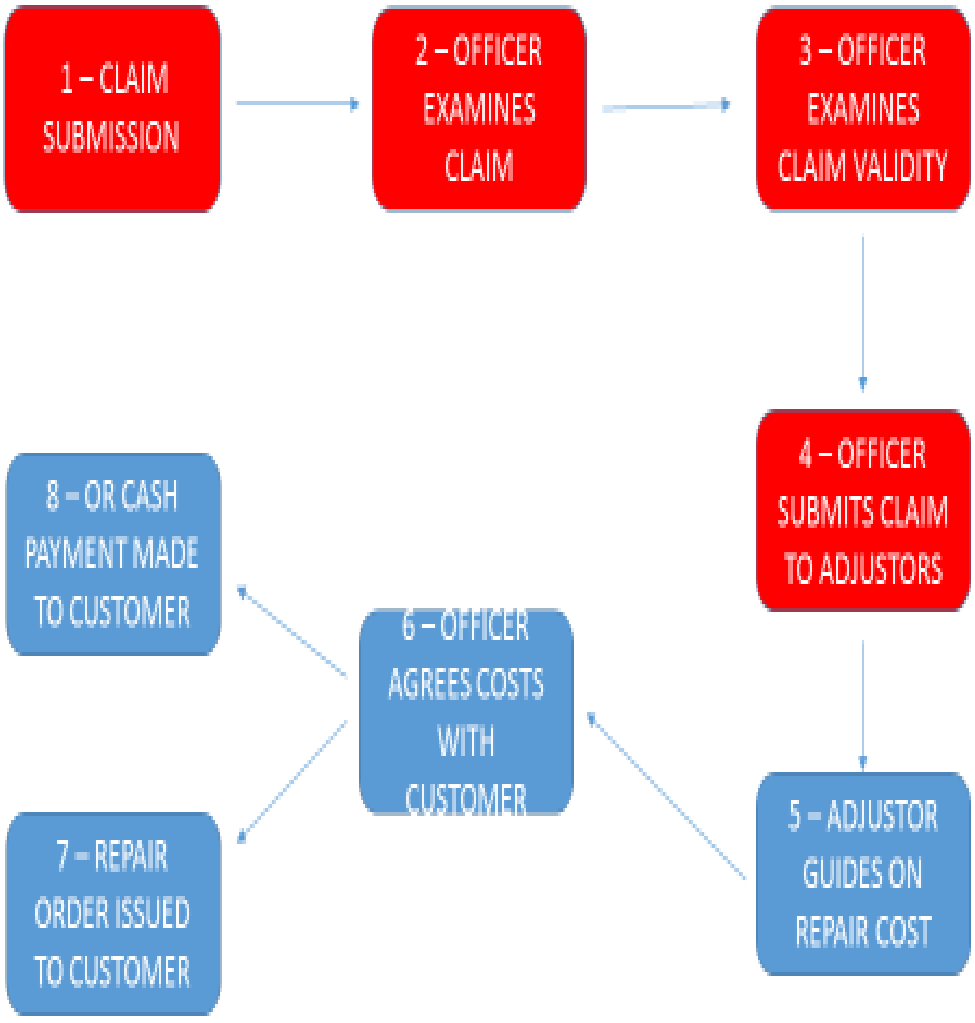

Figure 4: Insurance Claims Management Life Cycle

Though insurance fraud can occur at any stage in the Claims Management Life Cycle**,** the base line study identified stages 1 through to 4 as areas of vulnerability and prone to fraudulent acts. It established Data Reliability, Data Inconsistency, User Authorization and Data Integrity vulnerabilities in the insurance claims systems. Some insurance companies are still issuing manual policy documents (see appendix V) these can be duplicated and altered. The proposed prototype will help mitigate fraud occurrences in those stages.

An insurance transaction will generally have the following player's i.e. policy holders or applicants of an insurance service, third party claimants and insurers (the professionals that actually give the service).

The basic flow of the transaction is detailed below: -

I. The policy holder (applicant of an insurance service) or third party claimant encounters an incidence or a risk for which he or she is insured against and notifies the insurer (the professionals that actually give the service) e.g. theft of motor vehicle, fire, floods etc.;

II. The insurer requests the claimant (policy holder or third party claimant) to submit relevant documentation and fill out a claim form e.g. in a case of motor vehicle accident, the insured will be asked to provide a police incident report, driver's license and valid insurance certificate. In cases of health insurance, the documentation may include Bills, Prescriptions, Advance and final receipts, Diagnostic Test Reports, X Ray, Scan and ECG and other films;

III. The claimant (policy holder or third party claimant) then submits the requested documentation to the insurer and a case file is opened for that case. see appendix III**;**

IV. The insurer then does due diligence and checks whether the policy holder or third party claimant has a valid policy on which the claim is being based on. I.e. are the premiums fully paid, checks whether documents are valid and institutes preliminary investigations into the case;

V. When the checks are validated, the insurer arranges with the claimant, for a site or property inspection and

VI. At this stage, the claim then goes to the assessors for onward processing.

2.8 STANDARDS

In Information Technology, Standards are published documents that establish specifications and procedures designed to ensure the reliability of the materials, products, methods, and/or services people use every day Standards address a range of issues, including but not limited to various protocols that help ensure product functionality and compatibility, facilitate interoperability and support consumer safety and public health. (Russell 2014). When implemented, standards form the fundamental building blocks for product development by establishing consistent protocols that can be universally understood and adopted. This ensures compatibility and interoperability and simplifies product development. Taking the story closer to home, adopting standards will give the assurance that systems are designed and implemented with quality in mind and in conformity with the CIA triad model on information security. (Andress 2011).

a) Non repudiation - the assurance that someone cannot deny the validity of something

b) Integrity - the assurance of accuracy and completeness of data over its entire lifecycle.

c) Confidentiality - the assurance that informat6ion is protected from being accessed by unauthorized parties

d) Availability - the ability of a user to access information or resources in a specified location and in the correct format

e) Authentication - the process of giving individuals access to system objects based on their identity

f) Authorization - is a security mechanism used to determine user/client privileges or access levels related to system resources.

However, Zambia is faced with a situation were on 15.5% of firms have adopted internationally-recognized quality certification i.e. ISO 9000, 9002 or 14000. Source: World Bank, Enterprise Surveys Project (Trading Economics, 2013). Only 2% of registered companies in Zambia, are ISO certified (Saili, Mathew 2017**),** see appendix XVII.

2.8.1 KEY INTERNATIONAL STANDARDS

2.8.2 ISO (INTERNATIONAL STANDARDS ORGANIZATION)

International Organization for Standardization (ISO) is an international body that aims at developing and publishing International standards. It does so by creating documents that give guidance which when used consistently and correctly produces quality processes, goods and services. ISO only gives guidelines but does not certify. The actual process of certification is done by other appointed institutions like the Zambia Bureau of Standards (I.S.O)

2.8.2.1 ISO 9000 Standards

The International Organization for Standardization (ISO) published the ISO 9000 series of standards in 1987. This series of standards "provide guidance and tools for companies and organizations who want to ensure that their products and services consistently meet customer's requirements, and that quality is consistently improved" (ISO, 2014c). ISO 9000 is a set of international standards defining quality management and quality assurance mechanisms which when implemented, help companies identify and implement quality system elements that are needed to maintain efficient quality systems. The series is not industry specific and as such, can be applied to any organization irrespective of size and service type. Benefits of implementing ISO 9000 series standards include helping customers meet regulatory requirements and being guaranteed of continuous product development. (ASQ).

The ISO 9000 family, can be further broken down into different standards, namely;

I) ISO 9001:2008 (ISO, 2008b) sets out the requirements for a quality management system where an organization can demonstrate its capability to deliver products and services that fulfil customer and regulatory requirements and aims to increase customer satisfaction (ISO, 2005; ISO, 2009c).

II) ISO 9001:2015: Quality Management Systems - Requirements

III) ISO 9000:2015: Quality Management Systems - Fundamentals and Vocabulary (definitions)

IV) ISO 9004:2018: Quality Management - Quality of an Organization - Guidance to Achieve Sustained Success (continuous improvement)

V) ISO 19011:2018: Guidelines for Auditing Management Systems

Table 3. Seven quality management principles (Source: ASQ)

Customer Focus Helps managers understand customer needs, align organizational objectives with customer expectations, manage customer relations and improve customer experience.

Stake Holder Engagement Helps identify people's skills, enforces participation of stake holders for continuous improvement.

Process Approach Helps in efficient deployment of resources and activities

Leadership Helps managers establish a vision, set goals, empower employees.

Improvement Helps ensure consistency in product development and delivery.

Relationship Management Helps in creating linkages in the supply chain, herby optimizing resources and managing costs.

Decision Making Decisions made will be based on credible data from systems that have reliability, accountability, availability, confidentiality and security embedded in them.

(Todorov, 1996) summarized the constituents of the ISO 9000 series group in figure 6. ISO 9000 models are best suited for delivering quality systems. Its constituents are ISO 9001, ISO 9002, ISO 9003 ad ISO 9004-2. Between them, the standards cover all areas of system development from research design to end user testing. (Research Gate, 2018).

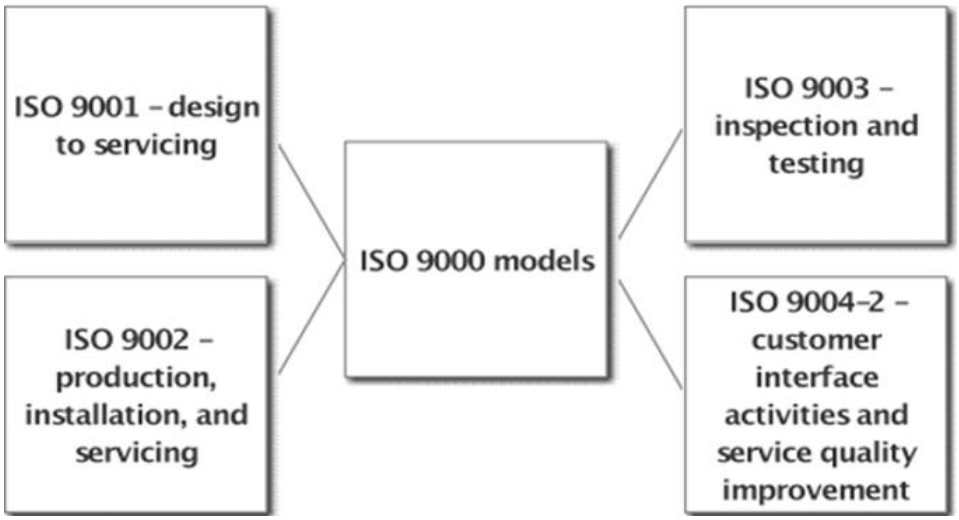

Figure 6: ISO 9000 Composition (Source: Todorov).

2.8.2.2 ISO 9001 – QUALITY MANAGEMENT SYSTEM

The research was centered primarily on ISO 9001, a component of the ISO 9000 family that deals with Quality Management System, ensuring that products and services are in tandem with customers' needs. The ISO 9001 standards can be of help organizations regardless of their type, size and service type to provide products that meet customer and statutory and regulatory requirements.

Originally published in 1987, ISO 9001 underwent revisions in 1994, 2000, and again in 2008. The latest revision was published in September 2015.

ISO 9001:1994 makes improvements to the control of design and development clauses, as well as provide other clarifications. The 1994 series also slightly modified the role of ISO 9002 and 9003. The ISO 9001:2008 clarifies issues on the application of ISO 9001:2000. Once adopted, these guidelines will lead companies to increased productivity, efficiency, product quality, customer satisfaction and their financial performance, as has been documented by several researchers (Sampalo et al 2009., Pantouvakis et al 2013., Omer Abdel et al 2011).

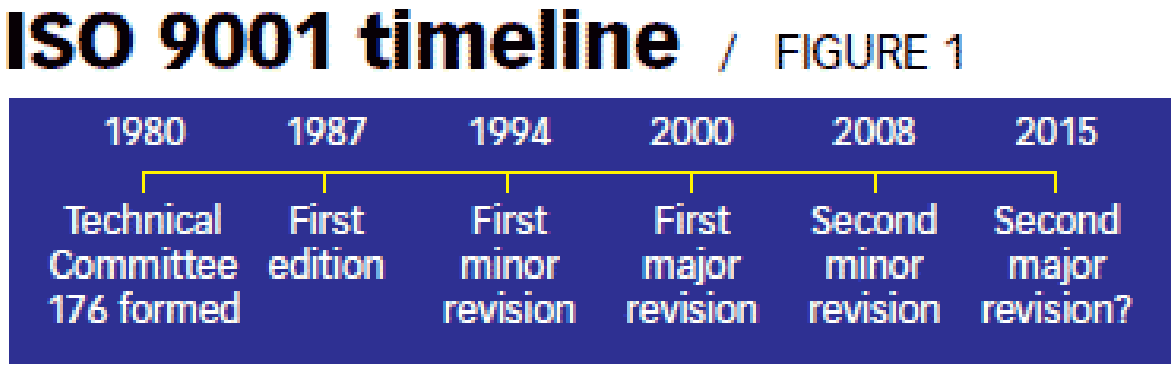

Figure 7 – evolution of ISO 9001 (Source: ISO)

2.8.2.3 ISO 27000 STANDARDS

ISO 27000 is the international standard used globally for managing risks to the security of information. The ISO/IEC 27000 series is at times referred to as the ISMS family of standards or 'ISO27K'. It provides requirements for establishing, implementing, maintaining and continuously improving an Information Security Management System (ISMS). It provides recommendations on Information Systems Security Management and mitigation of information risks through adoption of process controls. (I.S.O).

2.8.2.4 ISO 27001:2013 – Information Security Management Systems STANDARDS

ISO 27001 is the international standard used globally for managing risks to the security of information.it provides a set of standardized requirements for an Information Security Management System (ISMS). The standard adopts a process-based approach for establishing, implementing, operating, monitoring, maintaining, and improving your ISMS.

Benefits of adoption include Protecting client and employee information, managing risks to information security effectively, Achieving compliance with regulations such as the European Union General Data Protection Regulation (EU GDPR) and Protection of the company's brand image. (Certification Europe, 2017).

2.8.3 SIX SIGMA.

Six Sigma is a method that provides organizations with tools to improve business efficiency. This increase in performance and decrease cost leads to improvement in profits, employee morale, and quality of products or services. There are five phases defined in the Six Sigma Methodology. The DMAIC (the acronym for Define, Measure, Analyze, Improve and Control), has been adopted in Six Sigma phases to bring about efficiency in business processes.

Phase 1: Definition of the problem, creating a project plan or a team charter to define the objective of the exercise. When collecting data, all aspects, including organizational value, finances, resources and overall management strategies, and customer complaints must be considered. Interviews, surveys and internal feedback are a few methods that are used to collect this data.

The project charter consists of the following:

i) Problem statement;
ii) Project statement;
iii) Scope of the project;
iv) Organization's objectives;
v) Problem's influence on these objectives;
vi) Deadlines and
vii) Stakeholders

Phase 2: Measure: The DMAIC measure phase is uses three key processes to gather information. Value Stream Mapping: This process illustrates the current position of the problem.
Data Gathering: Data is gathered using the 5 Ws principle (when, what, who, where and why) Data Measurement Validation: this is where validating of the measured data is done. The data is gauged repeatability or reproducibility (Gauge R&R)
Phase 3: Analyze: The DMAIC analyze phase helps to determine the root cause of the problem. Methods used in the 'Analyze' phase include the following: -
DOE (design of experiments): Design of experiments or the DOE method helps to derive a structured solution from multi-variable data. This is a key method used to gain insights into the problem. Cause and Effect Analysis**:** This analysis process defines the hypothesis in a structured way identifying all the possible causes of the problems and its impact on the organization.
FMAE (Failure Modes and Effects): This method helps to identify points of weakness in the operations and its severity on the organizational system.
Phase 4: Improve Stakeholder involvement is cardinal at this stage in order to obtain necessary solutions. Brainstorming sessions are encouraged to obtain as many solutions as possible.
Phase 5: Control: A number of tasks are done in this phase, all aimed at having continuous improvement. Monitor**:** Monitoring the processes with the help of support tools and techniques is the primary step in the control phase. Periodic analysis through reports, charts and metrics are very important here. Documentation: Documentation management is very important for organizational growth and awareness campaigns among teams created about the importance of documentation.
Training: ALL employees need sensitization on the project for it to be successfully implemented otherwise it will be sabotaged. (Bright Hub PM, 2017)

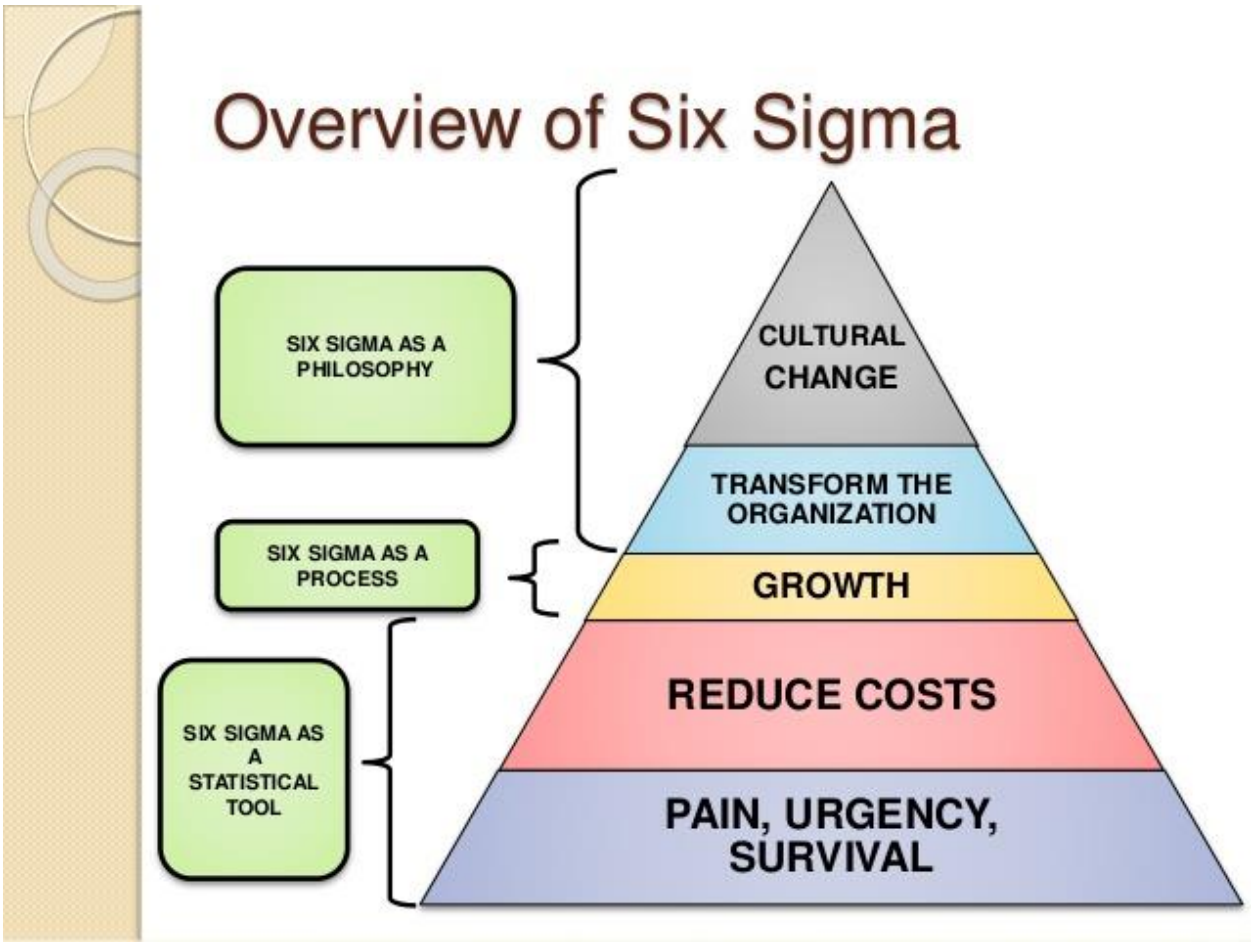

Figure 8. Six Sigma (Source: Bright Hub, 2017)

2.8.4 LEAN MANAGEMENT

Lean management is an approach to running an organization in such a way that changes are implemented systematically in processes in order to improve efficiency and quality. This guarantees continuous improvement in the organization. The Lean Management approach has the following principles: -

i)Value – having a detailed understanding of what value the customer assigns to product and services. This is what determines what the customer will pay. Establishing value allows organizations to create a top-down target price. The cost to produce the products and services is then determined. The organization focuses on eliminating waste so that they can deliver the value the customer expects at the highest level of profitability. The value stream is the totality of the product's entire life-cycle from the raw materials through to the customer's use of, and eventual

disposal of, the product. In order to eliminate waste, the ultimate goal of Lean, there must be an accurate and complete understanding of the value stream. Flow – this phase involves gaining deep insight into process flow in order to eliminate waste. Pull - The lean principle of pull helps ensure flow by making sure that nothing is made ahead of time, building up work-in-process inventory and stopping the synchronized flow. Perfection – involves counter checking all process to ensure perfection (KaiNexus, 2019)

2.8.5 LEAN SIX SIGMA

Lean Six Sigma is a method that relies heavily on collaboration amongst team members, in order to improve performance. This is accomplished by making small, systematic steps to remove waste and variation. It combines lean manufacturing/lean enterprise and Six Sigma to eliminate eight kinds of waste. (ASQ, 2019).

i) Defects;

ii) Over-Production;

iii) Waiting;

iv) Non-Utilized Talent;

v) Transportation;

vi) Inventory;

vii) Motion and

viii) Extra-Processing.

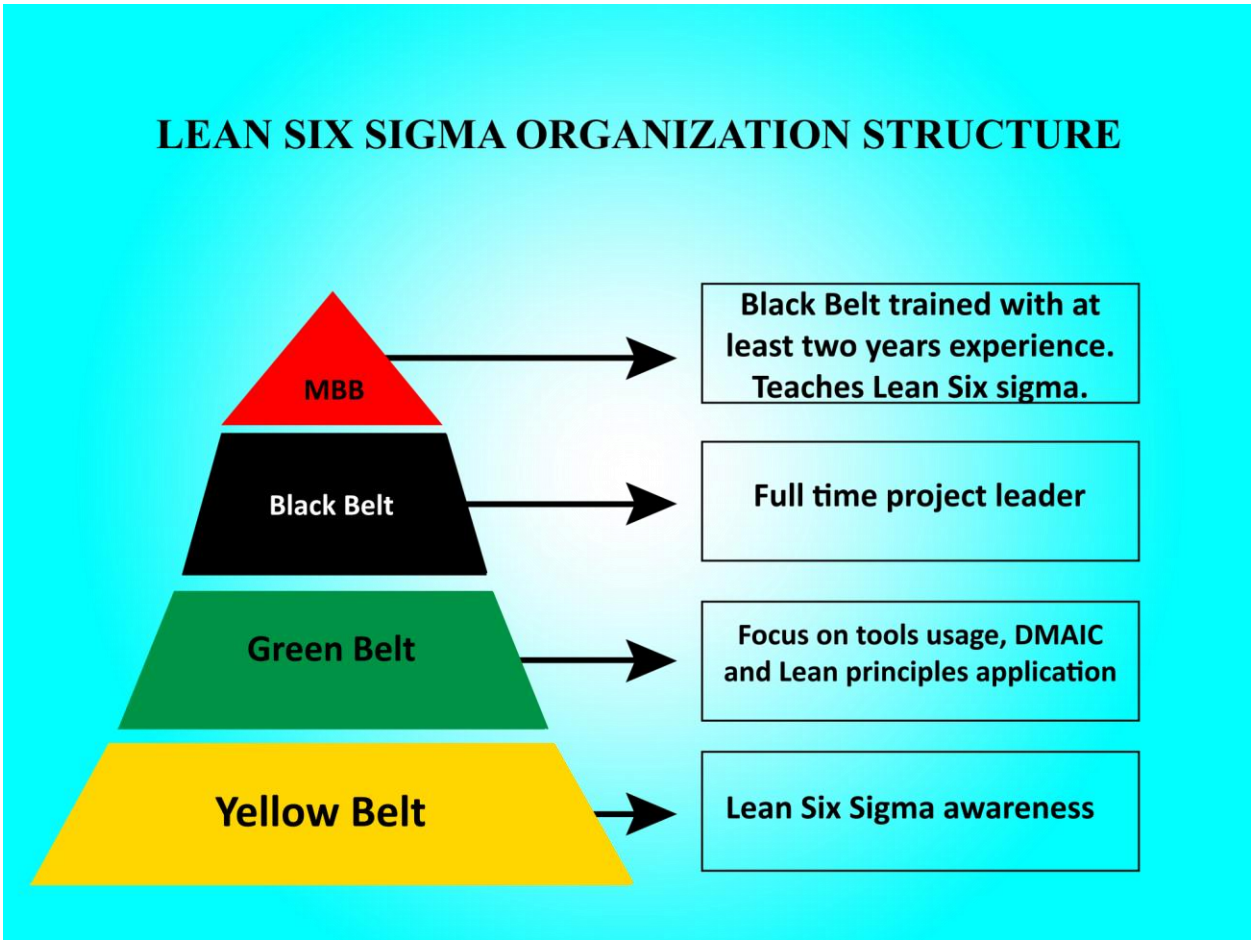

Figure 9. Lean Six Sigma (Source: KaiNexus)

2.8.6 TOTAL QUALITY MANAGEMENT

TQM is a structured approach to overall organizational management. It focuses on streamlining processes in order to improve the quality of an organization's outputs, through continual improvement of internal practices. Total quality management (TQM) is achieved through adherence to five principles - produce quality work the first time, focus on the customer, have a strategic approach to improvement (Ashikuzzaman ,2013).

Figure 10. TQM (Source: Ashikuzzaman ,2013).

2.8.7 Operational definition of terms

Insurance Agent – a can be an individual or a company that represents an insurer. They are responsible for selling and interpreting insurance policies to the customer and representing the customer when a risk for which they are insured for has occurred.

Insurance Broker – a sales agent appointed by an insurer to sale its products

Insurance Underwriter – underwriting refers to the process of identifying and classifying risks and applying rates to those risks. An underwriter is a trained individual that is able to identify, evaluate, classify and determine appropriate rates for those risks.

Insurance Claim – a demand made by the insured party or policy holder against a risk for which he or she is insured against, for payment of benefits. A number of processes must be conducted before a claim is paid out i.e. investigations, policy verifications, engagement of loss adjusters etc.

Repudiation – rejection of an insurance claim on account of a technicality.

2.9 Reviewed papers

Table 4 Peer Reviewed Papers

AUTHOR	TITLE of RESEARCH	FINDINGS
Ahmed Mohamed Ismail	ISO certification & performance of Insurance company's in Kenya (2017)	Positive relationship between adoption of ISO standards and performance in Insurance firms
Richard Opoku Mensah	An Investigation into the level of ISO 9000 certification and its impact on performance of Ghanaian firms (2015)	Adoption of ISO standards improves quality which in turn bolsters productivity in the firm
Koyi Grayson Mushiba Nyamazana Patricia Funjika – Mulenga	Management quality, Productivity and profitability in Zambia (2016)	The results reveal that bench marking, customer focus, people management, process management and leadership appear to be of primary importance and exhibit significant impact on productivity & profitability
Durai Anand Kumar Dr. V. Balakrishnan	A Study on ISO 9001 Quality Management systems Certifications – Reasons behind The Failure of ISO Certified Organizations (2011) India	the study results revealed that there were common gaps found in those certified organizations, classified into Leadership, Strategy, Quality and Social related issues

2.9.1 Web based Applications

Web applications are computer programs that allow users to interact with a remote server through a web browser interface. To an insurance company, a Web Applications offers greater benefits compared to office-based solutions. Web applications reduce business costs - less time spent talking to customers over the phone; eliminate printed materials; allow users to update their own details. Centralized data is secure and easy to backup (Shklar and Rosen 2009).

Some examples of insurance web applications are summarized in Table 5.

Table 5: Insurance Web Applications

INSURANCE APPLICATION	**SECURITY FEATURES**
1. Jubilee Health Insurance Application – Kenya (Source: https://jubileeinsurance.com/ke/products/j-care/)	a) Confidentiality b) Availability c) Authentication d) Authorization
2. Strategis Insurance App – Tanzania (Source: https://www.strategis.co.tz/)	a) Confidentiality b) Availability c) Authentication d) Authorization
3. Sanlam Insurance – South Africa. (Source: https://www.sanlam.co.za/personal/insurance/Pages/default.aspx)	a) Confidentiality b) Availability c) Authentication d) Authorization
4. MGEN-Online -Madison General Insurance – Zambia (Source: https://www.madison.co.zm/)	a) Confidentiality b) Availability c) Authentication d) Authorization

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The study was carried out both as a field assessment and desk research study. This chapter is focused on materials and methods that were used in this study. The chapter is structured around baseline study which includes: mixed methods research methodology, descriptive research design, target group, sample size, data collection tools, data analysis and ethical considerations.

3.1 Research Methodology Flow Chart

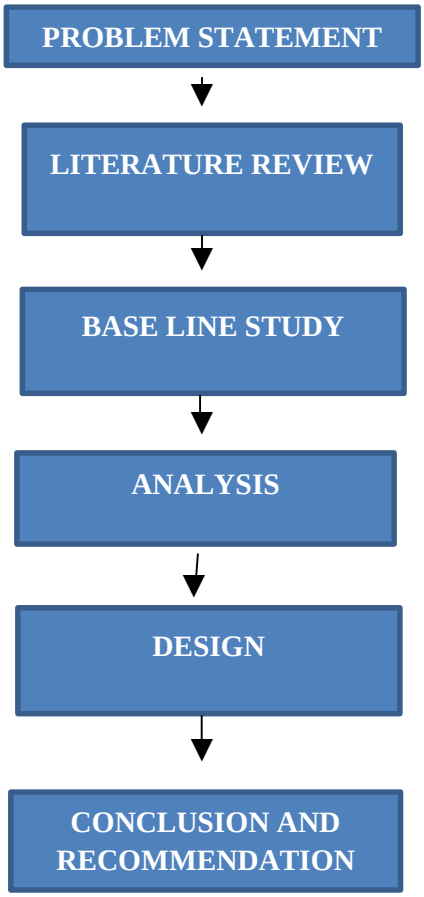

Figure 11. Research Methodology flow chart

3.2 Target Population

The sample for analysis were the top 10 Insurance Companies in Lusaka and their customers. In coming up with a target sample, consideration was made to the Insurance companies standings as captured in the regulators (Pensions and Insurance Authority) annual report of 2015 (see figure 1). The mentioned respondents were sampled from the: University of Zambia (UNZA), NICO Insurance Zambia Ltd, Armguard Zambia Ltd, NECOR Zambia Ltd, MINET Insurance Zambia Ltd, Mean wood Insurance Company, Multi - Choice Zambia Ltd, University of Lusaka, Barclays Bank Zambia Ltd, Guardian Insurance Zambia Ltd and Professional Insurance Zambia Ltd – (see appendix X). The significance of targeting the mentioned groups was meant to capture primary data from the mentioned area through purposive sampling. Table 5 highlights the actual results against the expected results of the study.

Table 6: Population sample summary

Respondents	Intended Sample	Actual Sample
Staff from Insurers	70	64
General Public	50	36
TOTAL	**120**	**100**

3.3 Sample Size

Though the sample size was determined by following Gogtay's guidelines, giving us a sample size of 100 respondents, special consideration was made to the insurance companies market shares or performances **see** figure 2**,** implying that some companies got more questionnaires than others. (Gogtay, 2010) which guide that to calculate the sample size based on the sample required to estimate a proportion with an approximate 95% confidence level, formula (1) below is used: (1)

Where;

n_r = required sample size,

p = proportion of the population having the characteristic,

$q = 1 - p$ and

d = the degree of precision.

The proportion of the population (p) may be known from prior research or other sources; if it is unknown, use $p = 0.5$, which assumes maximum heterogeneity (i.e., a 50/50 split). The degree of precision (d) is the margin of error that is acceptable. Setting $d = 0.1$ 0, for example, would give a margin of error of plus or minus 10%. Applying this formula to this research;

Since the researcher does not know, Gogtay recommends the researcher to assume = 0.5, and the value of q is = 1- p, d is to 90% accuracy; therefore

$p = 0.5$;

q =0.5and

d =0.1, margin of error of ± 10%.

Therefore, the sample size is calculated with confidence level of 90%, to be.

The sample size is calculated with confidence level of 90%, to be $n_r = 100$

3.4 Base Line Study

The baseline study was used in order to investigate the respondent's knowledge on the subject of Insurance, types of insurance Claims Systems on the market and establish the major security related challenges, faced with those systems. Additionally, results from the baseline study were used to formulate the Systems Requirements Specification for the development of the prototype.

3.5 Data collection

The study made use of both secondary and primary data. The primary data, was collected by way of data collection instruments i.e. structured interview guides and questionnaires. Secondary data was gathered from general searches on Insurance Journals, company websites, internet, documentaries, etc.

3.6 Data collection instruments

3.6.1 Questionnaires and Key Informant Interviews

The research used questionnaires and key informant interview guides as the data collection instruments (Donald R. Copper et al, 2011)

3.6.2 Data analysis

In information security, CIA triad model - Confidentiality, integrity and availability, is designed to guide policies for information security within an organization in addition to the three core principles, the triad also has three sub principles of Accuracy, Authenticity, Utility and Possession. (W. Stallings 2011). Accuracy is defined as the assurance that the information is fit for purpose, reliability is the assurance that the information collected is trustworthy, free from alterations and completeness is the assurance that information is free from errors.

3.6.3 Manual Data Analysis Data analysis involves the editing of raw data. This helps to detect and eliminate errors; and proactively make corrections. Data collected through questionnaire was analyzed before it was subjected to spreadsheet on a computer by checking for correctness and completeness.

3.6.4 Computer Based Data Analysis - The qualitative data collected via research instruments of questionnaires and key informant interviews was analyzed using Microsoft excel, a computer-based analysis using the spread sheet. All answered questionnaire items were organized, categorized, quantified and classified according to the study objectives. Microsoft Excel 2016, was used to analyze the data, which was then was then summarized in frequencies

and percentages. Microsoft Corporation is one of the world's biggest personal computer software vendors Microsoft Excel is a powerful spread application used for data visualization and analysis. The collected data was then presented using frequency tables, pie charts and graphical presentations. Qualitative data was classified and coded into themes and concepts for analysis based on objectives of the study. All interview responses were transcribed. Patterns and trends were drawn against the data collected, after which narrative reports were drawn. The findings were presented and discussed and all the data was interpreted in relation to the research questions. Analysis of the data led to theories, correlations and hypothesis being confirmed or refuted and areas of further research suggested.

3.6.5 System Requirements

a) Microsoft Edge or Google Chrome web browser;
b) PHP;
c) Microsoft windows 10 operating system;
d) MySQL;
e) Java;
f) HTML;
g) Laptop or Pentium IV processor unit 2Ghz processor, ≥ 2GB RAM and
h) XAAMP 5 or higher.

3.7 System Requirements Specification

The system requirements specifications detail the features and behavior of a proposed system or application. It outlines a software product`s parameters, goals, user interfaces, hardware and software requirements (Avison and Fitzgerald 2006). SRS can be further broken down into SSR (Software Systems Requirements) which outline functional and non-functional specifications of a system. FR (Functional Requirements) outline the functions that a system or component must perform. NFR (Non Functional Requirements) outline the quality attributes such as availability, usability, accessibility etc. NFR, specify criteria that can be used to judge the operation of a system, rather than specific behaviors (Hathaway 2016).

3.7.1 Functional Requirements

Table 7: Functional requirements

FR 1	The system administrator shall create users
FR 2	The system administrator shall be the super user and will have all the privileges for the entire system
FR 3	The system administrator blocks and updates users of the system
FR 4	The system administrator shall generate log files, backup and recovery files for the system
FR 5	Users shall have relevant access rights to log in and report an incident
FR 6	Users will have the ability to change their password and details such as address and phone number

3.7.2 Non-functional requirements

Table 8: Non-functional requirements

NFR 1	The system shall be easily maintainable
NFR 2	The system failure shall not affect data integrity
NFR 3	All software application modules shall be debugged
NFR 4	The system should be able to notify vendors that offer road side assistance of an incident if service required
NFR 5	The software system and application code shall be well documented, and this will be written in a familiar language
NFR 6	The system shall provide the documentation that shall have all functionality and any user maintenance for the system administrators

3.8 SYSTEM MODELLING and DESIGN

3.8.1 Unified Modelling language (UML) diagrams

UML is used primarily to visualize, specify, construct and document components of a soft. It utilizes a number of diagrams for concept building, examples include Activity diagrams, Use Case diagrams, Sequence diagrams, to mention but a few.

3.8.1.2 Activity Diagrams

These diagrams are used in UML to describe the dynamic aspects of a proposed system. they represent the flow from one activity to another activity. For the purposes of this research, I decide to use activity diagrams to clearly illustrate the flow of events in a particular system function

3.8.1.3 Deleting Users Activity

Appendix X illustrates the sequence of events that go with deleting User Accounts from the system. This function is a preserve only of the System Administrator, who is the principal user of the system. Once logged in, the administrator is able to delete users.

3.8.1.4 Incident Reporting Activity

Appendix XI illustrates the sequence of events that go with Incident reporting by a client on the system. A user must first be registered in order to access system resources, if not registered, he or she will be required to register their credentials. Capture images of the incident or scene, input those images into the system, upload those images. If the images are within the admissible parameters, the upload is validated and an acknowledgement sent to the user

3.8.1.5 Incident Validation Activity

Appendix XII illustrates the sequence of events that go with Incident Validation on the system. A user must first be registered in order to access system resources, if not registered, he or she will be required to register their credentials. Once logged in, the record is pulled up from the system, if located, incident report algorithm is run, which checks the validity of the Clients Insurance Policy. Thereafter, status notification is posted to the client

3.8.1.6 Awarding Client Activity

Appendix XIII illustrates the sequence of events that go with Awarding clients. A user must first be registered in order to access system resources, if not registered, he or she will be required to register their credentials. At log on, credentials are validated with database records, if entered credentials match database records exists, the user is logged into the system. If not, the system gives out an error message informing user of incorrect log in attempt.

3.8.1.7 Saving to the Data Base Activity

Appendix XIV illustrates the sequence of events that go with saving records to the Data base. User Account Creation and Deletion is a preserve only of the System Administrator, who is the principal user of the system. Once the administrator enters and verifies user account credentials, the record is then committed and saved to the data base

3.8.1.8 System Log - In Activity

Appendix XV illustrates the sequence of events that go with client logging into the system. A user must first be registered in order to access system resources, if not registered, he or she will be required to register their credentials. At log on, credentials are validated with database records, if entered credentials match database records exists, the user is logged into the system. If not, the system gives out an error message informing user of incorrect log in attempt.

3.8.2 Pseudo Code

Pseudocode is an informal way of demonstrating what a program is designed to output without using any code syntax or underlying technology considerations. It basically summarizes a programs process flow, excluding underlying details (Techopedia,2019). It was chosen as a design tool in this project due to its simplicity in consolidating concepts.

3.8.2.1 **LOGIN**

BEGIN

IF user = logged in

THEN END

ELSE

Enter user credentials

OPEN user database

LOCATE user credentials

MATCH user credentials

IF credential <> MATCH

THEN show error

Re-enter user credentials

RETURN

ENDIF

ENDIF

3.8.3 Sample Codes

3.8.3.1 LOG-OUT

```
<?php
require_once 'core/init.php';

$user = new User();
$user->logout();

Redirect:to('home');
?>
```

See Appendix XVI for more sample code

3.9 System Implementation

The web-based application prototype -INSUR AID was developed using PHP Programming language, MYSQL server for the back end (database). User interfaces were developed using HTML.

3.9.1 Limitations of the prototype

When complete, the web-based prototype (INSUR AID), is supposed to cover all departments of an Insurance company i.e. underwriting, accounts etc. but due to time and financial constraints the researcher could only develop the module that deals with claims handling. The prototype was merely aimed at providing proof of concept.

CHAPTER FOUR

DATA COLLECTION AND ANALYSIS

4.0 Introduction

The general objective of the study was to investigate claims handling systems in Zambia's Insurance Industry. The study employed the use of descriptive survey design that used structured questionnaires and semi structured interview guides as data collection instruments. The sample size was one hundred and forty (140) out of which response was recorded from one hundred and twenty respondents (120). The questionnaire was adopted the use of the Likert scale. Data collected was analyzed through descriptive and inferential statistics. Based on an objective analysis of data and discussion of results, the following are the summary of major findings and conclusions of this study.

4.1 Response Rate

A total of 70 questionnaires were sent out, with only 60 respondents returning. This signified a response rate of 85.71 %.

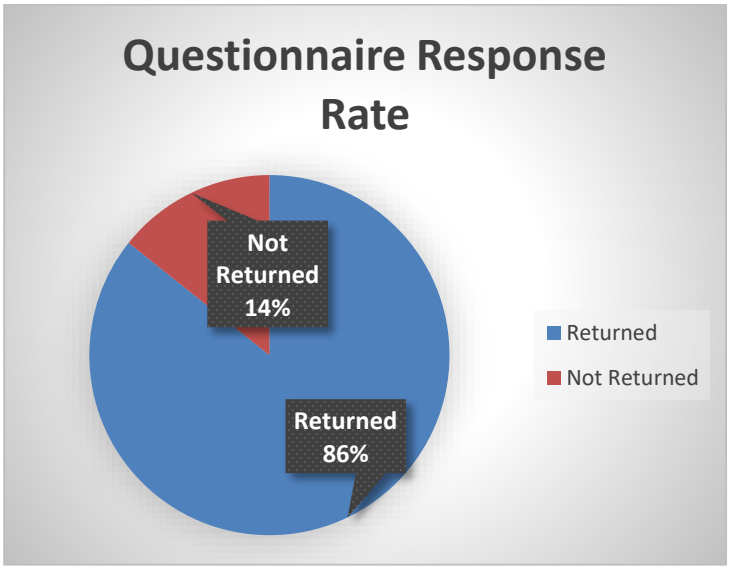

Figure 12: Respondents Response Rate

4.2. BIO Data of respondents

Table 8: Demographic profile of Respondents

Variable	Category	No.	%
Gender	Male	62	59.61
	Female	42	40.38
Age	20 - 29 years	33	31.73
	30 - 39 years	56	53.84
	40 - 49 years	17	16.35
	50 and above	7	6.73
Occupation	Executive Officer	4	3.84
	Director	6	5.76
	Manager	10	9.61
	Supervisor	7	6.73
	Subordinate	30	28.85
	Single	26	25
Marital Status	Married	55	52.88
	Widowed	10	9.62
	Divorced	5	4.81
	Separated	8	7.69
Edu. Qualification	G12	1	0.96
	Certificate	13	12.5
	Diploma	42	40.38
	Degree	41	39.42
	Masters	4	3.85
	PHD	2	1.92
	Others	1	0.96
Insurance	Adequate	15	14.42
Sensitization	Not Adequate	89	85.58
	Low Density	19	18.26
Area Analysis	Middle density	72	69.23
	High Density	10	9.62
	Life	13	12.5
Type of policies	Non-Life	122	117.31
	Experienced fraud	67	64
Fraud	Read about fraud	73	70
	Insurers involved in fraud	71	68

Source, authors field data 2018.

The raw data captured from respondents was analyzed and presented in the figure 4 above. Generally, the respondents were 40.38% female and 59.61% male. Age analysis reveals that 31.73% of respondents are aged between 20 and 29 years, 53.84% between 30-39, 16.35% between 40 and 49 and 6.73% aged above 50 years.by implication, the fact that 50% of the respondents are aged between 30-39 years signifies that this the highest number of uptake on insurance products. From the chart, NON-Life Insurance products account for 117% and Life Insurance products giving a paltry 12.5%. Notable also from the data is that levels of Insurance sensitization, with 85% of respondents feeling that sensitization was inadequate and a paltry 14% feeling that it was adequate. An analysis on the marital status of respondents revealed that 25 % were single, 52% were married,9% were widowed,7% separated and 4% divorced. The respondents in the married bracket also showed took up a lot more insurance product than any other bracket. Analysis of the levels of education reveals that respondents on average, are well educated with 79% having a Diploma or University Degree in their possession and 2% going as far as attaining a Masters or PHD. 0.96% indicated that they had not had any tertiary education.

4.3. *Findings of RO1*.

4.3.1. *RO1* - To investigate Insurance claims management processes.

4.3.1.1 Insurance Uptake - Out of the 100 respondents of the survey,13.4% mentioned that they do no use any insurance product, whilst 86.53% alluded to using some form of Insurance. Looking at figure 9, 117% use NON Life insurance products and 12% use Life Insurance products.

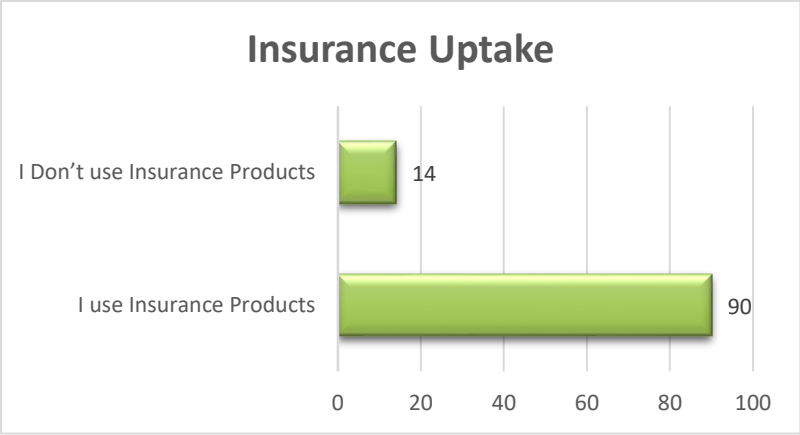

Figure 13: Insurance Uptake

One respondent when asked the question '*why are you signed up with this Insurer?'*, and the response was *'their systems are very efficient; my claims were dispensed in the shortest prime of 7 days from claim notification'*.

Another respondent answered *'their response to customer requirements, they are able to forecast and innovate in order to move in tandem with changing environments'*

One manager from an insurance company stated *'Insurers have a unique opportunity to leverage multiple data sources to create deeper customer relationships and to become more efficient'* the implication is that systems are what link customers to the business. More so in the insurance industry, a good system will guarantee retention of customers and vice versa.

Another Claims Manager had this to say about the impact of a claims management system on the business *'businesses need to invest in systems that will help manager and build customer relationships, offer information that is timely and credible and help in resource optimization. new systems such as Integrated ecosystems to create new risk pools, Digital adoption to enhance access to data and stream line processes, Block chain systems bring about reliability of processes and transactions and big data and analytics to make sense of the vast amount of data generated and consequently, create value'*

A C.O.O had this to say about impact of systems on the business *'we are where we are on the hierarchy of insurance companies in Zambia based on underwritten business because of the systems we are using in the business. Currently, we don't have accurate information on the overall customer base, underwritten business and claims outstanding. However, if we were to modernize our systems by adopting I.o.T (Internet of Things) to improve access to data and streamline operations.'*

4.3.1.2 Type of Policy - The diagram below gives a detailed breakdown of the different types of insurance policies undertaken by the respondents. Non-Life products are popular amongst the 30-39 years bracket whilst the Life products are mostly under taken by the 40 and above age bracket. From the interactions with the respondents, it can be concluded that service levels are one of the factors that influence insurance uptake. When a customer claim is managed properly, that customer will be retained and is likely to influence a friend to buy the same product or service.

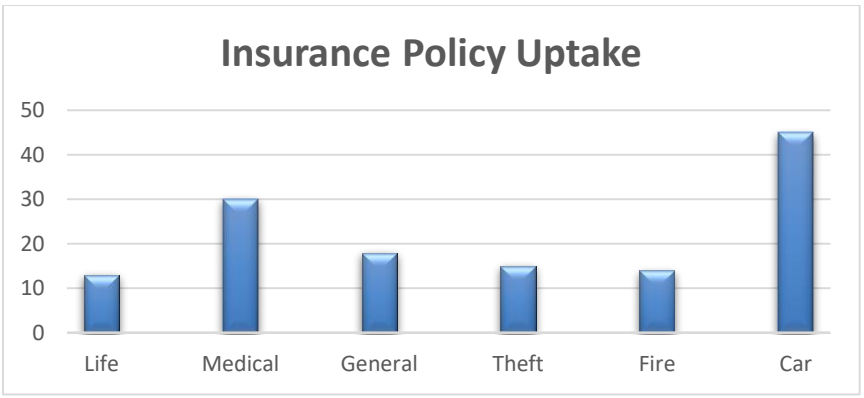

Figure 14: Insurance product Subscription

Motor vehicle insurance has the highest number of subscribers largely due to regulations imposed by the Government of the Republic of Zambia. A motorist is unable to by road tax without valid motor vehicle insurance. Medical insurance also has a high subscriber base owing to employees being offered medical insurance cover as a condition of service. Hence, the age bracket of 29-39 are the highest subscribers of this policy because that is the bracket which is in active employment. One responder had this to say when asked about the choice of policy they were signed up *for 'am only signed up for medical aid because my company pays for me, I don't pay a dim and my family is fully covered and can enjoy good health care from any medical facility that has arrangements with the insurers offering the service e.g. Momentum, M-Life, Sancare etc.'*

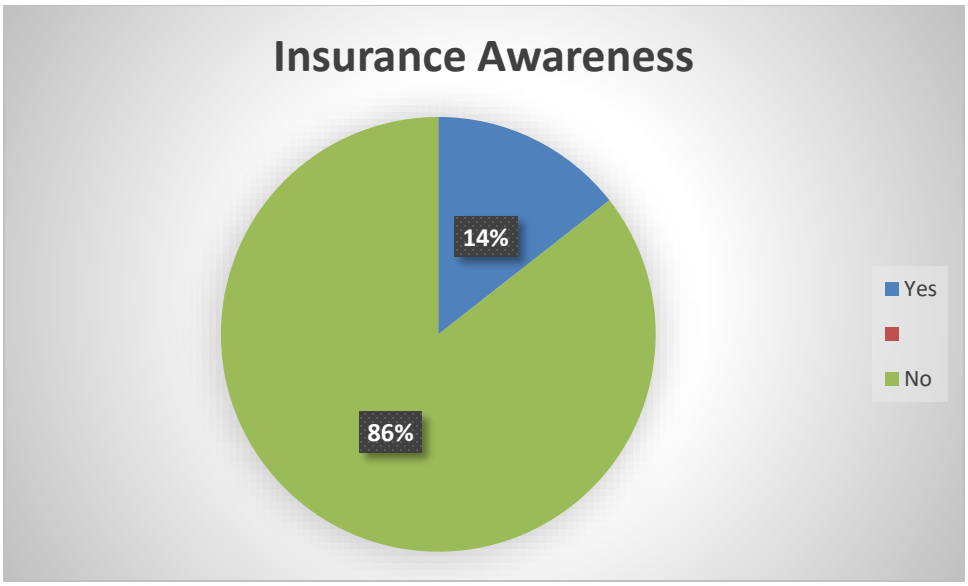

Figure 15: Insurance Awareness

4.3.1.3 Insurance Awareness - A survey on Insurance awareness from the respondent revealed that 86% felt that sensitization to the public was not adequate and 14% felt otherwise.

One respondent added *'my grandfather is very wealthy with a 1000 herd of cattle, goats, and pigs but the old man does not know about insurance. I wish an agent can go to his village and educate him.am pretty sure, the old man will buy a policy from them'*

Another respondent added *'these insurance companies only sale their business to people in town or urban areas yet the money is in the out skirts'*

4.3.1.4 Fraud - A vice that can impact the claims process and it can be committed by any one of the parties involved in a transaction i.e. policy holders or applicants of an insurance service, third party claimants and insurers (the professionals that actually give the service). Examples of fraud may include; inflating of claims, falsifying insurance applications, backing up a claim with fake evidence etc. An analysis on fraud was conducted from November 20,2018 and December 7,2018 revealed that 64% of respondents alluded to having been victims of insurance fraud, 70% alluded to having read about insurance fraud and 68% of respondents believe that Insurers are the deeply involved in insurance fraud. One respondent bluntly put it that *'Insurance Fraud can never be fully eradicated but can only be mitigated through strong regulatory reforms, strong punitive measures against offenders and Insurance firms investing in good systems. The system we use at work is too*

porous, files can be back dated, data can be altered in the system. Due to over reliance on paper work, documents are easily lost'. Another respondent added that *'Zambian security wings like the Anti-Corruption Commission, Zambia Police and Drug Enforcement Commission need to be trained on how to identify and stop fraudulent activities in the insurance industry'*

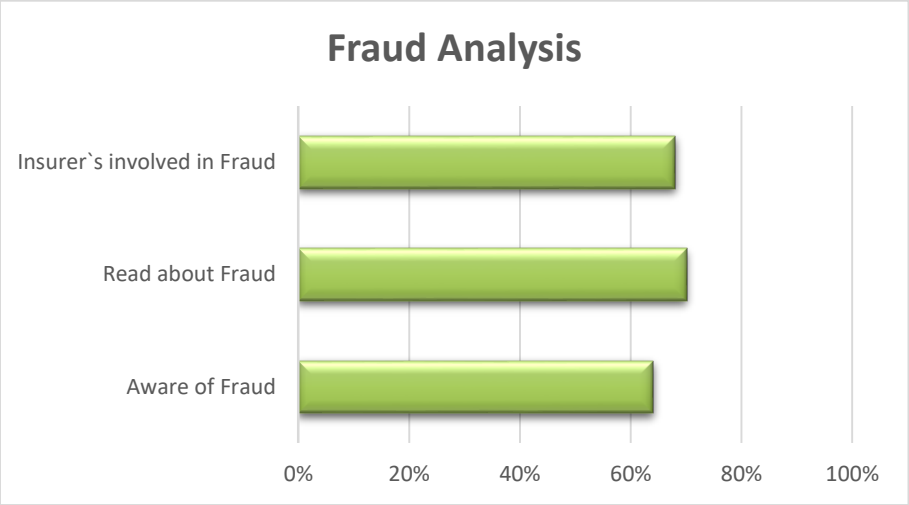

Figure 16: Insurance Fraud Analysis

4.3.1.5 - Poor Customer Service – The study revealed that service delivery from insurance companies was bad, with customer expectations not being met. An analysis on service levels aimed to assess whether respondents were happy with the levels of service offered by various insurers that they were subscribed to. A Likert scale with the following ratings was used: 1 = Strongly Agree, 2 = Agree, 3 = NAD, 4 = Disagree, 5 = Strongly Disagree.

56% of respondents indicated that they were not happy with the services being offered, 12% indicated that they were happy with insurance services,42% indicated that their needs were not being satisfied, 20% indicated that their needs were being satisfied. Further to that 40% of respondents indicated that the systems being offered were far from expectations whilst 34% indicated that expectations had been met. Going by the results obtained, 56% of respondents said the service was bad.

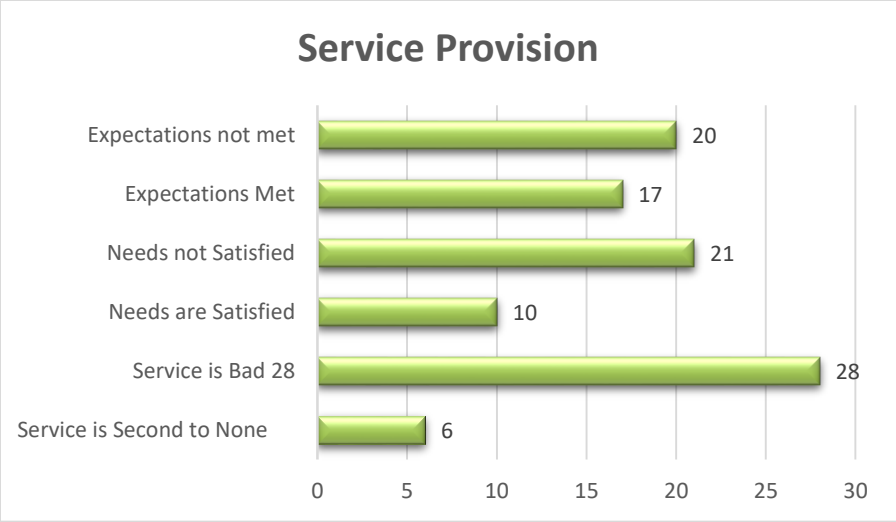

Figure 17: Insurance Service Provision

4.4. Findings of RO2

4.4.1 RQ2 - To analyze insurance claims management systems and standards used to develop their development?

Implementing international standards guarantees companies, products and services that are high in quality, having a high degree of customer acceptance and satisfaction and very efficient in resource utilization. Examples of such standards include Lean management, Six Sigma, Lean Six Sigma, Total Quality Management (TQ), ISO 9001 and ISO 27001 (Karapetrovic and Willborn 2012). The study revealed that information derived from industry systems, lack the 5 qualities that are expected of an information system i.e. accuracy, completeness, relevance, accessibility and consistency. The lack there of, is evident in the amount of fraud prevalence in the industry.

4.5. *Findings of RO3*

4.5.1 RQ3 - To develop an enhanced claims management process based on international Standards*?*

I) **– Web based Insurance Claims Management Application -** The researcher proposes a web based claims management application that will enable customers, submit claims online, upload pictures of the incident, be it fire or motor vehicle accident etc. the system will advise the customer of required inputs to process a claim and give periodic updates from the admin on progression of their claim. The prototype should have inbuilt security features such as user authentication, data Integrity, non-repudiation, user authorization, data reliability, time stamping, and geo location. The prototype will not only mitigate fraud in the submission process but also improve efficiency and productivity. The following screen shots highlight the user interfaces contained in the system.

4.6 INSUR AID PROTOTYPE – USER MANUAL

This section presents the results of the screen shots from the prototype application. The results demonstrate step by step instructions of how to operate the system.

Launching the application: From the start button,scroll through the list of programs,locate and

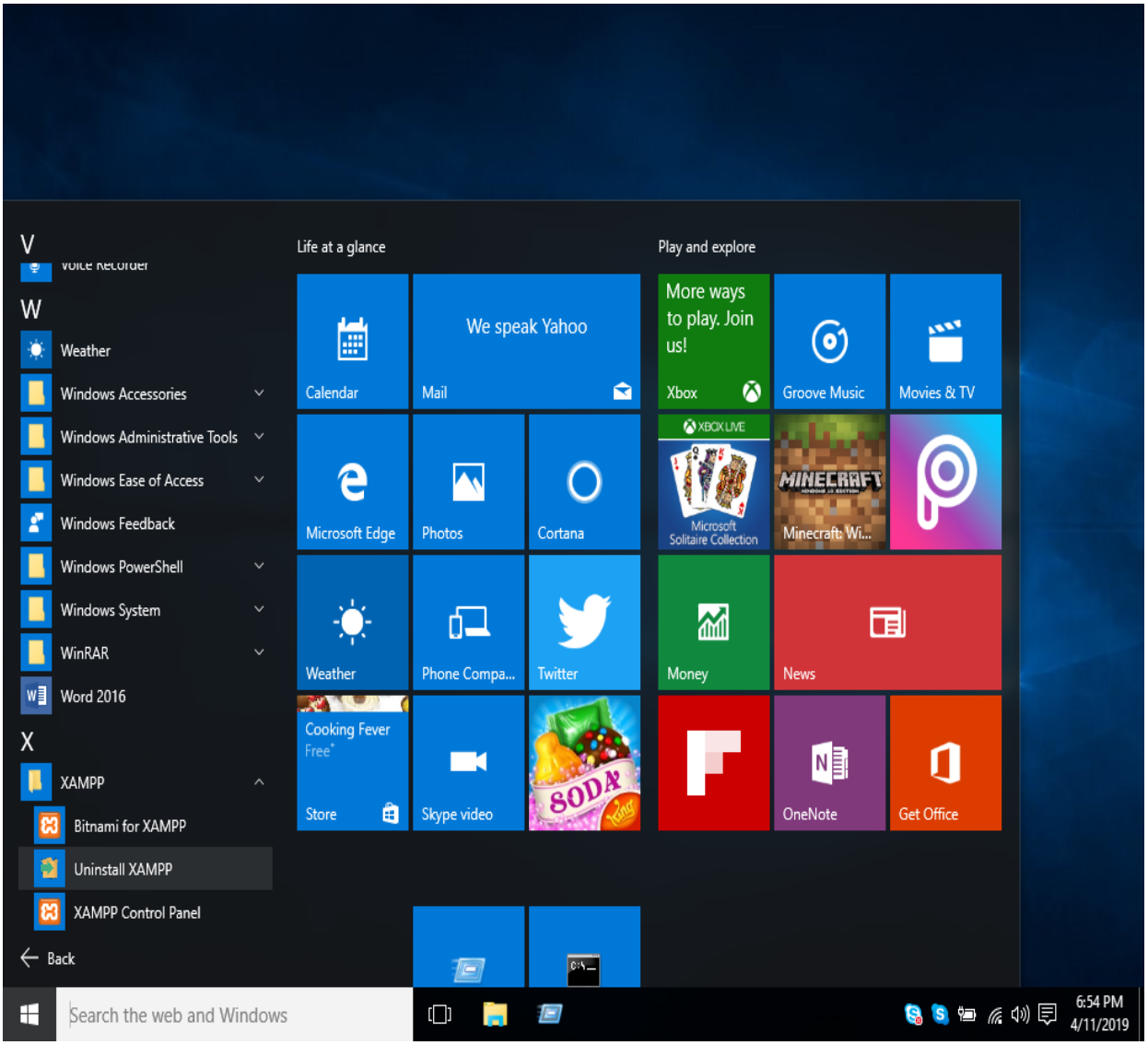

Figure 18: launching XAAMP from start menu

Once the XAAMP application loads, Open the control panel.,check and and ensure that APACHE and MySQL are running as shown in figure 19.

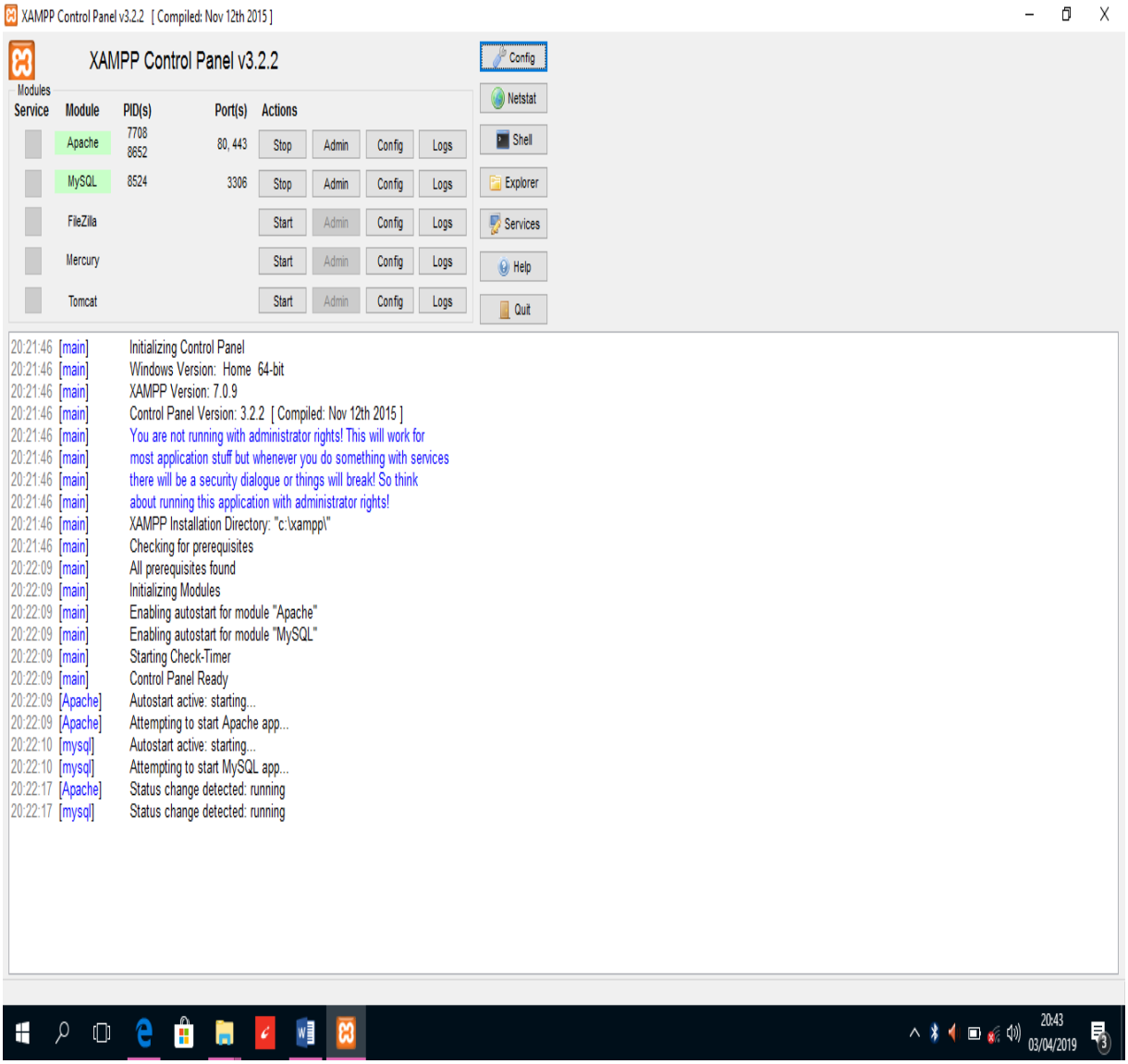

Figure 19: XAAMP Control Panel

After XAAMP has fully loaded and APACHE and MySQL are confirmed as running, Microsft Edge or Google chrome web browser should be lauched. In the address bar,type `Localhost/insu/home' as shown in figure 20.

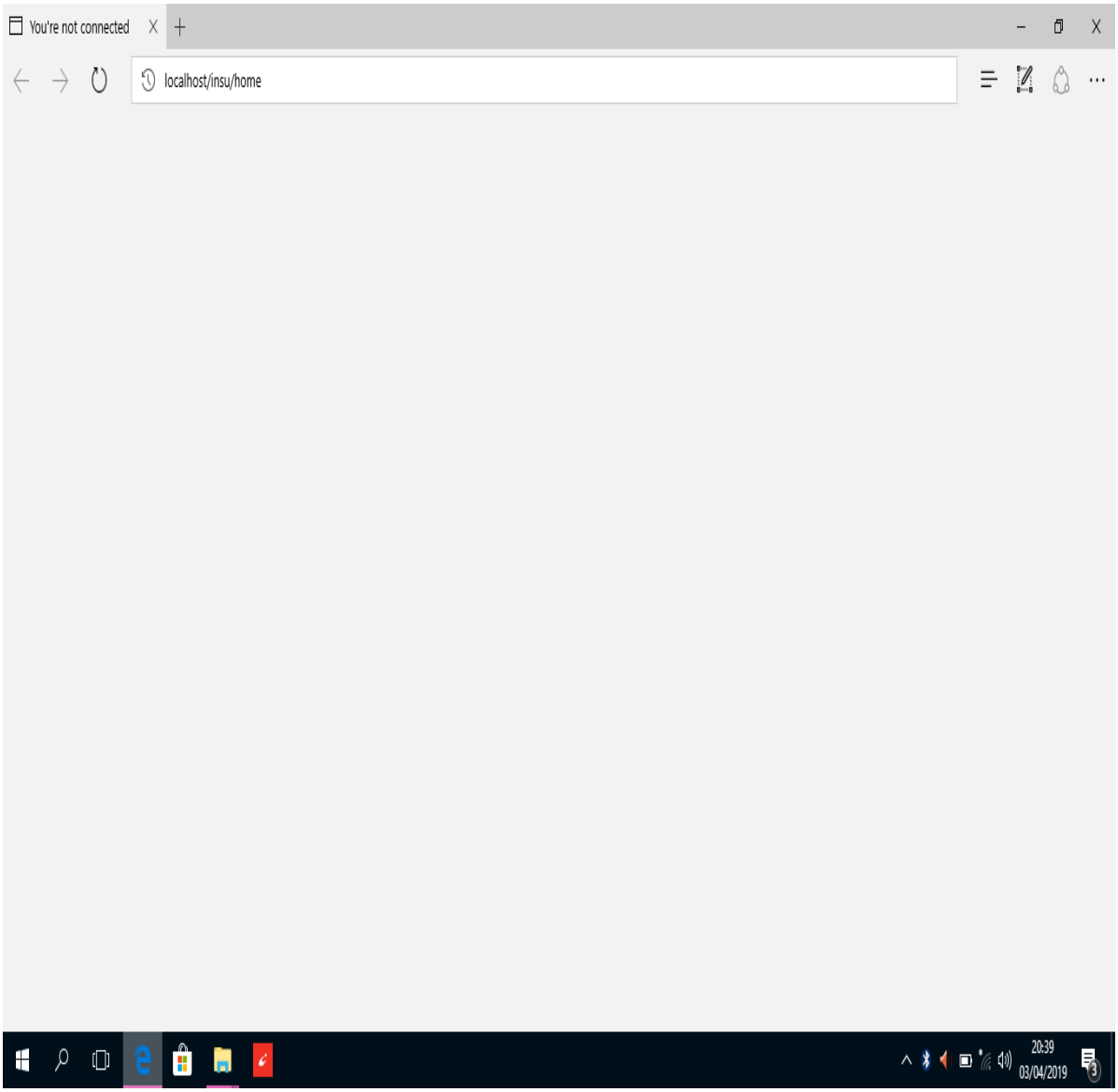

Figure 20: Web Browser page

Figure 21 illstrates the outcome of trying to run the Prototype Application before XAAMP has fully loaded or APACHE and MySQL services are not yet running

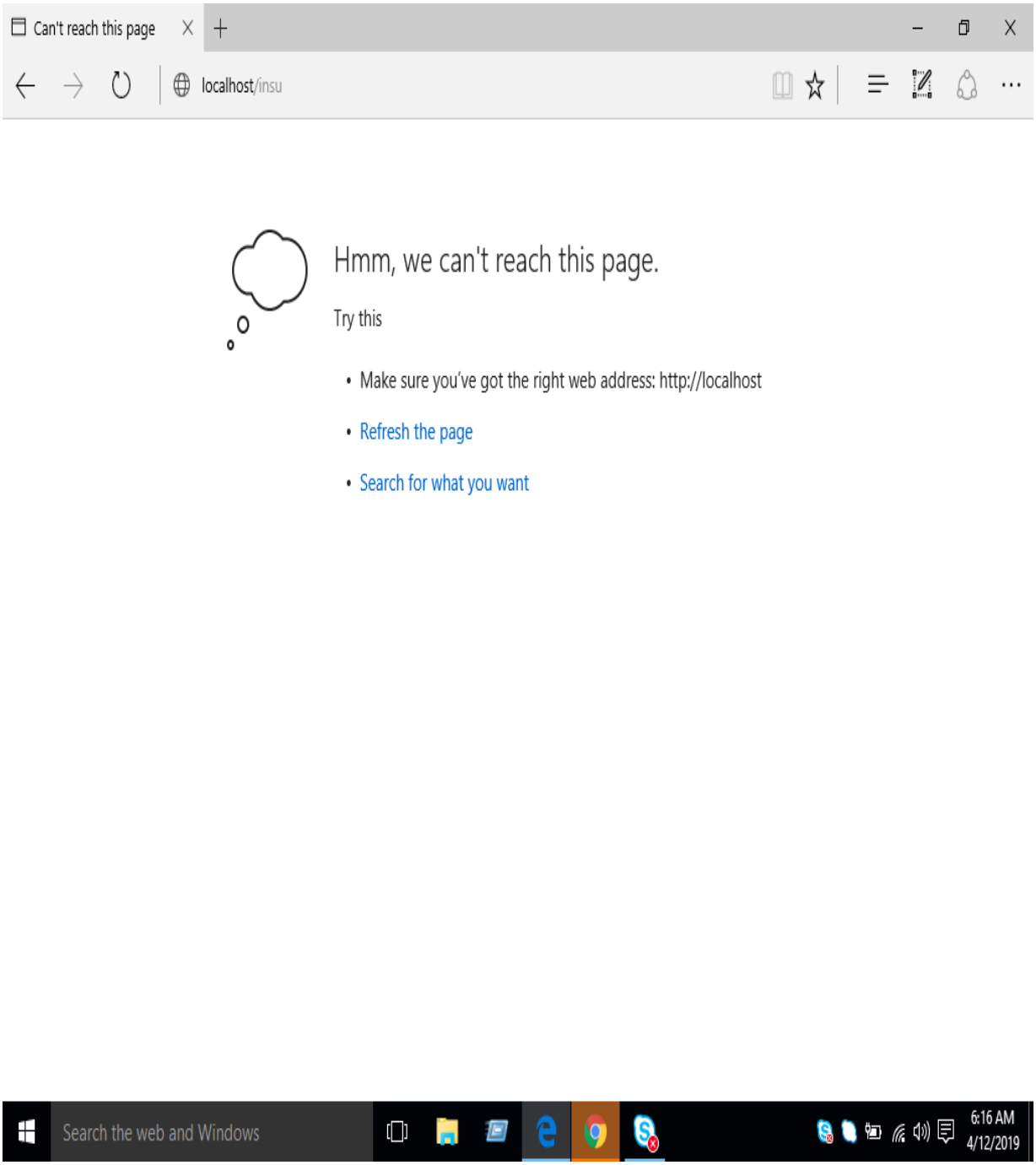

Figure 21: Application Error Page

When the application loads,the home page will de displayed as shown in figure 22. The site has bluish theme to it simply because of its appealing nature. The site also has a `feel good' ring to it due to its overall styling, layout and font choices.

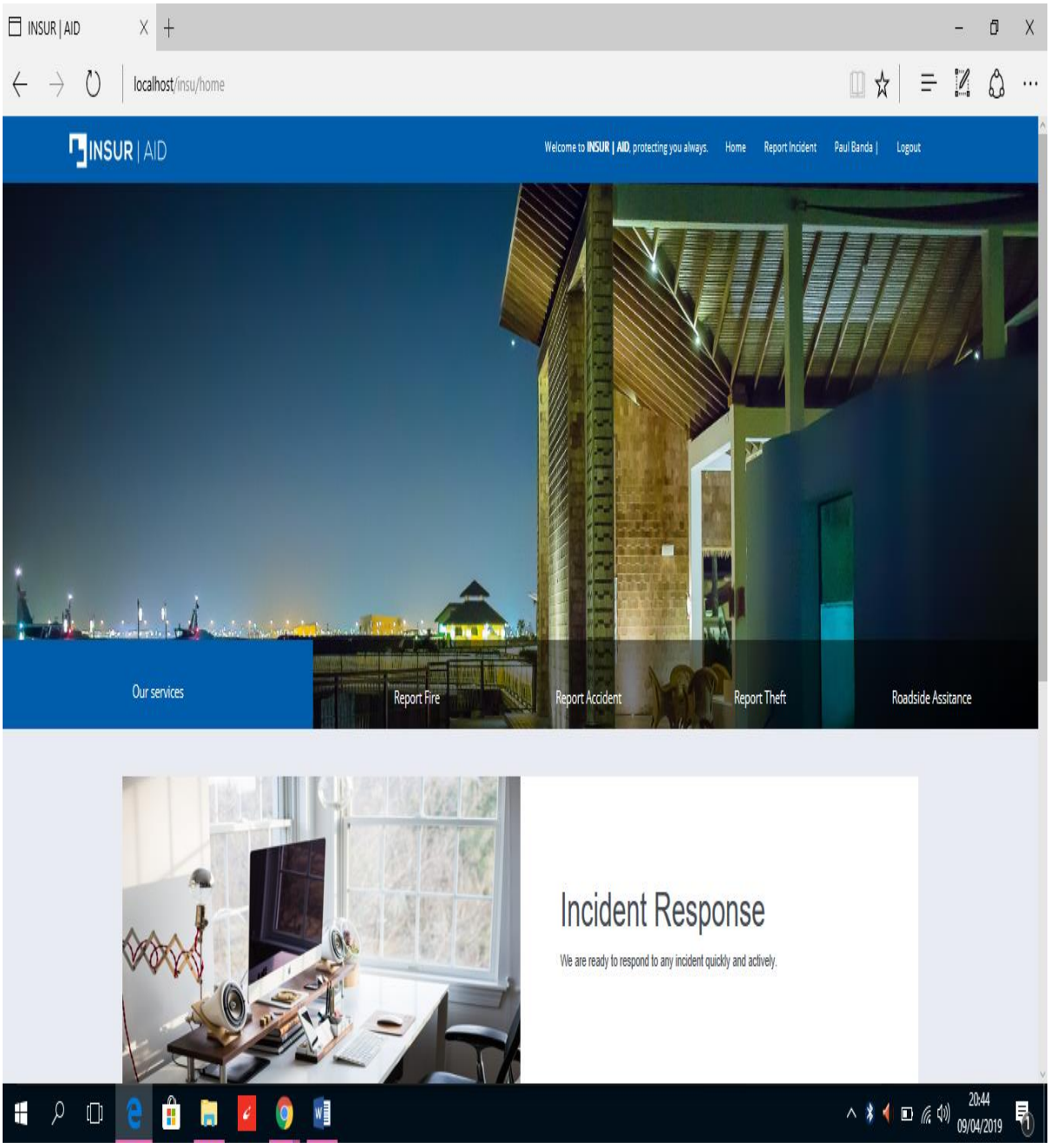

Figure 22: INSUR-AID Home screen

To gain access to the system,one have an Administrator or User account defined. The Administror account is created by default.

Figure 23 illustrates the User Log on screen.

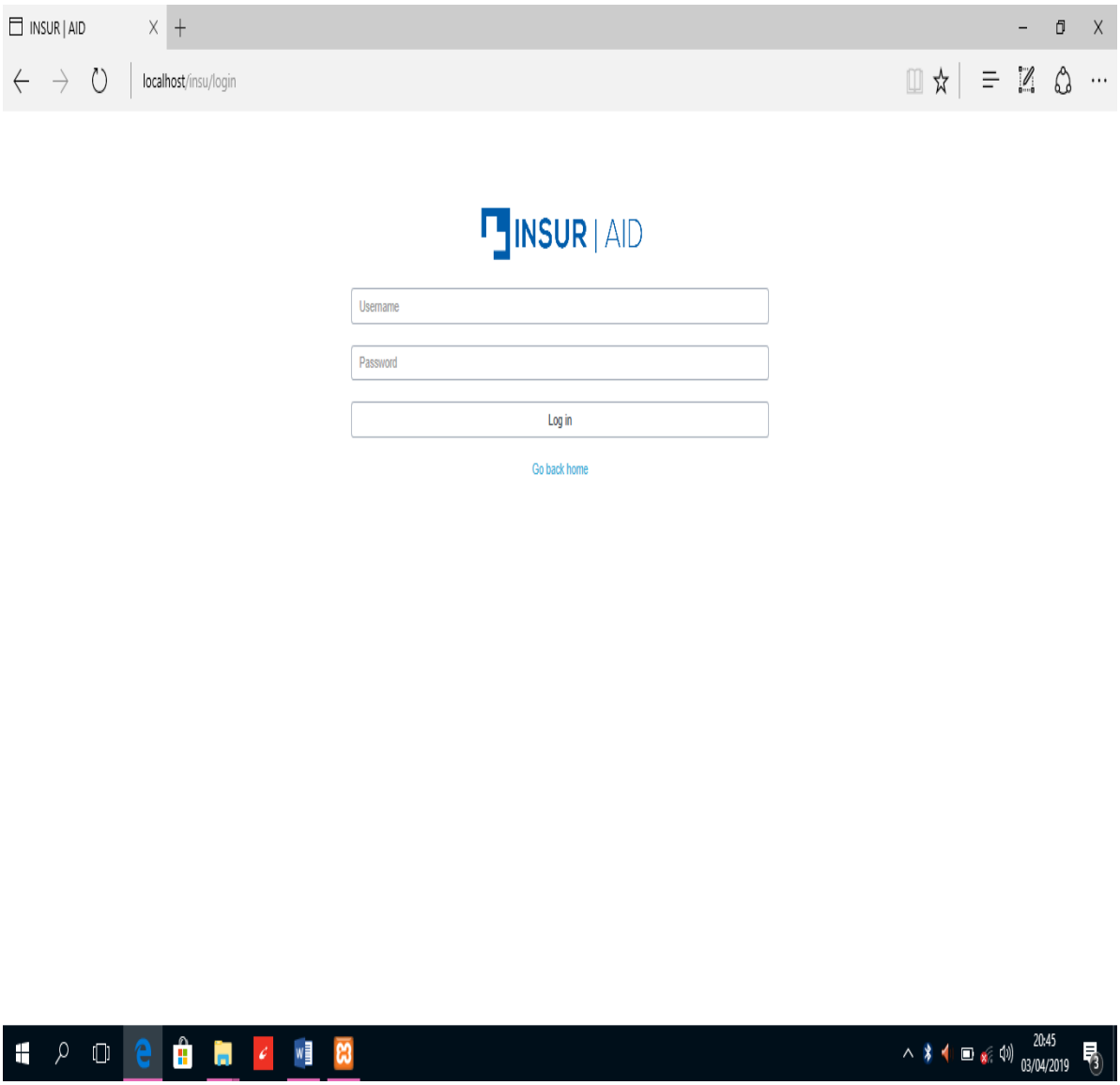

Figure 23: log on Page

Figure 24 shows the error screen that is invoked when an incorrect input is made at log in.

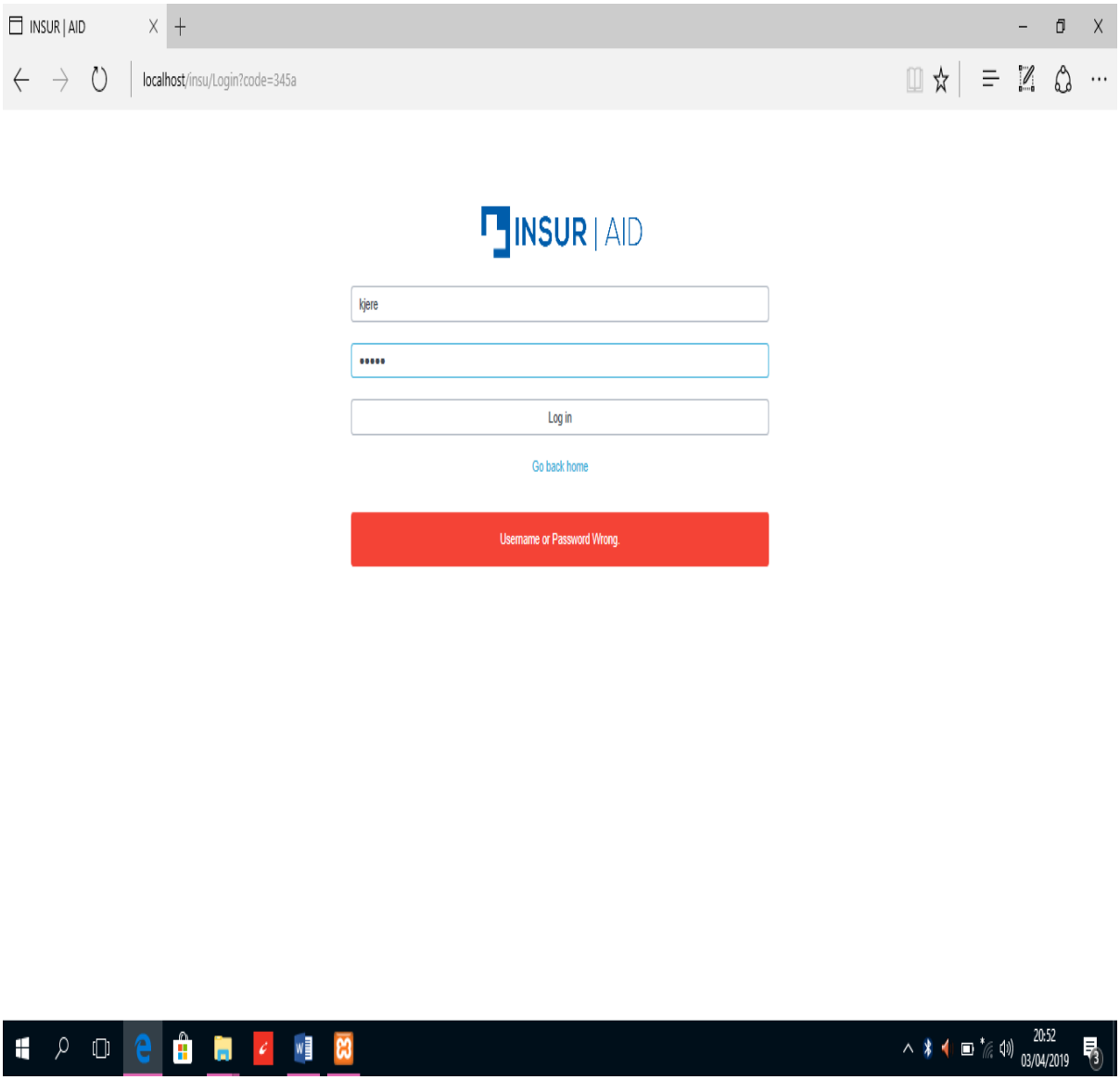

Figure 24: Invalid log on error

After successful login into the Administrator Account, the screen below is displayed. The Administrator is a super user of the system and is able to create customer accounts, delete customer accounts, respond to customers and view incidents posted by customers as shown in figure 25.

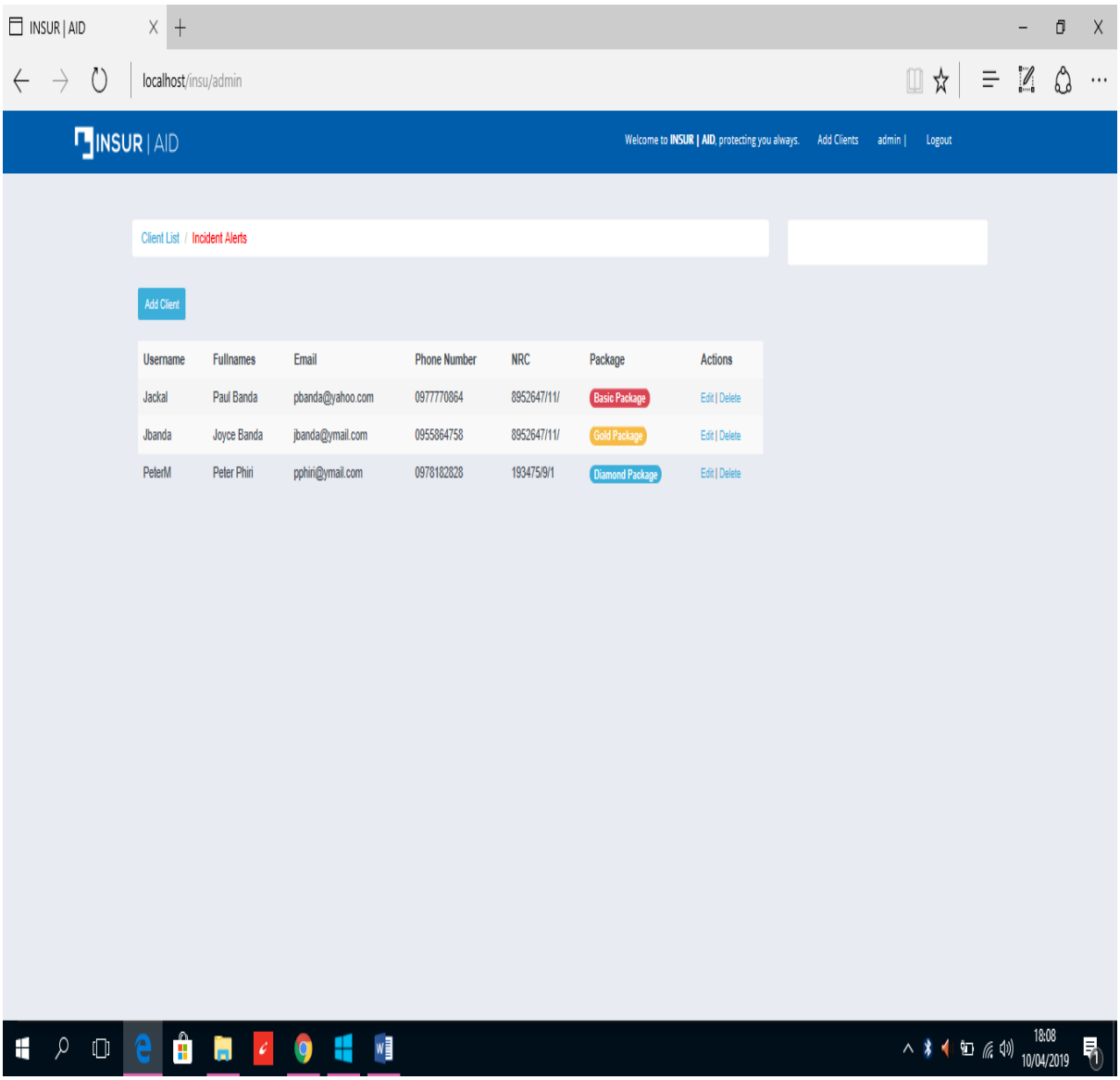

Figure 25: Home Screen - Administrator profile

Administrator is able to add clients to the System as shown in figure 26.

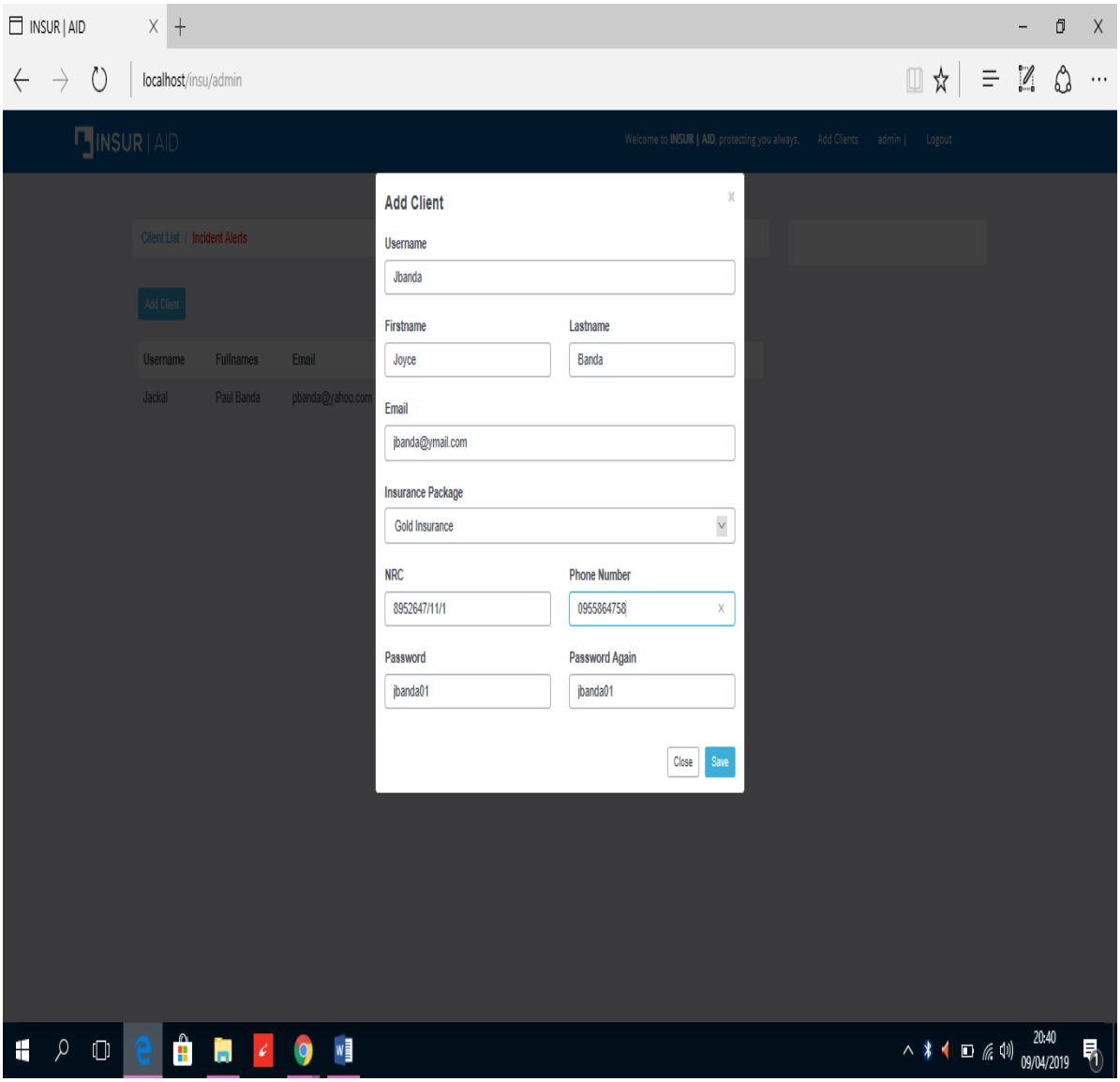

Figure 26: Adding a Client – Administrator Profile

Administrator is able to view Incidents or Claims from Customers as shown in figure 27.

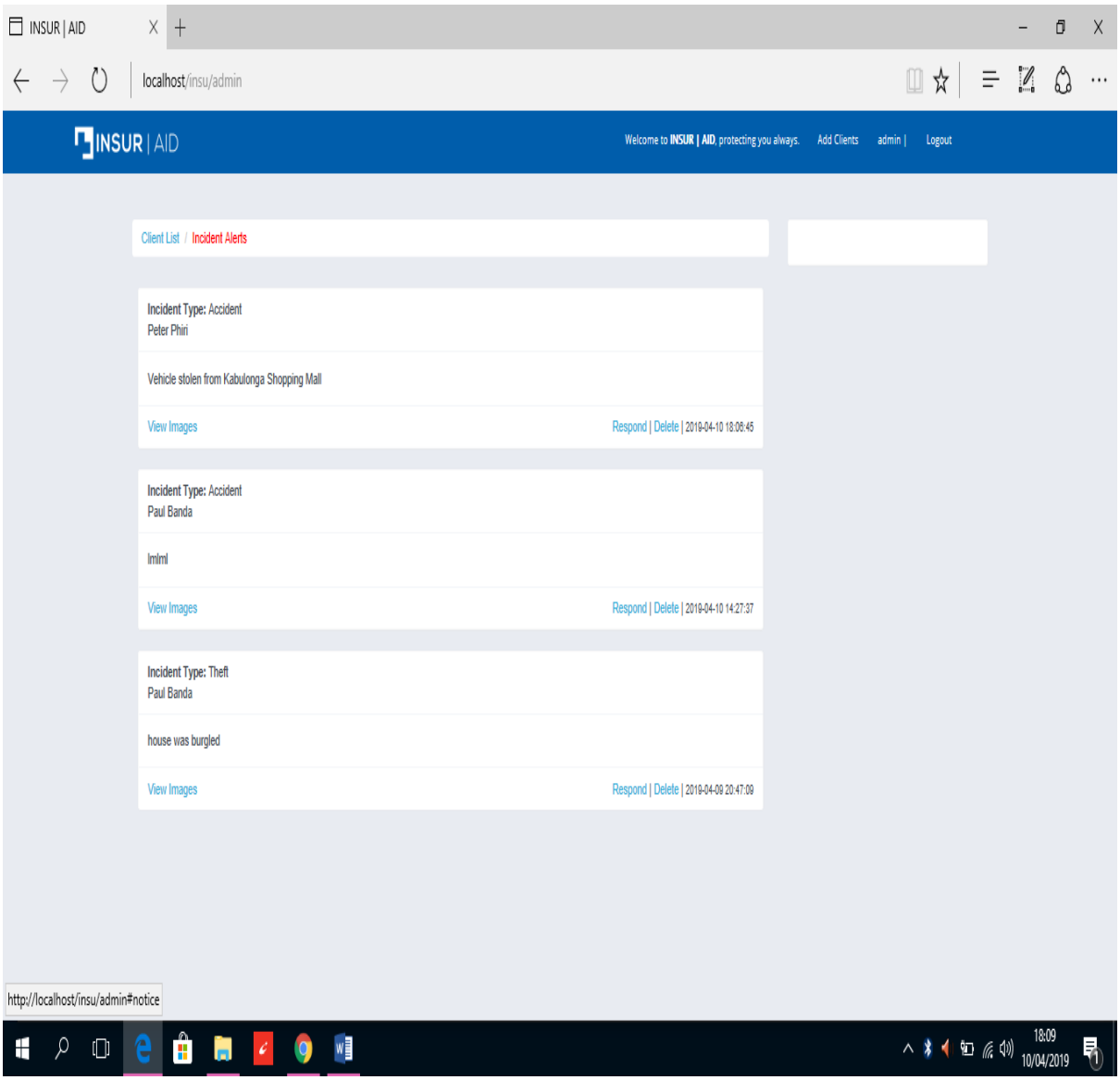

Figure 27: Incident List – Administrator Profile

Administrator is able to post periodic updates on Claim progression to the Customer as shown in figure 28

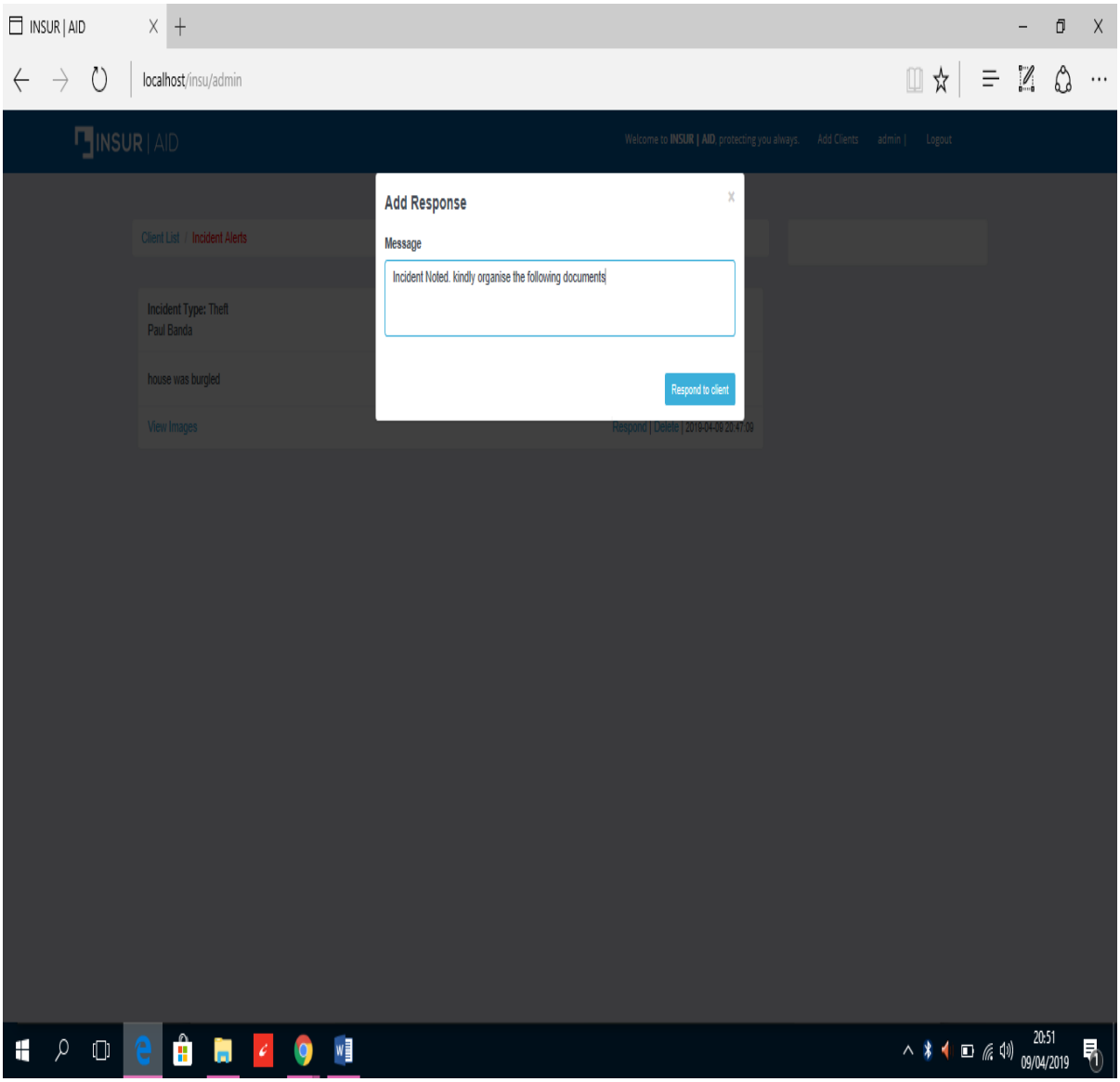

Figure 28: Sending Notification Updates – Administrator Profile

Administrator is able to amend or delete Customer Records as shown in figure 29

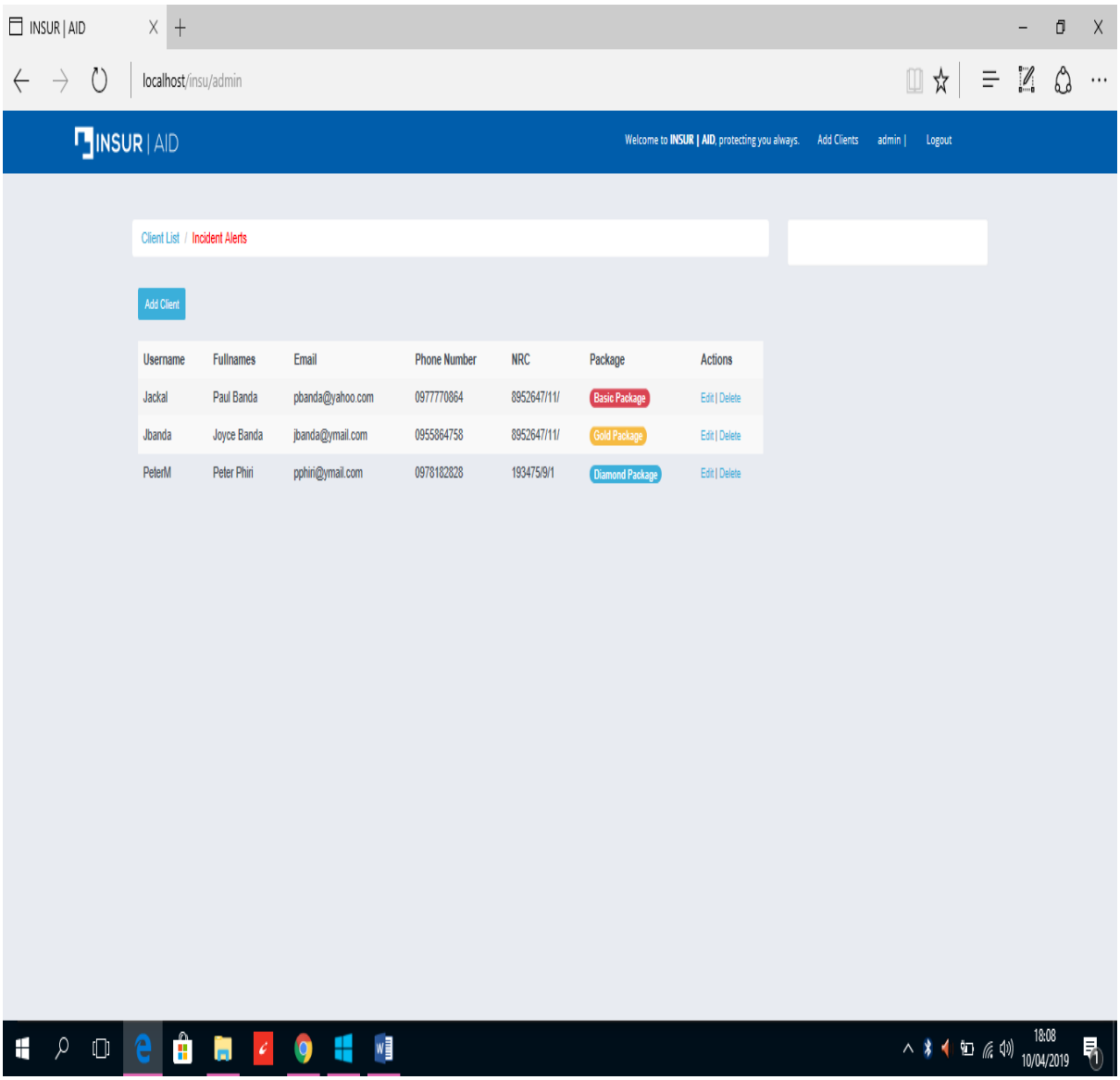

Figure 29: Amending or Deleting Customer records – Administrator Profile

A defined user of the system is able to log into the system as shown in figure 30.

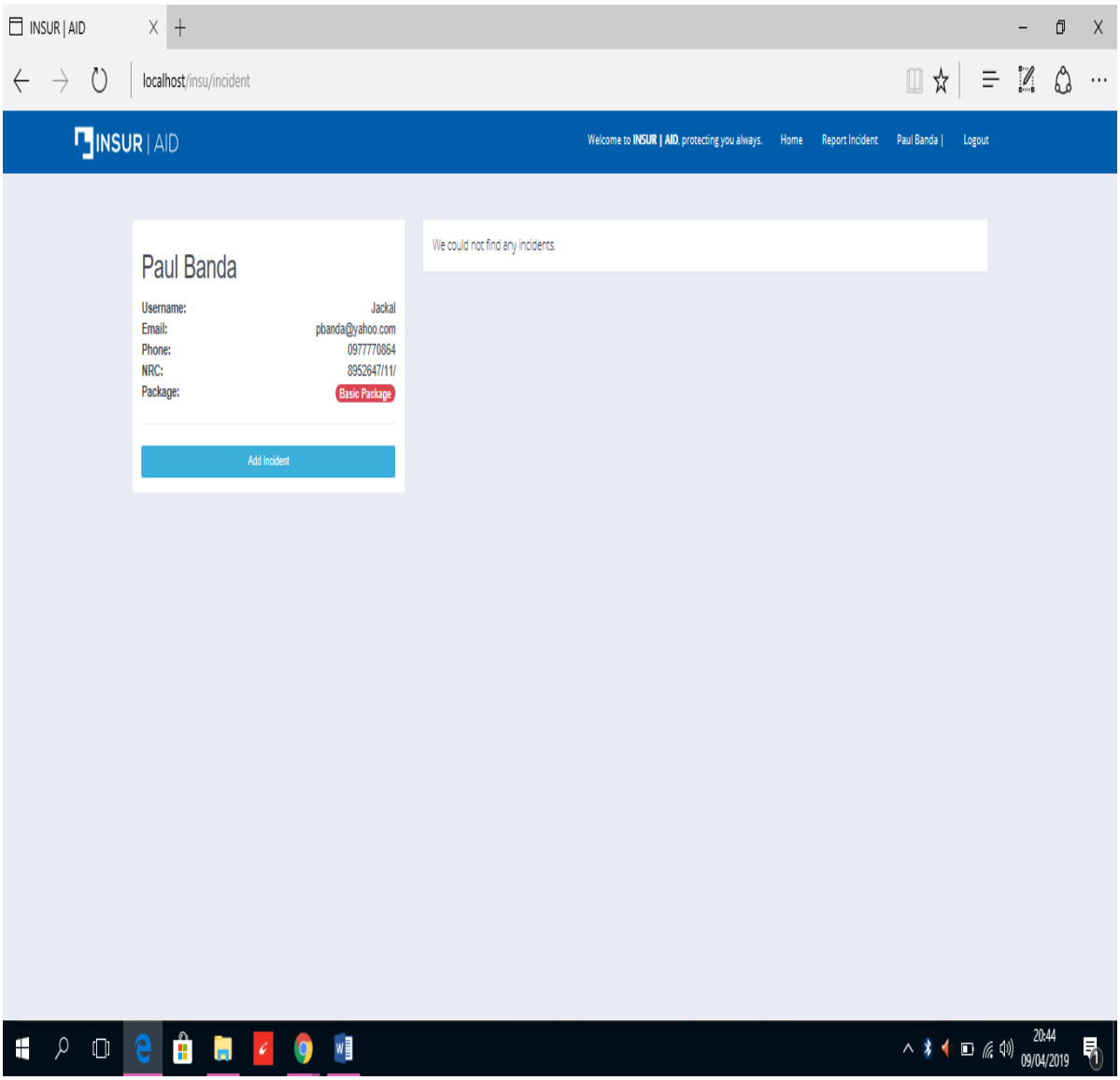

Figure 30: Home Screen – Customer Profile.

Once logged in, a customer is able to register an incident as shown in figure 31

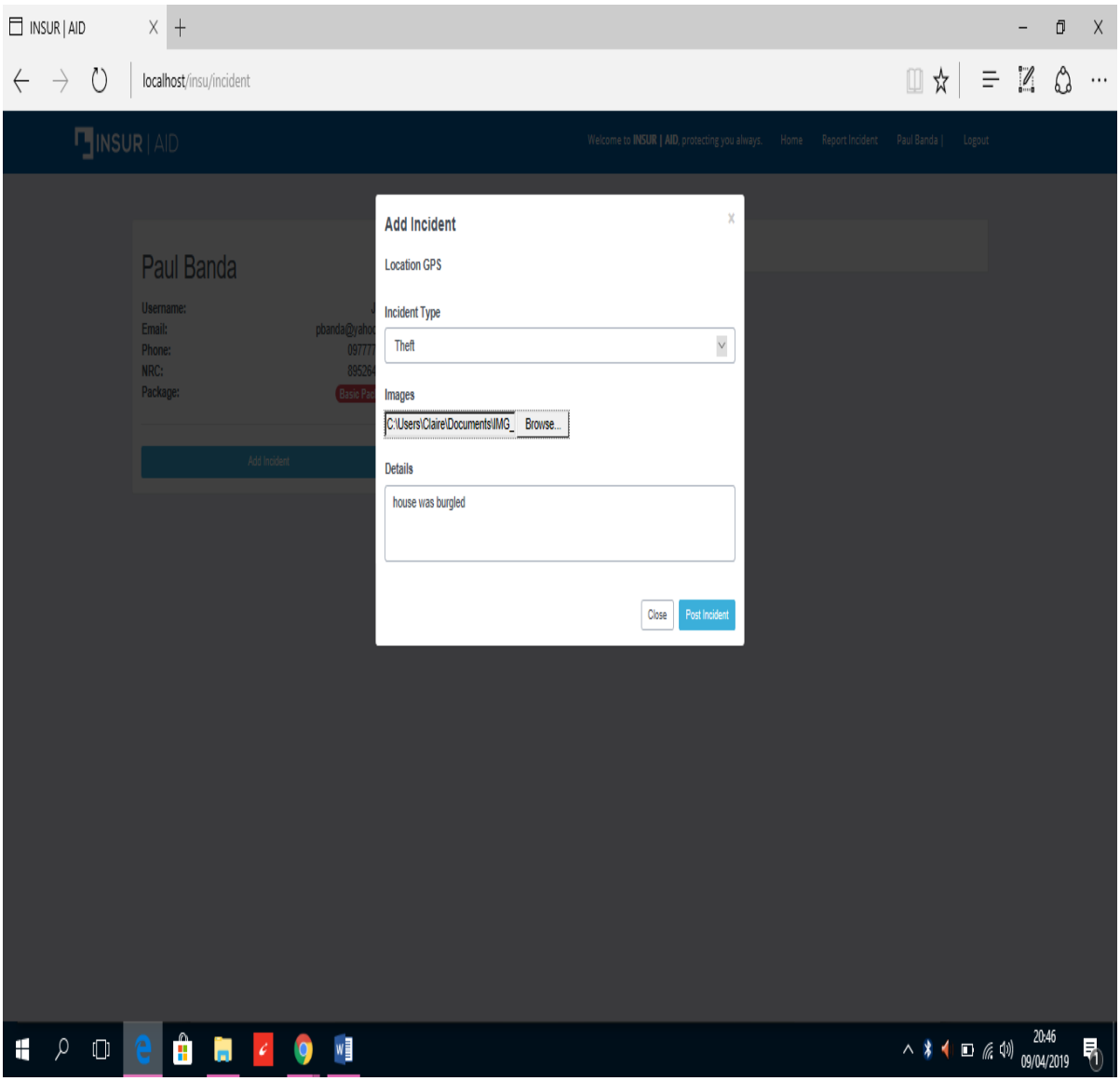

Figure 31: Incident Registration – Customer Profile

By default, PHP is set to allow uploads of files with a size of 2MB or less. So when a customer tries to upload a file that exceeds 2 MB, the error screen shown in figure 32 is displayed.

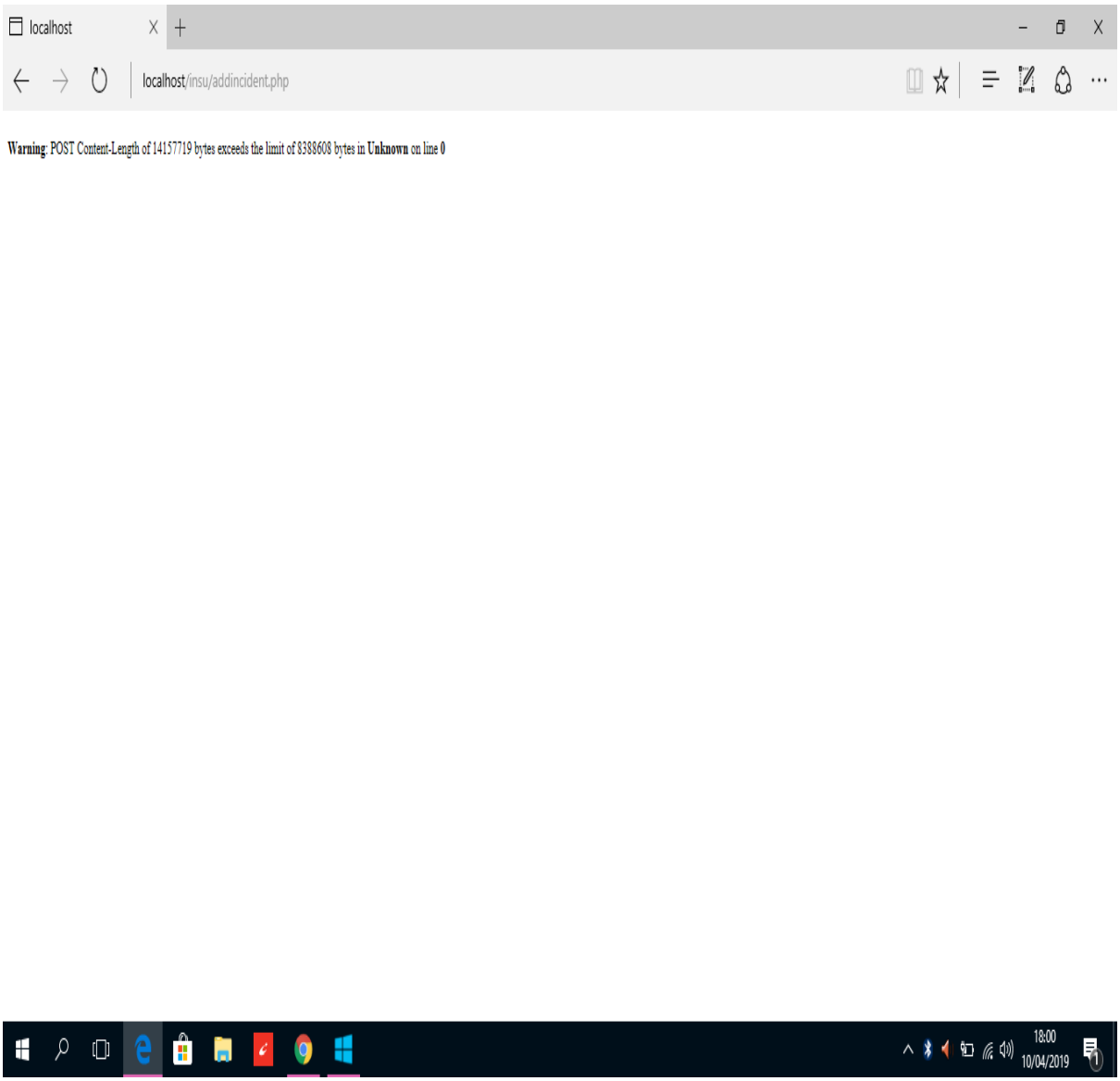

Figure 32: File Upload Error – Customer Screen

When a file that is within the allowable limits is successfully uploaded, the screen in figure 33 is displayed.

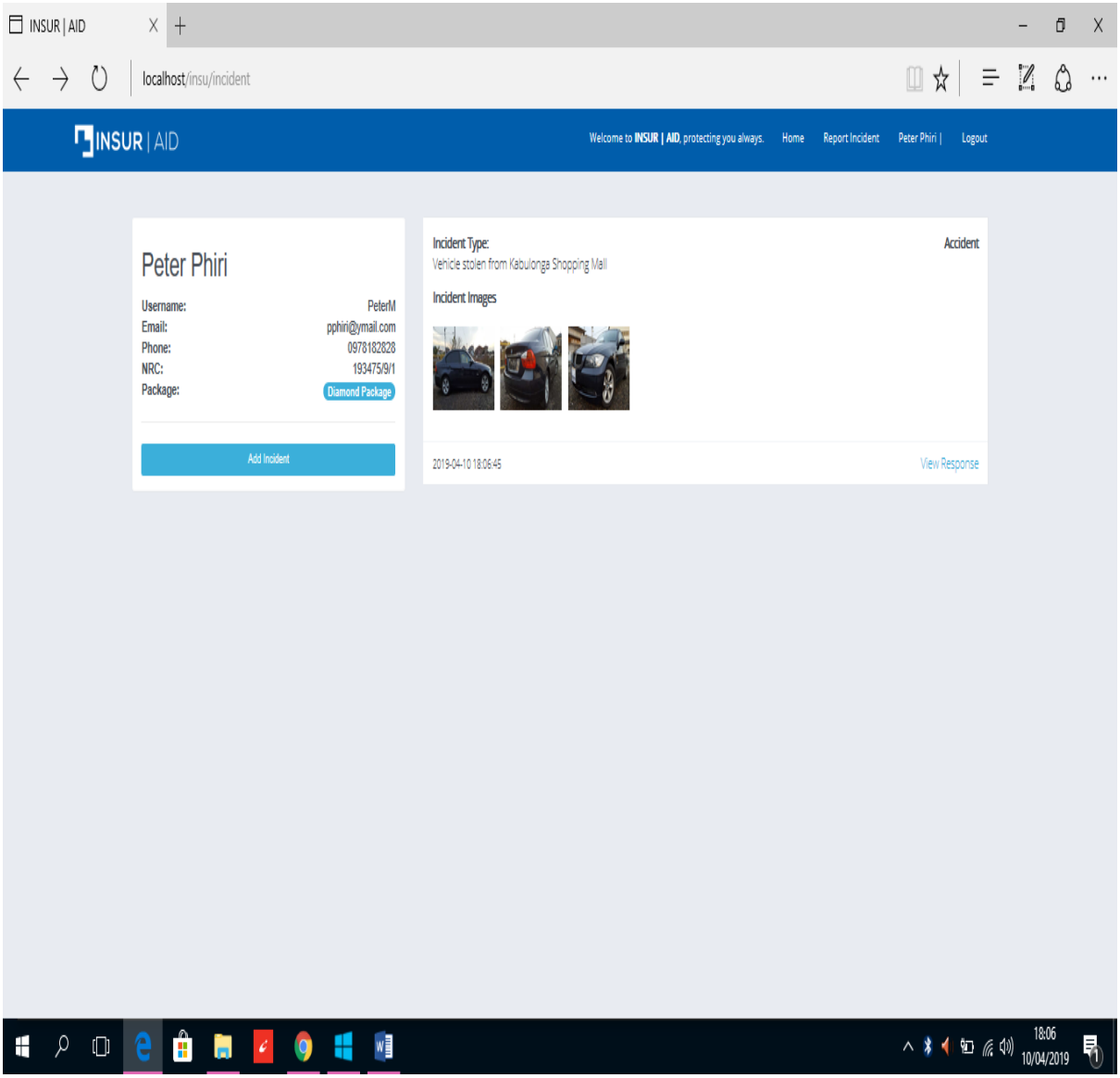

Figure 33: Incident Registration – Customer Profile

CHAPTER FIVE

DISCUSSION AND CONCLUSION

5.0 Introduction

The concluding chapter summarizes the purpose and objectives of the study, highlighting key findings and makes recommendation for further research.

5.1 DISCUSSIONS

5.1.1 *RO1* to investigate Insurance claims management processes.

The kind of insurance claims management system that a company adopts has a bearing on the following: -

I) **Customer Retention** – Customer Retention refers to measures undertaken by a company to lock in customers. This is one of the biggest challenges that insurers face in the industry. The choice of which insurer to sign up with is dependent on a number of factors i.e. pricing of policies, customer service, type of policies, claims turnaround time and claims dispensation systems. (Bain & Company's 2017). Customer retention in the insurance industry is hard to achieve, with statistics showing that at least 10 percent of the customers leaving each year due to poor services or cheaper premiums. It costs, on average, five times more to acquire a customer than to retain an existing one. (IMS, 2018). There was disagreement from the respondents on whether the type of claims system influenced the choice of insurer, with some saying it didn't, whilst the majority said it had a huge influence. The study revealed that 56% of respondents indicated that they were not happy with the services being offered, 12% indicated that they were happy with insurance services,42% indicated that their needs were not being satisfied, 20% indicated that their needs were being satisfied. Further to that 40% of respondents indicated that the systems being offered were far from expectations whilst 34% indicated that expectations had been met. Going by the results obtained, 56% of respondents said the service was bad. (Keiningham, et el 2016). This result is consistent with the findings of (Boakye, 2011) and who suggested that management should develop customer focus panels to discuss customer needs and views on retaining customers. He further suggested that face to face engagement of customers was key to getting insight on their performance. One of the ways ISO 9000 and 27000 standards can help in this regard is that they are customer focused

with heavy reliance on customer engagement. This therefore means that insurers will deliver on customer expectations.

II) **Product Uptake -** For companies to increase sales, they have to improve on customer adoption of their products. This is done by way of managing customer expectations (Lincoln Murphy, 2017). It was noted that respondents were aware of advances in technology to the effect that insurance products were now being offered online but reservations were made on the security of people's bio data. Respondents still felt that the old way of walking in and having an agent explain a policy was preferred. On the levels of insurance product uptake, the study reveals that 13.4% of respondents were not using any form of insurance and 86.53% alluded to using some form of insurance. The 86.53% had generally invested in both Life and Nonlife insurance policies. The choice of what product to subscribe to is largely dependent price, customer experience, employment and the needs or situation that one faces at a particular time. This tallies with the findings of research conducted by (Odemba 2013) on factors affecting uptake of life insurance in Kenya, suggested that high cost of insurance premiums coupled with inefficiency in claims settlement, was resulting in low insurance penetration. This view is also collaborated by other authors like (Dowd, 2007) and (Tenkorang, 2001). For instance, one cannot buy motor vehicle insurance when they don't own a vehicle but there are policies that don't necessarily require a change in the environment for them to subscribed to i.e. funeral policy of medical aid. These are more of proactive policies for future compensation when the risk occurs. Non-Life products being the most popular amongst the 30-39 years bracket whilst the Life products were under taken by the 40 and above age bracket. From the interactions with the respondents, it was concluded that service levels are one of the factors that influence insurance uptake. A good customer experience, results in customer retention and referrals. product or service. This result is consistent with the findings of (Ndiritu 2017) in his studies aimed at evaluating the factors affecting uptake of insurance products delivered through mobile and web based technologies in the Kenyan market, who suggested that there was need for insurers to reevaluate strategies and engage customers more often by creating awareness on their products and benefits. One of the ways ISO 9000 and 27000 standards can help in this regard is that they are able to help managers forecast future direction and trends. Stake holder engagement is also one of the key areas they address.

III) **Claims Turn Around Time -** It was agreed that the choice of insurer was largely based on reputation, claims management system and price. This perception has been shared amongst generations owing to the slowness that insurers take to dispense a claim. It has been said insurance companies follow a routine of deny, delay, confuse and refuse policy. (Amber 2017) argues that quick settlement of insurance claims, gives an insurer a competitive edge of competitors, reduces complaints and improves service. Denying valid claims is done so as to boost bottom lines, delaying valid claims is done so as to put off policy holders with undue red tape, confusing customers is done by way of technical jargons which customers do not fully understand (AAJ, 2018). It was noted that the majority of respondents felt that automation would reduce the claims turnaround time significantly though reservations were also noted on the downside of automation such as job cuts, exposure to cybercrime etc.

IV) **Fraud - A** vice that can impact the claims process and it can be committed by any one of the parties involved in a transaction i.e. policy holders or applicants of an insurance service, third party claimants and insurers (the professionals that actually give the service). Examples of fraud may include; inflating of claims, falsifying insurance applications, backing up a claim with fake evidence etc. there was disagreement on the initiator of fraud in an insurance transaction with some respondents arguing that the insurer is the initiator whilst others arguing that it's the customer. however, fraud can take place at any point in the transaction i.e. submission, investigation or discharge. Some insurers are still issuing out manual cover notes, which this is a recipe for fraud (see Appendix VI). The study revealed that 64% of respondents alluded to having been victims of insurance fraud, 70% alluded to having read about insurance fraud and 68% of respondents believe that Insurers are the deeply involved in insurance fraud. FRIMPONG (2016) in his study on fraud in the insurance industry in Ghana, stated that fraud was as result of weak internal controls, falsification of documents, poor employee enumeration and inadequate training. these findings are also consistent with views from other Authors like (Dione, 2012), Tseng and Kang (2015) and Pierre (2009). This ties in with the research findings that reveal that most insurers suffer from a lack of process controls in their systems, resulting in the upswing of fraudulent claims. It has also been observed that the regulator is not fully equipped to handle fraudulent cases as the laws of the land i.e. Information and Communication Technologies Act, 2009 have ambiguities and don not fully address the issue.

V) **Customer Service -** From the study, majority disagreed that customer experience was one of the factors affecting the choice of insurer. This was largely due to the fact that they had not yet encountered a risk and lodged in a claim. For those that had lodged in a claim, respondents argued that customer experience is indeed a motivator. Implementing ISO 9000 and ISO 27001 standards has an emphasis on customer engagement and stake holder involvement. However, results from the study reveal that 56% of respondents indicated that they were not happy with the services being offered, 12% indicated that they were happy with insurance services,42% indicated that their needs were not being satisfied, 20% indicated that their needs were being satisfied. Further to that 40% of respondents indicated that the systems being offered were far from expectations whilst 34% indicated that expectations had been met. Going by the results obtained, 56% of respondents said the service was bad. Most systems in the industry are not customer focused, with little or no mechanisms in place for customer engagement. From the study, it was deduced that employees that were engage by their employers, replicated that warmth back to the customer and creates a good experience. A motivated employee will go an extra mile to engage a customer e.g. by giving periodic feedback via phone, email, text or social media platforms. others may choose to do a site visit in order to reassure the customer that their plight was of utmost importance to the company. Not only does this bolster customer retention but it also raises productivity levels and revenues. (Picoult, 2018). Findings of this study were consistent to the findings of Duodu and Amankwahri (2011) who suggested that customer satisfaction can be improved upon by improving the Insurers reliability. Insurers reliability can only be improved upon by investing in systems of high quality based un ISO 9000 and 27000 standards. Further, Myftaraj et el (2016) suggest that insurers need to advertise themselves to reach a wide market.

5.2 *RO2* to analyze insurance claims management systems and standards used to develop their development*?*

Implementing international standards guarantees companies, products and services that are high in quality, having a high degree of customer acceptance and satisfaction and very efficient in resource utilization. Examples of such standards include Lean management, Six Sigma, Lean Six Sigma, Total Quality Management (TQ), ISO 9001 and ISO 27001 (Karapetrovic and Willborn 2012). The study revealed that information derived from industry systems, lack the 5 qualities that

are expected of an information system i.e. accuracy, completeness, relevance, accessibility and consistency. The lack there of, is evident in the amount of fraud prevalence in the industry.

5.3 *RO3 to develop an enhanced claims management process based on international Standards.*

The researcher proposed a web based claims management application that would enable customers, log in their claims online, upload pictures of the incident, be it fire or motor vehicle accident etc. The application prototype will advise the customer of required inputs that are required for claim submission and give periodic updates from the admin on progression of their claim. The prototype has inherent security features such as user authentication, data Integrity, non-repudiation, user authorization, data reliability, time stamping, and geo location time stamping, and geo location. The prototype not only mitigates fraud in the submission process but also improves efficiency and productivity. The Prototype was tested by Mean Wood Insurance Brokers and African Grey Insurance Brokers. validation questionnaires were then sent to the two companies and results compiled as shown below.

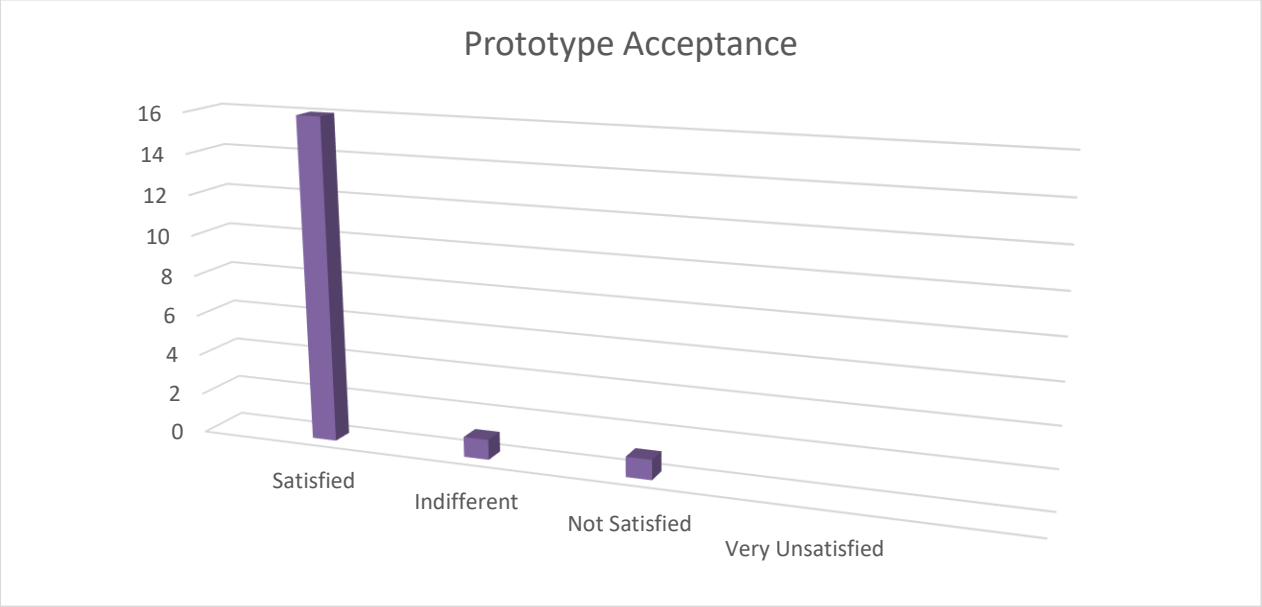

Figure 34: Prototype Acceptance

Majority of respondents expressed approval with the prototype as it impacted positively on their job functions.

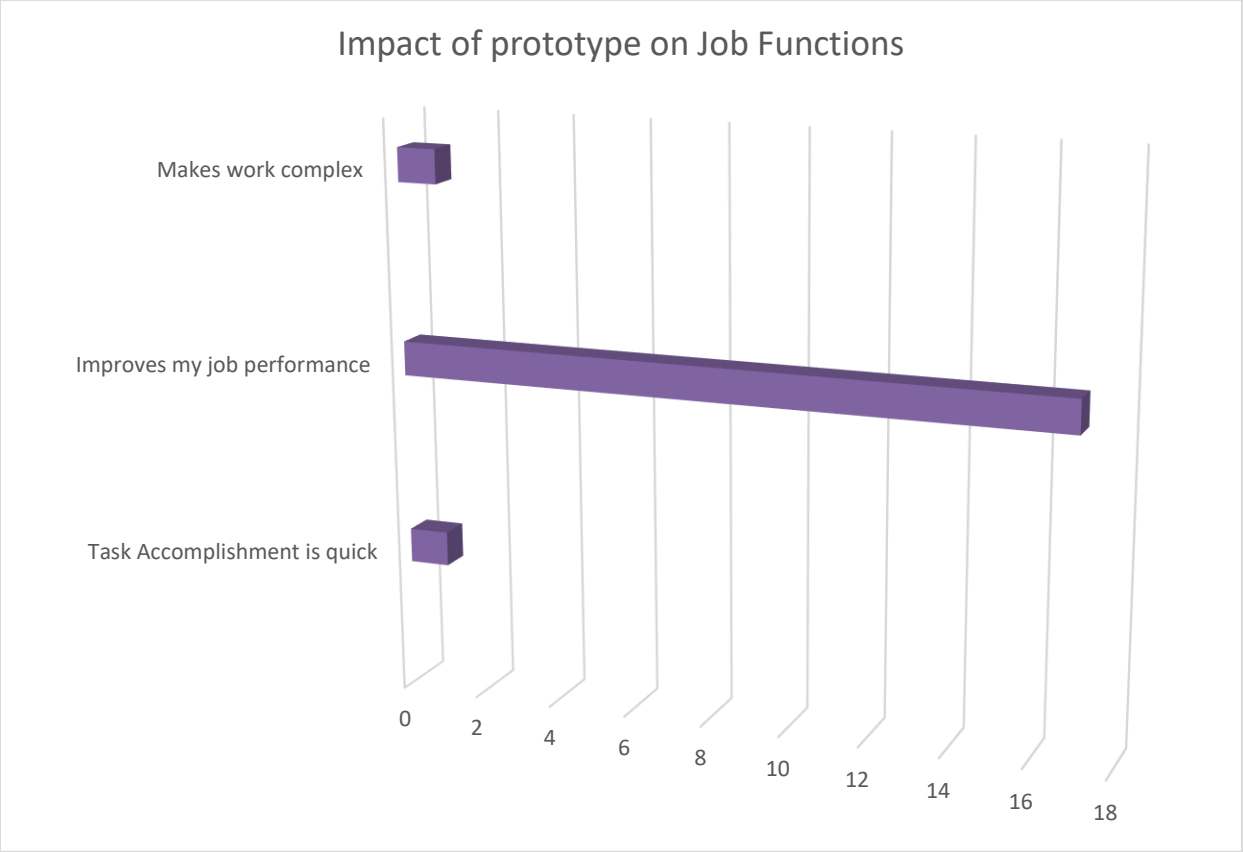

Figure 35: Prototype Validation

5.4 CONCLUSIONS

5.4.1 *RO1* to investigate Insurance claims management processes*?*

It has been established that there is a direct relation between claims management systems and the customer. The kind of system adopted influences customer retention, product uptake and claims turnaround time.

5.4.2 *RO2 to* analyze insurance claims management systems and standards used in their development?

The study identified areas of weakness in the insurance Claims Life Cycle i.e. data integrity, data reliability, user authorization. It has been established that the areas of vulnerability in the Insurance

Claim Life Cycle can be addressed by way of adoption of ISO 9000 and ISO 27001 standards. Adoption of these standards will mitigate insurance fraud. The developed prototype was based on ISO 9000 and ISO 27001 standards.

5.4.3 *RO3* to develop an enhanced claims management process based on international Standards.

Based on results of the baseline, the researcher identified adoption of ISO 9000 and 27001 standards in system development as they enhance quality and security. To that effect, the researcher developed web-based application for managing Insurance claims, termed INSUR AID Prototype. It was developed with the aim of mitigating Insurance fraud. It also makes improvements on efficiency, productivity and profitability in the long run.

5.5 Recommendations

5.5.1 Adoption of ISO 9000 and 27001 series standards

Companies need to adopt the use of ISO 9000 and ISO 27001 standards in order for them to have quality systems in place. Not only do these standards cut across industries or sectors, they're also international meaning references are not hard to find. A lot of the issues surrounding the Insurance Industry like fraudulent claims, high claims turnaround time, bad customer experiences, low levels of customer retention, inability by managers to forecast future trends etc. will be a thing of the past if these standards are adopted.

5.5.2 Adoption of Web based Insurance Claims management application prototype – INSUR AID

Insurance companies are urged to adopt INSURAID insurance claims management application. The prototype having received favorable review from two Insurance Companies, is evidence that it can alleviate some of the challenges that were identified by the baseline study

5.6 Suggestions for further research

The study has highlighted the specific gains that can be realized by adoption of the ISO 9000 and ISO 27001 standards in the development of claims Management Systems, for the business, customers and shareholders. Further studies should be done to ascertain the specific gains that can be derived from adopting ISO 9000 and ISO 27001 standards for the different departments in Insurance firms i.e. underwriting, marketing, accounts etc., as this research was restricted to the claims department.

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APPENDICES

APPENDIX I – Questionnaire

The University of Zambia

School of Engineering

By Karlos Jere (2016145858)

Master of Engineering – ICT Security

For further details or any queries, kindly get in touch on 076 11008633, karlosjere@gmail.com.

……

Dear Respondent,

I am a student at the University of Zambia in my final stage pursuing a Master of Engineering in ICT Security. As partial fulfilment for the award of a Master's degree, I am conducting a baseline study on:

"An Investigation on Claims Handling Processes: A Case of Zambian Insurance Companies"

You have been purposively sampled to provide information for the topic indicated above. The information being collected is purely for academic purposes as such, it will be treated with maximum confidentiality. Subsequently, you are not supposed to indicate your name or any personal information that can lead to revealing of your identity.

Your co-operation will be greatly appreciated.

For more information, queries in relation to the survey, you may wish to contact the following:

Research Supervisor: Dr. Dani. E. Banda (dani.banda@unza.zm) or

Assistant Dean: Dr. Erastus Mwanaumo (erastus.mwanaumo@unza.zm)

Part A: Bio Data - Please tick in the box as appropriate

1. What is your sex?

- ☐ Male
- ☐ Female

2. What is your age?
3.

- ☐ 20 -29
- ☐ 30 - 39
- ☐ 40 – 49
- ☐ 50 - 59
- ☐ 60 and above

4. Which part of Lusaka do you live in?

- ☐ Low density area
- ☐ Middle density area
- ☐ High density area

5. What is your level education?

- ☐ Grade twelve
- ☐ Certificate
- ☐ Diploma
- ☐ Degree
- ☐ Master's degree
- ☐ Ph.D.

Others specify…….

6. What is your marital status?

- ☐ Single, never married
- ☐ Married
- ☐ Widowed

☐ Divorced
☐ Separated

7. What is your occupation status at your work place?

☐ Executive Officer
☐ Director
☐ Manager
☐ Supervisor
☐ Subordinate

Part B ASSESSING THE PUBLICS' AWARENESS ON INSURANCE ACTIVITIES IN ZAMBIA.

7. Have you ever heard of insurance?

☐ Yes
☐ No

8. How did you know come to know about insurance?

☐ Through radio
☐ Through TV
☐ Through internet
☐ Friends

Others Specify……

9. What kind of work do you think insurance performs?

☐ Medical use – hospital use
☐ Criminal management – Police and other law enforcement
☐ Transfer of risk – theft, fire, accident
☐ Indemnity – Life and other intangible losses

Others Specify……

10. Do you use any insurance product?

☐ Yes
☐ No

11. What sort of insurance product do you use?

☐ Life
☐ Medical
☐ General
☐ Theft
☐ Fire
☐ Car

Others, specify

If NO, please state why you don't use any insurance product of any sort

……

…….

If YES, are you happy with the insurance service you receive from your service provider?

☐ Yes
☐ No

If NO, kindly state why

…….. …….

……

If YES, what impresses you about the service?

……..

…….

If NO, what do you think your insurance service provider must do to improve their service?

……..

…….....

12. Do you think the public is adequately informed on Insurance and insurance products in Zambia?

☐ Yes
☐ No

13. If not, what do you think PIA or GRZ or Insurance service providers should do to improve on their role in facilitating development and awareness on insurance?

……

……..……..

……

……

……..……..……

Part C PUBLIC'S ATTITUDE TOWARDS INSURANCE FRAUD

For each of the following statements (16-19) circle one of the options to indicate how you feel. The options are labelled 1 - 5.

SA = strongly agree (with statement) 1

A = Agree (with statement) 2

N = neither agree or disagree (with statement) 3

D = Disagree (with statement) 4

SD = strongly disagree (with statement) 5

14. Do you believe insurance service providers are involved in fraud over their client's funds?

	1	2	3	4	5
You are aware about fraud	SA	A	N	D	SD
You have been a victim of fraud	SA	A	N	D	SD
You have read about fraud	SA	A	N	D	SD
Someone you know was a victim of insurance fraud	SA	A	N	D	SD
Insurance service providers are not involved in any fraud	SA	A	N	D	SD

15. The level of service provision offered by insurance service providers is very good and does NOT require any changes.

	1	2	3	4	5
The service is second to none	SA	A	N	D	SD
Your needs are not satisfied	SA	A	N	D	SD
Your expectations are not met	SA	A	N	D	SD
The perceptions made and the reality do not tie in	SA	A	N	D	SD

16. Do you think that GRZ has a formulated strategy on insurance provision in Zambia that speaks to issues of fraud, service provision and customer protection?

	1	2	3	4	5
Strategy is the best around	SA	A	N	D	SD
Strategy requires change or modification	SA	A	N	D	SD
Insurance service providers must develop their own strategy that meets customer needs	SA	A	N	D	SD
Organisation must use the PIA insurance strategy to be customer centric	SA	A	N	D	SD

17. How would you want your Insurance claims to be managed?

	1	2	3	4	5
Through PIA standards or strategy	SA	A	N	D	SD
Through Insurance Service Provider's model	SA	A	N	D	SD
The status quo must not be changed	SA	A	N	D	SD

Part D EASE OF USE OF MODEL (Reliability, Usability, Performance, Portability)

18. For each of the following statements (7-11) circle one (or multiple) of the options to indicate how you feel. The options are labelled 1 - 5.

SA = Strongly Agree (with statement)	1
A = Agree (with statement)	2
N = Neither agree or disagree (with statement)	3
D = Disagree (with statement)	4
SD = Strongly Disagree (with statement)	5

19. According to you, the Insurance companies must be monitored to eliminate fraud.

	1	2	3	4	5
Strongly Agree	SA	A	N	D	SD
Agree	SA	A	N	D	SD
Indifferent	SA	A	N	D	SD
Do not agree	SA	A	N	D	SD
Strongly disagree	SA	A	N	D	SD
I do not know	SA	A	N	D	SD

20. In your words, how would you rate the satisfaction level of using insurance in Zambia?

	1	2	3	4	5
Very satisfied	SA	A	N	D	SD
Satisfied	SA	A	N	D	SD
Indifferent	SA	A	N	D	SD
Not Satisfied	SA	A	N	D	SD
Very unsatisfied	SA	A	N	D	SD

21. In your own words, would you recommend the current PIA or GRZ model for government use in the operations of insurance in Zambia?

	1	2	3	4	5
Strongly recommend	SA	A	N	D	SD
Recommend	SA	A	N	D	SD
Indifferent	SA	A	N	D	SD
Can't recommend	SA	A	N	D	SD

If you answered Strongly Recommend or Recommend, what are the best features of the model according to you?

_____

_____

_____

…….....

If you answered Indifferent or can't recommend, what recommendations would you suggest?

---

22. Make a comment on the current insurance service, fraud and related activity in Zambia based on your experience with it.

Part E ALTERNATIVE MODEL

23. Is there an optional Insurance service model that you have used before that can perform better that the current model used in Zambia?

☐ YES
☐ NO

If yes, then please state the model

……
……
……
……
……
……
……

Thank you for your help!

APPENDIX II – Validation Questionnaire

The University of Zambia

School of Engineering

AN INVESTIGATION ON INSURANCE HANDLING PROCESSESS: A CASE OF ZAMBIA.

By Karlos Jere (2016145858)

Master of Engineering – ICT Security

For further details or any queries, kindly get in touch on 076 11008633, karlosjere@gmail.com.

Dear Respondent,

I am a student at the University of Zambia in my final stage pursuing a Master of Engineering – ICT Security. As partial fulfilment for the award of a Master's degree, I am conducting a baseline study on: **"AN INVESTIGATION ON INSURANCE HANDLING PROCESSESS: A CASE OF ZAMBIA."**

You have been purposively sampled to provide information for the topic indicated above. The information being collected is purely for academic purposes as such, it will be treated with maximum confidentiality. Subsequently, you are not supposed to indicate your name or any personal information that can lead to revealing of your identity.

Your co-operation will be greatly appreciated.

For more information, queries in relation to the survey, you may wish to contact the following:

Research Supervisor: Dr. Dani Eliya Banda (dani.banda@unza.zm) or

Assistant Dean: Dr. Erastus Mwanaumo (erastus.mwanaumo@unza.zm)

……

Part A: Bio Data - Please tick in the box as appropriate

1) **Sex:** **(a**) Male ☐ (b) Female ☐

2) **Age in years.**

(a) 18 – 22 ☐) 30 – 34 ☐
(b) 22 – 26 ☐) 34 – 40 ☐
(c) 26 – 30 ☐) 40 and above ☐

3) **Marital status**

(a) Single ☐ (d) Separated ☐
(b) Married ☐ (e) Divorced ☐
(c) Widowed ☐

4) What is your level education?

☐ Grade twelve
☐ Certificate
☐ Diploma
☐ Degree
☐ Master's degree
☐ PhD

Others specify…….

5) Do you work within the ICT department or are apprised with ICT?

☐ Yes
☐ No

<u>Part B: ACCEPTANCE TO USE INSURAID.</u>

5. Have you ever heard about INSURAID?

☐ Yes
☐ No

6. Are you willing to have your personal data captured?

☐ Yes
☐ No

If yes, then please run the model with your details and proceed. If No then thank-you, no further action needed from you.

Part C: EASE OF USE OF MODEL (Reliability, Usability, Performance, Portability)

For each of the following statements (7-11) circle one (or multiple) of the options to indicate how you feel. The options are labelled 1 - 5.

SA = Strongly Agree (with statement) 1

A = Agree (with statement) 2

N = Neither agree or disagree (with statement) 3

D = Disagree (with statement) 4

SD = Srongly Disagree (with statement) 5

7. According to you, the learning curve for using this application is:

	1	2	3	4	5
Very Easy to use	SA	A	N	D	SD
Easy to Use	SA	A	N	D	SD
Not Sure	SA	A	N	D	SD
Difficult to Use	SA	A	N	D	SD
Very Difficult to Use	SA	A	N	D	SD
I did not use the program	SA	A	N	D	SD

8. In your words, how would you rate the satisfaction level of using the application that you experienced in terms of claims notification and response.

1 2 3 4 5

Very satisfied	SA	A	N	D	SD
Satisfied	SA	A	N	D	SD
Indifferent	SA	A	N	D	SD
Not Satisfied	SA	A	N	D	SD
Very unsatisfied	SA	A	N	D	SD

9. In your own words, would you recommend this application for use by Insurance companies and brokers?

	1	2	3	4	5
Strongly recommend	SA	A	N	D	SD
Recommend	SA	A	N	D	SD
Indifferent	SA	A	N	D	SD
Can't recommend	SA	A	N	D	SD

If you answered Strongly Recommend or Recommend, what are the best features of the programs according to you?

_____

_____

_____

……....

If you answered Indifferent or Can't recommend, what recommendations would you suggest?

_____

10. Would you like to work with the program more often?

	1	2	3	4	5
Yes, very much	SA	A	N	D	SD
Yes	SA	A	N	D	SD
Not Sure	SA	A	N	D	SD
No	SA	A	N	D	SD

11. How would you rate this application in meeting your job functions?

	1	2	3	4	5
Task Accomplishment is Quick	SA	A	N	D	SD
Improves my job performance	SA	A	N	D	SD
Model makes my work unnecessary complex	SA	A	N	D	SD
Personal biometric Data is secure	SA	A	N	D	SD

12. Make a comment on the program based on your experience with it.

13. This INSUR AID application is installed as follows:

a) Install Xampp control (for server simulation run)
b) Run Xampp Control click on config, select http. conf, and

c) Add .bat at end of this
d) Save, exit editor

Python and Xampp are dependent on Ms Windows Operating system in Use (the researcher has used Ms Windows 10 Home single Language – 2017. On this platform Xampp Control is at version 3.2.2).

Considering processes 13 a-d do you think the INSUR AID application is easy to install?

Yes ☐ No ☐

14. The INSUR AID application requires the following hardware resources:

a) Computer with at least 4GB RAM,
b) Hard disk capacity of at least 500GB,

Do you think these requirements are too much for the average PC?

Yes ☐ No ☐

Part D: ALTERNATIVE MODEL

15. Is there an optional Insurance application that you have used before that can perform the functions developed in INSUR AID?

☐ YES
☐ NO

If yes, then please state the application

_____

_____

_____

Thank you

APPENDIX III – Interview Guide

Question 1. have you ever heard of insurance?

Question 2. What insurance companies do you know of?

Question 3. Have you ever lodged in an Insurance claim?

Question 4. Were you satisfied with the timelines of the experience?

Question 5. What influences your choice of insurer?

Question 6. What do you think insurers can do to be more effective?

Question 7. What can you say about service delivery from Insurance Companies?

Question 8. What do you think can be done to Improve Insurance Awareness?

Question 9. Have you heard of Insurance fraud?

Question 10. Have you heard of the Pensions and Insurance Association of Zambia?

Question 11. How do you rate their performance? Can their efficiency be improved?

Question 12. Have you ever heard of international standards? E.g. ISO, Sigma etc.?

Question 13. Have you adopted international standards in your organization?

Question 14. What Is the Difference Between Quality Assurance and Quality Control?

Question 15. What Is Meant by Risk? How You Can Avoid the Risks?

APPENDIX IV – Incident Report Form

Plot No. 1131, Parirenyatwa Road, Fairview, Lusaka
P O Box 32825, LUSAKA, ZAMBIA.
Tel: (211) 222862/226547/226456, Fax: (211) 222863
e-mail: nicozam@zamnet.zm
www.nicozambia.com

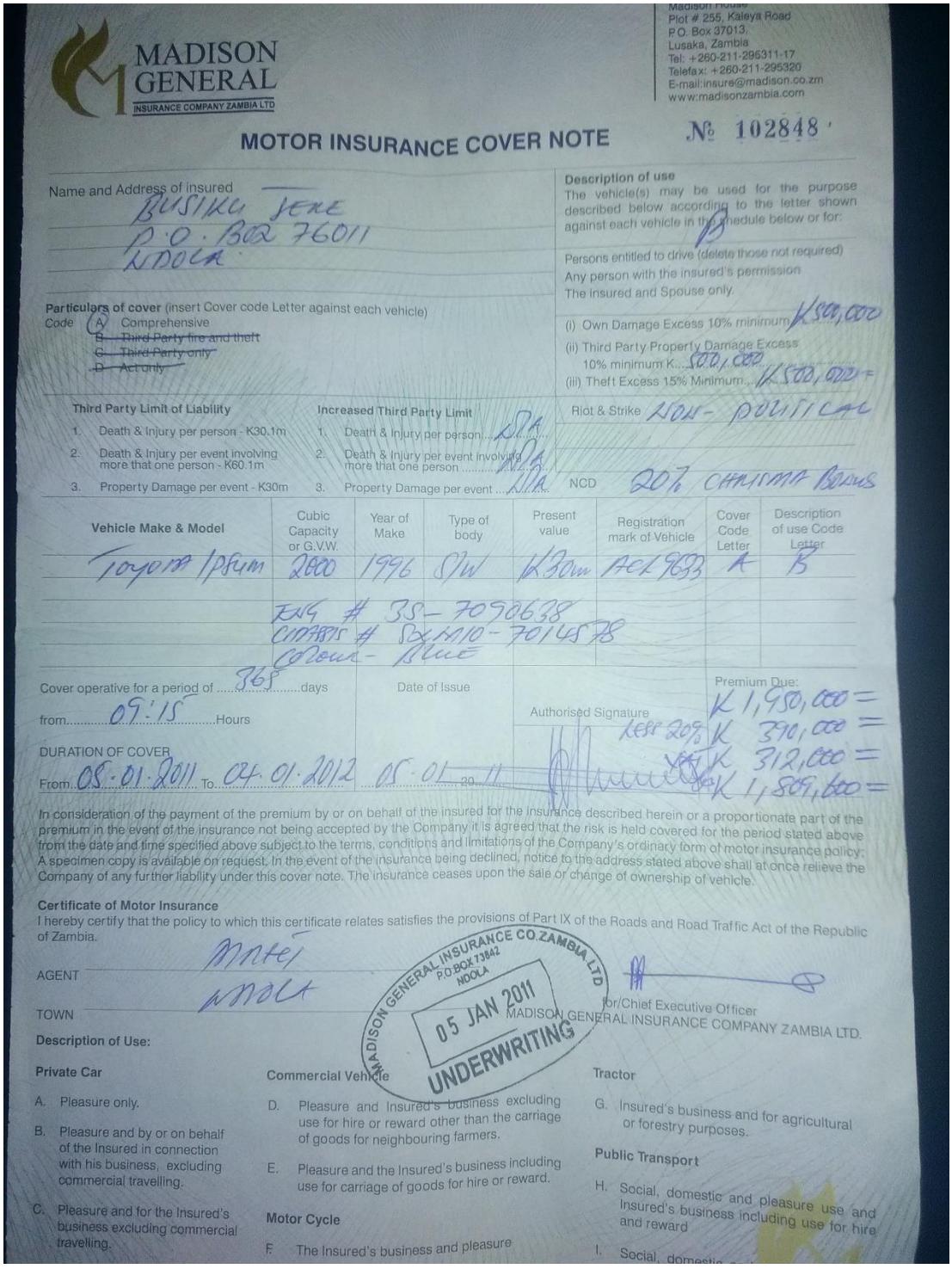
NICO INSURANCE ZAMBIA LIMITED

MOTOR ACCIDENT REPORT FORM

(Delete section not applicable)

INSURED	Name:					
	Postal Address					Tel No.:
	E-mail Address					Fax No.:
	Occupation			Policy No.:		
VEHICLE	If vehicle subject to Hire Purchase, Credit or Leasing agreement, state name and Address of Finance Company	Make	Chassis No. Engine No.	Gross Carrying capacity HP/CC:		Kilometres Completed
		Registration	Value	Model and Year		Date of purchase and price paid
DAMAGE	Damage to own vehicle					
	Estimate for repairs or attach quotation					
	Repair's name, address and telephone number					
	Where can your damaged vehicle be inspected?					
DRIVER	Full Name					
	Address					
		Phone No.				
	Occupation and Date of Birth					
	Driving Licence	No.	Date	Place	Class	Full/Learner
	State fully the purpose for which the vehicle was being used					
	Was he/she driving with your permission?					
	Was he/she in your employ?					
	Has he/she any motor insurance on own car? If yes, state Policy No. and Company					
	Details of any convictions for motoring offences					
	Has licence ever been endorsed?					
	Has he/she any physical defects?					

APPENDIX V – Insurance Policy



MADISON GENERAL
INSURANCE COMPANY ZAMBIA LTD

Plot # 255, Kaleya Road
P.O. Box 37013,
Lusaka, Zambia
Tel: +260-211-295311-17
Telefax: +260-211-295320
E-mail:insure@madison.co.zm
www.madisonzambia.com

MOTOR INSURANCE COVER NOTE

№ 102848

Name and Address of insured
BUSIKU JERE
P.O. BOX 76011
NDOLA

Description of use
The vehicle(s) may be used for the purpose described below according to the letter shown against each vehicle in the schedule below or for:
B

Persons entitled to drive (delete those not required)
Any person with the insured's permission
The insured and Spouse only.

Particulars of cover (insert Cover code Letter against each vehicle)
Code
A Comprehensive
~~B Third Party fire and theft~~
~~C Third Party only~~
~~D Act only~~

(i) Own Damage Excess 10% minimum K500,000
(ii) Third Party Property Damage Excess 10% minimum K 500,000
(iii) Theft Excess 15% Minimum K1,500,000=

Third Party Limit of Liability	Increased Third Party Limit
1. Death & Injury per person - K30.1m	1. Death & Injury per person N/A
2. Death & Injury per event involving more that one person - K60.1m	2. Death & Injury per event involving more that one person N/A
3. Property Damage per event - K30m	3. Property Damage per event N/A

Riot & Strike NON-POLITICAL

NCD 20% CHRISTMAS BONUS

Vehicle Make & Model	Cubic Capacity or G.V.W.	Year of Make	Type of body	Present value	Registration mark of Vehicle	Cover Code Letter	Description of use Code Letter
Toyota Ipsum	2000	1996	S/W	K30m	ACL 9033	A	B
	ENG # 3S-7090638						
	CHASSIS # SXM10-7014578						
	COLOUR - BLUE						

Cover operative for a period of 365 days
from 09:15 Hours

Date of Issue

Authorised Signature

Premium Due:
K 1,950,000=
Less 20% K 390,000=
VAT K 312,000=
K 1,872,000=

DURATION OF COVER
From 05-01-2011 To 04-01-2012 05-01-20 11

In consideration of the payment of the premium by or on behalf of the insured for the insurance described herein or a proportionate part of the premium in the event of the insurance not being accepted by the Company it is agreed that the risk is held covered for the period stated above from the date and time specified above subject to the terms, conditions and limitations of the Company's ordinary form of motor insurance policy. A specimen copy is available on request. In the event of the insurance being declined, notice to the address stated above shall at once relieve the Company of any further liability under this cover note. The insurance ceases upon the sale or change of ownership of vehicle.

Certificate of Motor Insurance
I hereby certify that the policy to which this certificate relates satisfies the provisions of Part IX of the Roads and Road Traffic Act of the Republic of Zambia.

AGENT Mate
TOWN NDOLA

MADISON GENERAL INSURANCE CO. ZAMBIA LTD P.O.BOX 73842 NDOLA 05 JAN 2011 UNDERWRITING

for/Chief Executive Officer
MADISON GENERAL INSURANCE COMPANY ZAMBIA LTD.

Description of Use:

Private Car
A. Pleasure only.
B. Pleasure and by or on behalf of the Insured in connection with his business, excluding commercial travelling.
C. Pleasure and for the Insured's business excluding commercial travelling.

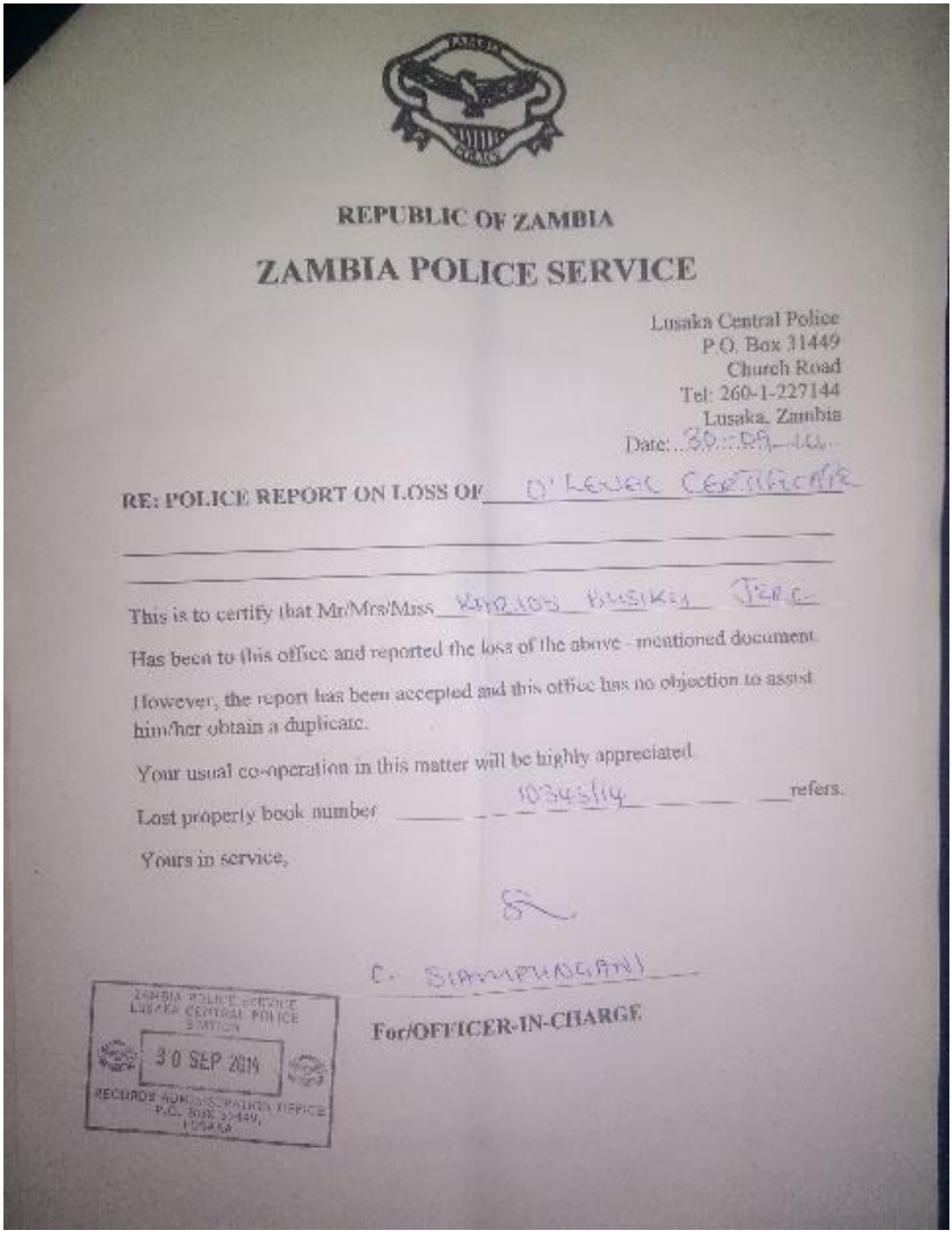
Commercial Vehicle
D. Pleasure and Insured's business excluding use for hire or reward other than the carriage of goods for neighbouring farmers.
E. Pleasure and the Insured's business including use for carriage of goods for hire or reward.

Motor Cycle
F. The Insured's business and pleasure

Tractor
G. Insured's business and for agricultural or forestry purposes.

Public Transport
H. Social, domestic and pleasure use and Insured's business including use for hire and reward
I. Social, domestic

APPENDIX VI – Police Report



REPUBLIC OF ZAMBIA

ZAMBIA POLICE SERVICE

Lusaka Central Police
P.O. Box 31449
Church Road
Tel: 260-1-227144
Lusaka, Zambia

Date: 30-09-2014

RE: POLICE REPORT ON LOSS OF O' LEVEL CERTIFICATE

This is to certify that Mr/Mrs/Miss KENNEDY BWALYA JERE

Has been to this office and reported the loss of the above - mentioned document.

However, the report has been accepted and this office has no objection to assist him/her obtain a duplicate.

Your usual co-operation in this matter will be highly appreciated.

Lost property book number 1034514 refers.

Yours in service,

C. SIAMPUNDAPANJI

For/OFFICER-IN-CHARGE

ZAMBIA POLICE SERVICE
LUSAKA CENTRAL POLICE
STATION
30 SEP 2014
RECORDS ADMINISTRATION OFFICE
P.O. BOX 31449,
LUSAKA

APPENDIX VII – Publication

Journal Published

Karlos Busiku Jere and Dr. Dani Eliya Banda, "Weaknesses in the Insurance Claims Management Processes: A Case of Zambia", *International Journal of Innovative Research in Science, Engineering and Technology*, Vol. 8, Issue 6, June 2019.
[Online]. Available: http://www.ijirset.com/upload/2019/june/76_Weaknesses.pdf

REVIEWER's REPORT

ISSN: 2319-8753

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Reviewers Guidelines

Reviewer's Aspect

Name	E-Mail	Affiliation	Country
KARLOS JERE	karlosjere@gmail.com	UNZA	Zambia

Comments on Manuscript

1. Subject content is excellent
2. Technical content is good
3. Domain of the paper is satisfied
4. Contribution to the field is good
5. Depth of research is excellent
6. Presentation is Satisfied

Recommendation: Accepted with the following modifications

Modifications are required to improve the Quality of article as per the 'IJIRSET format'

APPENDIX VIII – Research Authorization Letter

THE UNIVERSITY OF ZAMBIA
SCHOOL OF ENGINEERING

POSTGRADUATE OFFICE

P O Box 32379
Lusaka, ZAMBIA
head.elect@unza.zm

Tel: +260-211-290979
Fax: +260-211-293792

26th Februrary, 2019

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: KARLOS JERE

This is to confirm that the bearer of this letter Karlos Jere is a Master of Engineering Student in ICT Security at the University of Zambia, in the School of Engineering, Department of Electrical and Electrical Engineering.

He is currently conducting a research titled "**Automating claims handling processes in the insurance industry.**"

We will be most grateful for any assistance you may render to him as he carries out this academic assignment.

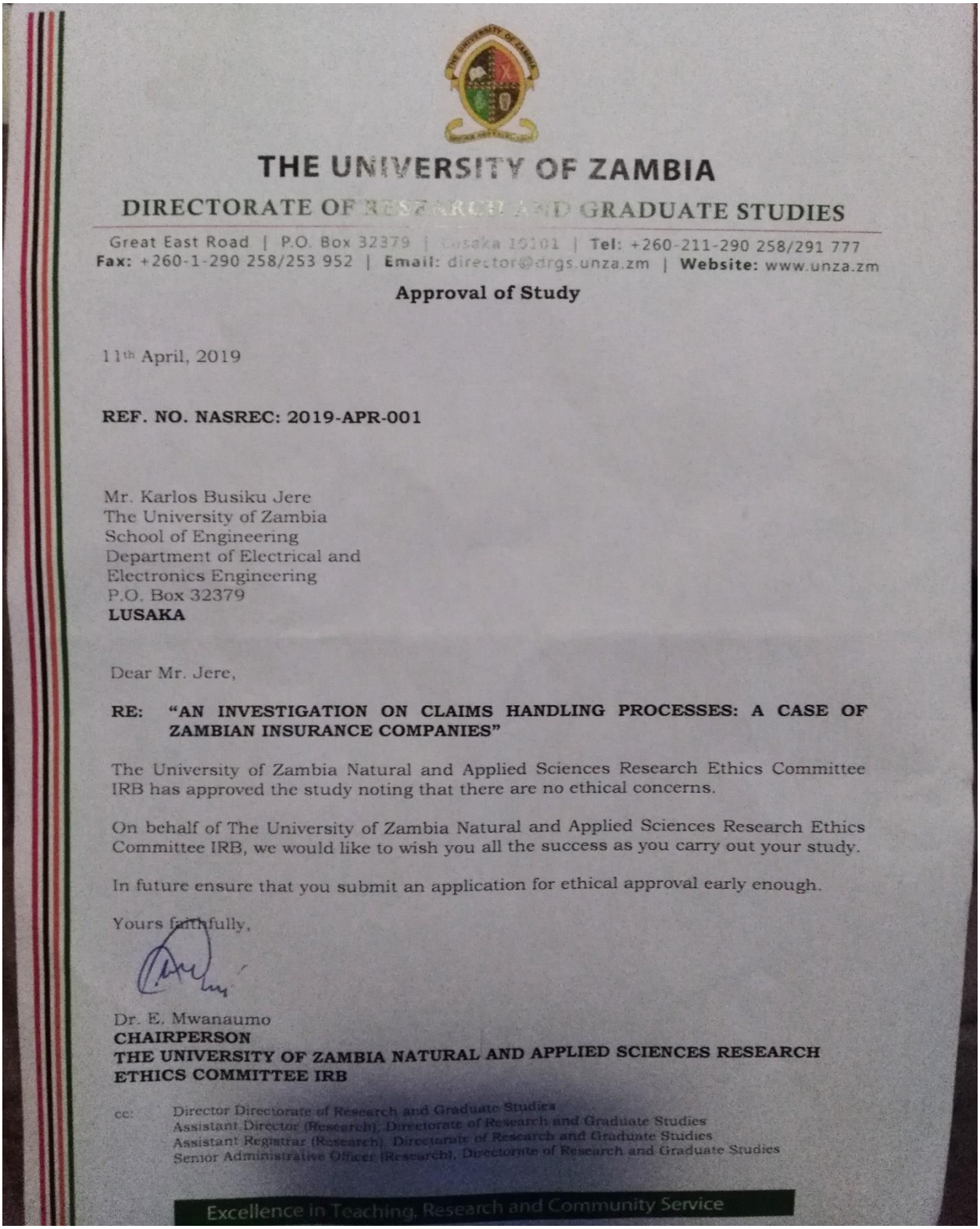
The School commits itself to have the information used strictly for education research purposes only and be kept confidential within UNZA itself.

Yours faithfully,

Dr. Charles Kahanji
ASSISTANT DEAN, POSTGRADUATE

Cc Dean, School of Engineering
Head, Electrical & Electronic Engineering

APPENDIX IX: Research Ethical Clearance by UNZA



THE UNIVERSITY OF ZAMBIA

DIRECTORATE OF RESEARCH AND GRADUATE STUDIES

Great East Road | P.O. Box 32379 | Lusaka 10101 | Tel: +260-211-290 258/291 777
Fax: +260-1-290 258/253 952 | Email: director@drgs.unza.zm | Website: www.unza.zm

Approval of Study

11th April, 2019

REF. NO. NASREC: 2019-APR-001

Mr. Karlos Busiku Jere
The University of Zambia
School of Engineering
Department of Electrical and
Electronics Engineering
P.O. Box 32379
LUSAKA

Dear Mr. Jere,

RE: "AN INVESTIGATION ON CLAIMS HANDLING PROCESSES: A CASE OF ZAMBIAN INSURANCE COMPANIES"

The University of Zambia Natural and Applied Sciences Research Ethics Committee IRB has approved the study noting that there are no ethical concerns.

On behalf of The University of Zambia Natural and Applied Sciences Research Ethics Committee IRB, we would like to wish you all the success as you carry out your study.

In future ensure that you submit an application for ethical approval early enough.

Yours faithfully,

Dr. E. Mwanaumo
CHAIRPERSON
THE UNIVERSITY OF ZAMBIA NATURAL AND APPLIED SCIENCES RESEARCH ETHICS COMMITTEE IRB

cc: Director Directorate of Research and Graduate Studies
Assistant Director (Research), Directorate of Research and Graduate Studies
Assistant Registrar (Research), Directorate of Research and Graduate Studies
Senior Administrative Officer (Research), Directorate of Research and Graduate Studies

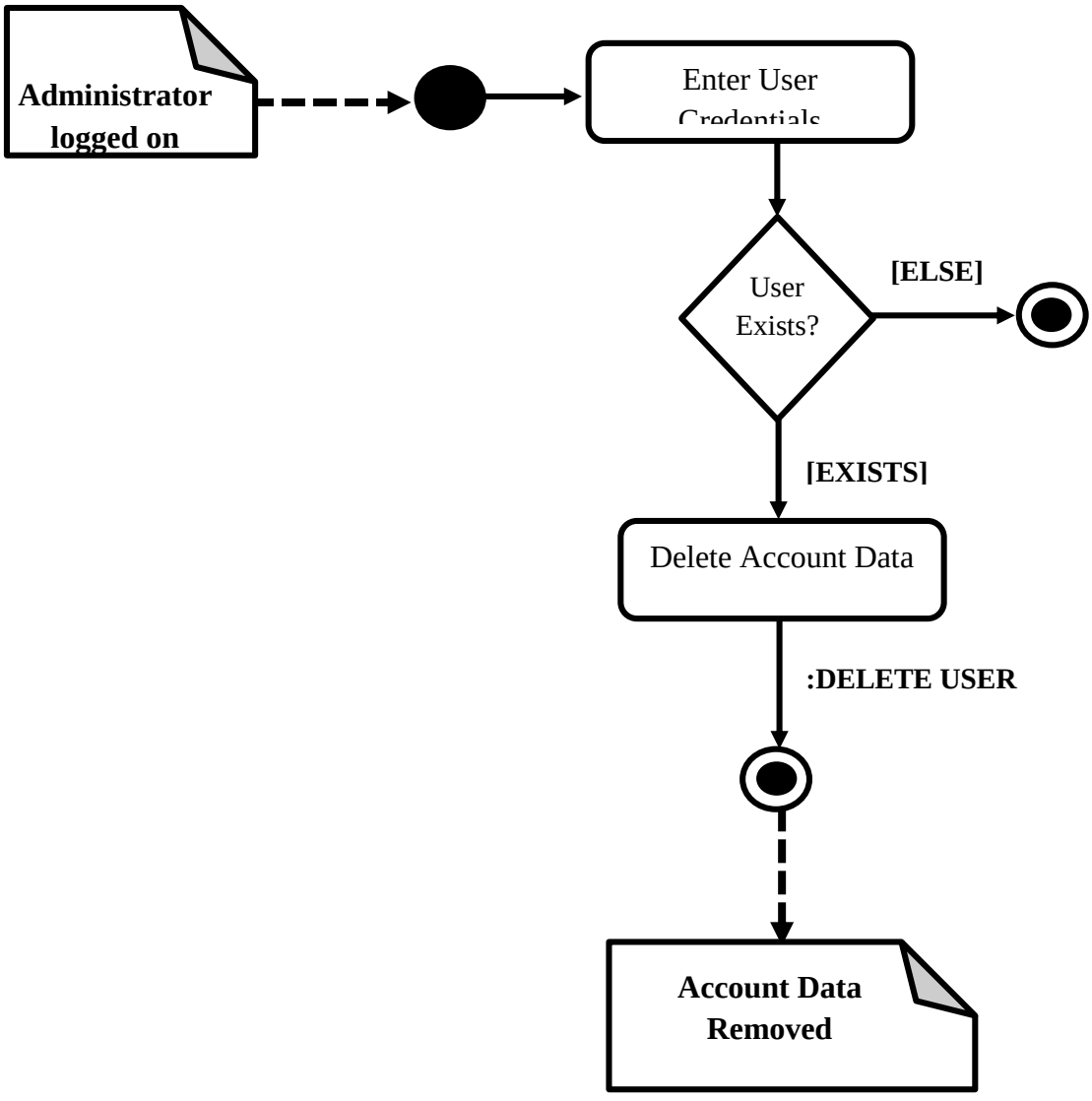
Excellence in Teaching, Research and Community Service

APPENDIX X: Population Sample

Organization	Sample Size
NICO Insurance Zambia Ltd	8
Armguard Zambia Ltd	8
University of Zambia	8
NECOR Zambia Ltd	8
MINET Insurance Zambia Ltd	8
Mean wood Insurance Company	6
Multichoice Zambia Ltd	6
University of Lusaka	6
Barclays Bank Zambia Ltd	6
Guardian Insurance Zambia Ltd	6
Professional Insurance Zambia Ltd	6
Madison General Insurance Zambia Ltd	6
Marsh Insurance brokers,	6
Goldman Insurance	6
Pensions and Insurance Authority	6

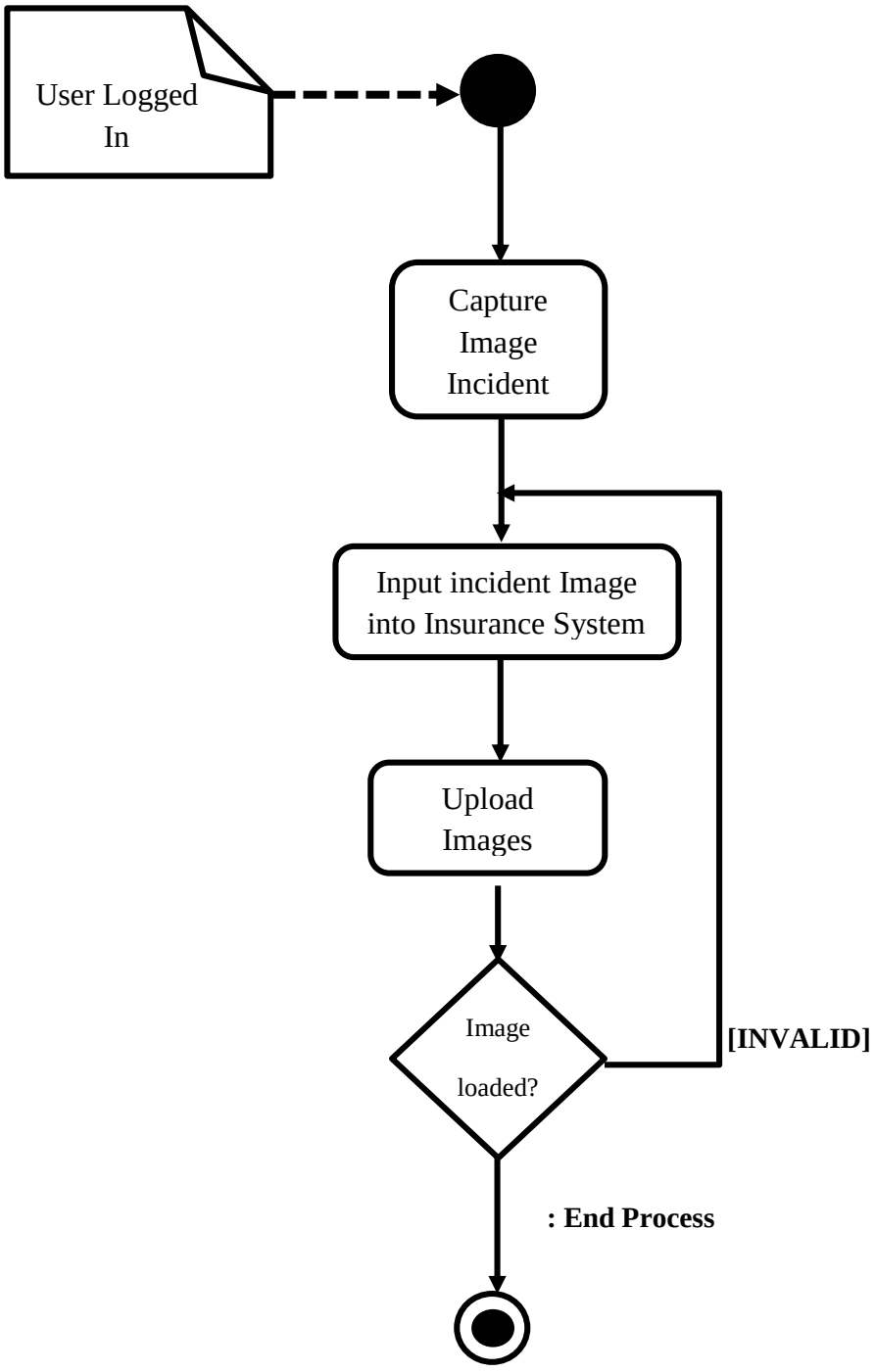
APPENDIX XI: ACTIVITY DIAGRAMS

Delete User



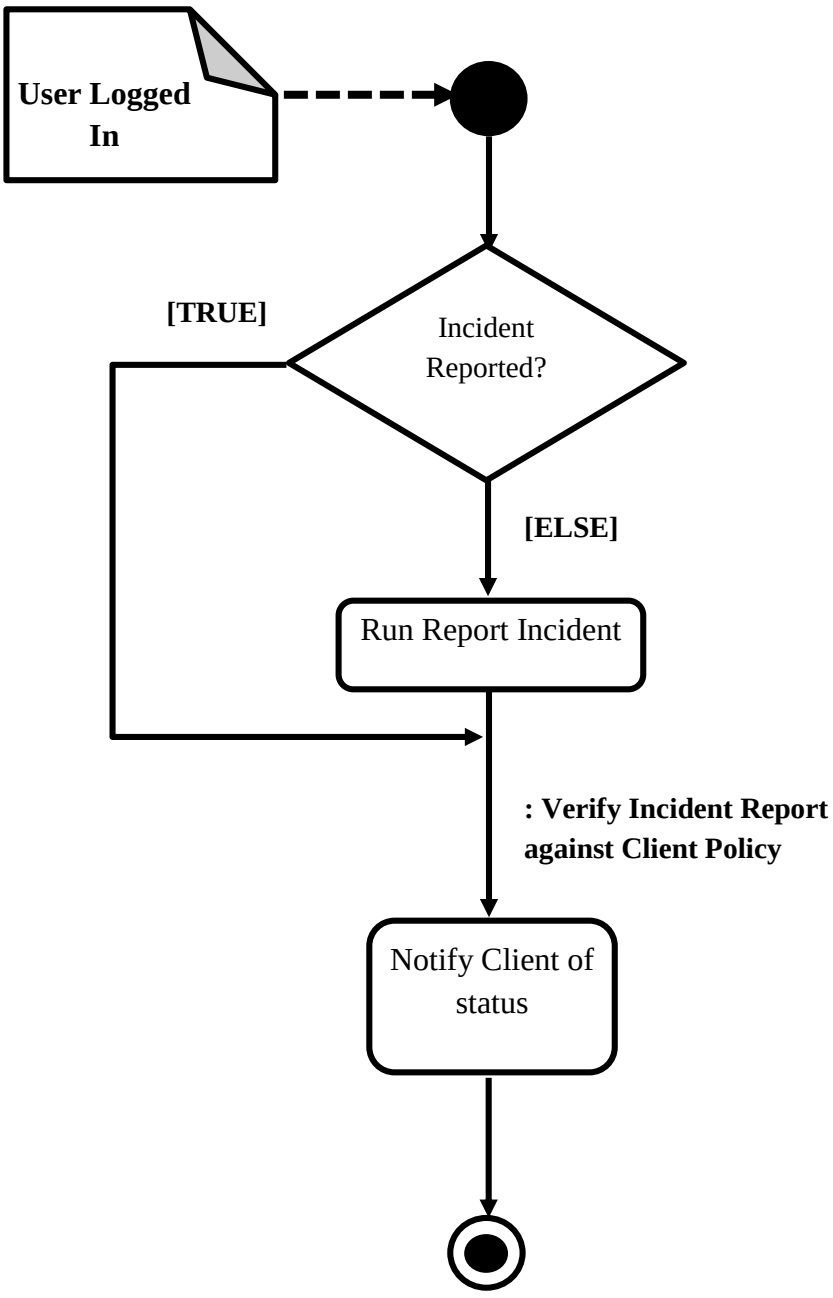
Report Incident

APPENDIX XII: INCIDENT REPORTING



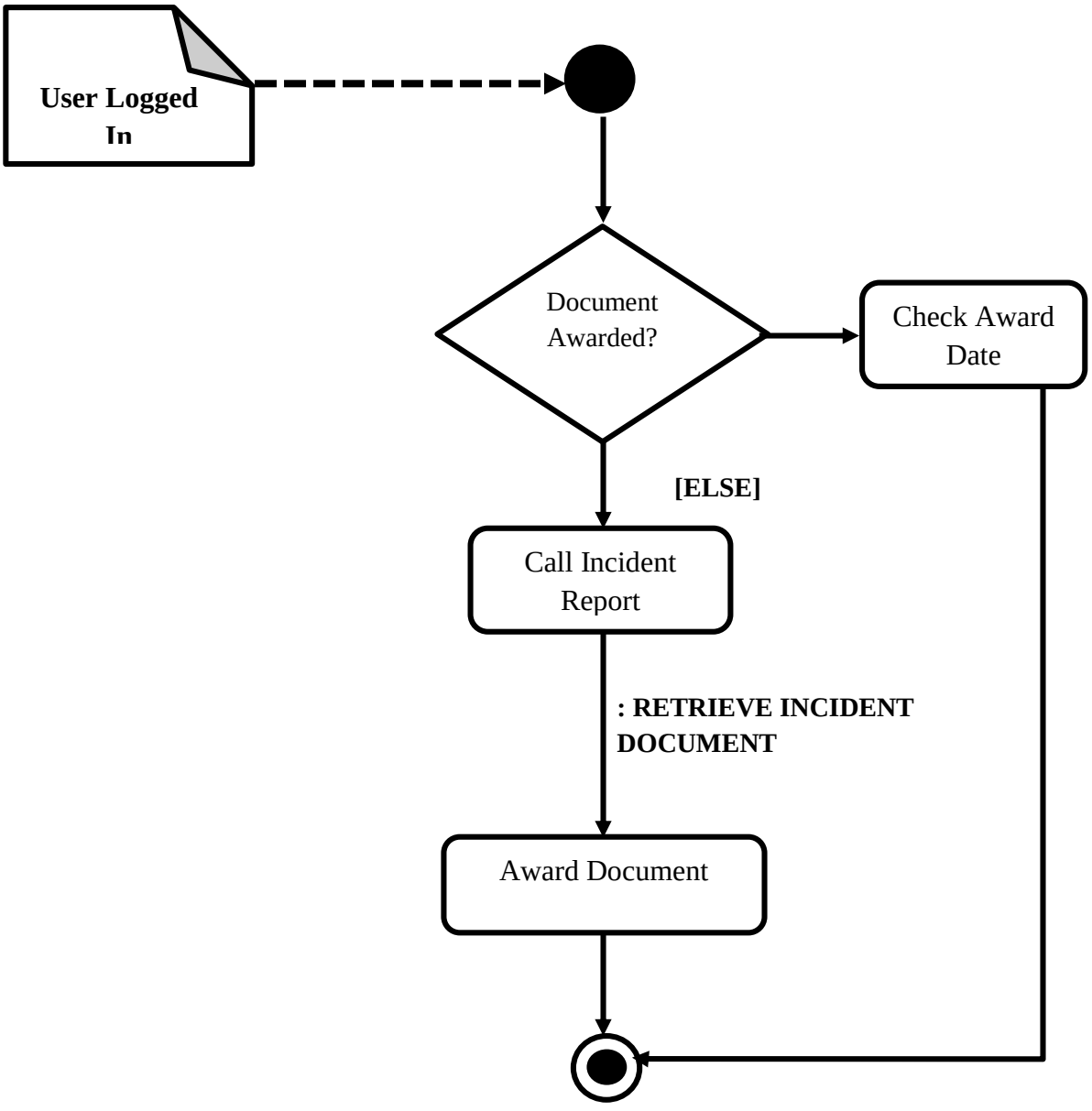
Validate Incident

APPENDIX XII: INCIDENT VALIDATION



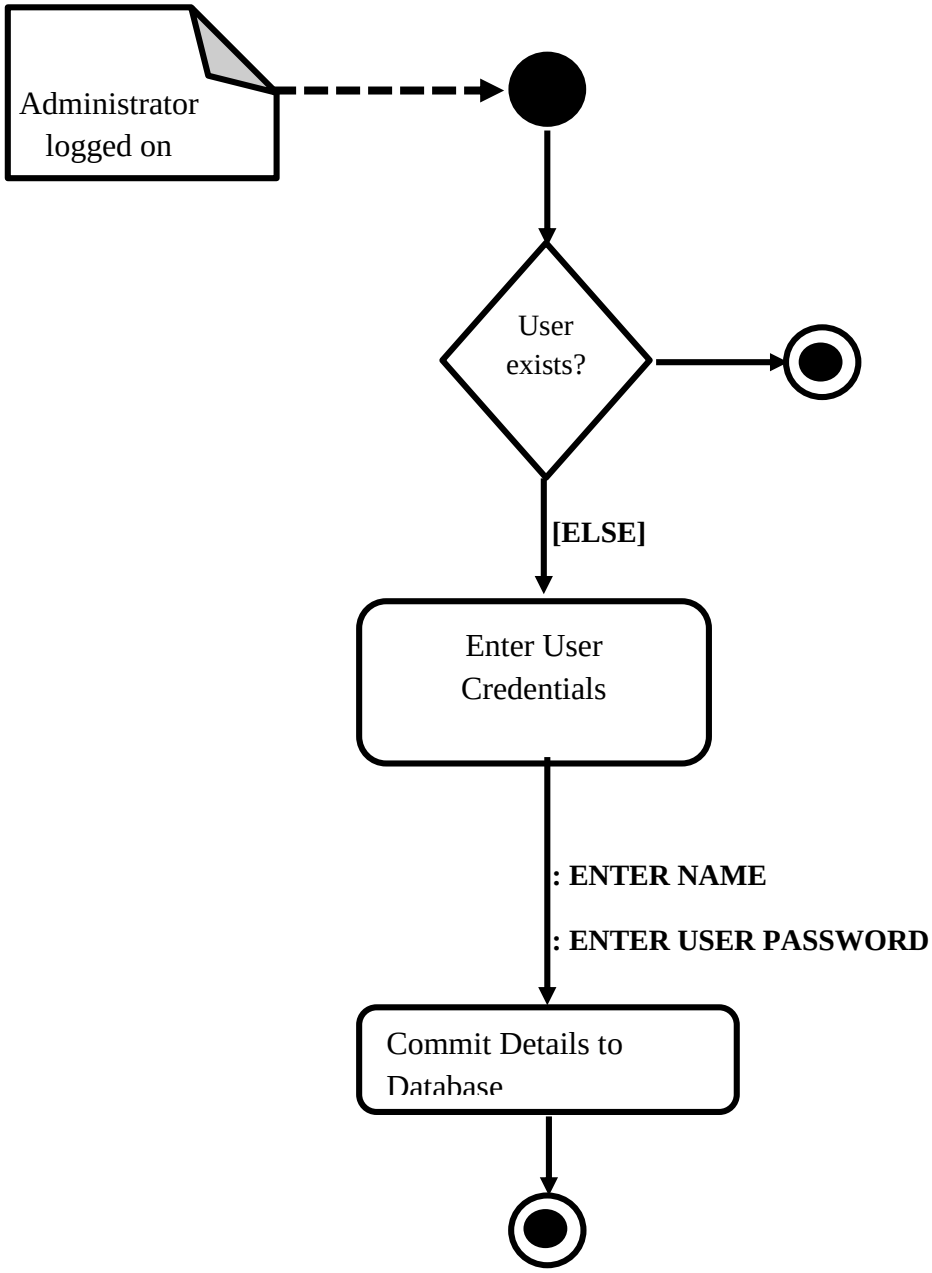
APPENDIX XIII: AWARD CLIENT

Award Client



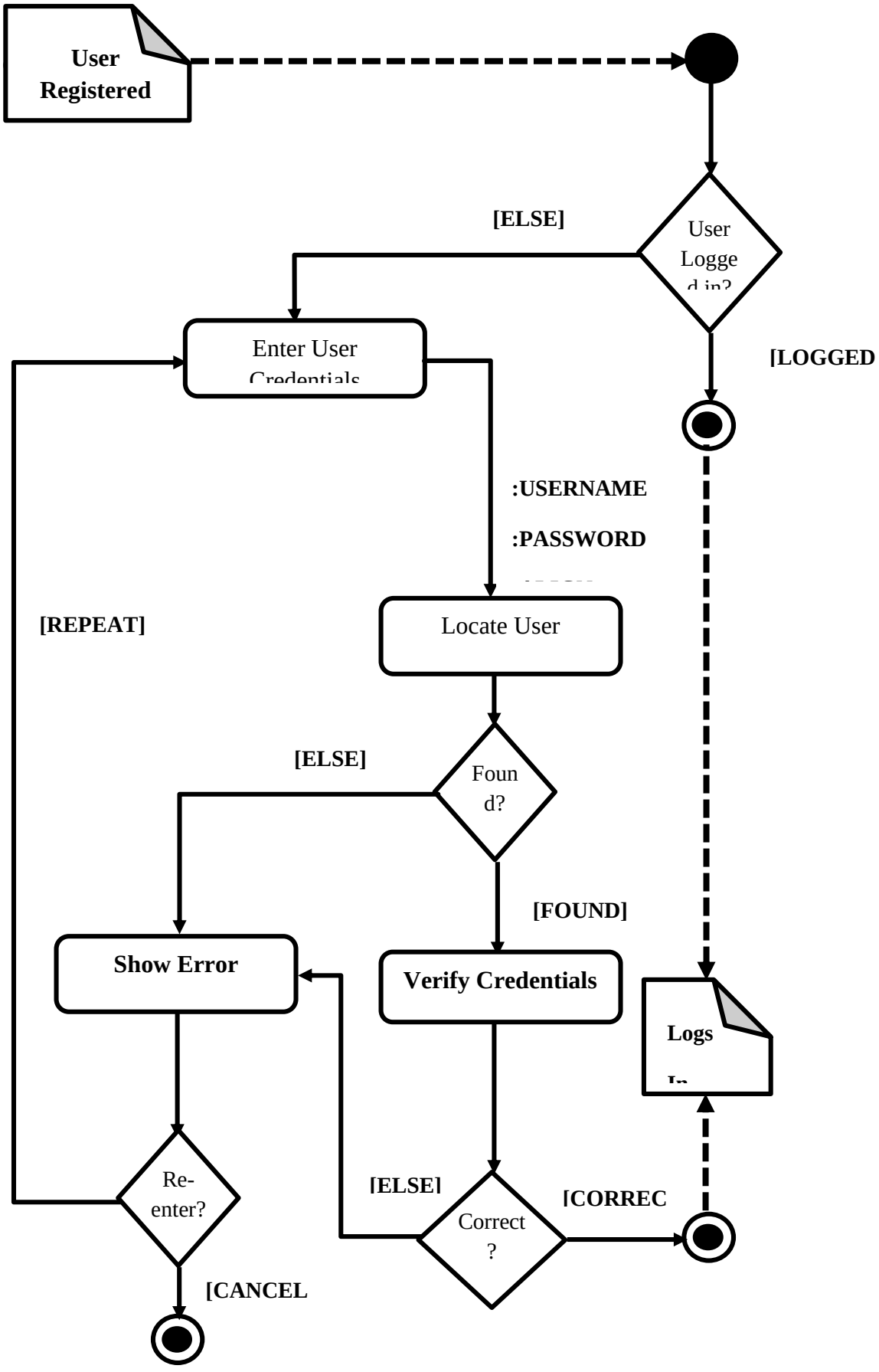
SAVE DATA TO DATABASE

APPENDIX XIV: SAVE TO DATA BASE



Log-In

APPENDIX XV: SYSTEM LOG IN



APPENDIX XVI: PSEUDO CODE

1. DELETE USER

BEGIN
IF admin logged in
THEN SEARCH user credentials
IF user credentials = FOUND
THEN DELETE user credentials
CLOSE database
END
ELSE
END
ENDIF
ELSE
Admin log in
RETURN
ENDIF
END

2. REPORT INCIDENT

BEGIN
IF user logged in
THEN capture image incident
UPLOAD image incident

IF image incident <> LOADED

THEN RELOAD image incident

ENDIF

ELSE

LOGIN user

ENDIF

END

3. VALIDATE

BEGIN
LOG IN user
IF incident reported
THEN END
ELSE
Call Report incident
Notify client
ENDIF
END

4. AWARD DOCUMENT

BEGIN
WHILE admin logged on
INPUT client identification
Check if client awarded
IF client = awarded
THEN check award date
Notify client

ELSE

Call incident report

Award client

RETURN

ENDIF

ENDWHILE

END

5. DELETE CLIENT DETAILS

BEGIN
WHILE admin logged on
Retrieve client record
IF client record <> FOUND
THEN
END
ELSE
DELETE client record
ENDIF

ENDWHILE

END

6. SAVE CLIENT CREDENTIAL

BEGIN

WHILE admin logged on
LOCATE client record
IF client record <> FOUND
THEN
END
ELSE
Create user credential
COMMIT user credential to database
CLOSE database
ENDIF

ENDWHILE

END

APPENDIX XVII – SAMPLE CODE

1. ADD INCIDENT / REPORT INCIDENT

```
<?php
require_once 'core/init.php';
$user = new User;
$data = $user->data();


if (Input::exists()) {


$validate = new Validate();
$validation = $validate->check($_POST, array(
'user_id'=> array(
'required'=> true,
),

'details'=> array(
'required'=> true,
),

'gps'=> array(
// 'required'=> true,
),

'incident'=> array(
'required'=> true,
```

)

));

if ($validation->passed()) {

$userid = Input::get('user_id');

$pmes = Input::get('details');

$retype = Input::get('incident');

$gps = Input::get('gps');

if ($retype == 1) {

$adres = "Accident
Greetings, we have received your report and please ensure that you and your assets are well protected and our team will get to you shortly.

Thank you.";

}elseif ($retype == 2) {

$adres = "Fire Incident
Greetings, we have received your report and we are working on assisting you as soon as possible.

please keep your device online and we will get to you shortly.

Thank you.";

}elseif ($retype == 3) {

$adres = "Theft
Greetings, we have received your report and we are working on assisting you as soon as possible.

please keep your device online and we will get to you shortly.

Thank you.";

}elseif ($retype == 4) {

$adres = "Roadside Assistance
Greetings, Your roadside assistance request has been received and we are working on assisting you, please wait and our team will be with you shortly.

Thank you.";

}

```
function gen($length = 8) {
$characters =
'0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ';
$charactersLength = strlen($characters);
$randomString = '';
for ($i = 0; $i < $length; $i++) {
$randomString .= $characters[rand(0, $charactersLength - 1)];
} return $randomString;}
$repid = gen();

if (!file_exists('gfiles'."/".$repid)) {
mkdir('gfiles'."/".$repid, 0777, true);
if (!file_exists('gfiles'."/".$repid)) {
mkdir('gfiles'."/".$repid, 0777, true);
}else{
// echo "<div id='errors'>Username Already Taken!</div>";
}
}

try {

$fields=(array(
// 'img1'=> $db_file_name,
```

```
'st_id'=> $userid,
'pmes'=> $pmes,
'retype'=> $retype,
'report_id'=> $repid,
'gps'=>$gps,
'typ'=>1,
'adres'=>$adres,
));

$query = new DB();
$query_insert = $query->insert("reports",$fields);

$to = "auxitechnology@gmail.com";
$subject = 'Test Mails';
$message = "

Sent To: <b>$gps</b><br></div>
<div style='padding: 2%;'>

$adres
<br>
</div>

";
$headers = "From: INSUR | AID <insuraid_tech@insuraid.com>" . "\r\n";
```

```
$headers .= "Reply-to: insuraid_tech@insuraid.com" . "\r\n";
$headers .= "Content-type: text/html" . "\r\n";

mail($to, $subject, $message, $headers);




if(isset($_FILES["file"]["name"])){
$doc_name = $_FILES["file"]["name"];
$tmp_name = $_FILES['file']['tmp_name'];
$location = 'gfiles'."/".$repid."/";
$target_file = $location . basename(@$_FILES["fileToUpload"]["name"]);
$imageFileType = pathinfo($target_file,PATHINFO_EXTENSION);
//$file_size = @$_FILES['size'];

$imgs = array();
foreach( $doc_name as $key => $n ) {
$images = $doc_name[$key];

$name = $_FILES["file"]["name"][$key];
$pics_id = gen();
if (isset($images)) {
if (!empty($images)) {
if($imageFileType != "bmp" && $imageFileType != "jpg" && $imageFileType != "jpeg"
&& $imageFileType != "png" ) {
```

```
$kaboom = explode ( ".", $images );

$fileExt = end ( $kaboom );

$db_file_name = $pics_id . "." . $fileExt;


if(move_uploaded_file($_FILES['file']['tmp_name'][$key], $location.$db_file_name)){


$img_names .= $db_file_name.",";

// $push = DB::getInstance ()->query ("INSERT INTO reports (img1, report_id, st_id) VALUES ('$db_file_name', '$repid', '$userid')");



}}}}}

$pushin = DB::getInstance()->query("UPDATE reports SET img1 = '$img_names' WHERE report_id = '$repid'");



}



Redirect::to("incident");


} catch (Exception $e) {

die($e->getMessage());

}

} else{

foreach ($validation->errors() as $error) {

Redirect::to("incident");
```

```
}

}

}
```

```
?>
```

2. LOG-IN

```
<?php

require_once 'core/init.php';


if (Input::exists()) {

if (Token::check(Input::get('token'))) {


$validate = new Validate();

$validation  = $validate->check($_POST, array(

'username' => array('required' => true),

'password' => array('required' => true)

));

if ($validation->passed()) {

$user = new User();

$remember = (Input::get('remember') === 'on') ? true : false;

$login = $user->login(Input::get('username'), Input::get('password'));//the 3rd param is the remember me (check the original).
```

```
if ($login) {
Redirect::to('index');
}else{
Redirect::to('Login?code=345a');
}

}else{
Redirect::to('Login?code=331a');

}
}
}
?>

<!DOCTYPE html>
<html dir="ltr" lang="en">
<meta http-equiv="content-type" content="text/html;charset=utf-8" />
<meta name="viewport" content="width=device-width, initial-scale=1.0, user-scalable=0,
minimum-scale=1.0, maximum-scale=1.0">
<head>
<meta charset="UTF-8" />
<title>INSUR | AID</title>
<base />
<?php include_once 'headfiles.inc'; ?>

</head>
```

<body>

<img src="images/dania_logo.png" style="width: 280px; height:65px; ">

<!-- <h1>Get Started with Atlasmara</h1> -->

<form action ="" class="form-horizontal" method="post" name='login'>

<input type="text" name="username" placeholder="Username" class="form-control" autocomplete="off" id="email">

<input type="password" placeholder="Password" class="form-control" name="password" id="password" >

<input type="submit" style="width: 100%;" value="Log in" class="btn btn-default">

<input type="hidden" name="token" value="<?php echo Token::generate(); ?>">

```
</form><br>
<a href="index">Go back home</a><br><br>

<?php
if(@$_GET['code']){
$erUser = @$_GET['code'];

if ($erUser == '345a') {
echo '<div class="alert dp-danger"
style=" width: 100%; margin-top: 2%; font-size: 1em;">
Username or Password Wrong.
</div>';
}elseif($erUser == '331a'){
echo '<div class="alert dp-danger"
style=" width: 100%; margin-top: 2%; font-size: 1em;">
Invalid account Information.
</div>';
}elseif($erUser == '345b'){
echo '<div class="alert dp-danger"
style=" width: 100%; margin-top: 2%; font-size: 1em;">
Your account has been Deactivated.<br>
<small>Contact Administrator</small>
</div>';
}
}
```

?>

</body>

</html>

3. LOG-OUT

```
<?php
require_once 'core/init.php';

$user = new User();
$user->logout();

Redirect::to('home');
?>
```

5. LANDING PAGE

```
<?php
require_once 'core/init.php';


if (Session::exists('home')) {
echo '<p>'.Session::flash('home').'</p>';
}

$user = new User();
$data = $user->data();

@$username = $user->data()->username;
@$access = $user->data()->groups;
```

```
?>


<!DOCTYPE html>

<html dir="ltr" lang="en">

<meta http-equiv="content-type" content="text/html;charset=utf-8" />

<meta name="viewport" content="width=device-width, initial-scale=1.0, user-scalable=0,
minimum-scale=1.0, maximum-scale=1.0">

<head>

<meta charset="UTF-8" />

<title>INSUR | AID</title>

<base />

<?php include_once 'headfiles.inc'; ?>

<style type="text/css">


</style>

</head>


<body class="main-body">


<?php

include_once 'lcheader.inc';

?>



<div class="banner" id="mobile-only">

<img src="images/data/ad.jpg" style="width: 100%; height: 300px;">

</div><br><br>
```

Our services

<ul class="list-inline">

<li class="col-lg-3 liztr">Report Fire

<li class="col-lg-3 liztr">Report Accident

<li class="col-lg-3 liztr">Report Theft

<li class="col-lg-3 liztr">Roadside Assitance

<!-- Fire Insurance -->

<img src="images/data/ds.jpg">

<h2>Incident Response</h2>

We are ready to respond to any incident quickly and actively.

<img src="images/data/gh.jpg" style="width: 100%;">

<h5>We will cover you always.</h5>

<img src="images/data/an.jpg" style="width: 100%;">

<h5>We will provide roadside assistance.</h5>

```
</div>

<div class="col-lg-4">
<div id='front-pic'><img src="images/data/adx.jpg" style="width: 100%;"></div>
<div id="front-body">
<h5>We will protect your home.</h5>
</div>

</div>

</div>

</div>
</div>
</div>

<br><br>
<div style="clear:both;"></div>

<!-- Footer
================================================ -->
<div class="footer" style="position: relative; bottom: 0; width: 100%;">
```


<img src="images/dania_logo.png" style="position: relative; float: left;

max-height: 40px;"/>

<h4>Site Navigation</h4>

<ul class="list-inline"><!--

Home

Services

Subscription

<!-- About -->

<!-- Client Login -->

INSUR | AID, protecting you always.

<h4>Contact Details</h4>

<ul class="list-unstyled">

(+260) 966000000

(+260) 978000000

Copyright © 2019 INSURE | AID. All rights reserved.

</body>

</html>

APPENDIX XVIII – ISO CERTIFIED COMPANIES IN ZAMBIA

ZAMBIA BUREAU OF STANDARDS
MANAGEMENT SYSTEMS CERTIFICATION

LIST OF ORGANISATION WHICH ARE CERTIFIED IN ISO STANDARDS IN ZAMBIA

S/NO	ORGANISATION	STANDARD (S)	ADDRESS	TELEPHONE/FAX	E MAIL
1	Total Zambia Ltd	ISO 9001:2008	TOTAL Zambia Limited Plot No.1709 Mungwi, Road Heavy Industrial Area P O Box 31724 LUSAKA ZAMBIA	Telephone No: +260211 374444/374440/374402/374403 Fax No: +260 21 1 241118	totalzambia@total.co.zm
2	Simply Red Industrial and Agro Ltd	ISO 9001:2008	Simply Red Industrial And Agro Ltd Plot 11837 Lubumbashi Rd off Mumbwa Rd, PO Box 31JFW, Lusaka, Zambia	Telephone No: +260 21 122 5339 +260 77 794 453, +260 77 694 844	simplyredpumps@zamtel.zm
3	Project Management and Training Consultancy (PMTC) Ltd	ISO 9001:2008	PMTC (Zambia) Limited 124 Kudu Road Kabulonga P.O Box 38322 Lusaka	Telephone No: + 260 211 250495 / 257507 Fax No: + 260 211 257507	zambia@pmtc.org

			Zambia		
4	Barloworld Equipment	ISO 9001:2008	Barloworld Equipment Plot No. 1557 / 1554, P.O. Box 20810 Independence Avenue, Industrial Area, Kitwe, Zambia	Telephone No: (+26-02) 211311 / 211191 / 211195 Fax No: (+26- 02) 213393 / 211193	service@barlows.com.zm
5	Davies & Shirtlif	ISO 9001:2008	Davis & Shirtliff (Z) Ltd PO Box FW112, Lusaka, Zambia	Telephone No: +260 21 184 5010, +260 21 184 5011, +260 21 128 8010 Fax No: +260 21 128 8011	lusaka@zm.dayliff.com
6	Gourock Ropes and Canvas (Z) Ltd	ISO 9001:2008	Gourock Ropes & Canvas (z) Ltd E - 12, Arusha Street P Box No. 70467 Ndola (Zambia)	Telephone No: +260 212 615402 / 615658 Fax No : +260 212 615658	gourock@gourockzambia.com
7	Zambia Metal Fabricators	ISO 9001:2008, 14001 and OHSAS	Zamefa Address: Plot 1400 H Fivog Rd, Luanshya, Zambia	Telephone No : 021 259 1000 260 212 510599, 511589, 510006 Fax No : 021 251 2637	
8	Zambian Breweries	ISO 9001:2008,	Zambian Breweries Plc Plot 6438, P.O. Box 31293 Mungwi Road, Lusaka	Telephone No: +260 211 244501 / 240131 / 246555 Fax No : +260 211 240631	info.zambrew@zm.sabmiller.com
9	Konkola Copper Mine	ISO 9001:2008, 14001 and OHSAS 18001	Konkola Copper Mine Private Bag KCM (c) 2000 Stand M/1408	Telephone No: +260-212-350604	corporate.communications@kcm.co.zm

			Fern Avenue Chingola		
10	Elsewedy Electric (Z) Ltd	ISO 9001:2008	Light Industrial Area Ndola.	Tel : +260 (212) 650120/1	zambia-transformers@elsewedy.com
11	Lafarge Cement (Z) Ltd	ISO 9001:2008	Lafarge Cement (Z) Ltd P.O.Box 32639 Lusaka	Telephone No: +260 211 279029/40 Fax No: +260 211 211 278134	info@lafarge.zm
12	Seed co (Z) Ltd	ISO 9001:2008	Seed Co International Zambia Limited P.O. Box 35310 SeedCo Business Park, Farm 683B, Mumbwa Road Lusaka	Telephone No : +260 211 846367-70 Fax No +260 211 289247	Info@seedco.zm
13	Airtel (Z) Ltd	ISO 9001:2008	Head Office Airtel Copmplex Addis Ababa Road Lusaka.	+260977915000	customerservice@zm.airtel.com
14	Mopani Copper Mines	ISO 9001:2008, 14001 and OHSAS 18001	Mopani Copper Mines Corporate Office, Central street,Nkana west, Kitwe.	Telephone No. 260 (212) 227225 260 (01) 221023, 220351, 228833 Fax No: 260 (01) 221057, 220449, 220727 260 (212) 222638, 222639, 222640	
15	Parmalat (Z) Ltd	ISO 22000	Parmalat Zambia Ltd Mungwi Rd Industrial Area, Lusaka, Zambia PO Box 34930, Lusaka, Zambia	Telephone No: +260 21 128 6855, +260 21 128 6321, +260 21 121 2274, +260 21 128 9311, +260 21 121 2276	parmalat@parmalat.co.zm
16	Universal Mining and Chemicals (Z) Ltd	ISO 9001:2008	Universal Mining and Chemical Industries Ltd Plot No.3944 Opp. Nitrogen Chemicals	Telephone No : + 260 211 311145/311241 +260 211 289 735 / 286 117 / 286 127 Fax No : +260 211 311054	

			Chibuku Road, Heavy Industrial Area Kafue Estates Zambia .	+260 211 288 856	
17	Kafue Gorge Regional Training	ISO 9001:2008	KGRT P.O Box 35, Namalundu, Zambia;	Telephone No: +260-211-371007/8 Fax : +260-211-371086	
18	Puma Energy	ISO 9001:2008	Puma Energy Zambia PLC, Airtel House, Stand No 2375, Addis Ababa Drive, PO Box 31999, Lusaka, Zambia	Telephone No : +260 21 1 376100 Fax No : +260 21 1 376149	Zambia@pumaenergy.com
19	Chloride Zambia	ISO 9001:2008	Chloride Zambia P.O. Box 21892 Kitwe Main Plot 3682 Cnr Dr. Aggrey Ave & Natwange Rd Heavy Industrial Area Kitwe	Telephone No : (0212) 21-5757/(0212) 21-8500 Fax No: (0212) 21-4002	chlodzam@coppernet.zm
20	Lublend	ISO 9001:2008	Lublend Ltd Plot 415A / 18 Kavu Rd, Bwana Mukubwa P.O. Box 70503 Ndola.	Telephone No: +260 212 655381/2/3/4 Fax No: +260 212 655149	
21	Polythene Products	ISO 9001:2008	Polythene Products Zambia Ltd box: 31107 Address: Plot 7182 Manda Rd Industrial Area, Lusaka, Zambia	Telephone No : 021 128 7861 (+260) 1- 28-7860 Fax No: 021 128 7864	
22	Sandvik	ISO 9001:2008	Plot 4077, Cnr. Lilongwe & Dr.	Telephone No: +260 2-21 03 55	

			Aggrey Street off Chibuluma Road, Kitwe SE-21149 Zambia	Fax No: +260 2-21 88 96	
23	Morganite	ISO 9001:2008	Vitanda St P.O. Box 70543 Ndola	Telephone No : (02) 61-1297 , (02) 61-1298 , (02) 61-5058 Fax No: (02) 61-2420, (02) 61-5072	morgan@coppernet.zm
24	National Airports	ISO 9001:2008	Kenneth Kaunda International Airport P.O. BOX 30175 LUSAKA, ZAMBIA	Telephone No : +260 211 271313 Fax No : 271007, 27129	prince.chintimbwe@lun.aero agness.chaila@lun.aero friday.mulenga@lun.aero
25	Scaw Ltd	ISO 9001:2008	Scaw Limited 1316 Dr.Aggrey Avenue Heavy Industrial estate P.O Box 20418 Kitwe.	Telephone No: +260 212 21393/2139333/213541 Fax No: +260 212 215432	scaw@iconnect.zm info@scawltd.com
26	Ndola Lime	ISO 9001:2008, 14001 and 18000	P.O. BOX 70057 Ndola Copperbelt Province Zambia Holding Company - ZCCM-IH	Telephone No : +260-212-616292/3 +260-212-627600 Fax No : +260-212-627614; +260-212-627616 +260-212-627615	info@ndolalime.co.zm