



**THE ROLE OF DIGITALIZATION FOR SUSTAINABLE LOCAL ECONOMIC
DEVELOPMENT OF A COMMUNITY IN NAMIBIA**

By

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Dissertation submitted in fulfillment of the requirements for the degree

Master of Technology: Business Information Systems

in the Faculty of Business and Management Science

at the Cape Peninsula University of Technology

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District Six Campus

2019

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ABSTRACT

This study dwelt on the role of digitalization for sustainable local economic development of a community in Namibia. In spite of the fact that Information and Communication Technology (ICT) plays a big role in socio-economic development, there is no clear indication on how it can be utilized to realize this purpose in the Namibia context. There is a phobia that people have about embracing the “technological determinism theory” thus they regard ICTs as a remedy that will solve all developmental challenges, without understanding that it can be infused within the local context, or with ill-conceived anticipations about its usability. Despite the fact that there are several huge digital projects in Namibia, it is still unclear how such technology is touching peoples’ lives particularly those in rural-based communities like the Oshikoto region. The general approach used in this thesis was the interpretive paradigm due to the subjective nature of the problem and as such the research design was qualitative since the study aimed at exploring the role of digitalization in sustaining rural development. The qualitative approach helped in finding out the views and perception of technology and non-technology users of a rural setting using Oshikoto region as a case study. The outcome is that digitalization of local government services can indeed sustain economic development of communities. Permission to conduct the study and in the selected locality was obtained, issues of confidentiality were emphasised and respondents were given the liberty to answer or not to answer the questions posed

The general findings indicate that the use of ICTs in Oshikoto has changed some people’s lives who have used it in changing degrees for example to improve working performance through the use of the computer, improving performance of students through basic computer skills and retrieving relevant information on development through the use of Internet, publications, and media services.

Keywords: Digitalization, Local Economic Development, Information and communication Technology, Case study, Structuration

ACKNOWLEDGEMENTS

I wish to thank:

- God Almighty for the completion of this master's journey; only due to his highly blessings and favour I could complete my dissertation;
- My mother Linda J for her moral support and encouragement to never give up;
- Dr Michael Twum-Darko, my dissertation supervisor and mentor, for his endless guidance and patience in the completion of this document;
- My family for their unconditional love, support and encouragement;
- Mr Tonga & Dr Osakwe for their great advices, compassion and consolation;
- All my friends and colleagues; this dissertation would not have been possible without your continuous contributions in different ways.

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GLOSSARY

Abbreviation/Acronyms	Definition
CPUT	Cape Peninsula University of Technology
ICT	Information and Communications Technology
NGO	Non-Governmental Organisations
IT	Information Technology
IS	Information Systems
UN	United Nations
GT	Grameen Telecom
SARI	Sustainable Access in Rural India
ML	Managerial level
SL	Supervisory level
LP	Local people
AMCOST	African Ministerial Conference on Science and Technology
DoT	Duality of Technology

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Digitalization is the reason of large-scale and sweeping changes across numerous features of business, human activities and communal development; providing unparalleled opportunities for value creation. There is a great similarity between Information and Communication Technology (ICT) and digital technologies in the area of infrastructure. Without ICT facilities, digitalization cannot take place. This process of digital transformation assist to widen an individual's spectrum and once it is moved to a community, it can lead to its digitalization. Digitalization is also the integration of digital technologies into everyday life by the digitization of everything that can be digitized. The literal meaning of digitalization gives an apparent idea of development and technology dependent world. Digital transformation is a foundational process that change in how an organization delivers value to its customers. While ICT or information and communications technology (or technologies), is the infrastructure and components that enable modern computing. Although there is no single, universal definition of ICT, the term is generally accepted to mean all devices, networking components, applications.

The thesis explored the role of digitalization in sustainable local economic development and used interpretive paradigm through the lens of duality of technology of Gideon's "Structuration theory" to tease out the phenomenon. It is arguable that the world has seen an appreciable importance in digitalization, with ICT, in enhancing and accelerating developmental processes and as a way of creating wealth globally. Mulira (2006, p 3) is delightful in saying lacking the practice of ICTs, the people will tumble behind in terms of growth. This has propelled Government and its agencies, various donors, Non-Governmental Organisations (NGO's) and investors alike, to spread the impact of diverse ICTs given their ability to be used for strategy advocacy, local power, educational development and civic educations, etc. In Namibia a variety of such initiatives have cropped up both in urban, semi-urban and in rural settings. As a way of acknowledging the in depth role of ICT especially in rural development given the challenges which move along with such settings, the thesis became opportune in unveiling the above assertion.

ICTs include improvements in design and manufacture of electronics, computing, and

telecommunications (UNDP 2001). The dispensation and storing of huge volumes of information, beside with quick delivery of information over communication setups (UNDP 2001). The ICTs mainly comprise of televisions and radio, telephones and internet which are world used. With the mentioned digital technologies, they support in the transfer of information to where it is vital and in a timely method. The benefits of ICTs are that they reduce distance, increase time, geographical limitations and eradicate hierarch. It all hints to cut charges of procedures (Adeya and Cogburn 2001). The combined legacy and aim of ICTs is that it was created on allowing individuals with the capability to communicate on time, this is notorious to be able to assist the growth procedure by accumulative competence, efficiency, equity and productivity (Yonah 2002). This practice of digital transformation assist to widen an individual's spectrum and once it is moved to a community, it can lead to its digitalization.

ICTs remain one of the most important tools when it comes to development, gradually suitable for technology driven, attainment through the world economy that deals with the exchange of goods and services and easy approach to acquire information and communication technology tools (Adeya and Cogburn 2001). It has always been the dynamic strength when it comes to digitalization of the global information society, in which information is observed as a valuable resource which can increase revenue and work prevails. An Information society/group is a culture in which the manipulation of information, the formation, and supply becomes an important cultural and economic where the driving force for change occur through distribution and consumption of knowledge (Dordick and Wang 1993). The society of information is made possible by ICTs and categorised by networking methods of accomplishments in economy, politics, Cultures and society which Castells (1996. P. 21) stated to as the networked society.

The influential tool for the process of social and economic development is considered as ICTs (UNDP 2001; OECD 2004). The World Bank (1998) and UNDP (1999) declare that ICTs have the most promising ways to put right the wellbeing of the unfortunate Individuals by providing more opportunities through availability of market information, economic opportunities, better access to health and education amenities and actual control. ICTs have created and made a new growing paradigm (Hilbert 2001).

Numerous global initiatives groups have been presented to ease the way they use ICTs for development in developing countries. This was to encourage them in order to support the link of digital engulf. Some of this innovators comprise of the World Bank's Global Information, Communication Technologies Department (GICT), Digital Opportunity Task Force (DOT Force), and UNDP's Information Technologies for Development Initiative (Info21) (UNICT Task Force 2002; WSIS 2003; UNDP 2001; GICT 2006; DOT force 2001; InfoDev 2008).

1.2 Rationale of the problem

1.2.1 Background

In the recent years, ICT has been part of the debate that arised on the its role in promotion of development and addressing the needs of the poor. This dispute has been permitted partly to a high disaster rate of digitalization in most of developing countries (Benjamin 2001a; Chapman and Slaymaker 2002; Heeks 1999; Maepa and Mphahlele 2004). There were many challenges experienced in trying to enhance ICTs in poor countries that where unnoticed or not taken seriously by the followers of ICTs for development projects. The dispute caused a lot of challenges to an extent of doubting the use of ICTs to decrease poverty in poor countries.

The opponents that do not support ICTs for development say that ICTS are just a waste of money and believed there many other issues that can be tackled for development. They added that it would make more sense if they prevent resources from ICT towards areas of greater impact, for ICT project do no bring any benefits claimed. The critics also stated that ICTs only bring harm to the people through avenues of misuse instead of profiting them (Wyatt *et al.*, 2003: 3-8; Moodley and Cloete 2004).

The followers and devotees of ICTs stated that if the gulf between the people that use ICTs and the people that do not use it will continue if ICTs are not supported. The subdivisions in the economy and people's lives are mend through investment in ICTs. ICTs are the only tools that will bring everyone into the digital age (WSIS 2003; InfoDev 2006; Chowdhury 2000).

On the further discussion, there are those other groups and individuals that believed positively that if digitalization (ICTs) are used wisely it can actually address development purposes, economic

and social goals of the poor (SDC and GPK 2004; Mansell 2002; Lewis 2004; Moodley and Cloete 2004). The opinion was supported by the current people that are into ICTs development area, such as ICTs cost, wireless skills, communication sectors and the look of new cost effective technologies (SDC and GPK 2004).

Despite of these developments or growth, the fact still remains that the gap between the people that access ICTS and those that do not access it, the people in urban areas and people in rural areas remain large in developing countries (Bridges.org 2003). This has contributed to the delay of digitalization in these areas. There is a wide gap between the views of what digitalization can do for the unfortunate individuals living in rural areas of developing countries and the reality of how this technologies tools are being used in these areas.

This investigation therefore sought to understand and interpret the role of digitalization in sustainable local economic development using Oshikoto region of Namibia as a case study. The study is centered on the fact that globally ICTs have been perceived as a tool for development and in particular fighting poverty especially in developing states. Governments and NGO's have spearheaded the spread of ICTs in many areas as a way to reach development. The report embodies the enunciation of the study objectives and research questions, the rationale for objective and research question selection, study area, literature review, theoretical findings, research methodology, data collection methods and instruments, data analysis, ethical considerations in the study, and the challenges/limitations of the study.

1.2.2 Problem statement

In spite of the capabilities of digitalization to improve socio-economic development, there is no clear indication on the role it plays to realize this purpose in the context of Namibia's rural areas. Mbarika, Ahmed and Benard (2005) and Musa Abdul and Simpson (2005) argue that technological development in Africa quite often concentrates on national economic growth, project based initiatives and technology transfer globally but very little towards rural development.

Furthermore, Namibia has not seen much development in the area of digitalization not because the government do not have policies on ground, but because there is no implementation plan that could be used to facilitate the process (Chacko2004; Moodley and Cloete 2004). Even though there are several huge digital projects in Namibia, it is still unclear how such technologies are changing peoples' lives particularly those in rural-based communities like the Oshikoto region. In as much as digitalization is not the cure for all developmental challenges, ICT in serving as an influential tool, when used appropriately as part of an overall strategy for development. It plays an important part in the developmental processes. (Long and Long 1992). Therefore, this research investigated the role of digitalization in sustainable local economic development.

1.2.3 Problem Conceptualization

Sustainable development symbolizes a substantial global challenge by compelling societies to equate the yearning for economic prosperity with the obligation to make sure there is continuous environmental protection and social development. Developing countries are mostly susceptible and are faced with enormous hurdles to sustainability. Consequently, much effort is placed on Information Technology (IT), which is seen to have a powerful potential, easily accessible and an inexpensive means of facilitating the shift towards sustainable growth. "IT, including high-speed computing, Internet, mobile telephony, geographic positioning systems, and Wi-Fi are major enablers of these economic activities and services" (Madon, 2000:23).

In as much as there are other ways to achieve sustainability, it is reasonably important to note that technology has brought in many changes in the daily lives of individuals. Not minding the mental skills an individual has, technical skills are always important. For the individual to have technological skill, his mind-set must be focused towards using available technical and mental skills facilitated by technology. This means that there must be an interaction between the individual and technology. Therefore, there must be that belief that technology will facilitate sustainable technological development for this goal to be achieved. If technology is accepted and integrated into the various types of economic activities, its benefits will be impacted on the community to bring about sustainable development.

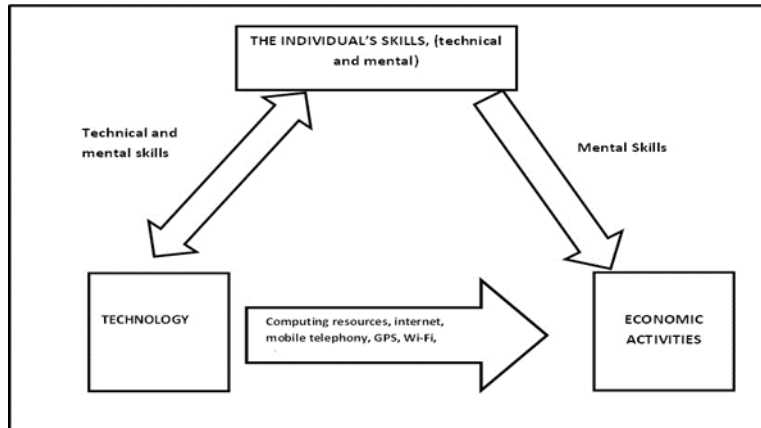


Figure 1.1: Problem conceptualization

1.3 Research aim, objectives and questions

1.3.1 Research aim and objective

The purpose of this research is to understand and interpret the influence of digitalization on sustaining economic development of a local community. Hence, the main objective to support the research aim was to:

“Investigate the influence of digitalization on sustaining the economic development of a local community in Namibia.”

1.3.2 Sub objectives

To address this research aim, the following sub-objectives were applied:

- i. To investigate the kinds of digitalization activities taking place in the local economy of rural areas;
- ii. To investigate the perceptions of the local people about the digitalization activities taking place in the local economy of rural areas;
- iii. To propose general guidelines that can be used to digitalize sustainable local development

1.3.3 Research Questions

- (a) How do digitalization activities take place in the local economy of Oshikoto?
- (b) How can the perceptions of the local people about the digitalization activities taking place in the local economy of Oshikoto be assessed?
- (c) *What general guidelines can be recommended to digitalize sustainable local development in*

Oshikoto?

1.4 Overview of Underpinning Theory

The underpinning theory for this research is Structuration Theory and in particular the dimensions of duality of technology (Orlikowski, 2000). Orlikowski (1992) developed an understanding of technology that clarifies it as an objective truth and an artifact that is created socially. The view sums up the use of technology by organisations into two main camps that technology is an unbiased influence that has existing causes on the influence organizational possessions. Technology is disposed by mankind and it's the result of planned choice and socio-action Orlikowski (1992). The theory defined technology as to how its actors work in a given social situation and to different attachment to how they use its features (p.38). This could be likened to how technology is viewed and used for institutional change and socio-economic development. Furthermore, considering the fact that it is continuous action of individuals (who can be known as human agents or actors), which institutionalizes and objectifies technology, agencies and structures are not autonomous. Their actions portray that human actors have the responsibility of creating technology. Orlikowski (1992) proposes that with technology became the creation and the outcome of the human act such as (modification/adjustment, appropriations/assumptions, development and design). Building into technology mainly involve interpretative outlines, required facilities and standards- rules for how something is to be done.

Looking technology as the formation of human deed, Orlikowski (1992) not only highlights that technology is standing due to the artistic human action, but that it is also an invention attributed to the action of human agents linked to its continuous and ongoing maintenance, adoption, and usage. Technology will be of no importance if there is no human action; it does not play any significant part in human affairs and it can only be influential through its usage.

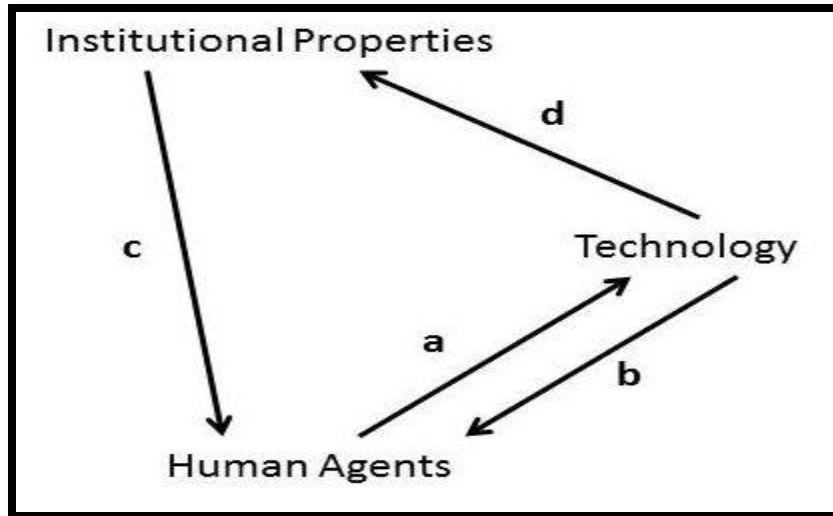


Figure 1. 3: Duality of Technology (Orlikowski, 1992)

Therefore, technology can only be understood through the action of human agents. Orlikowski (1992) noted The authorized settings and human agents that are included in technology development are very different. A technology can be developed by one organization and only to be used by a different organization which is therefore conveyed to third party. With this it mainly holds up effects for studies into Information Systems (IS), which means that when an information system is strictly developed for its own and in dependent of people’s interpretation it only means that information can be ignored due to the failure to acknowledge the influence of people (Orlikowski and Robey 1991:10).

1.5 Overview of literature review

1.5.1 Introduction

This section presents a review of related literature on ICT and rural development. It covers the various researches that has remained conceded out and how such knowledge can help as guiding in examining the contribution of ICTs to sustainable rural development. This literature is also analytically reviewed through identifying the gaps and also employing the lessons to inform the body of knowledge in ICT for development.

1.5.2 Digitalization and Sustainable Rural Development

Development in rural areas is used to contribute to different plans used to develop the existing conditions in non-urban communities, and such communities are categorised by principal activities and where economic deeds relate (Chamber 1983). Heeks (2008:26) propounds the reasons as to why ICT applications in communities and particularly in the semi-urban and rural areas should be prioritized. Firstly, he clarifies the moral argument, which covers the ethical lengths in development. In Namibia, ICT is evolving and becoming as a central channel for communication and also an instrument for sustainable growth, which is part of the community and local levels. On the other hand, this views have not been linked efficiently. With affordable ICT infrastructure and linked service delivery many rural and outskirts areas continue to practice because of development interventions. ICT projects can act as communication tool that strengthens community and local development (Mulira, 2007).

Namibia, just like other countries has accepted the possible and permitting component of ICT as a tool for socioeconomic development. The government has also backed to its growth by creating the ICT ministry and providing ICT grants especially to ICT providers. However, a large population of Namibians live in the rural settings, where even ICT developments are untapped but the ministry has the department that targets ICT centres especially at the local level with the decentralised setting already in place: a favourable aspect to extend ICT even to the rural poor in the country.

1.5.3 Implementation and delivery of ICT in rural communities

The type of information society we now live in has provided an uninterrupted link between technology access and socio-economic development therefore technologies are no longer consequences of development, but rather a basic condition for development. If the thinking has changed globally, the implementation and delivery of such newer technologies especially to rural communities should be thought of with great consideration. However, connecting digital tools in some services of the global most critical complications entails thoughtful the implementation and delivery of ICT especially in the rural communities and this is why most times such developments have neglected rural communities; well known for most challenges in ICT implementation.

Mulira (2007:29) disputes that even though the new technology tools are needed for development, the main elements of development are the individuals that states development goals could be achieved and which will be the development goals that will suit their own communities. This is to say that technology can be seen as a major player towards achieving developmental goals. However, it is significant to bear in mind the restrictions of the use of ICT in rural communities in particular the lack of the relevant technical skill and knowledge and information to get involved. This should be done bearing in mind the context of ICTs, particularly in rural communities bring limitation to strong community involvement due to the technicalities involved and also considering that a variety of rural communities like those in Namibia, people do not have much knowledge and technical know-how in getting involved in ICT projects; and if they do, their participation in minimal.

1.5.4 ICT Impact on rural communities

The impact of ICT on development has sufficiently charted in recent pasts as a multi-dimensional, multi-stakeholder and pervasive practice. The impact is key to those individuals that have the competence of connecting these technologies as they have observed rates of development (Tarjanne, 1998). Dymond and Oestmann (2002:48) highlighted some of the socio-economic impacts, which can add because of ICTs projects particularly to the local communities. For them the, “the benefits from ICT projects are inform of ‘consumer surpluses’, over and above the price paid for such services”. Such assistances can be in the method of business growth. Agriculturalists and small scale owners frequently say that the phones allow them to gain geographically and timely information, detailed information about economic development, which improves their control to bargain with “middlemen” and make them to make extra cash from their produce or safe a good price for their inputs. On other hand farmers, business women and students living in rural communities noted that some their phone calls have to do with business issues that would have made them to travel far distance just to bring a missive message or secure an answer to a problem.

This saves them the cost of travelling which is obviously higher than the cost of making calls. This means that when an individual resides in a remote area he or she has a higher advantage of saving costs. Other individuals believed that if calls were not made it brings effects mainly on personal or family members. Sometimes people only see their benefits in position of lifesaver, opportunities

and lower health risks. In the community where there are students and literate individuals it become easy for them to make use of computers example to download materials, business information etc. Institutions and government agencies are not left out for they align to the increase of efficiencies and the ability to convey services in a timelier through use of the ICT community projects (Dymond and Oestmann 2002). Focusing on the above impact, from field findings, this being a rural community, not all benefits were observed given the challenges of equipment and other services used while applying different ICTs. NGOs and a few institutions managed introducing and using these ICTs but this was for a short while given the costs which move along with ICTs and it being a rural setting, sticking to ICT standards was costly to many. However, the community felt the project was affecting their lives positively but with the challenges the telecentre is currently facing, there is little hope for the present and future generation.

1.6 Overview of the research approach

1.6.1 Introduction

This section discusses the strategies that the research will adopt in attaining the information necessary to achieve the research objective, research questions, the projected sources of information and procedures of data analysis. The general approach will be to use interpretive paradigm due to the subjective nature of the problem and as such, the research design will be qualitative since the study aims at exploring the role of digitalization in sustaining rural development. The qualitative approach will help in finding out the views and perception of technology users and non-technology users of a rural setting using Oshikoto region as a case study; thus, to understand the social and economic impacts of digitalization in the rural community. Since qualitative methods allow for triangulation other than mere fact presentation, completeness, credibility, and explanations, the researcher is optimistic that the findings will represent the role of digitalization in community rural development in Oshikoto region

1.6.2 Research Design: The Case

The research will adopt the case study design. It will employ the design so as to “allow for a holistic analysis of a case in sufficient breadth and width in order to get insight into the larger cases” (Oso and Onen 2005: 32). Within a critical realism framework to be used in the study, the study will use the qualitative methodology in order to find out respondents’ experiences from their own viewpoint. An area / place called Oshikoto is used as a case study. Oshikoto is part of the fourteen

(14) regions of Namibia; it got the name from Lake Otjikoto. Presently, Omuthiya is the administrative headquarters of Oshikoto. It has a population of 181,600 people (*Population 2015*). Its density is 4.7/km² (12/sq mi). The main pre occupation of the Northern part of the region is agriculture, while the Southern part is known for cattle farming and mining. The Northern and Southern parts of Oshikoto have close links culturally and historically. The Ndonga indigenes once extracted copper at Tsumeb for rings and tools production. Oshikoto is one out of the three Namibian regions with neither a shoreline nor a foreign border. The major crop grown in the north is pearl millet (Mahangu), while cattle farming take place in the Mangetti and the Tsumeb district. In as much as the mine at Tsumeb has a limited life span, with the support of subsidiary industries and services, they can boost commercial activities for the communities in that region.

There is communication network in most part of Oshikoto: a reliable access road passes across the region, which has linkage to the southern and the northern part of Namibia. The national microwave network terminates at Tsumeb, but telecommunications have passed through the region and as far as Oshikoto allowed by the laid optical fiber cable. This reason for choosing Oshikoto is its rural nature, which will enable the researcher to have, a better understanding of the role digitalization can play in a rural setting.

1.6.3 Study population

The population will be a crowd of persons who have detailed features/characteristics and are either directly or indirectly involved in the use of ICT for economic activities in and around Oshikoto and from which a sample will be drawn to control the parameters or characteristics (Creswell & Plano Clark, 2007; Maree & Pietersen, 2007). It will also target policy makers in the ICT ministry like those in the regional offices.

1.6.4 Sample selection and methods

The main sampling method for the study will be purposive – a non-probability form of sampling aiming at selecting interviewees in a strategic way depending on the research questions (Bryman 2008:415). Key informants like ICT officials both in the ministry and residents of Oshikoto region (both ICT users and non-project users in the area). Purposive sampling technique will be used in identifying samples to be used and in each category, random sampling will be used in order to select from target population.

1.6.5 Data collection instruments and methods

1.6.5.1 Semi-structured Interviews

The rationale for choosing to conduct one-on-one semi-structured interviews is to allow for addressing research questions properly and obtain in depth information from the interviewees on the issues addressed. Reference can be made to Bryman (2008:439), who said, “If a researcher is beginning the investigation with a fairly clear focus, [...] it is likely that the interviews will be semi structured ones, so that the more specific issues can be addressed.” The interview process will be flexible and will give the interviewees a better understanding on how to give reply, but with guidance, the interview process will be steered in a certain direction, even though there is also room for individual follow-up questions. When working in a group, semi- structured interviewing is also feasible so as to ‘ensure a modicum of comparability of interviewing style’ (Bryman, 2008:439). Respondents will be interviewed for getting in-depth information. This will enable triangulation of findings across sources and test issues of consistency and power.

1.6.5.2 Data analysis

Drawing from the interviews, “ideas or language and patterns of belief that link people together will be identified” (Oso & Onen, 2005). Through questioning the data and reflecting on the theoretical framework, the researcher will subject the ideas/data to significant intellectual analysis. As patterns and categories emerge in the data, the study will engage in the critical act of examining patterns that appear so apparent. In so doing, the researcher will come out with other probable clarifications for the data and the relationships among them.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of related literature on digitalization and rural development. It emphasizes the various research that has been carried out and how such knowledge can serve as a guide in examining the contribution of ICTs to sustainable rural development. This literature is also critically reviewed through identifying the gaps and also employing the lessons to inform the body of knowledge in ICT for development.

2.2 Digitalization and Sustainable Rural Development

Rural development is used to signify the various strategies used to enhance the living conditions in non-urban communities. “Such communities are characterized by predominant agricultural activities and where economic activities relate to the primary sector, production of food stuffs and raw materials” (Chamber 1983). Heeks (2008:26) propounds the reasons as to why ICT applications in communities and particularly in the semi-urban and rural areas should be prioritized. Firstly, he clarifies the ethical argument, which covers the ethical dimensions in development.

In Namibia, ICT is evolving and becoming a central channel for communication and an instrument for sustainable growth, comprising at the local levels and public levels. However, this view has not been bound effectively. This is the result of an ICTD “affordable infrastructure and related service delivery and capacity deficit” that numerous rural areas remain to knowledge and in part because of the “development-policy and experience divide” that hampers the effective use of ICT for developmental interventions. However “through a combination of research, policy support, advocacy partnerships, networking and capacity building, ICT projects can act as communication tools, development information and services hence the potential for strengthening community and local development” (Mulira2007).

Namibia, just like other countries, has documented the possible and qualifying element of ICT as a tool for socioeconomic development. The government has also contributed to its growth by creating the ICT ministry and providing ICT subsidies especially to ICT providers. However, a

large population of Namibians live in the rural area, where even ICT developments are untapped but the ministry has the department that targets ICT centres especially at the local level with the decentralized setting already in place: a favourable aspect to extend ICT even to the rural poor in the country. If ICT infrastructure is taken to these rural areas the process of digitalization of these areas will be smooth. This is because ICT and digitalization are at par. If there are no ICT infrastructures, digitalization cannot take place.

2.2.1 Information Communication Technology

Information and Communication Technologies have completely altered the styles of construction and organization of work at global and national levels and caused the process of development. The Millennium Declaration of the United Nations (UN) opinion ICTs as tools with the possible to attain the Millennium Development Goals set by the historic UN 2000 Summit. Target 18 calls upon member of the UN states to collaborate with the private sectors in order to benefit the new ICTs technologies ICTs (UNDP 2003). Most of the developing countries are advised to connect the information revolution to decrease poverty and seek constant growth. In addition, as Jinqui et al (2006: 294) notes, the risk of not partaking in the expansion of ICTs emphasized by the World Bank in addressing African issue is that:

The information revolution offers Africa a dramatic opportunity to leapfrog into the future, breaking out of decades of stagnation or decline. Africa needs to seize this opportunity, quickly. If African countries cannot take advantage of the information revolution and surf this great wave of technological change, they may be crushed by it. (World Bank cited in Jinqui et al (2006: 295))

2.2.2 ICT for Development (ICT4D)

During the 1980s, different corporations came in front and observed IT as a tool for delivering economic development (Heeks 2008:26). Until today, many people are confident that ICT has a role to play in national development and that there is no way a country can live the global age without this digital stand. Currently societies are greatly entangled in the world where ICT has

diffused into almost all ranges of human activity at an exceptional rate side by side with growth. Joseph (2002) sights ICT influence as ICT growth and ICT transmission where the former implies involvement in output, employment, and export earning, causing from the production of ICT interrelated goods and facilities that are incomplete to just one segment of the economy. The latter is ICT induced growth through improved efficiency, effectiveness, growth and human welfare resulting from the use of this technology by different subdivisions of the economy and society. This use of technology makes a major avenue for digitalization to take its course.

Conversely, Sein and Harindranath (2007) assert that ‘the nature of the link between IT and development remains unclear due to lack of clarity on how ICT is conceptualised’. Personally, I believe ICT can show a central role in national development but there is need to identify contextual strategies that facilitate ICT being developmental and in this I agree with Heeks (2008:26) who believes that we cannot exclude ourselves from the digital age but there is need to ask the poor communities on what ICT can develop and how they spend the little they have on it. Many ICT projects have been top down, the thinking for the developing world on what can help to bridge the ever-existing gap; and a techno centric approach has led to multi failures in ICT4D.

2.3 ICT and Rural Development

Rural development is used to indicate the progress of development through activities and initiatives that are practiced or taken to improve the living standard of the people living in non-urban, rural areas and remote villages. The societies are categorised by economic activities that relate to primary sectors, raw materials and food production, as well as the Agricultural activities (Chamber 1983).

The structure of South African Rural Development describes and outline rural development as assisting individuals in rural communities to establish the benefits in their own communities through local capacity, independent bodies, and investment in security and service justice. They deal with making sure women and children are protected from past injustice, and ensuring that there is security for the rural populations (Net tel Africa ...). The important principle in rural development are to make sure that during decision making the rural people are involved in every decision that affect their lives through association with rural local government, increase

employment, economic development and affordable infrastructure. In addition, Nettel Africa (...) Agrees to the fact that rural area are overpopulated in which most people are into farming or depend on natural resources in addition, this areas are afflicted by poverty.

Heeks (2008:26) proposes the details as to the importance to ICT for the unfortunate individuals living in developing countries and mainly the poorer within these countries like those in semi-urban and in rural areas. Firstly, he clarifies the ethical dispute, which includes the principled dimensions in development. "The world's poor live on the frontline of problems caused by informant professional from the wealthier countries from climate change to conflict and terror, from disease to resource depletion, where the poorer in developing countries grieve the most" (Heeks 2008:26). The request and demands from better of communities that are pleaded to assist the poor in technology by improving major problems that are caused by developed countries.

The developed countries edges the better- off societies to assist the poor people by designing technologies which will help them improving they living conditions. Second, there is a tolerant in self-interest that leads to many negative aspects, which also becomes a problem for the people at the top. When the poor get richer, they consume goods for the industrialised countries, which make everyone to benefit in the process of development (Heeks 2008:27). Heeks goes far in exploring the link of ICT that;

At the macro level, the economic, social, and political life in the 21st century will be increasingly digital, and those without ICTs will be increasingly excluded. We might also give a micro-level answer: Ask poor communities or look at how they spend what little money they have; not always, but sometimes, they prioritize the ICT option.).

ICT continue to develop as one of the most important tool for communication and exchange in both local and community level. The outcome of ICTD simply mean "affordable infrastructure and related service delivery and capacity deficit that numerous urban and rural communities continue to experience because of development-policy and experience divide" that delays the actual reason of growth in ICT involvements. Through a grouping of policies, study and networking ICT projects are resulted as communication tools for development and support communities for local development (Mulira 2007).

Countries like Uganda has acknowledged the possible element of social and economic development through information and communication technologies tools.

The government has also improved the growth by introducing the ICT ministry and ICT subsidies especially to ICT providers. However, a large population of Ugandans live in the rural settings, where even ICT developments are untapped but the ministry has the department that boards ICT centers especially at the local level with the decentralised setting already in place: a favourable aspect to extend ICT even to the rural poor in the country.

2.4 Nature of ICT in Rural Communities

According to Alemna and Sam (2006), detailed that through information centres and plans a rural community is geared up, it encourages the community members with excitement to make use of ICT services. It only show that people in the communities can be assisted to build their own information centres where native information is combined with other knowledge's to develop livelihoods. As they continue to oppose, the government alone in developing countries cannot carry any programmes in rural areas without the support from the various NGOs to reach development. ICTs are playing a huge role when it comes to the urban rural difference with other rural areas that need to be targeted because most of the technology activities happen in urban areas, which leads to lesser cost of implementation with literate people to adapt the technology. Just as Heeks proposes, equating the poorer with illiteracy is a broke for such developments every community has people that can act as infomediaries. Thus, enormously increasing the convenient way of getting online written materials although "we require interface innovation to drive access to ICT-based information, services, and jobs in the fields of audiovisual lines and to create interfaces for all local languages" (Heeks, 2008:28). There is an explosion use of mobile communication in rural communities, indicating signs that's ICTs are assumed as valuable tools for both business and socio-economic development that entice much more revenues than before. It is a great impact to people lives of rural population for good (Dymond and Oestmann, 2002).

In rural areas exist community- driven networks that offer possible solutions for speaking or contacting the rural connectivity that take advantages of latest wireless and other technologies that permit and allow cost-effective tools to reaching out to areas that have limited infrastructure.

However, the community has to know how to make use of this technology and exploit information accessible via the network, because physical access alone become meaningless. For community-driven information easily reached by means of network as well as the ICT skill set are important (Mulila, 2007). Some of the corporate ICT in rural areas are namely (Internet services, secretarial bureaus radios, community televisions and participatory video).

2.5 Implementation and Delivery of Digital infrastructure in rural communities

There is a direct correlation in the global information society between access to ICTs, which are digital infrastructure, and socioeconomic growth, and ICTs are no more the value of growth, but slightly a vital requirement for development (Net tel Africa ...). If the thoughtful has changed globally, the execution and delivery of such newer technologies particularly to rural communities should be thought of with great consideration. However, joining digital tools in the service provision of some of the world's most difficulties needs an indulgent of the implementation and delivery of ICT especially in the rural communities and this is why most times such developments have abandoned rural communities; well known for most challenges in ICT implementation.

Mulira (2007) argues that although the new technologies contribute largely to the development, the people remain the number one elements of development who should be responsible to set their development goals through their own groups, and to how these development goals will be accomplished. The effect here is that such technologies can be part of these tactical tools that can be used towards the accomplishment of the development goals. In this regard, one would agree with Muliras' who believes that strong community involvement in the planning and implementation activities would yield better developmental results. But, understanding the context of ICTs especially in rural communities would limit strong community involvement given the technical issues involved and also putting in mind that most rural communities like those in Uganda, are characterized by persons who do not have much expertise in getting involved in ICT projects; and if they do, just minimal participation is attained.

2.6 ICT Impacts on Rural Communities

Over the last two years, many of the developed countries have been in a transformation, which is

contributed by ICTs. To date, developing countries have also tracked suit in trying to catch-up in the development path. These technologies have been influential toward our lives namely in education, entertainment, economic, communication, and travel activities. They have been indivisibly connected with economic wealth and control, through Internet.

According to the study of Sein and Ahmad (2001) as well as Andrew and Petkov (2003) stated that if ICTs were correctly modified to local situations, then it can be an influential tool to fight poverty and increase sustainable development for the communities. Heeks (2008) notes that ICTs are currently being cohesive into a list of other development tools and approaches that might be suitable for growth. He suggests that this should start with classifying development goals, looking forward to know the role and importance of information and communication in accomplishing that goal, then study further to see if there is any other new technologies that could help deliver these goals.

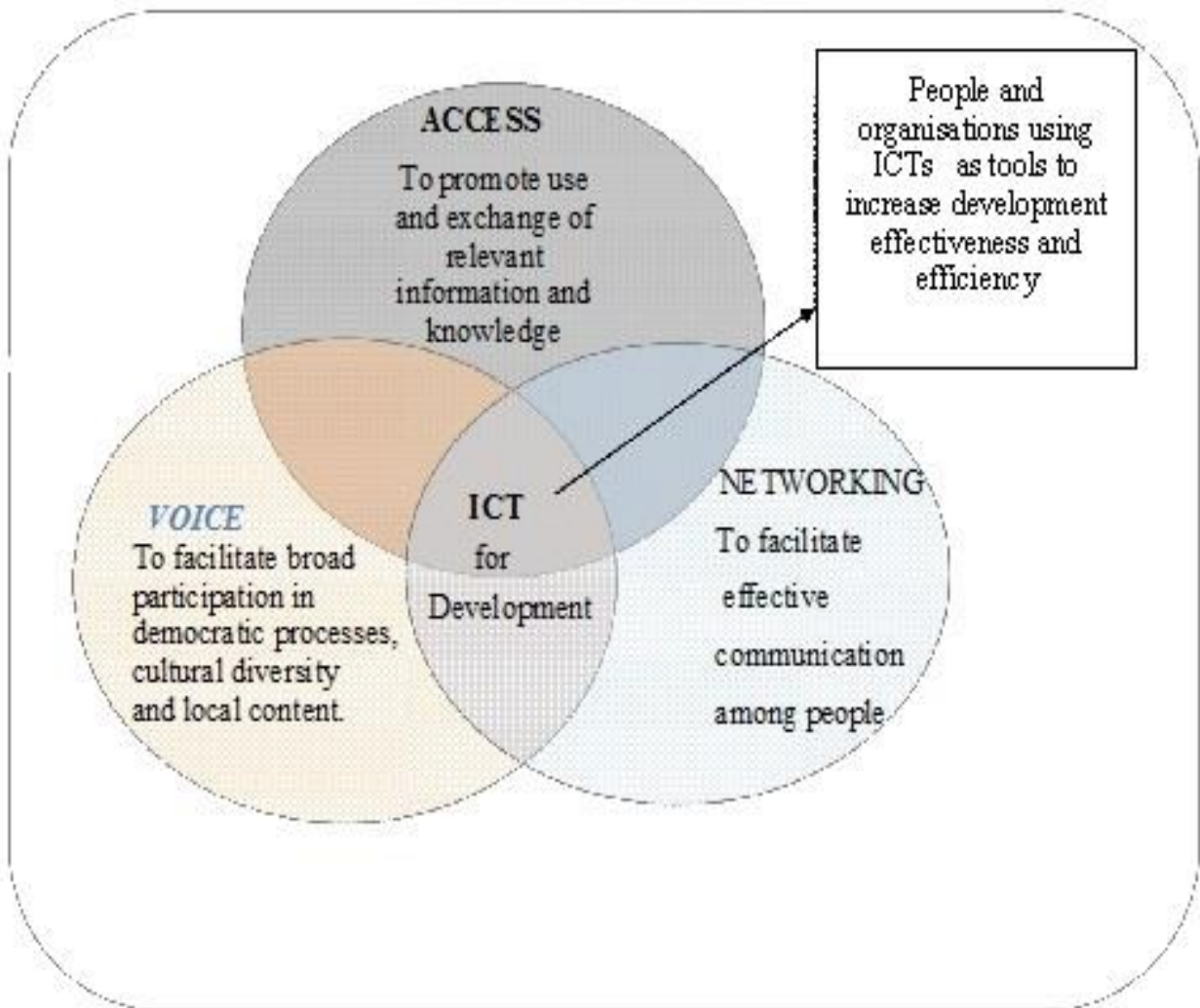
Given the works of Unwin (2009), Heeks (2008), Weigel and Waldburger (2004), it is arguable that the key to deploying ICTs effectively as tools in a given country should not begin with what ICT infrastructure. However, after a strong image of the nation's main growth experiments and a hard analysis on sustainable challenges on how and where ICTs can make an impact to those challenges. One does not begin with questions what ICTs a given country absences and what the country can do about it, but instead what specific types of change is needed to make a country more sustainable, in ways that include even the poor. As a possible set of tools, ICT can then be carried into study, which includes both rules and resources.

Therefore, ICTs can be perceived as means to other ends specifically sustainable communities, economic growth, reduction to poverty, great gender quality and opportunities to education. Most of mentioned ends has not been achieved yet and what could be the obstacles. The main thing is finding out knowledge and information can be used to transform this situations and then discover how technology can be used to support delivery. Many groups of this view believe that IVT should be abstracted as part of a bigger platform that goes beyond the technology activities and interactions performed in specific social and cultural settings. Weigel and Waldburger, (2004) offers a full structure for conceptualising ICTs for development depicted in Figure 2.1.

The context in Figure 2.1 finds three ways in which ICTs for development can be practiced to bring growth results that are applicable in the conceptualisation of ICT for sustainable communities. The first will be knowledgeable on how to get access to information and knowledge. ICTs are frequently defined in terms of their capacity to capture, store and process, transmit information, and share knowledge. This evidence and knowledge can relay to economically possible markets and income making chances, or community development activities, and education (CIDA, 2008). Having contact to information and knowledge maintain the society and gives to poverty decline by ideally letting persons to add to their sets (CIDA, 2008) and it also provide people with opportunities to commence production and engaging in labour markets while they participate in related exchange with other people (Ellis, 2000: 31).

In addition, appreciation and giving out of the native information influenced by the less fortunate people, particularly females, can improve to development if defined in such a way. The key factors of social development is information and knowledge, whereby knowledge empower and allow by giving an opportunity to people to make their own well-informed choices. Through ICT, there are general ways that can provide right to information and knowledge which contribute to the four factors aspects of sustainable communities such as (networking/learning, participation, improving transparency and social organization).

With new ways of getting access to information and knowledge offered by ICTs create important opportunities for four main aspects of sustainability namely improving transparency and accountability, participation, social organization, networking and learning. Access to important information and knowledge as emphasized earlier is key for empowerment and development (Weigel, 2004).



Source: Adapted from Weigel and Waldburger, 2004

Figure 2.2: ICT for Development Framework

The problematic issue with this conceptualisation is that it suggests that access to ICTs equals access to information and knowledge. There are however complex questions surrounding the issue of access to knowledge and information. Such as can individuals or groups reproduce knowledge just by transmitting information. These issues are much more complex because by definition information is interpreted data or organised data, while knowledge is codified by the recipients of the information and this is based on contextual factors that originate in the mind of the individual (see Section 2.2.5). For this reason the context of the people for whom access to information is targeted needs to be brought in as part of the equation in any analysis of the role access to information and knowledge delivered through ICTs can play.

The second connection between development and ICTs as proposed in Weigel's (2004) structure is the facilitation of a stronger voice of the people in democratic procedures and choices affecting their lives. A major constraint for people living in low-income communities is the lack of an effective voice in public life and on issues and decisions that directly affect their lives (Weigel, 2004). Access to ICTs can lead to the active participation of people, which is a precondition of "voice". They can be powerful tools in promoting the social inclusion that is a necessary factor for social sustainability. Tacchi (2006) defines "voice" as addition and contribution in social, political and economic approaches, meaning creating, independence and communication. ICTs and their relevance to "voice" can be related, for both individuals and groups, to a denial of access to modes of expression. The absence of access to technologies and platforms for supply of a range of different voices and it can be related to the absence of opportunities to participate in the design of ICT for development involvements themselves. ICTs can strengthen the voice of people with regard to their local culture and increase their contribution to the content of local media (Tacchi, 2006; Weigel, 2004). In this regard ICTs can contribute to community development by empowering citizens through participation and involvement in development initiatives.

Networking and communication among people is the third link in the framework (Figure 2.4). ICTs have changed the way that people interact and communicate. DiMaggio *et al.* (2001), for example, emphasis that the internet attempts altered methods of communication and different kinds of content (text, audio, visual images) in a particular medium. ICTs can strengthen community ties and aid in the formation of new communities (Gurstein, 2000; Haythornthwaite,

2002; 2005; Gaved and Mulholland, 2005). In developing countries, mobile phones and community radio are also transforming the way people network and interact and this is impacting the social capital of communities (Pigg and Crank, 2004; Kavanaugh and Patterson, 2002). This research builds on this framework and focuses on the ways ICT may be employed to give stronger voice of the people in communities, aid in enhancing community interactions through networking and communication among people and associations, and can provide access to relevant information and knowledge for community members as a strategy for enabling sustainable community development.

2.7 Utilizing ICTs for Community Development

The word community development is used to define participatory processes that up-keep service delivery and self-help when the local government is incapable to please and satisfy community ambitions (Gilchrist, 2007). Bartley (2003: 186) utters that networking with different people to help them to find ways to construct appreciative and provision between individuals to allow them make changes in their own lives and for better living standard and for the greater good. Municipal growth can be understood as a training of continuing community social connections, and as projects or programs that are aimed at implementing change or manipulating the community in some way. Development and communications studies have shown for some time that by giving people access to ICTs and encouraging them to create their own local content, they are better able to become active citizens (Simpson and Hunter, 2001; Stellar, 2002; Gurstein, 2001). Local content assists individual and community necessities, is easily accessible and promotes the social, cultural and/or economic development of the community, for example by building social capital and assisting local businesses.

The impression that ICT creativities can assist and help to empower local people in communities it has given a rise to many projects which is therefore seen as diverse variety of services providing right use and access to information and communication technologies (Shakeelet *et al.*, 2001:1). For better communication facilities and access of information telecentres have been supported throughout targeting impoverished communities. It is claimed that they will have greater influence if they allow the local people to be involved and participate in the management, evaluation, design and implementation (Caspary and O 'Connor, 2003; Colle, 2005; Gómez *et al.*, 1999; Roman and

Colle, 2002; Proenza, 2001; Whyte, 2000). There has been a long history of involvement of media in municipal deed, it is unexpected that not more ICT initiatives have built on this. Community involvement is usually supported in relations of telecentre schemes, with the hypothesis that this will lead to lasting sustainability. However, the funding models have not yet been proven to be entirely sustainable. With many other numerous areas that need study in this hypothesis, containing the model of information needs deeper assessment of the term sustainability and the causality and impact of ICT use (Blattman *et al.*, 2003; Hunt, 2001; Kanungo, 2004; Proenza, 2001; Roman and Colle, 2002).

ICTs have also showed to be valuable in some communities; example most poor women from Bangladeshi become phone workers for the Grameen Village Phone network, it has been witnessed an advance change and positive feedback by excellence of their fortunate access to a means of gaining valuable information (Aminuzamman, 2002). It uses two main approaches of ranging access to phone; first, one is providing phones straight to possible subscribers, which are mostly businesses and secondly renting out services of phones to Grameen Bank members who then gives services on a fee basis to the rest of the community.

Remarkable successes in telecentres methodology have always been there for community growth (Roman and Colle, 2002; Hunt, 2001; Kanungo, 2004), there is also a critical body of collected related works concerning telecentres. Robinson (1998) notes that in rural Mexico every after two years only five of the twenty-three innovative and useful telecentres are established by the Ministry of Environment in rural Mexico. Apart from that, a study by Best and Kumar (2008) to inspect a number of internet facilities in more than 50 various villages in rural India, under the Supportable Access in Rural India (SARI) and although it enjoyed many achievement it was still not sustainable.

Wade (2002:443) argues that for as long as there is a provision for connectivity and access for development, is likely to be saying that cheap books can cure illiteracy. He additionally stated that the concentration and focus on telecentres is no different from the disagreement between development and telephones. For instance level A is wealthy incorporated into market relationships with many telephones whilst level B is poorer, less integrated into market

relationships, and has fewer telephones thus a telephone rollout will make B wealthier and more interconnected (Wade, 2002:450). This telecentre method assist and support communities with technology although effective in some cases increases serious questions related with their economic, social and political sustainability (Gomez, 2010; Best and Kumar, 2008).

Certainly, according to most studies the better and best way to ensure that economic accomplishment of ICT in communities is to encourage the local people to be participant and create social foundations in support of new technologies (Kenny, 2001). In detail it only means assisting communities plan or outline their needs in terms of information (what, when, where, for what purpose and how), communication (with whom, why, and how) and Education and training (who needs it, when, where, and how) (Paisley and Richardson, 1998). The fast emergence and new enunciations of ICTs in marginalised communities therefore propose a need to understand and develop culturally suitable edges not only as avenues for information to be dispersed and exchanged among marginalised people, but also for local content creation, if there is to be meaningful uptake of ICTs in these communities.

2.8 Implementation and delivery of ICT in rural communities

The type of information society we now live in has provided an uninterrupted link between technology access and socio-economic development therefore; technologies are no longer values of development, but slightly a basic ailment for development (Net tel Africa ...). If the thinking has changed globally, the operation and delivery of such newer technologies especially to rural communities should be thought of with great consideration. However, linking digital skills and technologies in the service of some of the world's most serious complications involves considering the implementation and delivery of ICT especially in the rural communities and this is why most times such developments have deserted rural communities; well known for most challenges in ICT implementation.

Mulira (2007:29) argues that; “although the new technologies are part of the necessities for development, the main ingredients of development are the people themselves who should state their development goals for their own communities, and how these development goals will be achieved”. This is to say that technology can be seen as a major player towards achieving

developmental goals. However, bearing in mind the context of ICTs particularly in rural communities bring limitation to strong community involvement due to the technicalities involved and also considering that a variety of rural communities like those in Namibia, people do not have much knowledge and technical know-how in getting involved in ICT projects; and if they do, their participation in minimal.

The influence of ICT on development has been appropriately monitored in the recent past by means of different processes, which includes pervasive and multi-stakeholder. The impact is so important to those that have skills of applying these technologies, as they have perceived “galloping” rates of development (Tarjanne1998).

CHAPTER THREE: UNDERPINNING THEORY

3.1 Introduction

Former conceptions of technology have each observed on some phases of technology using the expense of other hoping to get the result of current state of knowledge in companies that was unclear and causing conflicts (Nampijja 2010). This chapter will discuss the theory underpinning this research, which is the theory of duality of technology. This chapter will also discuss its significant effects for research into Information Systems (IS) and how it relates to this study.

Orlikowski (1992) developed an interpretation of technology that explains it as an objective certainty and an artifact that is created socially. The view sums up the organisational technology into two main camps: “(a) technology is an objective external force that has deterministic impacts on organisational properties; and (b) technology is influenced by humans and is the outcome of strategic choice and social action” Orlikowski (1992). When defining technology, the theory explains technology as “both physically constructed by actors working in a given social context, and socially constructed by actors through the different meanings they attach to it and how they use its feature sets” (p.38). This could be likened to how technology is viewed and used for institutional change and socio- economic development.

Furthermore, considering the fact that it is continuous action of individuals (who can be known as human agents or actors), which institutionalizes and objectifies technology, agencies and structures are not autonomous. Their actions portray that human actors have the responsibility of creating technology. Orlikowski (1992) posits, “technology is the product of human action and is the outcome of creative human actions such as design, development, appropriations and modification”. Human agents build into technology through rules replicating knowledge, facilities to complete a task and standards on how work is to be done.

3.2 Theory in empirical research

Opinions that are relating to ICT for development range from the role of ICT in in the societies and its influence of the developing world at personal level. From the world level, Castells (1996) argued that ICT has been of a great influence that has shaped societies latest approach of development. The lower level that contain of individuals from different backgrounds are concerned with access and use of ICT facilities, for which van Dijk& Hacker (2003) sated that there is structure taking into account the dimensions in usage, skills, material and mental. Speaking of material facilities such as internet the most used facility is necessary but not sufficient to be used. The unfairness and usage between developing and developed countries allowed this view to be linked to toward ICT.

Gurstein (2003) invented the watchword “effective use”, this was for him to highlight the reputation and importance of “the capacity and opportunity to successfully integrate ICTs into the accomplishment of self or collaboratively identified goals”. Without the actual use, digital can be prohibited because it will contribute to the rise of social exclusion in a “digital vicious cycle” (Warren, 2007) it has always been the case for general ICT use. Concerning all this issues they have been supported by empirical evidence from the developing world (Howard, 2007), and no fitness was experienced in the past which included people in the communication groups for development (Kleine& Unwin, 2009). Now there is an absence of theoretical and conceptual underpinning for much of ICT4D allied studies.

3.3 Social theories and technology research

The social theory details that networks of relationships are the resources that can enable contact to other types/means of value to individuals for specific reasons and purposes (Balatti and Falk, 2002) In looking at social capital supported opportunities for ICT, emphasis is on how the social capital perception can be a link through which ICT skills and applications can cling on. Moreover, as Balatti and Falk (2002) put it, social wealth terms the resources that are accessed to persons or crowds by feature of networks, related standards and belief. Social networks, which enhance interactions both individually and collectively in communities, are considered to being knowledge resources, which ICT can as well exploit.

Norris (2003) believes that the network of friends, colleagues and neighbors are frequently associated with standards of generalised mutuality in the skein of mutual responsibility and obligations, which in the end improves coordination and collaboration. In here, shared understanding, Approved techniques and social dependence created by individual interaction and networks are supposed to make it possible and easier for people to work together for common benefits. In this regard, since the ICT project understudy is a community-facilitated initiative, the study established this essential role social capital could avail to ICT.

In the same light, Putman (2000) suggests that organisations in civil society like churches and community groups play an important role by linking assorted societal cleavages, fit in people from diverse backgrounds and values there by supporting the heart of tolerance, collaboration and mutuality thus contributing towards a compact rich and vibrant social infrastructure.

Social capital treats learning not as a matter of individual gaining of skills and knowledge but as a purpose of identifiable social interactions (Balatti and Falk 2002). And in this same light, since ICT involves skills gaining and in this case to a rural community where ICT resources are not sufficient, social capital composition in passing on knowledge to others can help the acquisition of such ICT skills and this was actually the case with the on-line discussion platform the ICT beneficiaries in the study engaged in.

Relating social capital to the study, the researcher personally feels the avenues of using social capital for gaining of skills is supreme and ICT being a bridge through which social capital can base on paramount. So the study used these avenues of the two-fold nature of social capital and ICT to understand whether social capital plays a role in helping the indigenes of Oshikoto region to gain skills. It was also to understand where social capital was not emphasized and yet it can be strongly helpful, the study proposed aspects management can think of in continuing to serve the community. The above models, coupled with literature review provide a lens through which the study analysed the role of digitalization in Oshikoto region. While as ICT especially in rural areas have suffered from scalability and sustainability mechanisms, the study used dimensions of duality of technology of Structuration Theory which helped in exploring the impacts of the projects to the community.

3.4 Duality of technology

The concept of duality of technology defines IT as the social construct of an individual's doings in relation to particular structural and cultural settings. Furthermore, IT can be seen as a set of rules and resources implicated in enabling conduct, which leads to the production and reproduction along with the transformation of those settings (Rose & Scheepers, 2001).

The notion of duality of technology is deeply investigated by Orlikowski (1992) who expressed the view of technology not to be solely perceived as a physical object, even though she does define it as a material artifact. She further explains material artefacts as:

“the outcome of coordinated human action and hence inherently social.”

Orlikowski (1992) and Jones & Karsten (2008) further argued that material artefacts are:

“created and changed by human action, but also used by humans to accomplish some actions.”

This is thus labelled as the duality of technology. Orlikowski (1992:411) asserts that technology can strengthen or change the established structure of organisations. Thus, reinforcement happens when users follow the technology's rules and resources. This was further articulated by Twum-Darko (2011:63 and 2014), Twum-Darko and Sibanyoni (2014) and Twum-Darko and Iyamu (2015).

The duality of technology sees preceding opinions of the technology facilities as either unbiased power or generally built product as a false clash. Technology is the creation of human action, while it also accepts basic possessions. That is, “technology is physically constructed by actors working in a given social context and is socially constructed by actors through the different meanings they attach to it and the various features they emphasize and use.” However, once technology get to be arranged it becomes longstanding and ends up losing its joints with human agents that have made it and it performs to be part of the objective, structural properties of the organization.

Organizations and Agencies are not self-regulating, its individuals that uses technology and objectifies it. Thus, if the human agent tend to change the technology in an interpretively very every time they make use of it will end up taking up the stability that is necessary for

institutionalization. However, with such a frequent evolving interaction with technology would challenge and weaken the benefit of using technology to achieve a goal.

Wynne (1988, p. 159), explained the situation of the British water transfer project that was implemented to assist in the increase of water demand expected for an outcome of project industrial. At the time of the design of this project and operation of technology, it was projected that the structure will pump repeatedly and with full ability. However, a period later it happened to be that the social expectations had been incorrect. The people got very disappointed because the water has not increased at all, and as the outcome the scheme was only used for some times and lay still for weeks. The challenge allowed growth of a large opening in the tunnel that causes an explosion with significant loss of lives.

The circumstance where no longer valid due to the assumption served as conditions normal operation in technology. The circumstances became unknown by the users and unavailable for the people that have sponsored technology and developers that where long gone.

As stated that a critical phase of human action is that it is knowledgeable, though many acts taken by human may have projected and unintended concerns. For instance, an organization that approves or make use of emails may have values of increasing communication and sharing of information (Sproull and Kiesler 1986). Other human agents that make use of technology has a direct outcome on local conditions in the environment of where they live. For instance, an individual can make use of a spreadsheet application to work out or calculate the annual revenues of the company, and built an impression of genuine business. However, the importance of that rule is to repeat the same thing established by the accounting professionals. They are also more vulnerable to technological breakdowns, which disrupt workflow, increase costs and delays, and adversely affect customers.

Looking at technology as the making of human action, Orlikowski (1992) not only stated that technology is in existence because of human actions but also added that it is the product credited to the actions of human agents linked to its ongoing maintenance and usage. With no human action, technology is therefore of no importance, it is influential through its usage.

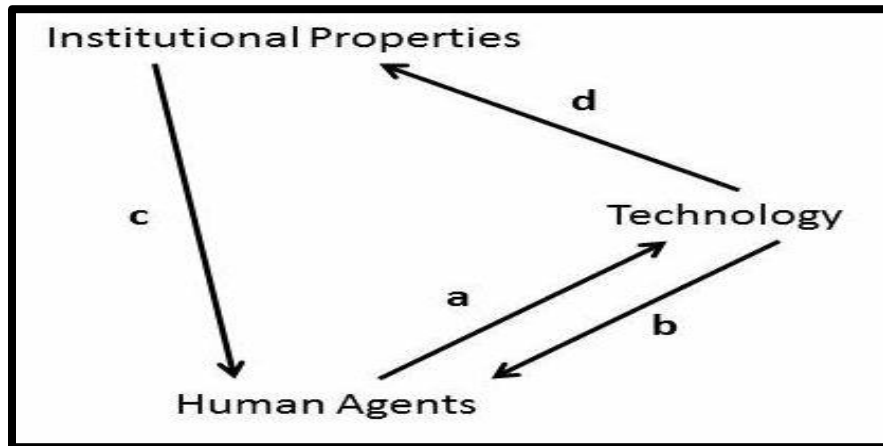


Figure 3.2: Duality of Technology (Orlikowski (1992))

Therefore, technology can only be understood through the action of human agents (p.410). Orlikowski (1992) noted that “the institutional conditions and human agents involved in technology development and use are different; a technology maybe developed by one organisation, used by another, and transferred into a third”.

Therefore, this grips main effects for research into IS. This means that “when an information system is strictly considered as having a reality of its own and as such independent of people’ interpretation of it, important information can be overlooked due to the failure to acknowledge the influence of people’s interpretation of it through interaction with it” (Orlikowski and Robey 1991, p.10).

3.5. Conceptual Research framework

Sustainable development symbolizes a substantial global challenge by compelling societies to equate the yearning for economic prosperity with the obligation to make sure there is continuous environmental protection and social development. Developing countries are mostly susceptible and are faced with enormous hurdles to sustainability. Consequently, much effort is placed on IT which is seen to have a powerful potential, easily accessible and an inexpensive means of facilitating the shift towards sustainable growth. “IT, including high-speed computing, Internet, mobile telephony, geographic positioning systems, and Wi-Fi are major enablers of these economic activities and services” (Madon, 2000, p.23).

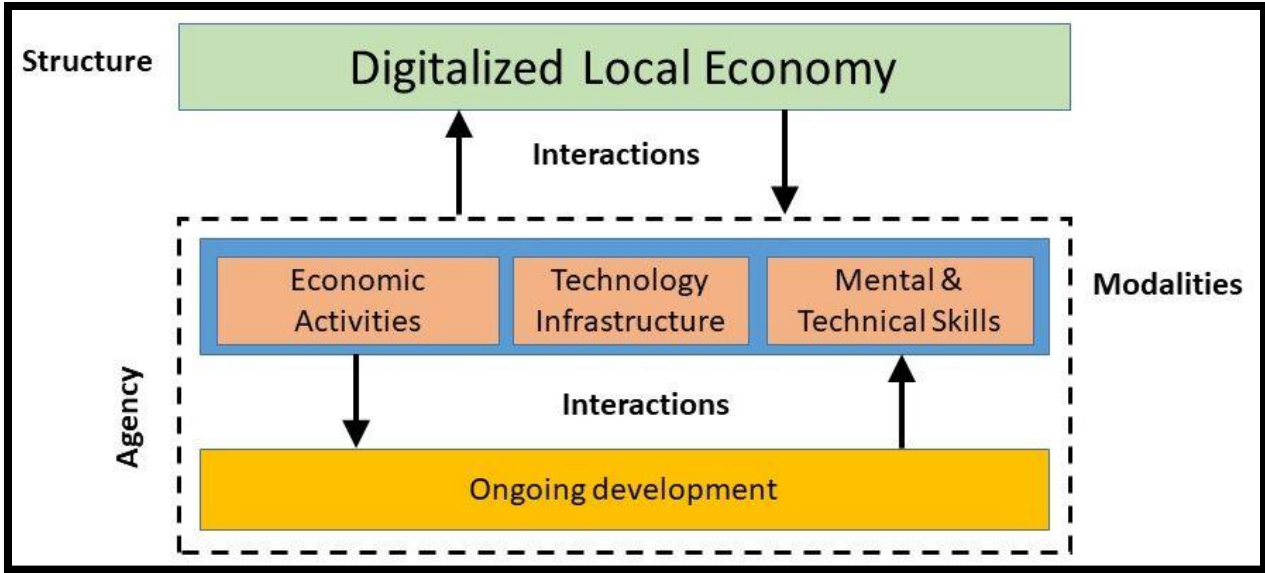


Figure 3.2: Conceptual Research Framework

In as much as there are other ways to achieve sustainability, it is quite significant to note that technology has brought in many changes in the daily lives of individuals. Not minding the mental skills an individual has, technical skills are always important. For the individual to have technological skill, his mind-set must be focused towards using available technical and mental skills facilitated by technology. This means that there must be an interaction between the individual and technology. Therefore, there must be that belief that technology will facilitate sustainable technological development for this goal to be achieved. If technology is accepted and integrated into the various types of economic activities, its benefits will be impacted on the community to bring about sustainable development.

CHAPTER FOUR: RESEARCH DESIGN

4.1 Introduction

This section confers the strategies that the research adopted in attaining the information necessary to achieve the research objective, research questions, the projected sources of information and procedures of data analysis. The general approach used is the interpretive paradigm due to the subjective nature of the problem and as such the research design used was qualitative since the study explored the role of digitalization in sustaining rural development. The qualitative approach helped in finding out the views and perception of technology users and non-technology users of a rural setting using Oshikoto region as a case study; thus to understand the social and economic impacts of digitalization in the rural community. Since Qualitative methods allow for triangulation other than mere fact presentation, completeness, credibility, and explanations, the researcher is optimistic that the findings will represent the role of digitalization in community rural development in Oshikoto region.

4.2 Research paradigm

The philosophical assumptions that underlies this research stems from the interpretive tradition. This denotes a subjective epistemology and the ontological belief that reality is socially constructed. According to Walsham (1993), the epistemological stance on interpretive approaches is that knowledge of reality is gained only through social constructions such as language, shared meanings, tools, documents, etc. In an interpretive research project there are no predefined dependent and independent variables, but a focus on the complexity of human sense-making as the situation emerges (Kaplan and Maxwell, 1994). Those who espouse the interpretive approach, claim that social phenomena must be understood in the social contexts in which they are constructed and reproduced through their activities.

4.3 Interpretive Research Approach

Based on the philosophical assumptions adopted, research can be classified as positivist, interpretive and critical (Myers et. al., 1998). Different research methods such as case study, and action research, can be positivist, or interpretive or critical, though often this distribution is extremely contentious (Walsham, 1995a).

An IS research project can be considered positivist if there is evidence of formal propositions, quantifiable measures of variables, hypothesis testing, deducing the inferences concerning the phenomena from the representative sample to a stated population (Orlikowski and Baroudi, 1991). Positivist approaches assume that the relationship between social reality and humans is independent, objective of the cause and-effect type. This approach has, however, been criticised in the literature on IS for its treatment of organisational reality, which is regarded as complex and not easily amenable to statistical deduction.

The use of the interpretive perspective will facilitate an increase in our understanding of the critical, social and organizational issues that are related to the adaptation and adoption of ICT/IS in organisations or communities. The interpretive approach operates under the assumption that access to reality is only possible through social constructions such as language and shared meanings. It has its philosophical base in hermeneutics and phenomenology. Walsham (1993) asserts that the purpose of the interpretive approach in IS is to produce an understanding of the context of IS and the process whereby IS influences and is influenced by the context. Interpretive approaches give the research greater scope to address issues of influence and impact, and to ask questions such as ‘why’ and ‘how’ particular technological trajectories are created (Boland, 1985, 1991; Orlikowski and Baroudi, 1991; Deetz, 1996).

4.4 Research Strategy and Design: The Case

4.4.1 Introduction

The research adopted the case study approach. It employed this research design approach so as to “allow for a holistic analysis of a case in sufficient breadth and width in order to get insight into the larger cases” (Oso and Onen 2005: 32). In the context of critical realism framework, the assumption was that there has not been enough literature that has chronologically provided insight into the phenomenon and as such adopting a subjective ontological stance would adequately make contribution to the understanding of the phenomenon. Furthermore, based on this reality and what can be known about this phenomenon, the study adopted an interpretive approach as a means through which the embedded human knowledge can be investigated to deepen the understanding of the phenomenon. The study therefore used the qualitative methodology in order to find out respondents’ experiences from their own viewpoint.

There are of focus which in this research is called Oshikoto, as one of the fourteen (14) regions of Namibia, got its name from Lake Otjikoto. Presently, Omuthiya is the administrative headquarters of Oshikoto. It has a population of 181,600 people (*Population 2015*). Its density is 4.7/km² (12/sqm). The main occupation of the northern part of the region is agriculture, while the southern part is known for cattle farming and mining. The northern and southern parts of Oshikoto have close links culturally and historically. The Ndonga indigenes once extracted copper at Tsumeb for rings and tools production. Oshikoto is one out of the three Namibian regions with neither a shoreline nor a foreign border.

The major crop grown in the north is Pearl Millet (Mahangu), while cattle farming takes place in the Mangetti and the Tsumeb district. In as much as the mine at Tsumeb has a limited life span, with the support of subsidiary industries and services, they can boost commercial activities for the communities in that region.

There is communication network in most part of Oshikoto: a smooth access road passes across the region which has linkage to the southern and the northern part of Namibia. The national microwave network dismisses at Tsumeb, but telecommunications have conceded through the region and as far as Oshakati permitted by the laid optical fiber cable. This reason for choosing Oshikoto region is because of its rural nature, which will enable the researcher to have a better understanding of the role digitalization, can play in a rural setting

4.4.2 Study population

The population was a group of persons who possessed specific characteristics and are either directly or indirectly involved in the practice of ICT for economic activities in and around Oshikoto. A sample was drawn from this population to control the limitations or characteristics (Creswell & Plano Clark, 2007; Maree & Pietersen, 2007). It also targeted policy makers in the ICT ministry like those in the regional offices.

4.4.3 Sample selection and methods

The main sampling method for the study was purposive a non-probability method of sampling targeting at selecting interviewees in a strategic way liable on the research questions (Bryman 2008:415). Key members were ICT officials in both the ministry and residents of Oshikoto region (both ICT users and non-project users in the area). This sampling method enabled the

identification and categorization of samples and in each category; random sampling was used in order to select members from the target population.

4.5 Data collection instruments and methods

4.5.1 Semi-structured Interviews

The rationale for choosing to conduct one-to-one semi-structured interviews was to be able to address the research questions and adequately obtain in-depth information from the interviewees on the phenomenon. Reference can be made to Bryman (2008:439), who states that:

“If a researcher is beginning the investigation with a fairly clear focus ...it is likely that the interviews will be semi structured ones, so that the more specific issues can be addressed.”

The interview process was flexible and gave the interviewees a better understanding of how to give reply, but with guidance, the interview process were steered in intended direction, even though there was also room for individual follow-up questions. This enabled triangulation of findings across sources and test issues of consistency and validity.

4.5.2 Data analysis

From the interviews, “ideas or language and patterns of belief that link people together was identified” (Oso & Onen 2005). Through scrutinizing the data and reflecting on the theoretical framework, the ideas/data were subjected to significant intellectual analysis. As patterns and categories emerged in the data, the study engaged in the critical act of examining patterns that appeared so apparent. In so doing, other probable clarifications came out with the data and the relationships among them.

4.5.3 Validity and Reliability

To begin the validity, the tool was subjected to the study of two specialists who considered the meaning of each item in the instruments to the objectives. Their references were used to finally amend questions and the format of the tools that had the ability to ask the expected data.

4.6 Ethical considerations

Permission to conduct the research study in the chosen locality was obtained from the authorities responsible in the region. Before leading interviews, the purpose of the study was clearly clarified to the respondents and approval for participating in the interview was sought from them. It was also emphasized to them that the information collected from them would be treated with due confidentiality. Additionally, respondents were at liberty either to answer or not to answer the study questions that were provided to them.

CHAPTER FIVE: FINDINGS AND INTERPRETATION

5.1 Introduction

The main aim of the study was to discover the role of digitalization in sustainable local economic development of the Oshikoto region of Namibia. Much focus was on analysing people's perception of digitalization and a boundless level of sorting the plans to ensure its sustainability. The data found in this chapter is in line with the research questions, literature reviewed and the theoretical framework.

This chapter is divided into four sectors. The first section analyses the background characteristics of the respondents as a way to understand their social-economic background visé their relationship with digitalization in the region. The second section looks at the kinds of technology activities taking place in the local economic of Oshikoto. The third section looks at the perceptions of the local people about the digitalization activities taking place in the local economy of Oshikoto. The last section looks at general guidelines that can be recommended to digitalize sustainable local development in Oshikoto.

Section 1: The Respondents

5.2 Background Characteristics of the Respondents

This section provides information about the background characteristics of the respondents in Omuthiya district. These characteristics include categories of residence, villages of residence, and gender of the respondents.

Table 1: Categories of the Respondents for the Study

Categories	Frequency (n=15)
Managerial level [ML]	5
Supervisory level [SL]	5
Local people(ordinary) [LP]	5

Source: Field Findings

In total, the study employed 15 interviewees, 5 fall under managerial level, other 5 falls under supervisory and the other 5 were ordinary people.

Table 2: Distribution of Respondents by Gender

Gender	Frequency (n=15)
Females	7
Males	8
Total	15

Source: Field Findings

This study put in thoughts that the gender viewpoint not only in data collection but also in the interpretation of findings. Through observation in the above table, it can be deduced that almost 46.6% percent of the study composed of female respondents. Although men as respondents account for 53.3% percent, most of them where seen in technical fields. For example, among the 15 respondents, only 7 were females. Also, in the supervisory positions, most of those interviewed where males and the region is composed of men and few women.

5.3 Section 2

Technology activities and local economy of Oshikoto

This section looks at the various activities carried out by the indigenes of the Oshikoto region and how technology is used to carry out these activities. When the participants were asked **if they are aware of any technology related activities local people of Oshikoto are engage in and if so, what are these activities**, the following were said:

Yes, cell phone banking introduced to the local people to make use of. [ML]

Let's create awareness, and also let the people know the danger of digitalization as you find the bad people that know about it and they try to take advantage for those that don't know. People should be educated about the negative and positive impacts should also be known[SL]

Furthermore, the participants were asked to state how these technology activities were used. Their responses were as follows:

We use phones to make internet transactions, and also deposit money [LP];

We make presentations using projectors [SL]

Computers are used for typing and internet for research purpose [LP]

Another question that was posed to the participants is **if these technology activities are meaningful to their lives**. They responded as;

They are meaningful because you don't have to spent time in queues anymore. [LP]

They are meaningful because this student's will someday have to go into the industry and they acquired to make use of technology [LP]

Yes, they are, not only for me but for the community at large, some people in their lives have never operated with the computer before but because of the centre, they get an opportunity to [LP]

Local people go directly to the centre to make use of the devices[MP]

I believe they are, back than we had to spent time waiting on a specific services, like they use to give service manually and i guess they were probably helping in a day approximately 30- 40 people and people had the necessity to come early in the morning to queue up and now due to technology things are improving. We also getting radio transmission now, our network back than there wasn't really network coverage but now the network is being upgraded [LP]

5.3.1 What management strategies are in place to ensure sustainability through the use of ICT facilities?

This was another question posed to the participants. They responded in various ways. Their responses are;

- *We buy them in shops and through online. [LP]*
- *As for schools they are being sponsored by government and public sectors. [ML]*
- *Technology is one of the things that we are striving for and we*

should use because this is where the world is going[SL]

- *The management in place at the centre is that there are people working there to ensure that the facilities are used effectively and managed on the daily bases[ML]*
- *I don't really know much about the management strategies[LP].*
- *Now we are talking on the governmental level, whereby the government in their natural sense they are also trying to get away from the manual systems[ML].*
- *They want to have coverage in terms of telecommunication across all the corners in the country in terms of vision 2030; they are trying to achieve that[ML]*
- *They do have long terms strategies and in terms of ensuring sustainability they have been sending staffs for training overseas. Which is something good; they are trying to empower people, to ensure that people pass on the information to the local people[SL]*

5.3.2 Are you aware of any technology related activities local people of Oshikoto engage in? If so, what are these activities?

According to the interview participants, one of the technological activities that take place in the regions is the cell phone banking which the bank introduced to the local people. This is what they have to say.

- *Technology has brought a lot of relief in the sense that it has reduced the burden of carrying money around and making payment. We also use it to take online short courses[LP]*

5.3.3 Are the activities meaningful to your lives?

The respondents believe that these activities are meaningful in their lives because they do not need to spend time in queues to get services and information access is now easy. All study respondents explained the different activities the project provides to the community. In their own words,

Training the community in computer applications like introducing the computers and its key components especially for the semi illiterates, training in MS windows, MS word, MS Excel as packages especially for the youths, and those in professional positions like the doctors, secretaries and the teachers, providing secretarial services to the community like typing, printing, scanning, photocopying, radio broadcasting which performs functions like advertising, educating, informing, marketing, training communities in developmental aspects using the digital content in making ICT meaningful to our lives, and digital content development done by capturing movie and photos in the field and passing on to the rest in educational forma[LP]

5.3.4 What management strategies are in place to ensure sustainability through the use of ICT facilities?

The implementation and delivery of innovative technologies especially to rural communities should be thought of with great consideration since such localities are known to be at a great disadvantage in terms of ICT delivery (Mulira 2007). It is consequently, from this linked that the study follows to understand the role of ICT in community rural development would require an analysis on how the ICT project implements and runs activities in a rural setting. Therefore, it is important to look at the management strategies that are in place to ensure sustainability through the use of ICT facilities

Strategies are formulated to care for or enhance certain activity. The respondents indicated that at government level, the idea is to get away from the manual systems. They also revealed the government strategic plans of try to have coverage in terms of telecommunication across all the corners in the country in terms of vision 2030. Some of the supervisors interviewed revealed that government has long term strategies in terms of ensuring sustainability. For instance, sending staff for training overseas, empowering people in the area of grants and donation of ICT facilities to community development center so as to ensure that the locals are trained to become computer literate.

Some of the top management personnel interviewed by the researcher have this to say:

There are people working there to ensure that ICT facilities are used effectively and managed on the daily bases[SL]

5.4 Section 3

What are the perceptions of the local people about the digitalization activities taking place in the local economy of Oshikoto?

5.4.1 What do you know about digitalization?

The way people feel about digitalization determine its acceptance and adoption. If they feel it is not important, their attitude towards its usage will be on the negative side, therefore, their perception is very crucial to its usage.

When the participants were asked about what they know about digitalization, their answers were diverse. Their responses are as follows:

I think of new technology, advanced technology starting from the 20th century up to now”[LP]

It is the converting of the information into system way, whereby systems are taken from traditional way to modern, and then being converted into systematic and saved into bits[SL]

Is the removing of paper work and using software’s and computers, it’s also the way of communicating electronically [SL]

In as much as these respondents see it in different perspective one striking thing is that the members of the community are aware that digitalization has a way of transformation the technological space in the community. This can be seen from their responses.

From their responses one will note that there is positive attitude towards the use of technology. The respondents believe that the behavior of members of the community toward technology is quite impressive. It was also noted that technology has made work easier for the general populace.

Though some of the respondents indicated that in as much as the general behavior of the members of the community towards digitalization is positive, a lot still needs to be done in the area of awareness as this will expose them and encourage them to use technology for their day to day activity.

5.4.2 What change have you witnessed in your lives ever since ICT was introduced in this region?

One of the changes that have taken place since the introduction of technology is in the part of efficient communication through the practice and usage of the internet, at different locations. This was noted by some of the respondents. Below are their comments;

*People communicate efficiently by using internet, at different locations
[ML]*

The local authority really wants to encourage but not many people are exposed to technology, only a few will want to partake [ML]

Everywhere where there is education obviously there will be changes for instance one of the changes is to be able to see someone that have not used a computer before but now are well to it, seeing elders with phones trying to access internet [LP]

For this to be more effective the local authority will have to put more effort to encourage but not many people. Most of the respondents saw the changes in the area of education, communication. As noted, learners in Oshikoto region benefit from digitalization through access to educational material through the internet. Most times, they use their cellphone to download materials since it is the easiest way to go about it. It was also noted the communication is now easy since one may not need to travel long distance to disseminate information. They do this through phone calls, television SMS and other means which have been made available to them through the use of ICT.

5.4.3 Does the local authority encourage the local people to get engaged in digitalization activities?

For digitalization to be effective authorities in charge must have to create an enabling

environment. This will encourage individuals to be more active in performing their activities.

The respondents also agreed in this direction. Some of them noted that most government establishments have customer service where assistance is given to those who need it. They are also motivated by offering the computer literacy platforms for free and also by taking technology to schools. Though in as much as the authorities carry out these activities, some respondents revealed that there are still challenges particularly in the area of internet access. They feel that this should be given priority so as to make digitalization more effective. Below is a summary of their responses;

Yes, they do because they are also working on customer service [LP]

The challenges are there, because in technology you have to make use of technology, and it also requires internet. The network connections are a bit challenging [LP]

They are encouraging, especially by offering the computer literacy platforms for free and also by taking technology to schools [LP]

To be honest I still have to see an employee from the local authority to really promote digitalization is something that we don't really see on a day to day bases, there's that a lot of bureaucracy it's very difficult to even know who is really responsible to up bring our town in terms of digitalization, but in actual sense I don't see much promotion coming from there, am still yet to see, maybe I missed it but I don't see it in broad but they still have room to improve a lot[LP]

In as much as some of the respondents believe that the local author is encouraging digitalization, some still have doubt. They noted that it is difficult to see an employee of the authority engage in the promotion of digitalization as they argued that most of them just pay lip service. They also mentioned the problem of bureaucracy in government where it takes a lot of time for decisions to be made as one of the reasons for slow digitalization in the Oshikoto region.

5.4.4 Are there any challenges you face in trying to make use of digitalization activities?

In as such as digitalization activities can transform the environment, it has it challenges in the Oshikoto region. As noted by some of the respondents,

Some people are not aware or trained on how to use technology that is implemented [LP]

One of the challenges is that we have been experiencing economic crisis in Namibia, an able to pay employees working in centres[SL]

Sometimes it's hard to convince the local people to see the centre.

Local authority is working very hard to overcome such[ML]

The challenges of network coverage and failures were noted as another problem being faced in the region. In terms of infrastructural maintenance this was mentioned as a basic problem faced since most facilities installed are not being maintained leading to incessant breakdown.

5.5 Section 4

What general guidelines can be recommended to digitalize sustainable local development in Oshikoto?

5.5.1 What do you know about the laws/ policies that facilitate growth of local economic development?

Oshikoto region, being mostly a rural setting, is made up of peasant farmers. Most of them did not have the conventional education. This may be the reason why some of the respondents noted that they do not know much about the policies of government.

A majority of the respondent noted as follows:

No I don't know much about the policies [LP]

I cannot really say much about the policies in place because Namibia is a

country full of democracy and you cannot force someone to do something out of their will. Unless if there are laws that covers the boundaries of the use of digitalization e.g. cybercrime laws [LP]

I am not aware of such policies, in this town we are usually depended from government I do not really see them making promotions and they are not letting us what the policies they have in place and programs. If it was there I would have known. On the national broad I think I have heard of a few but on this specific region I haven't heard of any [LP]

I am not really much educated about that, I was told that local economic development in Namibia policies are currently taking place on the parliament act of the vision 2030 , I don't much of the plans, they might be trying to taking technology on another level[LP]

5.5.2 How has the local authority tried to integrate ICT facilities in Oshikoto?

The responses from the respondent interviewed, showed that the local authority is doing its best to integrate ICT facilities in the Oshikoto regions. For instance, some of them noted that

They should integrate it by introducing computer literacy in schools and to the local people[LP]

They introduce ICT in the community, and have the centres to accommodate the local people[LP]

They are trying, as much as we can say they haven't done enough, they have computers in their offices. They hardly take it out to the local people, I don't know if the budget for the region is not that enough. I don't see them making much effort, they could have come up with campaigns educating us on technology but I don't see that much [LP]

Some of the respondents also argued that the burden of digitalization should not rest only on the local authority. They are of the view that the government at the center should also contribute to the growth of digital activities in the region so as to give it more presence.

5.5.3 How do you think digitalization can successfully be implemented in your region?

Inasmuch as digitalization is taking shape in Oshikoto region a lot still needs to be done to maintain the positive momentum. The respondents believe

They should give training to the local people, especially the one selling at market they don't practice advanced technology but still work manually by cash on hand [SL]

By creating awareness and teaching people about advantages on digitalization. Government should also allocate a budget for this[SL]

Mostly at home, introducing the communication technology to the people at home, the people that are educated on technology should start by teaching and involving people that do not know much about it. It should start from our homes and taken out there[LP]

I think we shouldn't really require so much on the government only, we can't only put the whole responsibilities to the regional council only we have private businesses here as well and the business should get involved in terms of educating people on technology, apart from using cell phones to go on (FB) they are not aware of anything else (technological revolution here in our area). Maybe they should educate people on different technologies you never know maybe some technological revolution of the next generation might come from the region. The local government should invest much in information technology it will be much better[LP]

5.5.4 What contributions do you make towards the ICT to ensure that it moves on sustainably?

Some of the respondents assist indigene of the region in the area of technology. As noted in their responses:

I help elderly people that don't make use of technology by educating them on how to use it[LP]

I'm a teacher, and am sure I have contributed to the society already[SL]

By coming up with projects and educating the community on the positive impacts of technology[SL]

I do try to make donations here and there, I have donated some cell phones and in my office we use Wi-Fi and ensure that staffs have computers[ML]

5.5.5 Are there any suggestions you would like to put forward as regards to digitalization development in the region?

For digitalization to thrive, respondents made some suggestions. While some of the respondents are of the view that staff of the local authority should be given more training, other argued that the training should trickle down to the locals. Nevertheless, the borderline is that training is important both to the staff of the local authority and the entire community. Other set of respondent called for more awareness so that indigenes will know more about digitalization and its benefit.

Another school of thought which cannot be overlooked posited that in as much as digitalization is given its pride of place, the authorities should not wish away the dangers it poses. Therefore, attention be given to the other side of the coin, which is in the area of cybercrime. This means that

policies to be in place to checkmate any nefarious activities that are inherent in the adoption of these digital innovations.

On the other hand, as indicated by some of the respondents, everybody should get involved. Projects specifically directed to educating people on technology also be carried out.

They should give training to the local community and make them understand the importance of using advanced technology[SL]

Let's create awareness, and also let the people know the danger of digitalization as you find the bad people that know about it and they try to take advantage for those that don't know. People should be educated about the negative and positive impacts should also be known[SL]

I think everybody should get involved not only, from us the business community, messages should be sent out there, not only through words but actions. We need funds and the involvement of the regional council, they can take the front step and we will follow. We need to engage in projects specifically directed to educating people on technology [ML].

5.6 Interpretation

5.6.1 Economic activities as Interpretive Scheme

The socioeconomic changes that complement technological taking are complete because they need reasoning changes and sensible changes in social procedures, physical resources and past informative schemes (Hinings and Greenwood, 1988). Interpretative patterns are known for their reputable, understood or taken for granted assumptions, principles or values of a culture that effects the way information can be understood and used in a social system (Hinings and Greenwood, 1988). Meanwhile the arrangements play dynamic parts in the inclosing of significant actions, that are critical in the organisation of structure and social relations that bring forth social actions to life in the community (Weick, 1995).

For the success way of improving people's lives in Oshikoto region there should be steps taken up, held to the level that changes take origin in the enlightening briefings in local cultures. Supporting digitalization with educational outlines from the values of accommodating communities is therefore lively for a successful technology transfer and acceptance. This is promising when there is provision and reassurance from authorities (**Section 5.4.3**). It also is partially because ICTs itself is an empowering tool, which creates new chances, possible new structures, and new methods of acting to things.

Even though ICT tools simply put up compound socioeconomic movements as of their flexibility, users should first be involved in some activities and only then they can take advantages of the skills they have gained toward technology to market their businesses and social tasks (**Section 5.3 and 5.3.1**). In most developed states with customs of innovation to technology, the optimal of technology and how the things are used in the society are influenced by economic factors such as, request for technology facilities, the drive for profits , capital accumulation and greater market share.

In Oshikoto region, tactics should be put into place to help monitor and convey the use of ICT into economically creative schemes for technology to be realized and it should happen where economic activity include low requests of technology. It could be in for top level policies to enhance its sustainability (**Section 5.3.1**). If there is no any plans to monitor ICT adoption, some tools are used to support other activities that do not contribute to economic growth.

It is therefore important for authorities in the Oshikoto region to assess what their resident's really want in favour to access ICT tools. According to Heeks (2005) explained that that a user's demand involves a bottom-up method of valuation which eventually discovers what users request and are ready to sponsor. Once the demand analysis is complete, specialists can then be gathered to search for new ICT facilities based on the demands. This can be achieved through envision of new services from a thought of the capabilities of ICT tools (Bunker, 2001). To generate new requests for ICT tools for instance, using mobile phones to relay market prices to enhance their profits there should be search for new solutions from existing problems in the society and the experts can rely

on the known competences of ICT tools to search for answers to possible difficulties in education, business, and other socioeconomic activities.

5.6.2 Technology Infrastructure as Facilities

The main reason of ICT infrastructure is that it benefits rural areas at the household and institutional level. For example, informal knowledge and weather forecast, market and health information are amongst the direct benefits imagined.

ICT strategy is to be one of the key influences that regulate the range of communication infrastructure in a specified environment (Lutz, 2003; Guerrieri et al, 2011). Above all, in the period of where technology advances and innovate on communication technologies grows at an advanced rate, in effect ICT policy bring into being crucial for corresponding socio economic development (Kramer et al, 2007). For sustainable infrastructure will in turn increase the number and quality of digital facilities that is procure this policy for communities. These facilities will go a long way in enhancing economic growth in the region.

The approval of ICT needs a business platform reassuring financial resources, open competition, trust, security and standardization for ICT. With all, that it will obliges the execution of sustainable actions to advance access to internet and telecommunications infrastructure as well as to increase ICT literacy, development of local internet based. Most developed African countries still rely on the content developed and managed in developed world. As a result, important costs are accessed through the content. One of the grounds that deject access to digital information is beliefs and language differences.

5.6.3 Mental and Technical Skills as Norms

The general nature of digital technology all the way through the work of everyday life pledges a alteration of current work and communication designs. The potentials of meeting and assimilation that digital technology compromises have allowed its supremacy of the technical developments in media and communications (Gere, 2002).

The creation of 'digital' technology brought into existence new methods such as, digital television, mobile phones, computer games, virtual reality and the Internet. These technological improvements in their turn affect principles, ways and customs in a society.

Eshet-Alkalai (2004) clearly stated that in the digital era, digital literacy was a survival skill of all time. Therefore, it established a scheme of skills and approaches that are used by users in a digital environment. The meaning provided by Clark & Visser (2011) comprises both technical skills and cognitive in using ICTs to find, create, evaluate, and communicate information within the digital environment. Robles (2016) explains about keen stabs to balance change and for stability of traditions that is exceedingly visible in education policy texts and everyday addresses. Evan (2015) detailed on the persistent nature of technology in this fast changing digital world and hence, the need to restructure the curriculum to fit the developing needs of the digital society.

According to Ala-Mukta (2011), "Technologies are increasingly being used in society and the economy, and this is transforming ways of working, studying, communicating, accessing information and spending leisure time. Being able to benefit from digital tools and media can support all the spheres of life in society today. The internet and social technologies are increasingly used by all groups of citizens" (ibid.:5). It is specified that the benefits use of technology differs from one user to another, for they each gain in different way. The people that do not have enough digital skills run the risk of not being included in important activities and probably endanger themselves in usage of the digital technology tools and media by not having full advantage of the available opportunities. This can also also affects the mental capabilities of member of the community.

Mental attitude determines an individual's reactions and understandings of a situation or circumstances. The mental attitude is changeable and it can be reformed in order to help the person's needs (Dweck 2007). It has been perceived that a very pretentious belief about one's self can guide and permeates nearly every part of an individual's life. The belief can enable success even though it can limit a person's potential. Among any other things, a mental attitude can influence ability to face challenges, confidence, creativeness, flexibility to setbacks, levels of

depression, and the tendency to stereotype (Dweck, 2007). In short, a mental attitude defines a person's daily lifestyle.

As mentioned before, the word "mental attitude" has its origins in perceptive psychology but now it is gaining ground in organisations and strategic management theory. Through filters only, an individual's present mental attitude can be protected and can help in selecting what one can absorb and understand it.

There is no hesitation that there are people in today's society who live with both growth and fixed mental attitudes. Nevertheless, with the process of digitalization it only shows that the society is going through very important processes. The mental attitudes live in a digital world, surrounded with digital technology. If we tend to add "digitalisation" to Dweck's (2007) explanation of mental attitude, it can be altered into a digital mental attitude.

This means that someone that has a background or a digital mentality is likely to be curious about technology and will try their best to grow or improve his/her situation through practicing it. With this mentality, it will always lead to embracing the encounters or challenges that that technology has because these challenges are seen as opportunities to become stronger and better. A person with a digital mentality they feel and become very relaxed around digital technology. They also tend to have a lot of information about it, which leads to integrating this knowledge and technology itself in his/her life style (**Section 5.4.2**).

5.6.4 Institutionalization of digitalized local economy

Given the above analysis and interpretation of collected data and drawing from the literature reviewed and theoretical lens for this study, actors and organizations have indicated a need to explore institutionalization processes in relation to the perception of the materiality on which it is based i.e., IT (Fountain, 2001). Orlikowski and Gash (1994) outline diverging perceptions of IT and its use in organizations and/or communities, and if not taken into account may restrict or have restricted an organization and/or a community from benefitting from digitalization capabilities. In this subsection, the focus is specifically on how digitalization, which "embodies" the local

economic development agenda as inscription, can become institutionalized and how it can contribute to the institutionalization of a digitalized local economy.

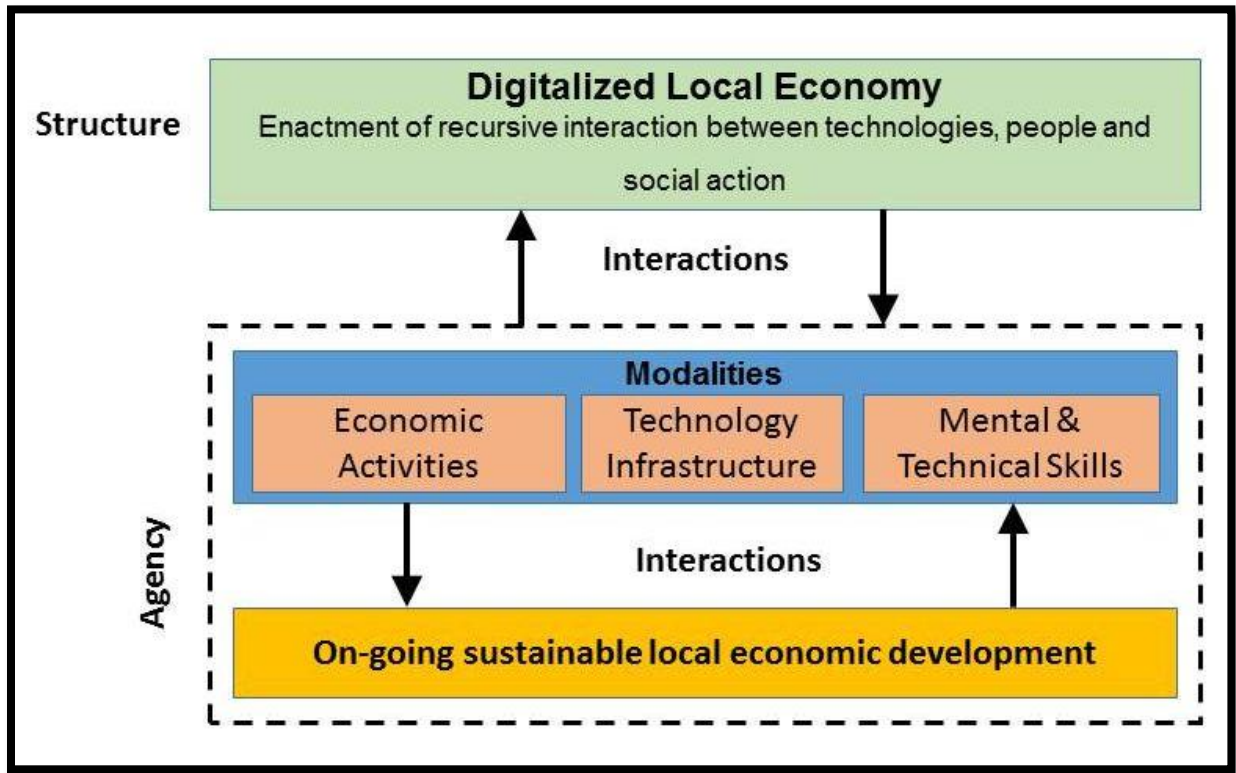


Figure 5. 2: Proposed Institutionalization of digitalized local economy

Figure 5.1 above illustrates the enactment of recursive interaction between technologies, people and social actions as embedded in the structural organisation of digitalized local economy. The figure interprets the role of technology infrastructure, economic activities and mental and technical skills in ensuring sustainability of local economic development in establishing digitalized local economy using Oshikoto region as a case study. The proposed institutionalization framework demonstrates an understanding of the efforts to institutionalize digitalized economic activities. Institutionalization of digital local economy is concerned with structures embedded with material practices that influence actors' continuous relationship and interaction with their institutional environment (Friedland & Alford, 1991; Thornton, Ocasio & Lounsbury, 2012). It thereby provides a theoretical framework in understanding how material practices related to digitalization influence the perception of technology infrastructure in digitalization. In addition, it clarifies the extent to which it is possible to change these perceptions.

By relating these perspectives to the current situation at Oshikoto, it indicates that the current diverging perceptions of the role of digitalization in institutionalizing sustainable local economic development are likely to exist in the organizations and/or communities. How organizations tasked with the responsibility to improve and sustain local economic development handle these differences may be crucial to the institutionalization process. However, the proposed institutionalization framework (Figure 5.1) can be used to explore these dynamics. It is therefore worthwhile to draw on the dimensions of duality of technology from Orlikowski and Gideon's of the concepts of institutionalization to explore the interplay between social structures, material practices and agencies to shape institutions to deliver community services.

5.7 Summary

This study tended to understand the role of digitalization in sustainable local economic development and was premised on the fact that digitalization is a panacea to development and not development in its self. In this, it means that digitalization can be used as a tool to foster economic-social development. As Harindranath and Sein (2007) assert, digitalization can be viewed as a tool and vehicle for development where and when digitalization is conceptualised as a technical entity, and a means to achieving effectiveness in the use of limited resources for service delivery. Moreover, in this view of digitalization as a tool, digitalization becomes drivers in the economy in achieving sustainable development.

The findings demonstrated in this section shows the extent to which communities felt that digitalization has impacted and changed their lives. Mulira (2007) asserts that Municipal-driven ICT compromise a likely solution for addressing rural connectivity taking advantage of new wireless and other technologies that enable cost-effective mechanisms for reaching out in areas with limited infrastructure, the case with the Oshikoto region. All this is in view of digitalization availing positive impacts to rural livelihoods.

The findings demonstrated that all what digitalization brings is digital business that enables the use of digital technology to connect service providers to their customers/clients and vice versa.

Thus, specifically, about online and internet activities which make individuals to find it easy to carry out businesses with the banks, government and other offices. Largely, the smart mobile phones are the key to digital business, which business owners and consumers felt they were really helping to achieve digitalization. However, a number of respondents also acknowledged the costs involved in the acquisition and use of technology/equipment and the lack and/or cost of electricity are hindering digitalization. In summary, technology has come to stay and extensive digitalization of communities will largely enhance the life of the rural populace.

CHAPTER SIX: CONCLUSION AND RECOMMENDATION

6.1 Introduction

This chapter presents the conclusions and recommendations, which are based on the findings of the study in line with the research objectives. The conclusions involve a summary of the most significant issues and their alleged effects as found out in the study. The recommendations on the other hand are proposed purposely for enhancing the role of digitalization in Oshikoto Region of Namibia.

6.2 Overview of the research

Chapter one (1) presented and introduced the research. It also presented the research problem, research objective, research questions and significance of the study.

Chapter two (2) reviewed related literature on digitalization and rural development. It emphasized the various researches that were carried out and how such knowledge served as a guiding in examining the contribution of ICTs to sustainable rural development. The literature is also critically reviewed through identifying the gaps and employing the lessons to inform the body of knowledge in ICT for development.

Chapter three (3) discussed the theory underpinning this research, which is the theory of duality of technology. The chapter also discussed its significant effects for research into IS as to how it relates to this study.

Chapter four (4) discussed the strategies that the research adopted in attaining the information necessary to achieve the research objective, research questions, the projected sources of information and procedures of data analysis. Finally, data was presented and in chapter five in line with the research questions, literature reviewed and the theoretical framework.

6.3 The research questions revisited

The aim of this research is to understand and interpret the influence of digitalization on sustaining economic development of a local community. This study was conducted to seek answers to the following research questions:

6.3.1 Research Question 1:

How do digitalization activities take place in the local economy of Oshikoto?

Findings revealed that digitalization take place in the region through the use of information technology to carry out various activities. For instance, it was revealed that members of Oshikoto region enjoy technology through using facilities to carry out banking transacting like cellphone banking and online shopping (**Section 5.3**), sending emails and also academic activities such as short courses using computers and the internet(**Section 5.3.1 and 5.3.1**).

6.3.2 Research Question 2:

How can the perceptions of the local people about the digitalization activities taking place in the local economy of Oshikoto be assessed?

The people of Oshikoto region, from their reactions, see digitalization from the positive perspective (**Section 5.5.2**). They believe that technology will certainly improve their lives and make things more easy (**Section 5.4.3**). The findings revealed that the responses showed that indigenes would be very happy if more technological innovations are introduced in the region (**Section 5.4.2 and 5.4.3**)

6.3.3 Research Question 3:

What general guidelines can be used to digitalize sustainable local development in Oshikoto?

In as much as the indigenes noted that they do not have much knowledge about laws, rules or regulations, they believe that set guidelines will go a long way to improve and set the pace for technological development (**Section 5.5.1**). The finding revealed that the regional government is in a better position to set the guidelines, which will guide the use of technology.

6.4 Research contributions

6.4.1 Theoretical Contribution

The theoretical framework constitutes the lens through which this research was carried out. This study was modelled on the dimensions of Duality of Technology (DoT) in relation to sustainable local economic development (**Chapter 3, section 3.4**). Both of these combined allowed for understanding the critical role of digitalization in Oshikoto regions, which demand a lot on actors such as technology infrastructural, economic activities and uptake capabilities. Without the use of DoT as a theoretical lens, it would have been difficult to interpret and explain the interplay between these actors and how digitalization of local economic development can be institutionalised to sustain such developmental agenda.

6.4.2 Methodological Contribution

This brings the knowledge experience extended over the submission of the case study scheme and the methods applied for collecting data. This practice may be useful for other studies on the implementation and use of ICT in other regions of Namibia. Furthermore, a procedural contribution relates to the suitability of applying research methodology developed in other contexts, which, in this study, was the use of qualitative approach from the perspective of an interpretive philosophy.

6.4.3 Practical Contribution

The practical contribution of this study is the comprehensive understanding provided by the case study. The case study revealed that ICT-related activities are interrelated to productivity in organizations and to some extent how the organisation plays itself in the community within which it delivers services. This implies that for effective implementation sustainable local economic development, the importance should be placed on the understanding of how the actors (not human alone) will interact together to achieve better performance.

6.4.4 Assessing the contribution

The contributions of this study are three-fold:

- (a) Firstly, they invent and lie in the evaluation of the relevant literature on the relationship between digitalization and how its use for the development of the community.

- (b) Secondly, the impact lies in the empirically ironic understandings provided by the case study (Oshikoto region) and the theory used to guide the digitalization initiatives in the region. This concept helped to achieve an understanding of the interaction between ICT and development.
- (c) Thirdly, to be able to assist other researchers in carrying out a similar study in other developing countries circumstances, a contribution lies in the fieldwork description and the data techniques applied in this study process (**Chapters 2, 3 and 4**).

6.5 Conclusion

The fact that there's a positive availability of ICTs in Oshikoto which therefore shows that the region is not left out of digitalization and not behind in the digital age. However, ease of use of technologies and the real influence on communities' development are not equal. This research set out to answer this question, along with a number of sub questions on the use of digital amenities within the community. The general findings indicate that the use of ICTs in Oshikoto has changed some people's lives who have used it in changing degrees for example to improve working performance through the use of the computer, improving performance of students through basic computer skills and retrieving relevant information on development through the use of Internet, publications, and media services (Section 5.3.3). Additionally, ICTs in Oshikoto are delayed by many institutional, socio-economic and technical problems such as poor infrastructure (section 5.4.4).

The expectations of the people in this region who make use of the digital facilities imitate the level of accepting and understanding the association that occurs between the living situations. With this positive approach it can be taken to mean an approval of ICTs by certain groups in the region, which proposes that these tools can be misused to improve local economic development efforts. As discussed in the findings, people of the region have experienced life changes in their effort to applicable ICTs. These changes include attaining new skills and more competence in job-related activities (**Section 5.3.3**). This low level of influence means that the weight should now be put on taking extensive actions that will meet not only the potentials of the whole region but also combine the advances that have been made in ICT appropriation by remote, rural communities (Thioune, 2003).

6.6 Recommendation

For the development of the needed technologies to be provided, it will have to be linked with needed skills, and the Government should be able to provide all the needed ICT infrastructures for the rural communities.

As a result of the findings, it is therefore recommended that the top officials (government) should offer the rural communities with the necessary ICT infrastructure needed. The government should start by revisiting the related national programs like “the rural electrification, rural telecommunications and the Connecting Communities programmes to feature in the structural requests to use Internet”. The development of the necessary infrastructure and technologies has to be used with the required skills.

Secondly, this study recommends and advise the local government and the community to work together to develop projects of particular programmes that could benefit, educate and update the community people to efficiently make use of ICTs. Such association can be reached through commitment by continued community engagement and involving them in the management of different centres, which will later have to function as technology leaders for both the individual centres and users. These recommendation further calls for research that will be more keen enough to keen to endure community engagement in such programs. For any existing education, programs or groups that are offered by the community library also have to be well reorganised in a way that they will be able to cater for different user levels.

Therefore, it is also suggested that the private telecommunication services providers and the government they should support the unconnected centres with financial schemes and entrepreneurs programmes, so that the centres become sustainable developed (Duncombe&Heeks 2002: 66).

In addition, the government management is advised and encouraged to support online submission of any information that will be needed for different services around the community like social services. The Economic Intelligence Unit (2013:6) have successfully reported cases of such (electronically by default) government services in e-mature states like the United Kingdom (UK).

This research advises and vouch to get some elements that they can make use and apply them toward social services in Oshikoto Region.

A belief such as that from the management of the government can oblige the people in the community to study how to make use of particularly internet. Kozma and Wagner (2006:7) refer to such a knowledge culture to both as constructive and intrusive. Whereby when the municipal have no options but to learn referred as (intrusive) and to address the social needs (constructive). For instance, none of the interview participants had made use of internet banking before just because they had not come across the need of using it or for such a transaction.

This study titles to set up structure of ordering ICT research output. With such a source it will be able to advice the decision makers at international and national levels like African Ministerial Conference on Science and Technology (AMCOST) on country level development.

To conclude, this study encourages that research should be done on various areas on which Nnafie (2002:12) refers to as “a complex and indirect sequence from use to impact”. For instance, one study could focus on different matters that are related to access of ICTs through library centres. It is also suggested that the valuation of the economic impact of different centres of the community should be studied; this is to have an open understanding to how they contribute and benefit the people. The research should therefore go further and study the usage of mobile telephones and how they can be incorporated to build programs that assist the community to access internet for development.

6.7 Limitations

Digitalization being a new approach to local economic development as further development on ICT4Dbrought some kind of resistance from the local population in answering some of the pertinent issues; for instance, whether ICT has impacted on their lives and their view as regards the digitalization in the area for fear of losing support from the service providers. Also, many people in local communities are quite expectant and once researchers get there, they hope to gain “handouts” in return of their information. To overcome this, however, a strong rapport from the start with community leaders and a clear introduction of the process of data collection was used

which helped to reduce these challenges. Another limitation is distance and financial implications as the data were collected from remote area.

6.8 Future Research

The study wishes to suggest that future research should focus on analysis of community involvement, in changing the current state of Oshikoto Region by means of use digital technology. More research has to be done on the application of digital technology in redefining state of rural communities. Future studies are needed to show if research recommendations in the use of ICT for local development have been implemented effectively. Further research is also needed to determine how the livelihood of the rural poor communities in Oshikoto can be improved through the implementation of digital business to empower small and local businesses.

6.9 Summary

This chapter did demonstrate that the objectives of the study have been achieved and has explained how the study attempted to contribute to knowledge. Furthermore, this research study's limitations provided insight into further areas of research to digitalized local economy and its development.

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APPENDICES

Appendix A: Interview Guide



Interview Guide

Introduction

My name is Elizabeth Veiko a postgraduate student at Cape Peninsula University of Technology (CPUT), registered under the faculty of MTech: Business Information Systems conducting a study on “The role of digitalization in a sustainable local economic development of a community in Namibia”. The purpose of carrying out this interview is to understand and interpret the influence of digitalization in a sustaining economic development of your community.

Informed Consent

Kindly consider this following information carefully before deciding whether to participate in this research.

What to be done on the research: If you are please to partake in this interview you will be asked several questions with your permission. I will voice record the interview to avoid making alot of notes. Your name on the audio will not be recorded.

Time required: Time interview will be approximately 45 minutes

Risks: No risks anticipated

Confidentiality: Everything that you say throughout the interview will not to be disclosed and your actual identity will not be revealed. The transcript without your name but with a unique number that i will assign to you will be kept until the research is completed.

Agreement: The nature and purpose of this research have been sufficiency explained and I agree to partake in this study.

Signature: _____ Date: _____

Name (print)

General demographics information:

Interview code; _____	Age _____
Gender: _____	Marital status: _____
Nationality: _____	Religion _____
Highest education: _____	Profession: _____
Current employer: _____	

Interview Questions:

1. *What are the kinds of technology activities taking place in the local economic of Oshikoto?*

Sub questions:

- a) Are you aware of any technology related activities local people of Oshikoto engage in? If so, what are these activities?
- b) How are these activities used?
- c) Are the activities meaningful to your lives?
- d) How are the technology devices acquired?
- e) What management strategies are in place to ensure sustainability through the use of ICT facilities?

2. *How can the perceptions of the local people about the digitalization activities taking place in the local economy of Oshikoto be assessed?*

Sub questions:

- a) What do you know about digitalization?
- b) What are the local people's behaviors towards digitalization?
- c) What change have you witnessed in your lives ever since ICT was introduced in this region?
- d) Does the local authority encourage the local people to get engaged in digitalization activities?
- e) Are there any challenges you face in trying to make use of digitalization activities?

3. *What general guidelines can be recommended to digitalize sustainable local development in Oshikoto?*

Sub questions:

- a) What do you know about the laws/ policies that facilitate growth of local economic development?

- b) How has the local authority tried to integrate ICT facilities in Oshikoto?
- c) How do you think digitalization can successfully be implemented in your region?
- d) What contributions do you make towards the ICT to ensure that it moves on sustainably?
- e) Are there any suggestions you would like to put forward as regards to digitalization development in the region?

Appendix B: Ethics Clearance



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Symphony Road Bellville 7535

Office of the Chairperson Research Ethics Committee	Faculty: BUSINESS AND MANAGEMENT SCIENCES
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At a meeting of the Research Ethics Committee on 02 November 2017, Ethics Approval
was granted to Elizabeth Veiko (217080731) for research activities
Related to the MTech/DTech: Mtech Business Information System at the Cape Peninsula University of
Technology

Title of dissertation/thesis/project:	THE ROLE OF DIGITALIZATION IN SUSTAINABLE LOCAL ECONOMIC DEVELOPMENT OF A COMMUNITY IN NAMIBIA. Lead Researcher/Supervisor: Dr M Twum-Darko
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Comments:

Decision: APPROVED

	02 November 2017
Signed: Chairperson: Research Ethics Committee	Date

Appendix C: Consent Letter



OMUTHIYA TOWN COUNCIL

Tel: (065) 244 700
Fax: (065) 244 730
E-mail: smbango@omuthiyac.org.na

P.O. Box 19262
OMUTHIYA
NAMIBIA

OFFICE OF THE CHIEF EXECUTIVE OFFICER

Enquiries: Mr. David Israel

Date: 31 July 2017

To whom it may concern

I Samuel P Mbango, in my capacity as Chief Executive Officer at Omuthiya Town Council give consent in principle to allow Elizabeth Veiko, a student at the Cape Peninsula University of Technology (CPUT), to collect data in this company as part of his/her Master of Technology research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate).

	Thesis	Conference paper	Journal article	Research poster
Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Regards


Samuel P Mbango
Chief Executive Officer



All official correspondence should be addressed to the Chief Executive Officer