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Impact of adoption and usage of ICT innovation on small scale business in Zambia

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Abstract
The small scale business sector is very important to most economies generating significant social-economic wealth and employment. A packet of 80 questionnaires, was sent to randomly selected firms from Retails, Wholesale, Mobile Banking and Finance, Information Technology related service and advertising sector using stratified random sampling method. The research findings reveal that common ICTs such as computers and internet have high usage among firms. However, the use of high-technology ICTs is still moderate and there is need for more effort from all stake holders to focus on stimulating accelerated ICT innovation and adoption. ICT innovation has brought many changes in the operations in the business world such Mobile banking, Electronic Commerce (E-Business) E- Banking, Computerized stocking, online Learning (E- Learning). Spending by cash is slowly becoming out of business as many are making payments via mobile and electronic transfers. Additionally, due to ICT innovation many firms have gone online in marketing their business. Many have opened WhatsApp, Facebook, Twitter and many more social media to increase their market share. In this regard ICT innovations serve as a means of increasing productivity and efficiency. The study therefore, recommends that awareness be increased on the importance of ICT innovation amongst firms.

Keywords: e-business, e-marketing, business innovation; information and communications technology (ict); small and medium enterprises (SMEs)

1. Introduction

1.1 Background

Today organizations of all types are utilizing Information and Communication Technologies (ICT) around the globe, not only for cutting costs and improving efficiency, but also for providing better customer service. Governments too, around the world, are adopting ICT to provide better services to their citizens. The adoption of ICT innovation by organizations requires a business environment encouraging open competition, trust and security, interoperability and standardization and the availability of finance for ICT (UNCTAD 2004) [27].

Information and Communication Technologies (ICT) have been diffusing rapidly in the industrialised economies during the last decades and are applied for a large variety of purposes. For example, ICT are used to facilitate communication, to easily store and process information, to automate business processes, or to widen the access to information via the Internet.

Most of the large and international organizations in Zambia have effective computer systems to efficiently conduct business. A number of large organizations have spent huge amounts of money on installing computer systems to support their business processes. However, the situation has not been spared the SMEs (Parker and Castelman 2007) [22], (Shiels *et al* 2003) [25], and (Fink and Disterer 2006) [11]. However, the government of Zambia has taken various measures to diversify the economy for sustainable development of the country and one of the major steps is to transform Zambia into a digital society by introducing Computer studies to all learning institutions as a compulsory subject. This in line with the vision 2030 and 7th National Development Plan. The adoption of ICT innovation will have significant positive consequences on SMEs and consequently on the economy of Zambia. There is a dearth of data and research about the size and contribution of SMEs towards Zambia economy. Therefore, through this research, we would like to learn about the effects and usages of ICT Innovation on SMEs in Zambia (Kasama District) and their current and future perceptions towards ICT

Entrepreneurs in the early days in Zambia usually start their business ventures in small capital, low value added, and it takes time to set up the business. The role of Micro, Small and Medium-sized Enterprises (MSMEs) in supporting economic growth and job creation is well established. Recently, tech MSMEs and start-ups have been thrust into focus, with governments seeking to enable domestic tech ecosystems and encourage home-grown digital products and services, including online marketplaces which make it easier for companies to transact with customers locally and abroad. ICT services have enabled the broader MSME population in general, but have also created unique opportunities for new entrants to introduce products and services which are transforming traditional industries.

There is solid empirical evidence confirming that MSMEs are a major engine of growth and job creation. (OECD. 2010) [31] As with regard to the sector's contribution to national income, global estimates show that MSMEs account for 60% to 70% of gross domestic product (GDP). (ILO. 2015.) [15] Concerning the relationship between firm size and economic growth, there is consistent evidence that a large share of MSMEs spurs economic growth at the industry or subnational level. The

picture is less clear at the aggregate national level. Econometric studies come out with contradictory findings concerning a positive, causal relationship between the prevalence of MSMEs and economic growth. The explanation is probably that the MSME sector is too heterogeneous for one single clear trend to be pinpointed on its contribution to growth.. In the present, technology helps the entrepreneurs to save time and capital during start-up process in E-business. Information and communication technologies has assist the present day entrepreneurs to excel more than the traditional entrepreneurs. This growing technologies makes the traditional entrepreneurs join into the ICT entrepreneurship (Cheng and Chang, 2004) [6]. Porter (2001) [23] argues that today the issue for organisations is not the acquisition and deployment of technology but rather how companies innovate. "Companies must be able to innovate on a global frontier. The rapid development of Information and Communication Technologies (ICTs) across the world is quickly changing the way people interact and conduct their businesses. ICT has brought the following four innovation activities: product innovation, process innovation, marketing innovation, and organizational innovation. ICT innovation is becoming the order of present business days. Studies (e.g. Mzekandaba, 2013; Austins and Tygris 2010; Eduardo 2006; Kollmann, 2006) [3, 9, 17] posit that ICT innovation is more and more important and useful; the evidence of ICT innovation can be seen from the successful entrepreneurs at Western countries like United States. The successful entrepreneurs in the United States are google.com, yahoo.com, Amazon.com, eBay.com, Youtube, Facebook and etc. Google.com is one of the successful stories about young adults who have the ICT knowledge gets to involve in ICT entrepreneurship (Eduardo, 2006) [9]. Doing business online is much easier and cost saving if compare to traditional ways of doing business (Marks and Albert, 2009). Online business does not require so much man power. Technologies play a supportive role in helping business developed efficiently and effectively (Kollmann, 2006) [17].

1.2 Statements of the problem

There is little research done on the Impact of ICT innovations on the Zambian Industry. The world has moved towards the Information age hence the need to investigate the impact this change is having on firms. It is vital for sound policy formulation at personal, organizational and national level to understand the impact of ICT innovations on society. Among several macro environmental factors affecting SMEs ability to serve their customers in Zambia is the technological environment. In addition, there is increased research and development where most technological advances focus on minor improvements. Many firms are out of the business due to technology advancement. The Banking sectors, has been invaded by the telecommunication companies by providing mobile banking. Many people find no reason why they should have a Bank account if water bill, Electricity bills, DSTv and many other utility bills can be paid via Mobile banking. Many firms are still with the old system of doing business, it could be in Education, health, retail business. Is ICT Innovation favouring everyone in business? What are the danger that ICT innovation has brought in the industry. Many have lost huge sums of money via cybercrime is this what ICT innovation can bring. This creates an investment dilemma and limits the diffusion of ICT innovations in Zambia. As a result there are huge adoption and usage gaps of technology in Zambia. Once technology is adopted it changes people physically, mentally and emotionally. Technology innovation also changes the way people interacts with others as well as how people interact with the environment

1.3 Objectives of the project

The main objective is investigate the adoption and use of ICT Innovation and their impact on selected small scale business firms in Zambia.

Specific Research Objectives

1. To investigate the impact of adopting ICT Innovations in selected firms in Zambia (Kasama District)
2. To investigate the level of usage of ICT innovations by SMEs.
3. To establish the types of ICT innovations used by firms in Zambia. (Kasama District)
4. To establish the effects of ICT Innovations on firm's performance

1.4 Theoretical framework / model

The research was based on Roger's Theory of diffusion of innovation. The innovation diffusion theory states that there are four factors which influence the adoption of innovation by target consumers. Firstly, the innovation, secondly, the communication channel employed to communicate information about the innovation, thirdly, time and fourthly nature of the group to which it is introduced. Diffusion of Innovation Theory research examines how ideas are spread among groups of people. Diffusion goes beyond the two-step flow theory, centering on the conditions that increase or decrease the likelihood that an innovation, a new idea, product or practice, will be adopted by members of a given culture. In multi-step diffusion, the opinion leader still exerts a large influence on the behaviour of individuals, called adopters, but there are also other intermediaries between the media and the audience's decision-making. One intermediary is the change agent, someone who encourages an opinion leader to adopt or reject an innovation.

Innovations are not adopted by all individuals in a social system at the same time. Instead, they tend to adopt in a time sequence, and can be classified into adopter categories based upon how long it takes for them to begin using the new idea. Practically speaking, it's very useful for a change agent to be able to identify which category certain individuals belong to, since the short-term goal of most change agents is to facilitate the adoption of an innovation. Adoption of a new idea is caused by human interaction through interpersonal networks. If the initial adopter of an innovation discusses it with two members of a given social system, and these two become adopters who pass the innovation along to two or more, and so on, the resulting distribution follows a binomial expansion. Expect adopter distributions to follow a bell-shaped curve over time (Rogers, 1971).

Discussion

Businesses can adopt a new practice if it will benefit them. To

estimate the benefits and costs of a new practice, decision makers often used analysis cost / benefit (Swarbroke, 2002). This model seeks to identify all the costs and benefits that accompany the proposed practice, in order to take a rational decision by decision maker in the business organization. When the expected benefits exceed the investment cost of a new practice, then businesses may be more motivated to adopt this practice. According to this model, a business will have low possibility to adapt a ICT innovation when it is perceived with high cost and low benefits. In contrast, an ICT innovation will have a high possibility to be adopted, when it is perceived with high benefit and low cost. By theory, this analysis model is simple and easy to use in evaluating of the economic costs and benefits associated with a new practice.

We all have heard about how inventions and innovations have changed the world and transformed the industry landscape and revolutionized the way in which technology is used to further material gain and benefit humanity. The examples of the Personal Computer or the PC that transformed the way in which offices work and the iPhone that was well and truly a game changer in the way in which it resulted in the Smartphone becoming an all-purpose computing assistant means that innovations and inventions have the potential to rejuvenate our lives and make it easier to leverage technology for material progress. Having said that, it must also be noted that no innovation can succeed if there are no users or consumers who would be willing to try them out and spread the message about their benefits to other consumers. Example of iPhone, For instance, when the iPhone was launched, Apple and the late legendary Steve Jobs were banking on the existing customer base for Apple products to try out the new gadget and ensure its marketability to a wider range of consumers. Similarly, when Facebook was launched, it was intended to cater to an early adopter segment of college graduates and students who would then become the informal and unofficial brand ambassadors for the product

1.5 Literature Review

Role ICT Innovation on firm competitiveness and performance

Melville *et al*. (2004), highlight that the use of ICT innovation brings about customer satisfaction by improving service quality thereby offering new opportunities for companies. Moreover, Apulu and Latham (2010) [2], claim that ICT Innovation enables customers to give immediate feedbacks that allow companies to react fast to customers' demands and recognize new market niches. This entails that organizations that are able to exploit the potentials offered by ICT can handle various types of innovative processes in their businesses since ICT innovation influences the performance of an organization in multifaceted ways. Thus, ICT innovation can bring about change in organizations and make them more competitive, innovative and assist to increase organizational growth (Obijiofor *et al*., 2005). For these reasons, Kapurubandara and Lawson (2006) [16] recommend that organizations need to adopt ICT innovation in order to remain competitive in the present competitive global economy.

ICT & business innovation

In addition to identifying the impact of ICT on firm competitiveness, this part ascertains how ICT promotes and effects innovation and productivity of firms. The Oslo Manual defines innovation as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (OECD, 2005, 46). Moreover, Porter (2001) [23] argues that today the issue for organizations is not the acquisition and deployment of technology but rather how companies innovate. Product initiation or development can no longer be solely determined by internal R&D functions, but rather depends on the contributions of a broad range of external players. External players might include suppliers, customers and research institutes. Here the concepts of open and closed innovations come into play.

Bassey *et al* (2005) [4] argued that everyone can innovate. Incorporating innovation in your business can help you save time and money and give you the competitive advantage to grow and adapt your business in the marketplace. Small business innovation generally refers to changing or creating more effective processes, products and ideas, and can increase the likelihood of a business succeeding. Businesses that innovate, create more efficient work processes and have better productivity and performance. Santos and Kelly (2010) argued innovation mean implementing new ideas, creating dynamic products or improving ones existing services. Innovation is a catalyst for the growth and success of the business and help adapt and grow in the marketplace. Mabel (2006) posit that innovation does not mean inventing, innovation means changing one business model and adapting to changes in your environment to deliver better products or services.

Successful innovation should be an in-built part of your business strategy and the strategic vision, where you create an environment and lead in innovative thinking and creative problem solving. Businesses that innovate create more efficient work processes and have better productivity and performance.

The impact of innovation on development

Innovation is central to modern theories of growth and development (Verspagen 2005) [29]. Along with the traditional factors such as costs, technological product, and process, innovations have become the key to competitiveness and business success. Competition in the global economy has increasingly become knowledge-based. Even in supposedly traditional economic sectors such as textiles, leather, or food processing innovation and technological advance has become the key to growth (Mytelka 1999). The same holds for service sectors such as distribution and retailing, financial services, and ICT services. Innovation is also intimately tied up with changes in the structure of the economy, technological upgrading in production, and moving to higher value added activities in global value chains.

Technological change is embodied in new generations of machinery and equipment and new generations of better educated workers. There are also disembodied advances in product and process technology, which result from formal and informal investment in R&D, capabilities, and on-the-job learning. Embodied and disembodied technological change raises total factor productivity—which has been found to

explain more than half of the variation in economic growth rates between countries (Helpman 2004). But it not only raises the quantity of economic output, but also the quality and nature of what is produced. It results in an ever wider range of new goods and services. This powerful impact of technological change is aptly described by Lipsey,
Carlaw, and Bekar (2005: 5) [18] People living in the first decade of the twentieth century did not know modern dental and medical equipment, penicillin, bypass operations, safe births, control of genetically transmitted diseases, personal computers, compact discs, television sets, automobiles, opportunities for fast and cheap worldwide travel, affordable universities, central heating, air conditioning. technological change has transformed the quality of our lives.

ICT and E-business use by sector

Cross-sector surveys show that there are some differences in the use of the Internet by SMEs across different sectors. In Europe, only around a third of SMEs receive orders over the Internet. Their most common use of the Internet is for distribution of product/service information. A slightly higher percentage of firms in manufacturing, wholesale and business services receive orders over the Web than those in retail and construction. Some SMEs send order confirmations via the Internet, although it is not clear how many of these orders were received over the Web rather than through other means, such as fax or telephone (European Commission (2002) [19]

Tourism

The volume of Internet e-commerce in tourism, has grown very rapidly, but still largely involves ticketing for passenger transportation and accommodation. The Internet is mainly used for travel-related information and promotion. In the United States, where on-line travel sales grew rapidly from USD 400 million in 1997 to USD 22.7 billion in 2002, they still only represented 10% of total travel sales in 2002 (Forrester, 2002). The impact of on-line direct sales on small players in the sector could be substantial: a quarter of travel agencies are quite small, with annual sales of less than USD 1 million, and an average of six employees per agency. On the other hand, the number of potential customers, some of whom may prefer a smaller agency's prices and services, is not small: in the United States, over 64 million people used the Internet for travel planning, little changed from 2002 due to the slower growth of "wired" households, but over 42 million people (30 percent of the adult population) used the Internet to book travel online, up 8 percent from 2002, and the number of online bookers doing all of their travel booking online continues to grow (Travel Industry Association of America, 2004).
However, use of Internet commerce in the tourism sector is likely to concentrate on B2C rather
than B2B transactions, as incompatibility between systems (e.g. central/computer reservation systems) and the dominance of relatively small agents and suppliers with less ICT capability may impede efficient electronic transactions along the supply chain for B2B transactions (Department of Industry, Tourism and Resources, Australia, 2002).

Textiles

Textile products, along with music and video, books and magazines and software, are among the leading consumer products sold over the Internet (OECD, 2002c) [32]. Projections for on-line apparel sales in 2003 ranged from 2-8% of sales, however, and physical stores remain the principal sales channel for the foreseeable future. Large retailers see B2C e-commerce as a complementary channel that provides more options to consumers. Consumers may check a printed catalogue before placing an order over the company's Web site and if the shipped item is not satisfactory, they can return it to the nearest physical store. Such multiple channel retailing may not be feasible for many small shops. In fact, the small size of B2C e-commerce generally does not justify a small retailer's investment.

Other Innovations

In Sep. 2011, Mega supermarket chain Tesco designed and launched a virtual supermarket in South Korea in hopes to gain more business than its competitor e-Mart. Koreans are the second-most hardworking people in the world and for them, grocery shopping once a week is a dreaded task.
www.huffingtonpost.com/2011/06/27/south-korea-virtual-supermarket_n_885150.html acessed on December 10 2016
On Dec. 11, 2013, Amazon announced it is expanding its AmazonFresh, same-day, grocery-delivery service to San Francisco, its third market, and allowing customers to receive fresh fruit, milk and other goods on their doorsteps. •Amazon faces competition in grocery delivery from heavyweights Kroger Co., Safeway Inc., and Wal-Mart Stores Inc. (Greg Bensinger, The Wall Street Journal, (Dec. 11, 2013). Additionally, Amazon, the world's largest online retailer, is testing unmanned drones to deliver goods to customers, Chief Executive Jeff Bezos says (BBC - Dec. 1, 2013). The drones, called Octocopters, could deliver packages weighing up to 2.3kg to customers within 30 minutes of them placing the order, he said. The US Federal Aviation Administration is yet to approve the use of unmanned drones for civilian purposes. It is expected that it could take up to five years for the service to start
Jan 17, 2014 - Google is developing smart contact lenses that will measure blood glucose levels in diabetics' tears. They are able to measure blood sugar levels once per second, and Google is working on putting LED lights inside the lenses that would flash when those levels are too low or high. They're still in the testing phase and not yet ready for prime time. Google has run clinical research studies, and the company is in discussions with the U.S. Food and Drug Administration.
(http://money.cnn.com/2014/01/17/technology/innovation/google-contacts accessed on 20/12/2016)

Transportation

Self-driving cars are a reality, with a host of companies developing autonomous systems. In fact, the first driverless vehicle – the Induct Technology Navia - is now on sale, and test vehicles from Google, Mercedes-Benz, Lexus and many others have driven themselves on public roads (under strict supervision). The world's first large-scale test of driverless cars will involve 100 Volvos taking to the streets of Gothenburg in 2017, (Andrew English, The Telegraph, 16 Jan 2014,http://www.telegraph.co.uk/motoring/road-safety/10570935/Autonomous-cars-is-this-the-end-of-

driving.html)

ICT in Zambia

Like other countries in sub-Saharan Africa, Zambia has experienced a tremendous upsurge in telephone ownership and use since the advent of mobile phones. The number of mobile phone subscriptions rose from less than 500,000 in 2003 to more than 3 million in 2008, around one cell phone for every two adult citizens. At least one of Zambia's mobile networks now has coverage throughout the national territory. The fixed telephone network, however, remains extremely limited in range and use – largely confined to the main urban centres, the Copperbelt and the rail links between them. In 2008 there were just over 90,000 fixed line subscriptions. While the mobile and internet sectors are competitive – there are three national mobile operators and some 20 internet service providers (ISPs) –the fixed network has remained a monopoly of the state-owned company ZAMTEL. ZAMTEL also has monopoly rights over the country's international gateway which allows phone connectivity to other countries.

Information for farmers via mobile phones

The Zambia National Farmers Union (ZNFU) operates an information service which is available by SMS to anyone who has access to a mobile phone. It provides details of commodity prices and is aimed at small-scale farmers. Farmers who have produce for sale can find out the best price they are likely to get for their produce in their district. They get both the prices and the contact details of potential buyers. This saves the farmers from being at the mercy of transporters as well as third-party agents who would offer farmers their prices rather than the current market price. Prices are updated on a daily basis and more detailed information is available from ZNFU officers as well as a website, www.farmprices.co.zm. In a similar manner, Cropserve, a supplier to the farming community, is piloting an SMS- and web-based service that provides guidance and pricing for inputs such as seeds. They are in the process of offering veterinary services through the same channels.

Challenges to ICT in Zambia

The report identifies a number of critical challenges facing three key stakeholder groups – ICT consumers, ICT service providers and the regulatory authority.

ICT Consumers

The biggest challenge facing potential ICT consumers is the high cost of equipment and broadband services. ICT equipment is already expensive for the citizens of a country with a per capita GNP which only just exceeds the cost of a single personal computer. The cost of PCs and peripherals such as modems is pushed up further by high rates of taxation. And costs for broadband services are high – around US$100 per month, compared with around US$20 in Europe. As a result, only the wealthy have access to the internet in their homes and offices, while most consumers rely on telecentres and cybercafés. Consumers also have little awareness of quality of service issues and there is little protection against unsatisfactory performance by operators and ISPs.

ICT service providers

Poor access to international infrastructure, leading to high broadband prices, is the biggest challenge facing communications service providers in Zambia. Although new undersea fibre optic cables may increase capacity and reduce bandwidth costs, as a landlocked country Zambia will still need to access these through overland links and so the outcome for service providers and consumers is uncertain. Service providers feel that the relatively inflexible regulatory regime is also a challenge. The time taken for new technologies to be approved has delayed the implementation of services such as Voice over Internet Protocol (VoIP). They are also critical of the 5 per cent commission on gross income that has been levied to finance universal access, even though tenders for the universal access fund were not invited until 2009. This levy is high by international standards and exceeds the dividends to shareholders. Thirdly, current local service providers, particularly the numerous local ISPs, may not be sustainable businesses. The report questions whether the market can sustain as many as 20 ISPs, and warns that local businesses may be taken over by regional multinationals, which play a major part in the African ICT sector.

Conclusion

In 2010, 142.4 million American households were viewing videos via the Internet, up by 4.8% from 2009. The average household viewing of this type occurred for 14 hours and 33 minutes monthly, an increase of 34.5% from the previous year (Amobi, 2011a). In July 2011, more than 180 million unique viewers of Internet video consumed an average of 1,107 minutes of online video (Kessler, 2011).

Apart from having widespread usage among households, ICTs are widely used by SMEs and multinational companies all across the world. This has resulted in the general increase of ICT facilities such as Internet servers. In 1994, Internet content was hosted on about 10,000 web servers. By 2006, more than 100 million servers were operating. In 2008, 187 million websites were operating and the number increased to 234 million in 2009 and 255 million in 2010. In 2011 online commercial revenues were 25% higher than in the previous year and the sixth consecutive year in which growth occurred. "By any measure, the internet has been one of the fastest growing commercial phenomena in history" (Kessler, 2011, p. 17).

The internet has changed the social aspect of society especially among the young people. Online access has spurred the development of social networking services, particularly among teenagers.

Social networking also operates through a variety of online services that allow individuals to use mobile phones to send out reports of daily activities. Social networking mobile applications such as twitter, WhatsApp and Facebook are obtained from websites online. The WhatsApp mobile application has found wide adoption for sharing messages, photographs and documents at all levels of human interaction (Stone & Richtel, 2007). Facebook emerged as the most popular social networking service (Kessler, 2009). In February 2010, the service reported more than 400 million users, a number equivalent to the third most populous country in the world, larger than the United States. The number of users

passed 500 million in July 2010 and 750 million by mid-2011. More than 250 million users accessed the service in 2011 with mobile devices. By late 2010, Facebook had become not only the largest social network in the world, but the third largest Social website of any kind (Kessler, 2011). Blogging and micro blogging became popular in the early 21st century. Twitter, a micro blogging service that takes advantage of the Internet, was created in 2006 by a group working at Odeo, Inc. (Sagolla, 2009). The group created Twitter while attempting to develop a technique of communicating short text messages by mobile phone. The messages, or tweets, consist of 140 characters. By March 2011, Twitter registered 175 million users, equivalent with the seventh most populous nation in the world (Kessler, 2011).

For the sample businesses that experienced an improvement in market share over the period of three years, half made high use of cellular phones and 40 percent made high use of the internet. This was not significantly different to a slightly lower 42 and 36 percent respectively for businesses that experienced growth in market share. However, the extent to which small and medium enterprises are taking advantage of ICTs demands further investigation tailored to the Zambian industry. Zambian SMEs can emulate the strides undertaken by SMEs in other countries to establish new trends of ICT adoption in Zambia despite the different economic environments prevailing in the two countries.

2. Methodology/Research Design

2.1 Project Design / Approach

The basic research design employed in this study was descriptive design. The choice of this design is chosen due to the fact that it enriches the data collection. The research design adopted on this study will be carefully planned, so as to be able to obtain accurate and complete information about the research project being used.

2.2 Sampling procedure

In determining those that will make up the sample size, the researcher used Simple Random Sampling (SRS) on a focused group using the consulting technique. This is to ensure that all the members of the population had equal opportunity of being selected into the sampled unit

2.3 Target populations and Sample size

Population is basically the universe of unit from which the sample is to be selected. According to Babbie (1992) a study population is the aggregation of element from which the sample elements actually selected. The population of interest in this study consists of Eighty (80) Small and Medium businesses selected randomly form manufacturing industry, transport and communication, finance and insurance in Kasama Town

Sample size refers to the number of items to be selected from the universe to constitute the sample, and this answer how many sampling unites should be surveyed and interviewed, (Kothari 1990). Large sample give more reliable results then small samples. The sample size of Eighty (80) in number will be used. However, Taro Yameni technique was adopted for this research work

$$\text{Thus } n = \frac{N}{1+N(e^2)}$$

Where:
N= Population of the study (100), n = sample size
(e) = level of significance, I= unit (a constant)
Note (e) = 0.05 (95% confidence level)

$$n = \frac{100}{1+100(0.05^2)}$$

$$n = \frac{100}{1.25}$$

Sample size = 80

2.4 Instruments of data collection

The research study will employ the combination of different data collection methods. This includes primary data (Interviews and 130 questionnaires) and secondary data collection method. This enhanced the validity and reliability of data. Both Interview and questionnaire methods will be used to collect data

2.5 Data analysis techniques

The data to be collected will be both qualitative and quantitative in nature, however, data processing and analysis will include computation, classification and tabulation to enable the analysis to be done well using STATA. Quantitative data was presented using descriptive statistic methods including table and charts. Qualitative techniques will be used to analyze qualitative data from the views of respondents. This will increase the validity and reliability of information.

2.6 Ethical Considerations

Before approaching a businessman, permission to meet with him or her will be sought from the town Clark and the mayor. Consensus will be sought for ethnographic research and interviews before data collection.

3. Results and Discussion

3.1. Results / Research findings

The business fields operated by enterprises

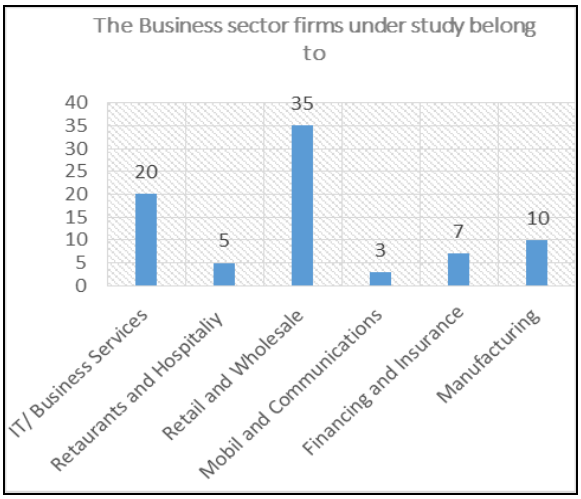

Fig 1

The chart above shows the business fields operated by enterprises. Majority of the SMEs under study were in Retail and wholesale business carry 43.75% of the total sample, followed by those in IT/ Business services (these include those in internet cafes, photocopying, typing and printing, scanning) these are the second to those in retail and wholesale. 25% of the total sample represents those in IT/Business services, then Financing and Insurance of 8.75% and the least was those in mobile and Communication carrying 3.75%

The number of year's firm has been in business

Majority of the enterprises (40%) had been operating between 3 -7 years, 10 % between 15-20 years, 15% below 3 years and a sum of 20% between 7-15 years. In contrast 5% had only been operating more than 20 years

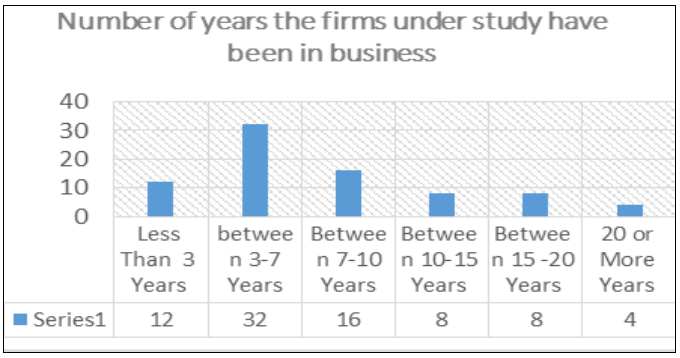

Fig 2

Existence of ICTs in small and medium business firms

The respondents were asked to states the what extend has their firms uses ICT Innovations using a multiple response question to indicate whether some ICTs such as Computers, telephone, CAD-CAM Software, Intranet and internet were present in their organisation. Results in Figure below reveal that 32% of the firms use ICT innovations at a good note, and 13% of them shows the excellent use ICT innovation. To the contrast only 5% of them are poorly using the ICT innovations

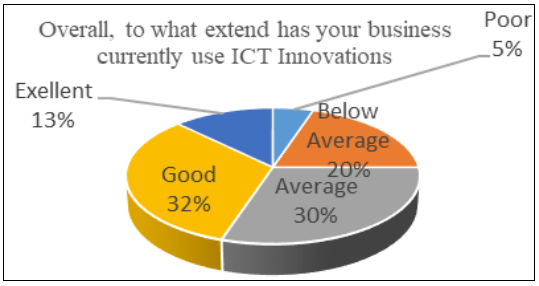

Fig 3

Usage of enterprise software

Investment in ICT infrastructure enables businesses to take advantage of the large number of different technologies available in the market. No matter how small the business and how basic the infrastructure, businesses always look to automate and computerize the essential business functions to save costs and time and to eliminate the need for support staff.

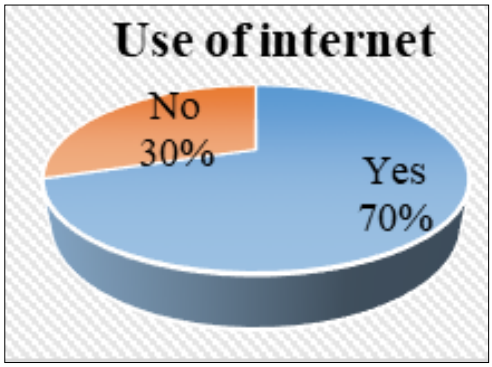

Fig 4

When asked whether they use the internet for their business activities and if so to what extent they use it, a significant number of 90% of all enterprises indicated they use the internet for their daily business operations while only 10% showed reluctance in using the internet as indicated in figure. Sending and receiving emails (80%), information sourcing (30%), online ordering (35%) and payments (31.25%), online sales (31.25%) and software downloads (35%) as well as customer feedback (35%) are overwhelmingly the main reasons enterprises use and are dependent for the internet.

Similarly, a question aimed to identify what are the key factors that constrain not to use the internet was administered to enterprises particularly those answered no for the previous question. A sum of 61.25% indicated that uncertainty about internet security is by and large the main reason that they cannot practically rely fully on internet and as such prefer on staying traditional. 67.5% of them were also of the view that their business partners and customers do no use that much the internet for business activities whilst 36.25% indicated that internet maintenance is difficult and expensive and with some (35%) worried about employees might waste their time. In contrast, companies that fully rely on internet do not see security as a major bottleneck rather they see the internet as simplifying their business activities if properly used with the right know-how and right technologies with built-in securities.

To summarize, the prominent reason for firms not to fully engage in internet is first and foremost related to the perception that security damages are if encountered devastating enough for good for the existence of their business. The view on internet and e-commerce as an unsuitable medium for business appears relatively strong. That is, because most of these firms see internet as ineffective in that they claim that their customers prefer personal or telephone contact for business deliveries, negotiations and transactions. The view that engaging fully in internet is not suitable for the business holds strong implication for small and medium-sized enterprises aiming to adopt ICT because they will not be able to take advantage of ICT in general unless its benefits justify the need to adopt it.

The perceived value added ICT Innovation could bring

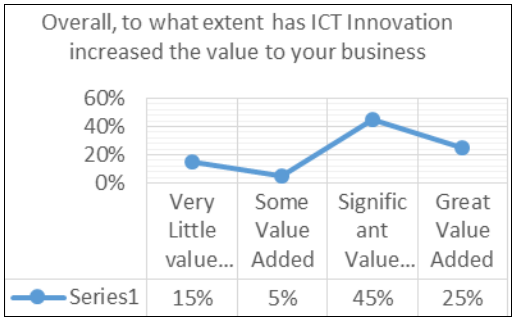

Fig 5

The respondents were also asked if they perceived use of the ICT innovation would further improve the value added of their business. The responses are mixed, with a total of 70% (45% +25%) stating that ICT added either significant or great value and improved their business activities, while 15% felt that it added little value and 10% indicated no value added, and 5% indicated some value added**.**

The values ICT innovation has added to business

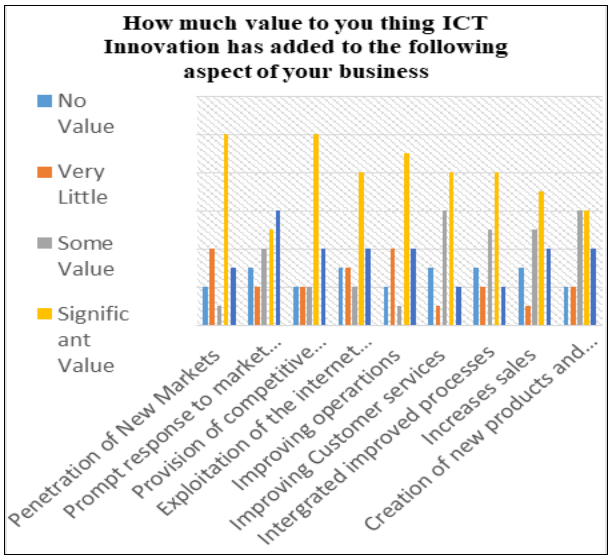

Fig 6

The values ICT has added to business

65% (50%+15%) of all respondents believe that the greatest value that ICT innovation has added to their business was the ability to penetrate into new markets and promptly respond to market changes (55%) as well as exploit network opportunities (60%). 65% of the respondents revealed that ICT innovation has improved their business operations and customer services (60%). Another 60% indicated that ICT Innovation had added value for their integrated processes while 50% reported ICT to have increased their sales and enabled creation of new products and services (50%). This reflects that ICT plays a pivotal role in the overall performance and competence of small and medium-sized enterprises.

The perceived benefits of ICT Innovation adoption

To determine what are the specific perceived benefits enterprises experience through ICT innovation adoption, respondents were asked to choose from a list of options designed to best describe benefits of ICT innovation. 75% of all respondents reported ICT Innovation to have significantly increased marketing efficiency. Clearly, this percentage indicates the value aspect ICT Innovation has already added to marketing. Another encouraging aspect is the increase of customer satisfaction with 70% of all respondents reporting to have achieved their goal in increasing customer satisfaction. 70% of respondents also reported to have managed reducing operational costs and experienced increase in revenue.

Similarly, those respondents that indicated increase in marketing efficiency, customer satisfaction and cost reduction also consider at a percentage level of 70% that their firm goals were achieved with ease and that their communication with partners improved (80%). More importantly, a total of 65% of all respondents also exercised quality improvement for their

products and services hence making their customer base increased. Clearly, there is a positive correlation between the responses referred on the previous question (extent of value created by ICT) and the specific benefits with regards to ICT usage. The positive correlation clearly suggests that ICT is becoming business critical for a growing percentage of enterprises

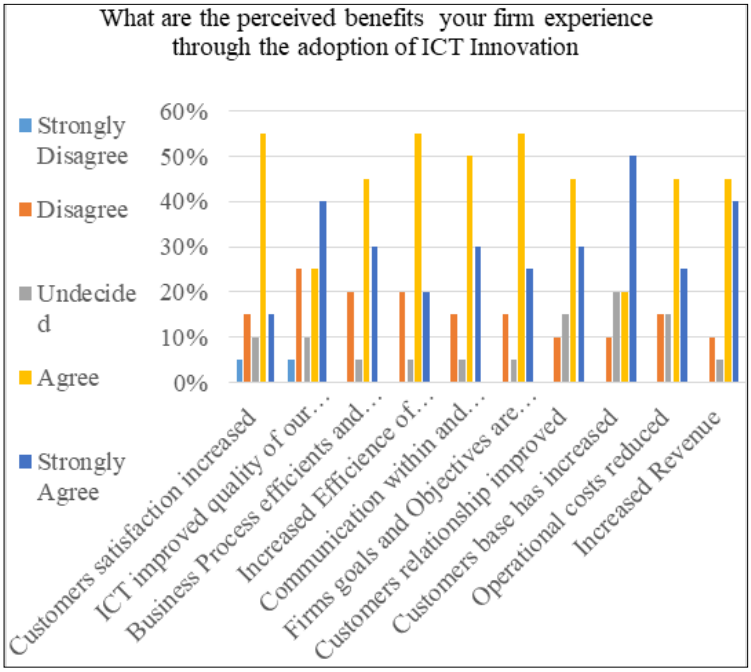

Fig 7: The perceived benefits of ICT innovation adoption

Discussion and Interpretation of findings

It is found that ICT usage within SMEs in Zambia is moderate in common technologies, but limited in the more sophisticated technologies such as wireless, data storage and network security solutions, E marketing, E Commerce, E- Business. It was noticed that Zambian SMEs are taking a comprehensive approach to their ICT innovations and investment focusing on both strategic and operational aspects of their business. The results of my study show that Zambian SMEs are making reasonable investment in ICT and that there is a modest competition among the SMEs. The main driving forces for ICT innovations investment was to provide better and faster customer service, to stay ahead of competition and following top management strategy. The competitive strategy for the majority of SMEs was to provide high quality products and services to their customers and to establish long term relationships with customers via ICT innovation.

Overall, it seems that only a small number of SMEs in Zambia are aware of the benefits of adopting ICT innovations.

The findings of my research show that the SMEs lack necessary ICT knowledge and skills and mechanism to find and receive advice and support.

ICT-based knowledge and products contribute directly to wealth creation, the use of ICTs contributes indirectly to national development through its impact in social and economic sectors such as agriculture, health and education, and by empowering individuals to take advantage of new opportunities. Individuals also benefit from the availability and use of ICTs in a number of ways – for example, by substituting phone calls for travel, which saves time and money, and by using ICTs to obtain information on prices, for their own produce and for purchases, Electronic Commerce, Business, marketing. Electronic transfer of funds to settles account payables such water bill, Electricity bills, DSTv, and other products and services. In these various ways, ICTs can have a significant impact on a country's ability to achieve the Sustainable Development Goals (SDGs).

4. Conclusions

While some of the SMEs in Zambia are clearly aware of ICT and its benefits, there exist certain restrictions and barriers to ICT innovation and investment. many firms feel that a lack of necessary internal skills is a major barrier. This is consistent with other studies that SMEs do not have enough Human Resources (Wymer and Regan 2005). There has been a recent increase in technological colleges and the general investment by the Zambian government in the ICT industry to overcome shortage of IT staff especially in Education. Others feel that the monetary costs of ICT solutions and implementation are too high. (Harindranath *et al* 2008) [12] also identified cost as the single most factor threatening future investment in ICT. Almost 53% of the decision-makers within the surveyed firms feel that there is not enough information available at their disposal about relevant and effective technologies. This finding also confirms findings of (Harindranath *et al* 2008) [12], (Chibelushi 2008) [7] and (West Foucs 2007) study who found concerns over costs and uncertainty over the business benefits-followed by a lack of internal expertise. This shows that there is a need for free advice and relevant information for SMEs. Of the respondents, 31% feel they simply have no time to implement the projects. About 47% of the firms are uncertain about retaining their ICT innovation investment

because every day new technologies are coming on a new market. A few of the firms also complained about lack of infrastructure in certain areas in some areas. One business specifically complained about the unavailability of internet access in some of the areas

5. Recommendations

1. There is a need for more focus and concerted efforts on increasing awareness among SMEs on the benefits of adopting ICT Innovation in order for SMEs to be more productive and competitive.
2. There is a need for providing affordable ICT products, services, solutions and relevant professional advice for SMEs. There is a need for government and professional trade organizations (such as Chamber of Commerce and Industry, ZICTA) to address the gaps and issues identified in this study. The findings of this research will provide a foundation for future research and will help policy makers in understanding the current state of affairs of the usage and impact of ICT on SMEs in Zambia.
3. Currently high taxes should be reduced on imported ICT equipment and software, and tax breaks should be used where appropriate to accelerate ICT adoption
4. The government should encourage local software developers to develop small-scale packages that are suitable for local market conditions.
5. Public–private partnerships should play a leading role in the development of a national fibre optic network. This will require coordination between operators of fixed networks to ensure that installations are not duplicated while other areas remain unserved.
6. Rural populations in particular should be persuaded of the economic benefits of using ICTs. This will require substantial ICT literacy training, but will be important in reducing the economic and knowledge gap between urban and rural communities

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