

**INFLUENCE OF ZUKU FIBRE OPTIC PROJECT ON  
THE PERFORMANCE OF SMALL BUSINESSES IN  
NAIROBI COUNTY, KENYA**

**MWANGANGI STEPHEN MUSEE**

**A Research Project report Submitted in Partial Fulfilment of the Requirements  
for the Award of Degree in Masters of Arts in Project Planning and  
Management, to the University of Nairobi.**

**2017**

## DECLARATION

### Declaration by the Student

This research proposal is my original work and has never been presented for an award of a degree, diploma or a certificate in a university.

Signature: ..... Date: .....

**Mwangangi Stephen Musee**

ADM: L50/62332/2013

This Project report has been submitted for examination with my approval as the University of Nairobi Supervisor

Sign: ..... Date: .....

**Prof. Charles Rambo(PHD)**

**Chairman**

**Department of extra-mural Studies**

**School of continuing and distance education**

**University of Nairobi**

## **DEDICATION**

To my parents Mr and Mrs. Mwangangi and wife Ms. Rebeca Mutisya for remaining supportive throughout the entire period of my study

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## **ABBREVIATIONS AND ACRONYMS**

CA	:	Communication Authority of Kenya
EASSy	:	The Eastern Africa Submarine Cable System
FONN	:	Kenya Fiber Optic National Network
GCCN	:	Government Common Core Network
GDP	:	Gross Domestic Product
GOK	:	Government of Kenya
ICT	:	Information and Communications Technology
IS	:	Information System
ISP	:	Internet Service Provider
IT	:	Information Technology
KES	:	Kenya Shilling
KIPPRA	:	Kenya Institute for Public Policy Research and Analysis
LION	:	Lower Indian Ocean Network
NOFBI	:	National Optic Fibre Backbone Infrastructure
PEOU	:	Perceived Ease of Use
PU	:	Perceived Usefulness
SEACOM	:	South-East Asian Commonwealth Telephone Cable
SIDA	:	Swedish International Development Cooperation Agency
SME	:	Small and Medium Enterprise

TAM	:	Technology Acceptance Model
TEAMS	:	The East African Submarine System
TFP	:	Total Factor Productivity
TRA	:	Theory of Reasoned Action
USA	:	United States of America

## ABSTRACT

The small business sector is very important due to its contribution to the economy. Just like in other underdeveloped nations, the small business sector is considered Kenya's growth engine due to its contribution in the prosperity of the nation. The construction of ICT infrastructure in Kenya, opened the country to digital interaction, socially, politically and businesswise. In 2008, 77% of the small businesses in Kenya owned a business, but only used them for basic application such as communication and automation. The main aim of this study was to investigate the impact of the Zuku fibre optic project on the performance of small firms in Kenya's capital, Nairobi County. To attain this purpose, the following objectives were formulated: To establish how communication efficiency through Zuku fibre optic project influences performance of small businesses in Nairobi County; To assess how internet access through Zuku fibre optic project influences performance of small businesses in Nairobi County; To establish the extent to which communication costs through Zuku fibre optic project influence performance of small businesses in Nairobi County and to determine how access to e-commerce through Zuku fibre optic project influences performance of small businesses in Nairobi County. This was achieved by using a descriptive survey design. The study's target population is made up of 1,576 small businesses within Nairobi City, which are connected to Zuku Internet services. A stratified random sample of 310 small businesses was selected. Data was then be collected using questionnaires through face to face interview. Data was entered into Microsoft Excel 2013 and quantitative data analysed using descriptive statistics, which are indices describing a given sample. The descriptive statistics used include: mean, standard deviation, frequencies and percentages. In the research, 230 questionnaires were used to collect data. Out of all the respondents, 59.5% were male while 47.4% were female aged between 26-35 years. 30.3% of the businesses being in the ICT sector and 60.7% of the businesses being 2-5 years old. 72.22% of the respondents were proficient when it comes to computer literacy. 95.65% of the respondents used online communication at least on a weekly basis, with 84.35% of them using online communication on a daily basis. 66.09% of the respondents had access to the internet used it on a daily basis for business related research. Communication costs for businesses before and after connection to Zuku went up in businesses that spent below KES 5,000 and went down for businesses that spent above KES 10,000. 69.57% of the businesses had a website mainly used it to communicate to customers and potential customers. Profits, dividends to shareholders and value of assets increased after connection to Zuku. Variables on communication efficiency, internet access and communication costs had a positive Pearson Correlation Coefficient with increase in profit. Access to Internet has a high correlation to the performance of a business. Factors such as the age of the business also affect the performance and profitability of small business. Improved communication efficiency, access to internet and access to ecommerce leads to improved ease of doing business, thus improving business performance. Communication costs tend to increase for businesses that spent less than 5,000 per month to take advantage of the internet, while those that spend above 5,000 record lower communication costs introduced by the internet, to improve business performance. In conclusion, small businesses should not just be encouraged to adopt the internet, but should also be trained to make the best use of it so as to save on cost, time and improve their performance.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

The significance of small businesses is highlighted by their contribution to the growth of economies all over the world. Across the globe, McClelland (1987) argues that governments have realized the importance of the small business sector to the prosperity of their future economies. As a result, these governments especially in the underdeveloped world have taken various measures to encourage entrepreneurship as suggested by McClelland and Harper (1991) in Calvin (2002). As revealed by Day (2000) micro and small enterprises stimulate economic growth due to the following reasons; they produce new products/services, offer new markets for existing products/services as well as create new employment opportunities. In addition, are not only innovative but also enhance the adaptation and widespread use of technology that is important for economic growth (Day, 2000). Lastly, as indicated by (Hall, 1995) small firms and entrepreneurs in the small business sector play a major part in boosting the economy. This is because they make up the bulk of enterprises in majority of the economies worldwide.

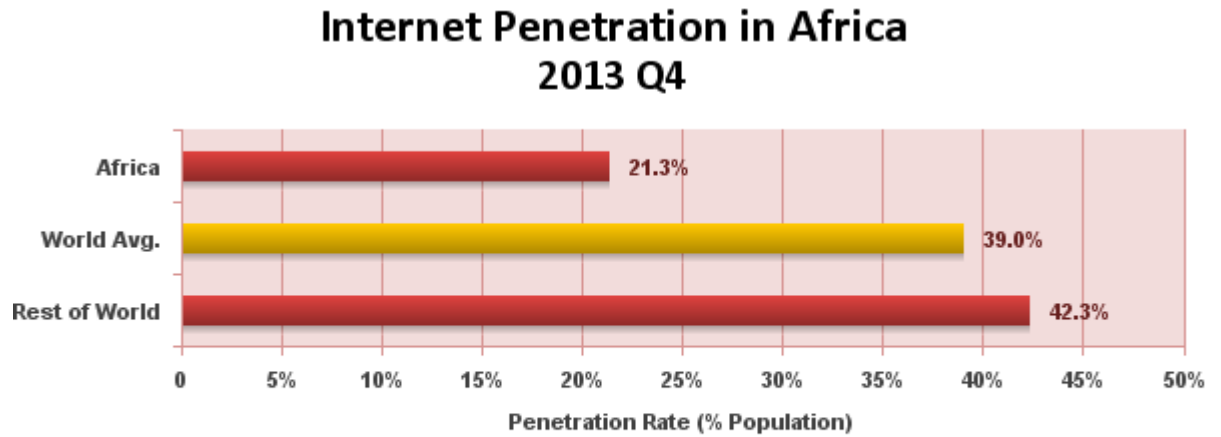
Smallbone and Wyr (2000) disclose that small and micro enterprises are important for economic development at the community, national and international levels. For example, in underdeveloped economies, majority of the individuals especially at the community are employed in the small business sector. Poon and Swatman (1999) emphasize the significance of the informal business sector by revealing that it accounts for close to 80% of the global economic growth.

Incorporating and fully utilizing the Internet into the daily functions of small firms greatly improves their competitiveness. As argued by Chapman et al. (2000) the Internet offers small firms an opportunity to compete at a similar platform as large and established organizations. This has been enabled by the development and growth of e-commerce particularly in the last decade (Bianchi and Bivona, 2002). Bianchi and Bivona (2002) add that small firms have capitalized on e-commerce to not only promote their businesses but also compete against established enterprises. In the current business environment, forward thinking businesses have adapted and utilize the internet and e-commerce to attain and maintain their competitive edge. Due to the benefits realized by businesses on the Internet, researchers and governments are investing their resources, time and effort to encourage small organizations to incorporate the Internet in their daily activities (Beckinsale and Levy, 2004).

As discussed by Omwenga (2009) is of the view that the underdeveloped world especially Sub-Saharan Africa has been digitally isolated for the longest period as compared to other parts of the world. Sub-Saharan Africa has been digitally isolated due to the high interconnectivity costs as compared to other parts of the world. Countries in this region have been forced to pay 50 times more for similar bandwidth as compared to developed countries such as the United States (Juma and Moyer, 2008). In addition, countries in Sub-Saharan Africa pay high interconnectivity costs as compared to countries whose GDP is almost 2,000 times higher. This isolation not only hinders Sub-Saharan Africa from growing economically but also creates a high education gap with the rest of the world as the Internet is a reliable source of information (Omwenga, 2009). Africa is the continent with the lowest internet penetration in the world. In December 2013, the Internet World Statistics noted that Africa had an internet penetration of 21.3%. The penetration correlates to the portion

of total individuals in the continent utilizing the internet. Figure 1 shows Africa's Internet penetration compared to the rest of the world.

Figure 1: Internet Penetration in Africa in 2013



Source: Internet World Stats - [www.internetworldstats.com/stats1.htm](http://www.internetworldstats.com/stats1.htm)  
240,146,482 estimated Internet users in Africa for December 31, 2013  
2,802,478,934 Internet users in the World on December 31, 2013  
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African nations started undertaking several projects to enhance connectivity and encourage the growth and use of the Internet within the continent. Several fiber optic projects were proposed, and some of them have been constructed or are under construction with the promise of bringing connectivity to the continent. Many nations have bundled the deployment of broadband Internet with economic and social development, a promise that can only be verified by the test of time and the proper deployment plan and use of the Internet within these nations.

As discussed by Juma and Moyer (2008) organizations and governments have made several attempts to enhance Internet connectivity within Africa. For example, in 1993, New Jersey's Columbia Technology initiated the Africa One project intended running a fiber optic cable across the entire continent. In this project, a self-healing loop of fiber optic project was developed and laid under the sea around Africa. Various implementation partners such as Lucent Technologies and Global Crossing Limited



were involved. Lucent Technologies was tasked to supply necessary software and hardware equipment while Global Crossing Limited was tasked to oversee and support undersea construction as well as provide project management services. The fiber optic project was expected to offer end-to-end connectivity between Africa and 19 countries and 185 major cities worldwide. However, this project collapsed following the meltdown of the global telecommunication industry and the collapse of some of the major implementation partners.

It is, important to note that there has been tremendous growth in Internet penetration and usage in Africa since 2009. The the internet penetration for instance, has risen from 5.6% in 2009. Internet users have also increased from 3.6% in 2009 to 8.6% of the world's population in 2013 (internetworldstats.com). Africa is no longer dubbed "the dark" Continent but has turned to be a haven to angel investors, thanks to the ICT revolution being witnessed across countries in Africa.

From the advent of the Internet to Kenya in the early 1990s, Kenya relied exclusively on an Internet gateway that was run as a monopoly by the then state owned Telkom Kenya (currently 51% owned by France Telecom), which relied on expensive satellite systems to connect the country to the global Internet (Omwenga, 2009). The year 2009 marked the introduction of high-speed fiber optic cables that complement the prevalent international Internet access mechanisms in the country.

Proceeding from an increasing demand for bandwidth and a realization of ICT opportunities for economic development highlighted in the Government of Kenya (2007) Kenya Vision 2030 study, the Kenya government, the private sector and public private partnerships, invested in submarine fiber optic cable projects to connect the country to the information superhighway. The notable submarine fiber projects

included the East African Submarine System (TEAMS), SEACOM, the Eastern Africa Submarine Cable System (EASSY) and the Kenya Fiber Optic National Network (FONN), a terrestrial backhaul fiber to extend broadband transport infrastructure across the country.

The completion of these projects led to increased access to internet in the country and internet penetration. By 31<sup>st</sup> December 2013, Kenya was ranking 5<sup>th</sup> in Africa in internet penetration as shown in table 1.1 below.

Table 1.1: Africa 2014 Population and Internet Users Statistics For 2013

	<b>AFRICA</b>	<b>Population</b>	<b>Internet Users</b>	<b>Internet Users</b>	<b>Penetration</b>	<b>Internet</b>	<b>Facebook</b>
1	Morocco	32,987,206	100,000	18,472,835	56%	8%	5,091,760
2	Seychelles	91,650	6,000	46,192	50%	0%	27,600
3	Egypt	86,895,099	450,000	43,065,211	50%	18%	12,173,540
4	South Africa	48,375,645	2,400,000	23,655,690	49%	10%	6,269,600
5	Kenya	45,010,056	200,000	21,273,738	47%	9%	2,045,900
6	Mayotte (FR)	217,909	n/a	103,136	47%	0%	19,500
7	Tunisia	10,937,521	100,000	4,790,634	44%	2%	3,328,300
8	Mauritius	1,331,155	87,000	519,150	39%	0%	367,900
9	Nigeria	177,155,754	200,000	67,319,186	38%	28%	6,630,200
10	Saint Helena (UK)	4,255	n/a	1,600	38%	0%	n/a

Source: *internetworldstats.com*

As defined by the GOK (2007) Information and Communication Technology (ICT) is an enabler of other economic sectors as it offers numerous opportunities for small firms to access markets. ICT is a very vital tool in the current business world that is highly globalized and consumers as well as product/service providers possess a lot of knowledge. There are various factors hindering small businesses from accessing markets including but not limited to; low quality products, lack of technical know-how to explore markets and scarce resources for conducting market research and promoting products/services in target markets. ICT is vital in overcoming these challenges as it facilitates communication with target markets, it is a reliable source of information

necessary for production of quality products, greatly reduces distruction costs, enables access to international markets, enables competitive positioning and drastically reduces other overheads such as market identification, transactions and networking costs.

The Wananchi Group Holdings, Wananchi, was established in 2008 is committed to enhancing Africa's connectivity to the Internet. It attempts to attain this by providing high quality but affordable household Internet services. It is also amongst the major internet service providers in the corporate sphere particualrly in the East african region. Currently, Wananchi group has evolved into not only an Internet but alos a telecommunication company offering various services meeting the unique demands of its target market.

According to <http://softkenya.com/it/internet-service-providers-in-kenya/>, there are 124 service providers in Kenya. Of these, the most popular ones in the market are: Safaricom, Airtel, Zuku, Faiba, Orange and Access Kenya. We chose to work with Zuku because by 2011, Zuku was the only company offering affordable internet access in the market through fibre optic cables (Msimang, 2011). Since then, their subscription has grown from 7,500 to 63,542 (CA, 2015).

As discussed by Wheelen and Hunger (1989) small enterprises are amongst the strongest pillars of Kenya's economy as they not only account for up to 50% of the newly generated employment opportunities but also for more than 80% of the nation's employment in the past decade. One of the primary features of these small firms is innovation as argued by Carter (1990). The drive for innovation among small firms is a motivation for the use of the internet to make their businesses more efficient. The

affordability of Zuku's fibre optic internet has led to increase in subscriptions, both from residential homes and small businesses.

## **1.2 Statement of the Problem**

As alluded by KIPPRA (2002) small enterprises are thought to be the engine of Kenya's economy due to their contribution in the prosperity of the nation. The nation's small business sector not only provides goods and services but also offers employment opportunities, promotes innovation and sparks competition. Majority of the businesses in Kenya, over 75%, are small enterprises which: employ more than 4.6 million individuals, account for more than 87% of the new jobs and contribute more than 18.4% of the country's gross domestic product as disclosed by (GOK, 2009). Therefore, Kenya's government considers the small firms sector as the focal point for industrial development hence various development strategies are centered around it (GOK, 2009).

After the implementation of the ICT/network infrastructure in Kenya, the country was not only opened but also enhanced its interaction with other nations in terms of business, social and political issues. The nation enjoys way more benefits from the IT infrastructure as the small firms access markets at ease at lower costs which has enhanced their efficiencies and competitiveness.

ICT is very essential for Kenya's economy because small businesses are the dominant enterprises operating in the nation. It offers these firms potential for increasing their profits, enhancing their competitiveness and growth. As a result, the government is ever engaging in efforts intended at promoting the widespread utilization of ICT by the small organizations. Despite these efforts, lack of information on the use of ICT in Kenya's small business sector will hinder the government from attaining its objective

of sustainable economic development. As noted by Mokaya and Njuguna (2010) the use of ICT by small firms in Kenya has not met the expectations hence it is a growing concern for various stakeholders such as; the government, investors, economic policy makers and development partners.

As argued by Levy and Powell (2002) majority of the micro enterprises are of the misled perception that the Internet is not vital for their growth. As a result, they have not incorporate it into their business strategy. The fact that these businesses have not incorporated the Internet in their overall strategy greatly hinder their utilization of ICT in their functions. This is the reason why majority of the small businesses in underdeveloped economies have been slow to adapt online business solutions (Levy and Powel, 2002). On the other hand, larger corporations have been quick to implement online business solutions such as ecommerce leading to the developmnet of new business models and improvements in efficiencies (Drew, 2003).

Despite the various challenges hindering the adoption of the Internet by small business in Kenya, studies reveal that usage of computers in the nation has drastically increased in the recent past. Up to 77% of the small businesses in Kenya not only own but utilize computers in their day-to-day activities (Kiveu, 2008). However, most of these businesses only utilize the computers for basic applications such as processing sales and communication. Another study on internet usage by small Kenyan businesses indicate that only about 28% of the micro firms own websites for marketing and selling their products/services (Kiveu, 2008).

Currently, there is little literature and information as regards to how the fibre optic project has impacted the performance of small firms in Kenya's Nairobi County. This

study is aimed at assessing how the use of ICT has impacted on the performance of small enterprises.

### **1.3 Purpose of the study**

The purpose of this study was to investigate how the Zuku fibre optic project has impacted on the performance of small enterprises in Kenya's capital, Nairobi County.

### **1.4 Objectives of the Study**

The study aimed at achieving the following objectives:

- i. To establish how communication efficiency through Zuku fibre optic project influences performance of small businesses in Nairobi County.
- ii. To assess how internet access through Zuku fibre optic project influences performance of small businesses in Nairobi County.
- iii. To establish the extent to which communication costs through Zuku fibre optic project influence performance of small businesses in Nairobi County.
- iv. To determine how access to e-commerce through Zuku fibre optic project influences performance of small businesses in Nairobi County.

### **1.5 Research Questions**

This study aimed to answer the following research questions:

- i. How does communication efficiency through Zuku fibre optic project influence performance of small businesses in Nairobi County?
- ii. How does internet access through Zuku fibre optic project influence performance of small businesses in Nairobi County?
- iii. To what extent does communication costs through Zuku fibre optic project influence performance of small businesses in Nairobi County?

- iv. How does access to e-commerce through Zuku fibre optic project influence performance of small businesses in Nairobi County?

### **1.6 Significance of the Study**

In Kenya, the small business sector plays a vital role in alleviating economical and social issues. As a result, the government and other stakeholders have high expectations on the sector expecting it to; create new jobs, improve the standards of living and stimulate industrialization. Due to the high expectations, this sector has to attain and retain high performance. The use of ICT in the daily functions of small businesses offers numerous growth opportunities.

ICT is associated with various benefits such as cost reductions, high productivity and enhanced creativity. The implementation of the Zuku fibre optic project in Kenya offers an opportunity for the small business sector to benefit from ICT. This study offers adequate information on how the small firms in Kenya can fully capitalize on the fibre optic project to attain growth. This information is important for the owners of the small businesses, policy makers, researchers, development partners and other investors.

### **1.7 Limitations of the Study**

According to Kombo (2006), limitations refer to the hurdles a researcher anticipates over which they have no control. Anticipated challenges would include not having sufficient funds to facilitate logistics across the county. This will be overcome by controlling excessive expenditure. Some of the respondents might not be available to participate in interviews during the data collection process. This will be overcome by scheduling appointments with the respondents, for the exercise. Some businesses

would not have well-kept records due to lack of structures. This will be overcome by capturing estimates of records over time, i.e monthly, weekly, annually.

### **1.8 Delimitations of the Study**

Oso and Onen (2009) describe delimitations as the boundaries of the study in terms of geographical coverage. The small businesses sector is distributed throughout the whole economy while fibre optic networks have only been installed in major cities in Kenya. Nairobi, being the Capital city and the host of most small businesses and the largest client base to Zuku. This is what draws the study to focus on small businesses in Nairobi County.

Furthermore, of the many ISPs in the city, the study will focus on Zuku clients because Zuku has rolled out marketing campaigns to provide affordable Internet services based on fibre optic network in Nairobi. It is therefore expected to have the largest dataset of clients, which includes small businesses.

The study also targeted small businesses because of their existence in numerous numbers and consideration as key drivers in the economy.

The study was thus conducted on small businesses in Nairobi County, who had been subscribers to Zuku service for at least 6 months. The respondents were business executives to the small businesses and the operations management from Zuku.

### **1.9 Assumptions of the Study**

The study was carried on the assumption that the businesses were already connected to internet, and subscribed to Zuku internet services, which is used in day to day running of businesses. It was also assumed that they would be willing to participate in the study and engage in giving honest responses to the questions that the researcher sought to answer.



### **1.10 Definition of Significant Terms used in the Study**

Below are the definition of significant terms used in this study:

**Zuku fibre optic project:** Zuku fibre optic project was an initiative that saw the laying down of fibre optic cables for fast transmission of data by Wananchi Online. This led to the creation of Zuku, an internet and tv service provider, based on fibre optic cables.

**Enhanced communication efficiency:** This is a pattern of exchanging information and ideas with others that is sufficient for meeting one's needs and life goals and can be strengthened. This will be measured by: frequency of communication via emails per month, frequency of communication via social media platforms, response rate on communication channels used.

**Reduction of communication costs:** This is the achievement of minimum unit price between two persons relaying desired information to each other. This will be measured by the actual costs of current communication via internet avenues compared to conventional means

**Internet Access:** This is the ability to access files and documents in World Wide Web platform, through a computer or mobile device. This will be assessed by use of Internet services provided by Zuku.

**Access to e-commerce:** This is the ability to sell and purchase goods/services as well as pay for them/receive funds over the Internet. This will be measured by the number of businesses with websites as well as the existence of website integration with online payment services.

**Small businesses:** These are businesses with 5-49 employees employed full time (CBS, ICEG & K-REP, 1999).

**Performance of small businesses:** This is the measure of the outcome of a businesses' actions, in terms of either profit or assets acquired. This will be measured by Return on Equity, Return on Assets and the cost of capital.

### **1.11 Organization of the Study**

This study is comprised of five distinct chapters: the first chapter is concerned with; background to the subject matter, opportunity statement/problem, rationale of the study, issues concerned with undertaking the study, strategies for mitigating the aforementioned limitations, research objectives, research questions, importance of the study, and assumptions made while conducting the study. Chapter two is concerned with literature review. This entail review of theoretical and empirical literature on enhanced communication efficiency influences performance of small businesses, how internet access influences performance of small businesses, how reduction of communication costs influence performance of small businesses, how access to e-commerce influence performance of small businesses and the conceptual framework. The third chapter is concerned with the study's methodology; design of the research, target population, method used in selecting the sample of the study, data collection instruments, ensuring the reliability and validity of the data collection instruments, data collection, and data analysis approaches. Chapter four is concerned with interpreting the collected data. The findings of the study and recommendations for future research are presented in the last chapter.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This section sought to discuss key theories on how ICT influences competitiveness among small businesses, highlight findings of other researchers and authors by reviewing reports, studies, historical records, books and other information that has been documented relating to the effects of ICT on financial performance of courier service providers. It will begin by introducing fibre optic services in Kenya, then proceed to explain each of the factors that are perceived to be a determinant of financial success to the businesses.

#### **2.2 The concept of Zuku Fibre Optic Project in Kenya**

MoICT (2014) discloses that is linked to the global broadband highway through undersea fibre cables namely; TEAMS, LION, EASSY, and SEACOM. The national optic fibre backbone infrastructure, NOFBI, then connects majority of the nation's major towns. The Kenyan government has been reviewing NOFBI with the intention to extend its capability so as to improve Internet connectivity to more parts of the country. The government is also in cooperation with other relevant stakeholders to implement wireless Internet infrastructure so as to complement NOFBI.

Kenya's government has also implemented the Government Common Core Network, GCCN. GCCN serves as a secure and shared governmental ICT infrastructure. It is primarily meant to: support information flow, work processes and promote exchange of information among the various ministries and departments, enhance public's access to government services, eliminate data redundancies and duplication, support

monitoring and evaluation, as well as ensure responsiveness in reporting (Kenya e-Government Master Plan, 2013).

Internet penetration in Kenya has drastically risen in the recent past as postulated by CCK (2014). The number of operators who have deployed their infrastructure has increased leading to stiff competition and lowered tariffs. More individuals are also accessing the Internet using their mobile phones. CCK (2014) reveals that by September 2013 there were up to 31.3 million mobile phone subscribers in Kenya and an Internet penetration of more than 76.9% through these devices. More than 19.1 million Kenyans had access to the Internet utilizing 41.8% of the nations available bandwidth of 60,900 Mbps (CCK, 2014).

### **2.3 Performance of Small Businesses**

Previous studies have revealed that there are several factors impacting on the performance of small firms particularly limited resources. However, as argued by Harper (1996) the degree to which lack of financial resources influence the performance of small enterprises is still debatable. Several studies by Godsell (1991), Hart (1972) and Dia (1996) show that additional capital is not necessary to improve the performance of a small business. They also reveal that the obstacle of lack of capital can be overcome by creativity. Since access to capital is a challenge in underdeveloped economies, majority of the business owners rely on their own savings or family members for capital Godsell (1991). Majority of the small business owners cannot meet the minimum requirements for commercial loans. At the same time, the commercial loans are very expensive. Kallon (1990) is of the view that the main sources of capital for small enterprises include but not limited to; 65.6% personal

savings, 10.9% family members, 9.4% commercial loans, and 7.8% business partners/shareholders.

As postulated in a study by Kazooba (2006) administrative issues are one of the primary causes of failure for small enterprises. In this study, lack of technical know-how in running businesses and other skills such as record keeping have contributed to the failure of majority of the small businesses (Kazooba, 2006). Other issues identified in the study include but not limited to; poor planning, inadequate managerial experience and lack of resources and skills to conduct market research (Lussier, 1996, Mahadea, 1996 and Murphy, 1996).

Adoption and use of technology adds value to small and medium enterprises that capitalize on the available information sources to overcome the aforementioned obstacles (Hagman & McCahon, 1993). However, there is little information to indicate that small businesses in sub-Saharan Africa use IT to solve managerial issues (Levy & Powell, 2000). Levy and Powell (2000) adds that majority of the available information only show that these organizations adapt IT due to cost issues. For small organizations so save on cost and also overcome their managerial issues, they should incorporate ICT in their overall business strategy.

#### **2.4 Communication Efficiency and Performance of Small Businesses**

As argued by Andersen (2001) experience gained from exposure and participating across various industries and information gained from the Internet promote innovation. IT enhances both the internal and external communication capabilities of small firms hence stimulating innovation. Small firms learn from the exchange of information with similar and experienced firms stimulating creativity in overcoming various obstacles (Andersen, 2001). However, for this to occur the small businesses

have to adhere to decentralized decision-making approach to encourage the entire business to participate in the information interchange (Andersen, 2001).

Using technology to improve communication within and outside the business is positively correlated to its overall performance (Andersen, 2001). However, the level of dynamism and complexity of the industrial setting also have a great influence on the performance. In highly dynamic and complex industries, usage of the Internet and Intranet boost the performance of an organization. Andersen (2001) adds that the use of the Intranet with an autonomous decision-making approach is associated with increase in sales and profitability. On the other hand, the Internet positively impacts on the performance of organizations operating in industries with less complexities.

Incorporating various information systems is also associated with positive influence on the performance of businesses. In a study conducted in Kenya and Tanzania by Wolf and Matambalya (2001) businesses using various forms of ICT have realized positive growth. To begin with, in organizations where up to 76% of the staff had adapted the use of computer applications benefited from increased competitiveness and management efficiency. Secondly, the increased use of mobile phones in addition to fixed phones and faxes aided businesses in expanding their markets.

As argued by Isaac (1984) communication also has an impact on the overall cooperation in a market. Businesses that communicate and cooperate have a higher chance of setting competitive prices. The opportunity to discuss the various pricing strategies among the sellers enables them to disregard individual gains and promote price harmonization.

## **2.5 Internet Access and Performance of Small Businesses**

Using the Internet in the daily functions of a small business contributes to high performance in various ways. For example, these businesses can access and implement certain applications online that are necessary for the overall productivity of the organization. Secondly, the Internet reduces associated overheads such as research and marketing costs, transaction costs and costs associated with accessing new markets leading to higher margins.

The use of computers in Kenya has significantly increased in the recent past. As revealed by Kiveu (2008) up to 77% of the small businesses in Kenya not only own but also use computers in their daily activities. However, these businesses primarily use the computers for basic functions and applications such as automation of processes. These businesses also deploy the computers in a reactive manner.

Jose, Marcel and Batista (2007) are of the view that small businesses should deploy ICT in proactive manner and utilize for various functions as opposed to just basic applications. Small businesses should consider ICTs as productive input factors necessary for: enhancing the productivity of employees; cutting down operational costs; promoting effective communication with suppliers, within the organization and customers; as well as facilitating collaborative ventures.

## **2.6 Reduction in Communication Cost and Performance of small businesses**

The majority of the small businesses were using fixed phones and faxes as the main tools of communication (Kiveu, 2008). However, these tools are expensive to purchase and maintain hence hindered the small firms from communicating effectively. The introduction of mobile phones has greatly improved communication

due to the low cost of investment. However, maintaining mobile phones is also costly which discourages effective communication (Kiveu, 2008).

The Internet allows small organizations to access and utilize various communication and collaborative tools that are cheaper and easy to use. These tools improve communication within the organization as well as facilitate information interchange and linkages externally. The reduced communication costs also encourages the employees of the organization to exchange ideas and gather information from other sources which is vital for organizational learning and stimulating innovation.

## **2.7 Access to e-commerce and performance of small businesses**

As argued by Mutula and Van Brakel (2006) ICTs particularly the Internet offer small businesses an opportunity to compete at the same platform as large and experienced enterprises. The small firms can access borderless and 24 hours trading market space that they can capitalize on to increase their production and sales. In addition, the small enterprises access the market space remotely as ICTs eliminate various barriers of entry such as regulations and high capital that hinder businesses from accessing and operating in new markets (Lloyd & Kroeze, 2008).

Accesses to global markets through ICTs enable small firms to deliver and sell their products/services to international customers hence compete with larger organizations. As discussed by Ramsey et.al (2003) ICT greatly reduces the impact of distance and costs associated with cross border business. As a result, small businesses capitalize on ICT to expand their reach and customer base leading to higher sales and growth. Using ICT, the small businesses compete favorably at the international market against larger and established organizations with adequate capital and resources as well as adequate technical know-how (Hanna, 2010).



## **2.8 Theoretical Framework**

As postulated by Fishbein and Ajzen (1980) and Hubona & Geitz (1997) two theories namely Theory of Reasoned Action, TRA, and Technology Acceptance Model, TMA, can be used to describe the use of ICT to enhance the performance of organizations.

### **2.8.1 The Theory of Reasoned Action**

Developed by Martin Fishbein and Icek Ajzen, the theory of reasoned action attempts to not only foretell but also explain behavioral intentions. Fishbein and Ajzen (1980) discuss that this theory of constructed of three main components mainly; Behavioral Intentions (BI), Attitudes (A) and Subjective Norms (SN). This theory suggests that the behavioral intentions of an individual are shaped by his/her attitudes and behavior. Fishbein and Ajzen developed the following formula to explain this theory:  $BI = A + SN$ , where; attitudes (A) are the beliefs attributed to certain things (Fishbein & Ajzen, 1980). For instance, the attitudes of employees towards tasks vary. Their performance in those tasks depends on their attitude towards the tasks.

Subjective norms (SN) are concerned with the opinions of individuals towards a particular matter (Fishbein & Ajzen, 1980). Normally, opinions are situational and are influenced by factors such as; the society, politics and the economy. For instance, some employees give their best in the workplace because they believe that their efforts will be realized leading to a promotion or pay rise. Fishbein and Ajzen (1975) describes behavioral intention, BI, as the capability of an individual to plan to act in a particular manner. For example, an employee believes in working hard so as to rise up the ranks and earn a better pay. An opportunity arises within the organization and the top management promises to appoint the employee of the month to the new position.

Through the attitude and subjective norm of the hard working employee, he/she is propelled to work hard so as to get the new position.

### **2.8.2 The Technology Acceptance Model (TAM)**

Developed by Fred Davis, the Technology Acceptance Model or TAM is concerned with predicting the acceptability of an information system (Davies, 1989). It is based on the Theory of Reasoned Action and as argued by Legris, Ingham and Collette (2003) it is intended at estimating whether a new tool will be accepted or not. In addition, it also serves the purpose of predicting some of the alterations to the system so as to increase the chances of the end users accepting it. In this theory, Hubona and Geitz (1997) argue that perceived usefulness and perceived ease of use greatly affect the acceptability of an information system.

Perceived usefulness is defined by Davies (1989) as the level to which a person is of the view that using a system will improve his/her performance. Davies (1989) also defines perceived ease of use as the level to which a person is of the view that it requires minimal effort to utilize a certain system. Basing on the Theory of Reasoned Action, TAM postulates that the use of a system is influenced by the behavioral intention (Hubona & Geitz, 1997). However, the behavioral intention is shaped by an individual's attitude towards the system's ease of use and utility. For instance, an organization may introduce a new system to be incorporated and utilized in its daily activities. Certain employees may not like the new system but will use it because they believe that will improve their performance and it does not require high technical skills to operate (Legris, Ingham & Collette, 2003). The organization may implement certain modifications such as making the system very user friendly so as to increase the chances of the employees accepting and using the new system.

## **2.9 Conceptual Framework**

The conceptual framework of of this study perceives that productivity is measured by profitability of the business. This is influenced by internet access, enhanced communication, reduced communication costs and access to e-commerce. The extent to which they influence profitability, is what this study intends to find out.

**Independent Variables**

**Communication Efficiency**

- Communication via emails
- Communication via social media
- Communication response rate

**Internet Access**

- Subscription to Zuku services
- Research/gathering information
- Transfer of Documents
- Online services e.g online banking

**Communication Costs**

- Adoption of online communication
- Customer relations management
- Advertising costs

**Access to e-commerce**

- Possession of a website
- Online payment integration
- Foreign markets

**Dependent Variables**

**Small Businesses Performance**

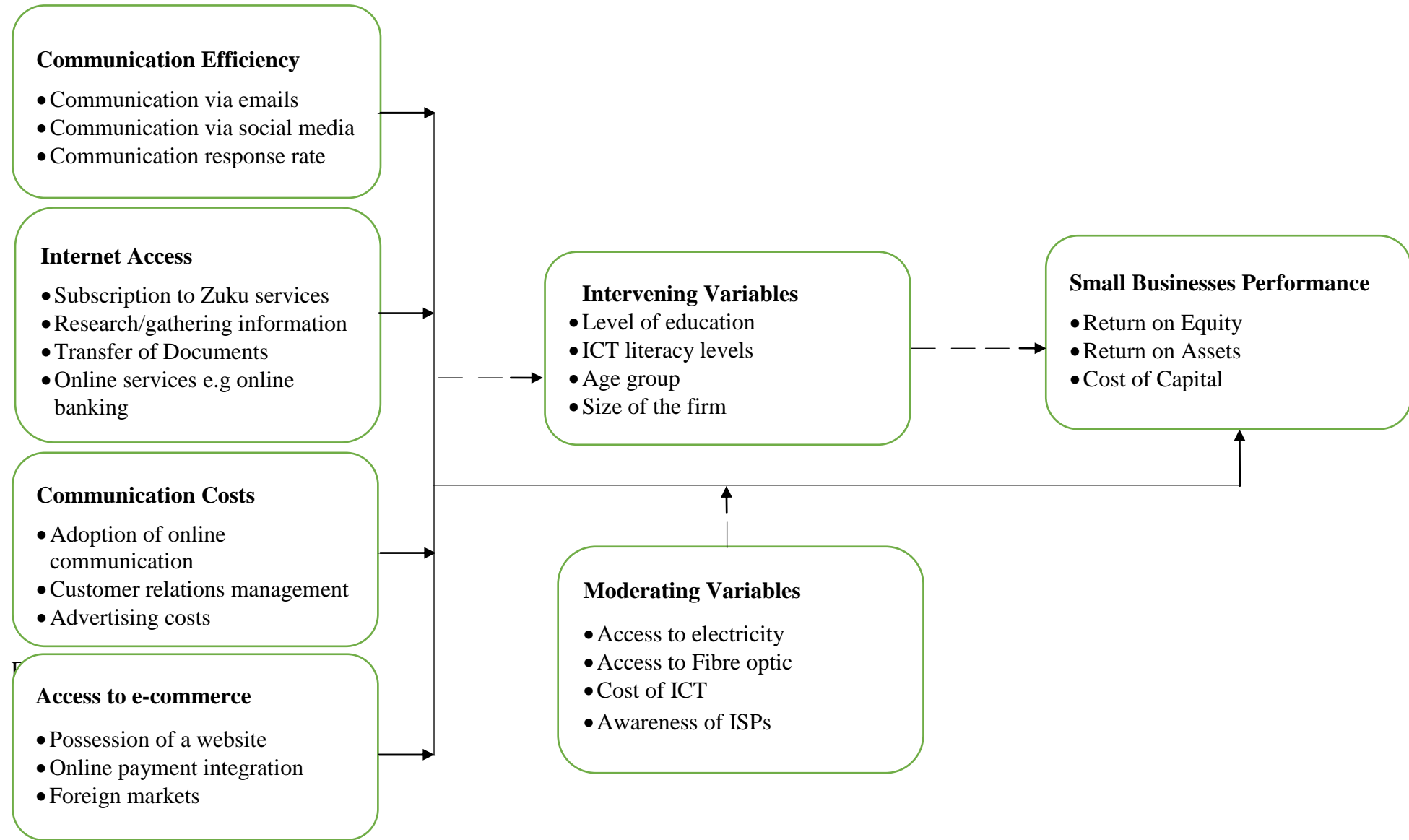
- Return on Equity
- Return on Assets
- Cost of Capital

**Intervening Variables**

- Level of education
- ICT literacy levels
- Age group
- Size of the firm

**Moderating Variables**

- Access to electricity
- Access to Fibre optic
- Cost of ICT
- Awareness of ISPs



## **2.10 Summary of Literature Review**

As suggested by Kiveu (2008) majority of the studies indicate that the usage of computers in Kenya especially in small businesses has drastically increased in the recent past. Kiveu (2008) reveals that close to 77% of the small firms in Kenya own computers but mainly use them for automating their processes and basic communication. Further studies show that only about 285 of the small firms in Kenya have a website while less than 24% of them utilize the Internet to market and sell their products.

From the available information, it is clear that majority of the studies on the impact of small businesses is only on the developed world. Little information and few studies have been conducted on the influence of ICTs on the performance of small enterprises in underdeveloped countries such as Kenya. The potential of ICT on the performance of businesses and efforts of the Kenyan government such as the fiber optic cable project are essential to the growth of the small business sector.

Despite the Kenyan government investing numerous resources and efforts of the fibre optic cable project, it has not been focused on improving the performance of the small business sector using ICT. It is also clear that majority of the small businesses lack the knowledge and technical skills required to capitalize on ICT so as to improve their performance. While majority of the research studies have focused on the impact of ICT in general, few have focused on the fibre optic project. Therefore, this study is intended at investigating the impact of the fibre optic project on the performance of the small businesses in Nairobi County, Kenya.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This section describes the steps of action, processes and resources used to gather the information in this study. This is a significant section as it directly influences the findings and conclusions of the study. This section addresses; the design used in conducting the study, target population, sample size and procedure used in determining the sample, data collection instruments, determining the reliability and validity of the research instruments, testing of the research instruments, collecting the data, ethical considerations while collecting the data, and also describes the approaches that will be applied in data analysis.

#### **3.2 Research Design**

Of this particular study, the researcher applied the descriptive survey design when tackling the research questions. In this approach, questionnaires are used to gather information from a group of individuals through various ways such as in person, telephone or email. These questionnaires gather the opinions, attitudes, habits, beliefs and responses from the target population (Kombo & Tromp, 2006).

#### **3.3 Target Population**

The study targeted operators of small businesses in Nairobi County, Kenya. The results from this target population was used to provide a whole view of the influence of fibre optic project on the performance of small businesses in Nairobi. According to CA (2015), by March, Zuku had 63,542 subscribers in Kenya, with a majority of the subscribers being domestic subscribers. According to data available in Nairobi County, (2015) there are 3,169 small businesses within Nairobi town area, with 1,576

connected to Zuku. Therefore the study targeted all the 1,576 small businesses within Nairobi town area.

### **3.4 Sampling Size and Sampling Procedures**

A sample is that part of a subset of the study unit from which data is collected to generalise the findings of the study under review. The study used sampling frame to determine the size of the sample to include in the study and the procedure of arriving at the sample.

#### **3.4.1 Sample Size**

The sample size was derived using Krejcie & Morgan (1970) Table shown in Appendix 1. From the table, the sample size required from a population of 1,576 is 310 respondents.

#### **3.4.2 Sampling Procedure**

To constitute a homogenous group, the study applied stratified sampling techniques. For the exact individuals to participate in the study, the researcher used the following formula to obtain the size of each strata:

$$ns = \frac{n}{N} (Ns)$$

Where: ns= the desired strata's sample size

n = the desired sample from the population

N = population size

Ns = Strata's population size

This gives the following sample size in table 3.1

Table 3.1 sample size

<b>Business Category</b>	<b>Population</b>	<b>Sample size</b>
Accommodation/lodging	197	39
Bar	73	14
Bar and Restaurant	527	104
Butchery	3	1
Cyber Café	203	40
Entertainment Facility	3	1
IT Services	92	18
Kiosk	26	5
Learning Institution	1	0
Night Club	3	1
Petrol Station	1	0
Professional Services	5	1
Repair workshop	3	1
Restaurant	303	60
Restaurant with Accommodation	10	2
Trader Shop	124	24
	<b>1576</b>	<b>310</b>

**Source: Author (2016)**

### **3.5 Research Instruments**

The data was collected using semi-structured questionnaires. Semi-structured questionnaires were used because they are confidential and the information can be collected from large sample and diverse regions. The questions were organized into sets that aimed at answering the research questions. Observation was also be used to collect data because it is free of biases inherent in the self-reported data and it involves real time.

#### **3.5.1 Pilot Testing**

Connelly (2008) suggests that a pilot study sample should be 10% of the sample projected for the larger parent study. This is what this pilot employ to check if the tools applied meet the desired goals. This was used to check if the questions asked help get the desired responses, questions that would be difficult to respond to and any gaps that would exist in the questionnaire. The Pilot testing was conducted by



interviewing two respondents in each using the questionnaire to take note of how they respond to the questions.

### **3.5.2 Validity of Research Instrument**

Kathuri and Pals (1993) define validity as the state of being logically acceptable. Of this particular study, validity of research instruments is the state in which the tools of data collection are appropriate for the issue under study and target population. To ensure validity of this study's research instruments, the tools were presented by the researcher to the supervisor. The comments and recommendations from the supervisor were incorporated so as to refine the data collection tools.

During the actual research various measures were taken to ensure validity of the collected data. They include but not limited to: i.) Comparing the description of something offered by various informants. ii.) Understanding and using the vocabulary/terminologies of the target group. iii.) Taking notes as regards the questions asked and offered responses. This is significant in reducing chances of selective forgetting and distortions during data analysis. iv.) Recording personal thoughts when using direct observation as a data collection method. v.) Documenting all of the informants making remarks where appropriate so as to help in making sense of all the comments.

### **3.5.3 Reliability of Research Instruments**

Mugenda and Mugenda (2003) describe reliability as state in which data collection instruments attain similar results after numerous trials. Of this particular study, the internal consistency reliability approach is utilized to ensure reliability of the research tools. In this approach, the same issue under study is investigated by different tools to check whether they yield consistent results.

The formula below was used to check reliability of research instruments:

$$r_{xt} = \frac{stdev(t)}{stdev(x)}$$

The different questionnaires used in the study have varying questions and their reliability is checked utilizing correlation techniques.

### **3.6 Data Collection Procedures**

The proposal was presented before the University of Nairobi examination panel for defence. Upon approval of the proposal, the researcher obtained a letter of introduction from the University of Nairobi and a research permit from the National Commission for Science, Technology and Innovation as pre-requisite for data collection. Once all permissions were granted, the researcher visited the study area to make appointments with assistant chiefs and the respondents. The respondents visited then agreed on dates for the research instruments administered to them through a drop and pick later, after one or two days for analysis.

### **3.7 Data Analysis Techniques**

This study utilizes a mixed method approach comprising of both quantitative and qualitative data collection techniques. After the data collection exercise, the captured data was entered into Microsoft Excel for analysis using descriptive statistics. The descriptive statistics models used in this study are namely; mean, standard deviation, frequencies, and percentages. Deductive logic is used in analyzing the qualitative data collected using the open-ended questions. The findings of the study are presented in tables.

### **3.8 Ethical Considerations**

The researcher gave a written declaration to assure those concerned of their confidentiality and that the information given would be used for purpose of learning and that it would be treated as such. The official letter from the university helped to instil confidence in the sources of data and therefore the letter was of utmost importance to the study.

### 3.9 Operationalization of Variables

Objective	Variables	Indicators	Scale	Method of Data Collection	Analysis
1. To establish how communication efficiency influences performance of small businesses in Nairobi County.	Communication Efficiency	1. Frequency of communication via emails per month. 2. Frequency of communication via social media platforms. 3. Response rate on communication channels used.	Ordinal Ordinal Ratio	Questionnaires	Mean Percentage Frequencies
2. To assess how internet access influences performance of small businesses in Nairobi County.	Internet Access	1. Connectivity to Zuku internet services. 2. Use of internet to gather business information. 3. Transfer of documents via internet. 4. Access to online services, e.g online banking	Ordinal Ordinal Ordinal Ordinal	Questionnaires	Frequencies
3. To establish the extent to which communication costs influence performance of small businesses in Nairobi County.	Reduction in communication costs	1. Use of online communication channels. 2. Costs of customer relations management. 3. Use of online advertising avenues.	Ordinal Ordinal Ordinal	Questionnaires	Mean Percentage Frequencies
4. To determine how access to e-commerce influences performance of small businesses in Nairobi County.	Access to e-commerce	1. No. of businesses with websites. 2. Existence of website integration with online payment services. 3. Access to foreign markets	Ordinal Ordinal Ordinal	Questionnaires	Mean Percentage Frequencies
5. Performance of Small businesses	Performance	1. Return on Equity 2. Return on Assets 3. Cost of Capital	Ratio Ratio Ordinal	Questionnaires	Mean Percentage Frequencies

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATIONS, INTERPRETATIONS AND DISCUSSIONS

#### 4.1 Introduction

This section is a presentation of analyzed data from the field, explanations and discussions according to the research objectives. The analysis is presented by a presentation of the demographic and socio-economic characteristics of the sample surveyed. Thereafter the analysis and discussion is based on the objectives of the study namely whether the effects of communication efficiency through Zuku fibre optic project influence performance of small businesses in Nairobi, how internet access through Zuku fibre optic project influence performance of small businesses in Nairobi, how reduction of communication costs through Zuku fibre optic project influence performance of small businesses in Nairobi and how access to e-commerce through Zuku fibre optic project influence performance of small businesses in Nairobi.

#### 4.2 Questionnaire return rate

The study sent out 310 questionnaires to business operators out of which 230 were duly filled and returned. Table 4.1 gives the response rate.

Table 4.1 Questionnaire Response rate

<b>Response Rate</b>	<b>Frequency</b>	<b>Percentage</b>
Returned	230	74.2
Not returned	80	25.8
<b>Total</b>	<b>310</b>	<b>100.00</b>

The table shows a total of 230 (74.2%) responded to the questionnaires while 80 (25.8%) did not respond. According to Mugenda and Mugenda (1999), a response rate of 50% is adequate for analysis and reporting; a response rate of 60% is good and that of 70% and above is very good. Thus, the return rate of this survey was deemed acceptable for the study. The good questionnaire return rate was attributed to the fact that most of the questionnaires were guided as most respondents could not fill by themselves since they were occupied. This also allowed personal interaction and

giving ample time to the respondents to attend to the questionnaires first hand. The 80 questionnaires not returned were those that respondents suggested to fill and submit at a later time, but defaulted.

### **4.3 Demographic Characteristics of respondents**

The study looked at the respondent's characteristics of gender, age group, highest level of education, business' industry and age of business. These were discussed in the subsequent sections.

#### **4.3.1 Distribution of business operators by gender**

The business operator's gender was determined by the questionnaire analysis. Finding about business operators' gender was important to assess their distribution in business operations, which in turn determines who makes the decisions on the various aspects of business operations. Table 4.2 explains the distribution of respondents by gender.

Table 4.2: Distribution of business operators by Gender

<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Female	90	40.5
Male	132	59.5
<b>Total</b>	<b>222</b>	<b>100.0</b>

Out of the 222 business operators who responded to this question, 90 (40.5%) were female while 132 (59.5%) were male. It can be concluded that men were more involved with small business operation activities than women. This shows that more males contribute to business performance, compared to female counterparts.

#### **4.3.2 Distribution of business operators by Age**

The study sought to establish the distribution of business operators by Age. Tech savvy is attributed to the young generation, and the researcher was careful to observe the same in the study. In view of this, respondents were asked to state their age bracket. The results were as reflected in Table 4.3.

Table 4.3: Distribution of business operators by Age

<b>Age (Years)</b>	<b>Frequency</b>	<b>Percentage</b>
15-25	60	26.3
26-35	108	47.4
36-45	42	18.4
46-55	16	7.0
56 and above	2	0.9
<b>Total</b>	<b>228</b>	<b>100.0</b>

Of the 230 respondents, 228 heeded to the quest for age, out of which the majority, 47.4% were between 26-35 years followed by the age between of 15 to 25 years at 26.3%. This trend indicates that of the respondents, it is the younger people mostly engage in business operations. This also indicates that most of the respondents would not have a difficult time embracing technology in their business operations. This shows that persons below 35 years have a higher contribution to business performance, compared to persons above 35 years.

#### **4.3.4 Distribution of business operators by level of education**

The business operators were asked their highest education level attained. This was important as the level of education determines if information sharing can be done with ease. Table 4.4 shows the results.

Table 4.4: Distribution of business operators by the highest education level

<b>Highest education level</b>	<b>Frequency</b>	<b>Percentage</b>
Diploma	86	37.4%
Post-graduate	16	7.0%
Primary School	2	0.9%
Secondary School	24	10.4%
Undergraduate	102	44.3%
<b>Total</b>	<b>230</b>	<b>100.0</b>

From the study, all the respondents had attained at least primary school education. 88.7% of the respondents having attained a diploma degree, and above. This indicates high literacy levels among the respondents, who would comprehend business operation activities and the ability to add value to the study.

The biggest proportion of respondents are Undergraduate degree holders (44.3%), followed by diploma degree holders (37.4%), then secondary school certificate holders (10.4%). This could be a confirmation to Calvin (2002) and Day (2000) who suggested that entrepreneurship has a critical role in economic development. This is confirmed in this study by showing the jobs created to the business operators. It also evident that business operators who contribute to business performance tend to have education levels not exceeding Diploma degree.

#### **4.3.5 Distribution of business operators by business industry**

The business operators were asked to categorize their businesses into industries they belong to. This was important as the industry of operation informs the level of expected use of technology, thus influencing the impact of fibre optic to a business. Table 4.5 shows the results.

Table 4.5: Distribution of business operators by the highest education level

<b>Business Industry</b>	<b>Frequency</b>	<b>Percentag</b>
Education	22	10.1%
Energy	8	3.7%
Entertainment	8	3.7%
Food	16	7.3%
Hospitality	18	8.3%
ICT	66	30.3%
Other	28	12.8%
Retail	36	16.5%
Wholesale	16	7.3%
<b>Total</b>	<b>218</b>	<b>100.0</b>

From the study, 218 out of 230 respondents identified the industries their businesses operate in. Majority of the business operators were in the ICT sector, followed by retail, other industries and education. These industries indulge with IT, and therefore indicates that the respondents not only have adopted but very often use technology in their daily activities. The biggest category recorded was in the ICT section (30%), which is more than double the other categories. This shows that ICT has a great contribution to business performance.



### 4.3.6 Age of Business

The business operators were asked to indicate the ages of the businesses into industries they belong to. This was important as the age of the business informs the level of expected use of technology, thus influencing the impact of fibre optic to a business as shown in table 4.6 shows the results.

Table 4.6: Distribution of business operators by age of business

Age of business	Frequency	Percentage
2-5 years	136	60.7%
6-10 years	32	14.3%
Less 2 years	34	15.2%
More than 10 years	22	9.8%
<b>Total</b>	<b>224</b>	<b>100.0</b>

As can be seen from Table 4.6, 224 out of 230 respondents revealed the period which their businesses have been in operation. The study reveals that majority of the businesses are startups with 60.7% having been in operation between 2 and 5 years while 15.2% have been in existence in a period of less than 2 years. On the other hand, only 9.8% of the respondents revealed that their businesses have been in operation for more than a decade. This is an interesting result as it suggests that more small businesses are coming up which are the engine for economic development. From this, it takes at least 5 years to grow from a small business. It also shows that the age of small businesses has a positive impact to business performance.

## 4.4 Communication Efficiency and Small Businesses' Performance

### 4.4.1 Computer Literacy

The first objective of the study was to establish how enhanced communication efficiency through Zuku fibre optic project influences performance of small businesses in Nairobi County. This was assessed by asking the respondents to rate their computer literacy skills, frequency of communication and the tasks carried out online.

It was important to find out if the respondents were in a position to adequately respond to the questions that would help achieve the objectives of the study, and the impact of fibre optic project on the business. This was assessed by assessing the

respondents' computer literacy skills and the tasks they can handle. The respondents were asked to rate their proficiency in various computer skills, that would be impacted by the fibre optic project. table 4.7 below shows a summary of the findings from the respondents.

Table 4.7: Tasks respondents can handle

	<b>Word Processing (Ms word)</b>	<b>Workbooks (Excel)</b>	<b>Presentation (PowerPoint)</b>	<b>Social Media</b>	<b>Using Search Engines</b>	<b>Overall</b>
Not Well	0.87%		1.74%	56.52%	4.35%	15.87%
Average	9.57%	13.04%	12.17%	9.57%	8.70%	10.61%
Very Well	55.65%	48.70%	47.83%	26.96%	49.57%	45.74%
Well	30.43%	33.04%	32.17%	6.09%	27.83%	25.91%
No Response	3.48%	4.35%	3.48%		5.22%	4.13%
Don't know	0.00%	0.87%	2.61%	0.87%	4.35%	2.17%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	

Computer literacy was assessed based on 2 categories: ability to prepare basic business documents using the computer and the ability to use online communication platforms. Table 4.7 above shows percentage responses out of 230 respondents. From the table, 72.22% of the respondents were proficient when it comes to computer literacy. The item that poses a challenge to respondents is the proficient use of social media platforms. This shows that given a chance, the respondents can sufficiently employ computer tasks, in order to improve their businesses. Getting to know if the fibre optic project will have an impact on their businesses would therefore be possible.

#### 4.4.2 Adoption of Online Communication

After knowing that the respondent has the ability to handle computer tasks, it was important to know the respondents' online communication frequency, since this is one aspect that should be impacted by the fibre optic project.

From the 230 respondents, 95.65% of the respondents used online communication at least on a weekly basis, with 84.35% of them using online communication on a daily basis. Table 4.8 below shows the breakdown.

Table 4.8: Frequency of Online Communication

	<b>Email</b>	<b>Social Media</b>
Per day	84.35%	84.35%
Per week	11.30%	11.30%
No Response	4.35%	4.35%
	100.00%	100.00%

The rate of use of online communication platforms is similar across email and social media platforms. This shows that both tend to have an equal level of importance to business operators.

#### 4.4.3 Customer Relations Management

At the same time customers preferred the use online communication to provide feedback to business operators as shown in Table 4.9.

Table 4.9 Responses from customers via

	<b>Email</b>	<b>Social Media</b>
Not Frequent	12.17%	11.30%
Frequent	38.26%	37.39%
Very Frequent	43.48%	42.61%
No Response	6.09%	8.70%

These confirm that there is enhanced communication efficiency among the customers.

#### 4.5 Internet Access and Small Businesses' Performance

Respondents were also asked to disclose what they mainly use the internet for. This would help to know the importance of having access to the internet to business operators. This was assessed using three questions: access to Zuku internet connectivity at the business press, use of internet in internet related activities and a breakdown of the actions carried out. The results are displayed in the table below.

Table 4.10 Internet connectivity and use

	<b>No</b>	<b>Yes</b>	<b>No Response</b>
Do you have internet connection in your business premise from ZUKU?	28.70%	66.09%	5.22%
Do you use internet for business related activities?	3.48%	80.00%	16.52%

For every respondent who confirmed the use of internet in business related activities, they were prompted to let us know the actions from a checklist. The findings are hereby indicated in table 4.11 below.

Table 4.11 Internet use and frequency

	<b>Per day</b>	<b>Per week</b>
Online research and collecting info	66.09%	17.39%
Document transfer	69.57%	13.91%
Online banking	32.17%	14.78%
Advertising and marketing	33.91%	20.00%
Placing and Receiving orders	29.57%	29.57%

From the study, the business operators mainly use the internet for transferring documents. This is a confirmation to Levy and Powell (2002) who postulates that the internet is a vital communication platform for businesses.

#### **4.6 Communication Costs and Small Businesses' Performance**

In order to establish the extent to which reduction of communication costs through Zuku fibre optic, it was prudent to compare the communication costs the small businesses had before and after connection to Zuku. This was done by asking the respondents to place the costs in categories, and have the responses in table 4.12 below.

Table 4.12: Communication costs before and after connection to ZUKU

	<b>Before connection to Zuku</b>	<b>After connection to Zuku</b>
Less 1,000	2.61%	5.22%
1,000-5,000	25.22%	33.91%
5,000-10,000	14.78%	3.48%
Above 10,000	3.48%	2.61%
No Response	53.91%	54.78%

From table 4.12 above, we can observe that after connection to Zuku there is a reduction in respondents who spend above 5,000 shillings per month, while those who spend below 5,000 increases. This shows that there is a reduction in communication costs among 11.3% of the respondents.

In addition to this, we also observe that 46.09% could give estimated communication costs before connecting to Zuku, while 45.22% of the respondents could do so after

connecting to Zuku. The slight observation in reduction of the respondents in these 2 groups could be attributed to observable high communication activity via the internet.

#### 4.7 Access to e-Commerce and Small Businesses' Performance

Another objective of the study was to determine how access to e-commerce through Zuku fibre optic project influences performance of small businesses in Nairobi County.

Access to ecommerce was assessed by finding out the ability to sell products via the internet platform. This is possible through the business having access to an online platform. Respondents were therefore asked if they have a website, and how their business benefits from the website. The findings are listed in table 4.13 below.

Table 4.13 How businesses benefit from websites

Does your business have a website?	No	24.35%
	Yes	69.57%
	No Response	6.09%
How does your business benefit from the website?	Receiving enquiries /complaints/ feedback from customers	48.98%
	Receiving orders for goods/services	26.53%
	Reaching customers in new geographical regions	23.81%

60.57% of the respondents have websites, while 24.35% of the respondents have no websites. This shows that businesses are making steps towards tapping into e-commerce.

After knowing that majority of the respondents have websites, it was important to know the reasons propelling the business operators to adopt e-commerce. As can be seen from Table 4.14 below, only 46.96% respondents replied to this question. Majority of these respondents (26.96%) acquired a website for the purpose of receiving enquiries/ complaints/ feedback from customers. The study also reveals that: 10.43% acquired a website for receiving orders for goods/services, 5.22% for reaching out to customers in new markets while 4.35% were propelled to acquire a website due to other reasons.

Table 4.14 Enabling factors

Receiving enquiries /complaints/ feedback from customers	26.96%
Receiving orders for goods/services	10.43%
Reaching customers in new geographical regions	5.22%
Other factors	4.35%
No Response	53.04%

#### 4.8 Performance of Small Businesses

In order to establish the extent to which e-commerce has influenced the performance of the businesses, it was important to compare profits realized by the businesses before and after connecting to Zuku. This was achieved by asking the respondents to reveal their level of profits before and connecting to zuku as seen in Table 4.15 below.

##### 4.8.1 Business profit

There is a significant growth in profits realized after connecting to Zuku as shown by the study: businesses making average monthly profits between Ksh 500,000 to Ksh 1,000,000 as well as those reporting between Ksh 1,000,000 to 5,000,000 experienced growths of 9.57% and 10.43% respectively.

Table 4.15 Profits after connecting to Zuku

	Before connecting to Zuku	After connecting to Zuku
Below Ksh 500,000	58.26%	35.65%
Ksh 1,000,000 – Ksh5,000,000	1.74%	9.57%
Ksh 500,000 – Ksh1,000,000	2.61%	10.43%
No Response	37.39%	44.35%

On the contrary, businesses realizing average monthly profits of below Ksh 500,000 reported a decrease in margins of 35.65%. This is a confirmation to Andersen (2001) that e-commerce is related to organizational performance.

After knowing that businesses reported an increase in profits after connecting to Zuku, it was prudent to determine the changes in the sum of money paid regularly to the shareholders before and after connecting to Zuku.

#### 4.8.2 Dividends to shareholders

Table 4.16 below, there is an increase in the dividends paid to shareholders in businesses realizing average monthly profits between Kshs 500,000 to Ksh 1,000,000 and Ksh 1,000,000 to Ksh 5,000,000 of 4.35% and 2.61% respectively.

Table 4.16 Dividends after connecting to Zuku

	<b>Before connecting to Zuku</b>	<b>After connecting to Zuku</b>
Above Ksh. 5,000,000	0.87%	0.87%
Below Ksh 500,000	16.52%	9.57%
Ksh 1,000,000 – Ksh5,000,000	0.87%	2.61%
Ksh500,000 – Ksh1,000,000	2.61%	4.35%
No Response	79.13%	82.61%

Businesses realizing profits margins below Ksh 500,000 reported a decrease in the dividends paid to shareholders.

#### 4.8.3 Value of assets

After knowing the changes in the dividends paid to shareholders, it was important to determine whether there was a change in the value of assets before and connecting the businesses to Zuku.

Table 4.17 Value of assets after connecting to Zuku

	<b>Before connecting to Zuku</b>	<b>After connecting to Zuku</b>
Below Ksh 500,000	42.61%	17.39%
Ksh 1,000,000 – Ksh5,000,000	1.74%	13.04%
Ksh 500,000 – Ksh 1,000,000	4.35%	11.30%
No Response	51.30%	58.26%

As seen in Table 4.17 above, changes in the businesses value of assets is similar to that of profits realized and dividends paid to shareholders. The study reveals that businesses realizing profits above Ksh 500,000 reported an increase in their value of assets while the value of assets of those realizing profits below Ksh 500,000 decreased.

#### 4.8.4 Businesses status before and after connecting to Zuku

After knowing the changes in profits, dividends paid to shareholders and value of assets, it was prudent to determine the financial position of the businesses before and after connecting to Zuku.

Table 4.19 Business status after connecting to Zuku

	Decreased	Increased	No Response
Profit status after connecting to Zuku	1.74%	57.39%	40.87%
Dividend status after connecting to Zuku	1.74%	14.78%	83.48%
Assets status after connecting to Zuku	0.87%	47.83%	51.30%

As shown by Table 4.19 above, the study reveals that the financial position of the businesses greatly improved after connecting to Zuku in terms of profits realized, dividends paid to shareholders and value of assets.

#### 4.9 Statistical Analysis

The study aimed to determine the influence of Zuku fibre optic project on the performance of small businesses in Nairobi County, Kenya. The dependent variable of the study is changes in profits realized by the small businesses after connecting to Zuku. Data on the domains of the independent variables was also organized and the means, standard deviations and Pearson correlation coefficient determined.

##### 4.9.1 Communication Efficiency and performance of small businesses

The means, standard deviations and Pearson correlation coefficient of the tasks that the respondents could handle was determined as presented on the table 4.20 below:

Table 4.20: Means and Standard deviations of the tasks handled online

Task	Scale	Mean	Standard deviation	Pearson Correlation
Word processing (Ms Word)	1-4	3.46	0.711	-.052
Workbooks (Excel)	1-4	3.35	0.783	-.062
Presentation (Powerpoint)	1-4	3.25	0.939	-.070
Social Media	1-4	3.47	0.755	.175
Using search engine (e.g google, bing)	1-4	3.20	1.087	-.070



In table 4.2 above, the scale was within the range of 1-4 (where 1= not well, 2=average, 3=well and 4 = very well. As per table 4.20, word processing (Ms Word) has a mean of 3.46 and a standard deviation of 0.711 which implies that the respondents can handle tasks using Ms Word well, with a variation not going below average rating and reaching very well ability. Use of Workbooks has a mean of 3.35 and a standard deviation of 0.783, this suggests that the respondents have a capability to use Excel at a rating of 3 (well), and a variation not going below average rating and reaching very well ability. Presentation (PowerPoint) has a mean of 3.25 and a standard deviation of 0.939 implying that the respondents' overall capability of using presentation tools such as PowerPoint is well and the variation of the respondents not going below average rating and reaching very well ability.

Social media has a mean of 3.47 and a standard deviation of 0.735 indicating that the respondents can handle tasks on social media platforms well and the variation not going below average rating and reaching very well ability. Lastly, search engine (e.g. Google, Bing) has a mean of 3.20 and a standard deviation of 1.087. It can be argued that the respondents have an overall well capability concerning the use of search engines such as Google, with a variation not going below average rating and reaching very well ability.

When we look at correlation with increase in profit, it is observable that all the variables have a negative Pearson correlation at 0.05 level of significance, except use of social media, which has a correlation  $r = 0.175$ . The negative correlations show that the variables have no positive impact to increase in profit. On the contrary, the positive Pearson correlation coefficient shows that increase in rating on the use of social media, has a positive impact on increase in profit.

The mean and standard deviation of the number of times either weekly or daily that the respondents use social media and email in work related activities was determined and presented in table 4.21 below.

Table 4.21: Means and Standard deviations of number of times social media and emails are used in work related activities

<b>Communication mode</b>	<b>Scale</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Pearson Correlation (r)</b>
Email	1-2	1.88	0.324	-.075
Social media (Facebook, g-plus, Twitter, WhatsApp e.t.c)	1-2	1.88	0.324	.172

In table 4.21 above, the scale used was between 1 and 2 (where 1 = weekly, 2 = daily). From table 4.21, both email and social media have a mean of 1.88 and a standard deviation of 0.324. We can see that the mean score is closer to 2 than 1. This shows that there are more respondents who use email and social media on a daily basis, than on weekly basis.

If we look at the Pearson correlation coefficient at 0.05 level of significance, we observe that email use has a negative correlation, while social media use has a positive correlation,  $r = 0.172$ . This shows that an increase in the rate of using social media as a communication mode has a positive impact to increase in profit.

The means and standard deviations of the frequency in which the respondents receive responses from their clients on email, social media and other modes of communication was calculated and presented as in table 4.22 below.

Table 4.22: Means and Standard deviations of frequency of responses received on modes of communication

<b>Communication mode</b>	<b>Scale</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Pearson Correlation (r)</b>
Email	1-3	2.33	0.697	.053
Social media (Facebook, g-plus, Twitter, WhatsApp e.t.c)	1-3	2.34	0.691	.184

It was in the interest of the researcher to find out the frequency of responses from customers, which was recorded on a scale of 1-3 (where 1=not frequent, 2=frequent and 3=very frequent). From 4.22 above, use of email has a mean of 2.33 and a standard deviation of 0.697, while the use of social media has a mean of 2.34 and a standard deviation of 0.691. This shows that both communication modes are used frequently by customers to provide responses to business owners.

Receiving responses from customers tends to have a positive influence on increase in profit. This is because both have a positive Pearson correlation to increase in profit at 0.05 level of significance; email has r value of 0.053, while social media has r value of 0.184.

#### **4.9.2 Internet access and performance of small businesses**

The means, standard deviations and Pearson coefficient of the use of the internet in business related activities was determined as presented on table 4.23 below:

Table 4.23: Means and Standard deviations of the use of the internet in business related activities

<b>Online activity</b>	<b>Scale</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Pearson Correlation (r)</b>
Research and gathering information	1-2	1.79	0.408	-.071
Transfer of documents	1-2	1.83	0.375	-.067
Banking services e.g. internet banking	1-2	1.69	0.469	n/a
Advertising and marketing your business	1-2	1.63	0.487	-.126
Placing and receiving orders	1-2	1.50	0.504	n/a

In table 4.23 above, the scale was within the range of 1 and 2 (where 1 = weekly and 2 = daily). As per table 4.23, research and gathering information has a mean of 1.79 and a standard deviation of 0.408 which implies that the respondents look for information online weekly with a variation not going below average rating and reaching very well ability. Transfer of documents has a mean of 1.83 and a standard deviation of 0.379 suggesting that the respondents share their documents online weekly with a variation not going below average rating and reaching very well ability. Banking services such as internet banking has a mean of 1.69 and a standard deviation of 0.469 indicating that the respondents conduct financial transactions online on a weekly basis with a variation not going below average rating and reaching very well ability.

Advertising and marketing has a mean of 1.63 and a standard deviation of 0.487 insinuating that the respondents promote their goods and services weekly on the internet with a variation not going below average rating and reaching very well ability. Placing and receiving orders has a mean of 1.50 and a standard deviation of 0.504 implying that the respondents purchase or sell their goods/services online weekly with a variation not going below average rating and reaching very well ability.

When we look at correlation with increase in profit, it is observable that all the variables have a negative Pearson correlation at 0.05 level of significance. The negative correlation is an indication that the variables have no positive impact to increase in profit.

#### **4.9.3 Communication Costs and performance of small businesses**

The means and standard deviations of the communication costs before and after connecting to Zuku was determined and presented.

Table 4.24: Means and Standard deviations of communication costs

Communication costs	Scale	Mean	Standard deviation	Pearson Correlation(r)
Before connecting to Zuku	1-4	2.42	0.719	.105
After connecting to Zuku	1-4	2.08	0.652	.029

It was in the interest of the researcher to determine whether there were changes in communication costs before and after connecting to Zuku which was recorded on a scale of 1 to 4 (where 1 = less than 1,000; 2 = between 1,000 and 5,000; 3 = between 5,000 and 10,000; and 4 = above 10,000). From table 4.24 above, the communication costs before connecting to Zuku has a mean of 2.42 and a standard deviation of 0.719. On the other hand, the communication costs after connecting to Zuku has a mean of 2.08 and a standard deviation of 0.652. The means are seen to change from 2.42 to 2.08 suggesting that the communication costs reduced dropped after connecting to the internet.

The cost of communication has a positive influence on increase in profit. This is because both have a positive Pearson correlation to increase in profit at 0.05 level of significance; before connecting to Zuku has r value of 0.105, while after connecting to Zuku has r value of 0.029.

#### **4.9.4 Access to Ecommerce and performance of small businesses**

There was a negative correlation between access to ecommerce and business performance. Thus, this was not discussed.

When we look at correlation with increase in profit, it could not be computed.

#### **4.9.5 Business performance**

Business performance was measured using three aspects: profit, dividends and asset base. An increase in these domains shows the business is having a positive business

growth, while the contrary means otherwise. The means, standard deviations and Pearson correlation; these aspects were captured for periods before and after connection to Zuku, to measure the performance.

Table 4.25: Means and Standard deviations of dividends paid to shareholders

<b>Dividends</b>	<b>Scale</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Pearson Correlation (r)</b>
Average monthly profit before connecting to ZUKU	1-4	1.10	.381	.051
Average monthly profit after connecting to ZUKU	1-4	1.53	.776	.132
Has your profit increased or decreased?	1-2	1.97	.170	1
Dividends paid to shareholders before connecting to ZUKU	1-4	1.33	.761	.101
Dividends paid to shareholders after connecting to ZUKU	1-4	1.70	.923	.191
Has your dividends increased or decreased?	1-2	1.89	.315	.686**
Total value of assets before connecting to ZUKU	1-4	1.16	.458	.050
Total value of assets after connecting to ZUKU	1-4	1.90	.857	.154
Has your Has your value of assets increased or decreased?	1-2	1.98	.134	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

As shown on table 4.25 above, there is an observable increase in the mean of the profit domains before and after connection to Zuku, among most respondents. This signifies growth in the businesses of most respondents. When we look at the Pearson correlation at 0.05 level of confidence, it's observable that all the variables have a positive correlation coefficient to increase in profit. This shows that a rise in the variables have a positive influence on profit increase.

The first business performance domain was change in monthly profit. The scale used was in the range of 1-4 (where 1= below Kes 500,000, 2= from Kes 500,001-1,000,000, 3= from Kes 1,000,001-5,000,000 and 4=above Kes 5,000,000). In the means, the means are seen to change from 1.1 before connection to Zuku to 1.53 after

connection to Zuku. There is a bigger standard deviation on the profit after connection to Zuku, showing that there are respondents who recorded profits of bigger variation.

Changes in monthly profit affects the dividends paid to shareholders. The scale used was in the range of 1- 4 (where 1= below Kes 5,000, 2 = from Kes 5,000 -10,000, 3 = from Kes 10,000 -50,000 and 4 = above Kes 50,000). In the means, the means are seen to change from 1.33 before connection to Zuku to 1.70 after connection to Zuku. There is a bigger standard deviation on the dividends paid to shareholders after connection to Zuku showing that there are respondents who reported dividends of bigger variation.

The means and standard deviation of assets before connecting to Zuku was determined. The scale used was in the range of 1- 4 (where 1= below Kes 500,000, 2 = from Kes 500,001-1,000,000, 3 = from Kes 1,000,001-5,000,000 and 4=above Kes 5,000,000). In the means, the means are seen to change from 1.16 before connection to Zuku to 1.90 after connection to Zuku.

#### **4.9.6 Summary of the relationship between the dependent variables and the independent variable**

As per the study, access to internet has a high correlation to the performance of a business. Factors such as the age of the business also affect the performance and profitability of small business. Small businesses that have been in operation for more than 5 years tend to be profitable as compared to those that are less than 5 years old. This is due to a combination of factors such as; access to credit and capital, experience and a renowned brand name.

##### **4.9.6.1 Communication Efficiency and performance of small businesses**

Respondents' overall capability of using presentation tools such as PowerPoint is well and the variation of the respondents not going below average rating and reaching very

well ability. Respondents have an overall well capability concerning the use of search engines such as Google, with a variation not going below average rating and reaching very well ability.

Pearson correlation coefficient shows that increase in rating on the use of social media, has a positive impact on increase in profit. This shows that an increase in the rate of using social media as a communication mode has a positive impact to increase in profit. Receiving responses from customers tends to have a positive influence on increase in profit.

Frequent communication to customers is also significant to the performance of a business. Reduced communication costs significantly boost the savings hence improving the profits.

#### **4.9.6.2 Internet access and performance of small businesses**

Respondents conduct financial transactions online on a weekly basis with a variation not going below average rating and reaching very well ability.

#### **4.9.6.3 Communication Costs and performance of small businesses**

The cost of communication has a positive influence on increase in profit. This is because both have a positive Pearson correlation to increase in profit at 0.05 level of significance; before connecting to Zuku has r value of 0.105, while after connecting to Zuku has r value of 0.029.



## **CHAPTER FIVE:**

### **SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents a summary of the findings, discussions, conclusions and recommendations for future research.

#### **5.2 Summary of findings**

The main objective of this study is to determine the influence of Zuku fibre optic project on the performance of small businesses in Nairobi County, Kenya in terms of; enhancing communication efficiency, reducing communication costs and whether using e-commerce has increased the business value. The findings are in the following subsections.

##### **5.2.1 Communication Efficiency and Small Businesses' Performance**

In order to determine whether communication efficiency as a result of Zuku fibre optic has an impact on communication efficiency of small businesses, the study assessed the respondents' frequency of communication and tasks carried out online. However, it was prudent to first establish their degree of computer literacy. From the study, 72.22% of the respondents are proficient when it comes to computer literacy. After the respondents' ability to handle computer tasks, the study then determined their online communication frequency. From the 230 respondents, 95.65% of the respondents used online communication at least on a weekly basis, with 84.35% of them using online communication on a daily basis. The study also assessed the respondents' use of social media platforms. The rate of use of online communication platforms is similar across email and social media platforms. As regarding the tasks carried out online, the study reveals that majority of the respondents use the internet for transferring business

documents. The improved communication efficiency leads to improved ease of doing business, thus improving business performance.

### **5.2.2 Communication Costs and Small Businesses' Performance**

As per the study, the researcher sought to determine the costs of communication before and after the respondents connected to Zuku. This was intended at determining the extent to which Zuku has reduced communication costs. The findings of the study are interesting as respondents who spend below 5,000 shillings every month in communication reported a significant increase in costs. The increase could be due to the need to take advantage of the internet benefits, to improve business performance. Those spending 5,000 to 10,000 and those above 10,000 each month in communication reported that the costs of communication reduced to 3.48% and 2.61% respectively. The reduction in spending leads to higher gross profit, thus improving business performance.

### **5.2.3 Internet Access and Small Businesses' Performance**

66.09% of the respondents have access to internet, while 66.09% use internet on a daily basis, for at least one business related activity. The fact that business operators greatly embrace internet based activities show how important the internet is, thus important in business performance.

### **5.2.4 Access to Ecommerce and Small Businesses' Performance**

Another goal of the study was to determine how the use of e-commerce or ability to sell goods/services online has increased the value of small businesses. The study began by finding out the number of small businesses with websites. From the study, 69.57% of the respondents had websites. After knowing the number of respondents with websites, the study sought to discover some of the factors propelling the respondents to have a website. It was discovered that, the primary reasons

encouraging the respondents to get a website include: receiving enquiries, complaints and feedback from customers, receiving orders for goods and services, and accessing customers in new geographical locations. These in turn improve business performance in terms of profits realized, dividends paid to shareholders and value of assets.

### **5.2.5 Small Businesses' Performance**

From the study, businesses realizing profits of below Ksh 500,000 reported a decrease in profits after connecting to Zuku. On the other hand, businesses realizing profits of more than Ksh. 500,000 reported significant growth in profits after connecting to Zuku. These businesses also reported an increase in the amount paid to their shareholders as well as an increase in the value of their assets.

## **5.3 Discussions of the findings**

The findings of this study are similar to Mugenda and Mugenda (1999) who discusses that the use of internet in small businesses greatly improves their communication efficiency.

### **5.3.1 Communication Efficiency and Small Businesses' Performance**

The study reveals that 95.65% of the respondents use the internet for communication on a weekly basis while 84.35% use it on a daily basis. The high adoption and utilization rate is an indication that online communication produces the intended results as well as improved business performance.

The findings are also consistent with Calvin (2002) who argues that the use of the internet is associated with various efficiencies particularly reduction of wastages in time, effort and resources. As a result, a lot of individuals and organizations would be attracted to use the internet so as to enjoy these benefits. Small businesses spending less on communication report an increase in communication costs after connecting to the internet.

### **5.3.2 Communication Costs and Small Businesses' Performance**

From the study, business spending less than 5,000 and those spending between 5,000 and 10,000 reported an increase in communication costs to 5.22% and 33.91% respectively. This is an indication that there are improved online activities in such businesses as they are seeking to benefit from the efficiencies of communicating online which will in turn improve business performance.

### **5.3.3 Internet Access and Small Businesses' Performance**

In addition, communicating online is associated with other benefits such as savings in time, effort and resources. The study also reveals that the use of online communication platforms is similar across email and social media platforms. This shows that both tend to have an equal level of importance to business operators and an augmenting effect to business performance.

### **5.3.4 Access to e-commerce and Small Businesses' Performance**

This finding is directly related to use of e-commerce and the value of the businesses. The increase in online activities by some of these businesses not only leads to high communication costs but also reduces their profits margins, amount paid to shareholders and also the value of their business assets.

## **5.4 Conclusions of the study**

From the findings of the study we can conclude the following:

Majority of the small business operators are proficient in computer literacy and use computers, the internet and social media very often. These small business operators conduct various activities online including but not limited to; researching and collecting information, transferring documents, online banking, advertising and promoting their goods/services as well placing and receiving orders.

While the use of the internet is associated to reduced communication costs, some small businesses have not been favored. Businesses spending more than 5,000 per

month on communication have experienced a decrease in their communication costs. On the contrary, businesses which spend less than 5,000 monthly on communication have experienced an increase in their costs after connecting to Zuku fibre due to increased online activities.

The use of the internet also increases the value of small businesses in terms of profits realized, amount paid to shareholders and value of assets. However, this has only been experienced in businesses realizing profits of more than Ksh 500,000. This is as a result of the increased communication costs in businesses realizing profits of less than Ksh 500,000 which cuts down their profit margins, shareholder dividends and diminishes the value of their assets.

## **5.5 Recommendations of the study**

Based on these findings, the following recommendations were suggested:

More small businesses should be encouraged to use the internet so as to benefit from the efficiencies associated with online communication hence improving their performance.

Even though small and micro-enterprises should be encouraged to use the internet more in their operations, they should be trained on the best practices. These best practices are intended at ensuring that they fully benefit from the efficiencies of using the internet while cutting down their communication costs. This will result to high performance and high savings leading to increased profits, dividends paid to shareholders and value of assets.

### **5.5.1 Suggested areas for further research**

As demonstrated by the study, there are other factors that influence the performance and profitability of small businesses in Nairobi County. These factors include but not limited to; age of the business operators and years the business has been in operation

which greatly affect the experience of the business. These factors also affect access to capital and/or credit services for these small businesses.

### **5.6 Contribution to the body of knowledge**

Enhanced communication is significant in building public relations between the small businesses and their target audience. Public relations improve the image of the businesses which is significant in attracting higher sales.

Access to the internet is very critical as it provides the platform on which businesses can enjoy benefits such as enhanced communication, reduced communication costs and ease of access to markets as well as information.

Reduced communication costs are essential in ensuring that businesses pass important product information to customers and market their products. In addition, customers are also encouraged to enquire on goods/services from the small businesses.

Access to e-commerce is important as it boosts access to markets, price information and eliminates middlemen.

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## APPENDICES

### APPENDIX I: Sample Size Determination Table

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Figure 3: Sample Size Determination Table



## APPENDIX II: Business Operators' Questionnaire

Dear respondent:

I am a student of The University of Nairobi carrying out a research study as a part of fulfillments for the award of Degree in Masters of Arts in Project Planning and Management.

I humbly seek to get your opinion about the issue in question to facilitate the study of the INFLUENCE OF ZUKU FIBRE OPTIC PROJECT ON THE PERFORMANCE OF SMALL BUSINESSES IN NAIROBI, A CASE OF ZUKU LTD.

Your opinion will be highly confidential and specifically used for academic purposes

1) Gender;

Female

Male

2) Age group

15-25

26-35

36-45

46-55

56 and above

3) What is the highest level of your education?

Primary School

Secondary School

Diploma

Undergraduate

Post-gradua

4) In which industry is your business?

Hospitality

ICT

Food

Entertainment

Energy

Retail

Wholesale

Transport

Education

Other (specify)  .....

5) How old is your business?

Less than 2 years

2-5 years

6-10 years

More than 10 years

### **COMMUNICATION EFFICIENCY**

6) Of the following, which tasks can you handle?

Very well

Well

Average

Not Well

Don't

Know

Word processing  
(Ms word)

Workbooks (Excel)

Presentation (Powerpoint)

Social Media

Using search engine (e.g google, bing)

b.) How many times (per day/week) do you use the following in work related

Online Communication Mode	Per day	Per week
Email		
Social media (facebook, twitter, g-plus, whatsapp, etc)		

activities:

c.) How frequent do you receive responses from customers and suppliers when you communicate using the following media:

Online Communication Mode	Very Frequent	Frequent	Not Frequent	No response
Email				
Social media				
Other (specify)_____				

### INTERNET ACCESS

7) Do you have internet connection in your business premise from ZUKU?

Yes  No

8) a) Do you use internet for business related activities? Yes  No

b) If yes in above, which ones? (tick all that apply)

Online Activity	Per day	Per week	Not Applicable
Research and gathering information			
Transfer of documents			
Banking services e.g internet banking			
Advertising and marketing your business			
Placing and receiving orders			
Other (specify)			

c.) Kindly give an estimated comparison on the following:

	Before connecting to Zuku	After connecting to Zuku
Estimated Communication Cost	Ksh.	Ksh.

**ACCESS TO E-COMMERCE**

- 9) a) Does your business have a website? Yes No
- b) How does your business benefit from the website?
- Receiving inquiries/complaints/feedback from customers
  - Receiving orders for goods/services
  - Reaching customers in new geographical regions
  - Other (explain).....

10) Which internet enabling activities have had most impact on your business' performance? .....

**BUSINESS PERFORMANCE**

11) Kindly tick in the box that best describes your business, before and after connecting to ZUKU.

	Below ksh. 500,000	Between ksh. 500,000 and ksh 1, 000,000	Between ksh. 1,000,000 and ksh. 5,000,000	Above ksh. 5,000,000
Average monthly profit before connecting to ZUKU				
Average monthly profit after connecting to ZUKU				
Has your profit increased or decreased? .....				

	Below ksh. 5,000	Between ksh. 5,000 and ksh 10,000	Between ksh. 10,000 and ksh. 50,000	Above ksh. 50,000
Dividends paid to shareholders before connecting to ZUKU				
Dividends paid to shareholders after connecting to ZUKU				
Has your dividend increased or decreased? .....				

	Below ksh. 500,000	Between ksh. 500,000 and ksh 1, 000,000	Between ksh. 1,000,000 and ksh. 5,000,000	Above ksh. 5,000,000
Total value of assets before connecting to ZUKU				
Total value of assets after connecting to ZUKU				
Has your value of assets increased or decreased? _____				

## APPENDIX III: Letter From University



**UNIVERSITY OF NAIROBI**  
COLLEGE OF EDUCATION AND EXTERNAL STUDIES  
SCHOOL OF CONTINUING AND DISTANCE EDUCATION  
DEPARTMENT OF EXTRA-MURAL STUDIES  
NAIROBI EXTRA-MURAL CENTRE

Your Ref:  
Our Ref:  
Telephone: 318262 Ext. 120

Main Campus  
Gandhi Wing, Ground Floor  
P.O. Box 30197  
N A I R O B I

12<sup>th</sup> July, 2016

REF: UON/CEES//NEMC/23/508

TO WHOM IT MAY CONCERN

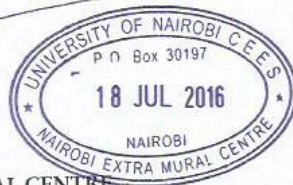
RE: STEPHEN M. MWANGANGI -REG.NO.L50/62332/2013

This is to confirm that the above named is a student at the University of Nairobi, College of Education and External Studies, School of Continuing and Distance Education, Department of Extra- Mural Studies pursuing Master of Arts in Project Planning and Management.

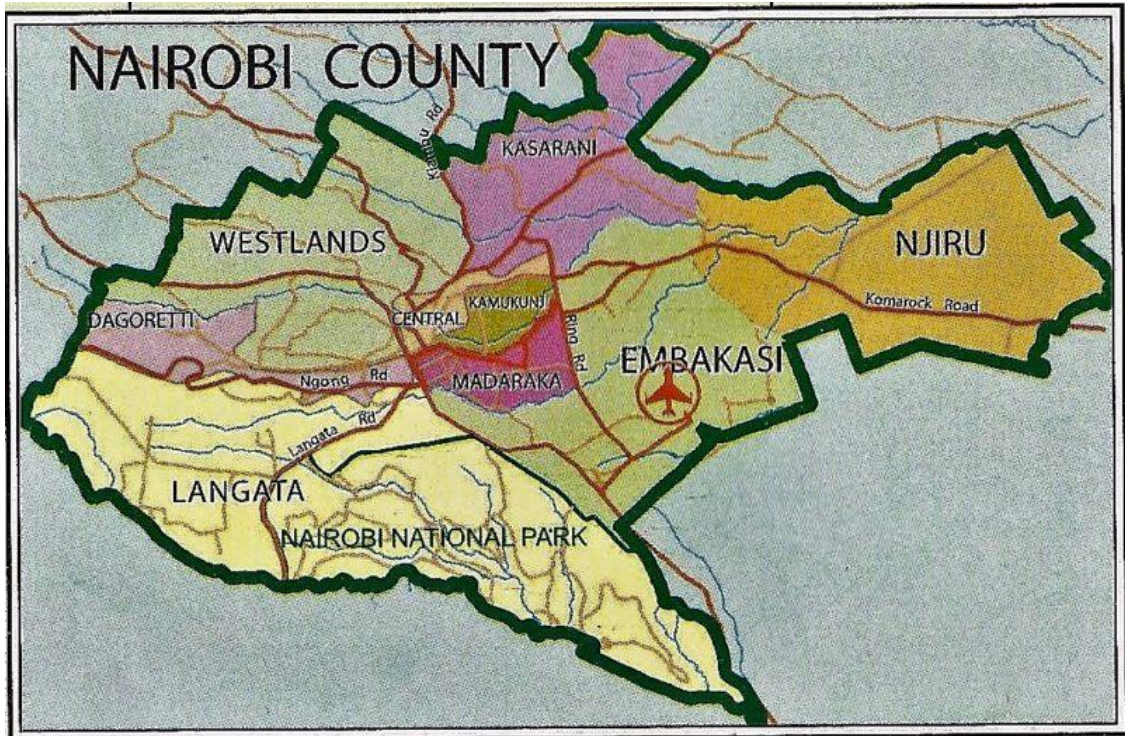
He is proceeding for research entitled "influence of zuku fibre optic project on the performance of small businesses in Nairobi county Kenya".

Any assistance given to him will be appreciated.

CAREN AWILLY  
CENTRE ORGANIZER  
NAIROBI EXTRA MURAL CENTRE



## APPENDIX IV: Map of Nairobi County



Source: <https://softkenya.com/kenya/nairobi-county/>